

CampbellReith
consulting engineers

# Kemp Heaton Avenue

## Flood Risk Assessment and Drainage Strategy

For

Great Places Housing Group

Project Number:

13753

August 2023

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## EXECUTIVE SUMMARY

CampbellReith has produced this Flood Risk Assessment (FRA) and Drainage Strategy to support an outline planning application for the proposed residential development at Kemp Heaton Avenue, Bury. The proposed development incorporates approximately twenty five residential dwellings ranging between one and two bedroom as well as eighteen supported living apartments within a low rise complex. The development also includes access, infrastructure, gardens and landscaping.

No surface water bodies are present on site however, the River Roch, an ordinary watercourse, lies just beyond the eastern boundary of the site. The entirety of the site is contained within Flood Zone 1 and is considered to be at low risk from fluvial flooding. Surface water flood risk will be mitigated and managed on site through levels design and as such is considered to be a low residual risk. The site is not deemed to be at risk from groundwater flooding. The site is at low or very low risk of flooding from all other sources.

The geology of the site indicates Clay, Silt, Sand and Gravel over layers of Sandstone.

There is an existing public combined sewer running through the centre of the site within Kemp Heaton Avenue. Taking into account the site levels and invert of existing system a gravity system is proposed to drain foul effluent from the site with a discharge into the existing United Utilities public sewer.

The proposed surface water drainage strategy seeks to utilise a combination of Sustainable Drainage Systems such as permeable paving and cellular attenuation tanks to provide attenuation and water quality improvements. Surface water runoff will be discharged into the existing public surface water sewer in the north eastern corner of the site via a package pump station with discharge at no more than greenfield runoff rate for all rainfall events up to and including the 1 in 100 year + 40% climate change event.

The proposed development is located in an area which is at the lowest risk of flooding from any source. The proposed strategy will not increase flood risk on or off the site for the lifetime of the development.

# 1.0 INTRODUCTION

## 1.1. Brief

1.1.1. CampbellReith has been commissioned by Great Places Housing Group to prepare a Flood Risk Assessment (FRA) in accordance with the National Planning Policy Framework, to inform the residential development at Kemp Heaton Avenue, herein referred to as 'the site'. The site location is contained in Appendix A.

1.1.2. This assessment is a qualitative report and has been based on readily available information and is supported by a site visit undertaken by CampbellReith.

1.1.3. The FRA has been prepared in support of an outline Planning Application for the above proposed development.

## 1.2. Project Overview

1.2.1. The development incorporates approximately twenty five residential dwellings ranging between one and two bedroom as well as eighteen supported living apartments within a low rise complex. The development also includes access, infrastructure, gardens and landscaping. The proposed site layout is shown in Appendix F.

## 1.3. Aims and Objectives

1.3.1. This report has been prepared in accordance with the National Planning Policy Framework (NPPF)[1] and the accompanying Planning Practice Guidance (PPG)[2].

1.3.1. This FRA aims to identify the sources of flooding related to the site whilst demonstrating the feasibility of residential development and how residual risks, if any, could be managed.

1.3.2. The objectives of this FRA are to:

- Establish whether the site is likely to be affected by current or future flooding from any source;
- Establish whether proposed future development will increase flood risk elsewhere;
- Establish whether the measures proposed to deal with these effects and risks are appropriate;
- Ensure the evidence to satisfy the Local Planning Authority's (LPA) (if necessary) Sequential Test, and;
- Establish whether the Lead Local Flood Authority (LLFA) has records of flood risk on the site and within the surrounding area;
- Present the findings of the assessment through a site constraints plan (if applicable)
- Demonstrate surface water can be managed on site by preparing an illustrative surface water drainage strategy.

[1] Ministry of Housing, Communities & Local Government (2021) National Planning Policy Framework. Ref: ISBN 978-1-5286-1033-9, CP 48.
[2] Department for Environment, Food & Rural Affairs and Environment Agency (2021) Planning Practice Guidance: Flooding and Coastal Change

## 2.0 PLANNING POLICY

### 2.1. National Planning Policy Framework (NPPF)

2.1.1. The NPPF as updated in July 2021 sets out the government's national planning policies to protect people and property from flooding from either now or in the future which all Local Planning Authorities (LPAs) are expected to follow. There are three main steps which should be followed to ensure that the risk of flooding from development is minimised; assess the flood risk, avoid flood risk and manage and mitigate the flood risk.

2.1.2. The NPPF recommends that new development adopts a sequential, flood risk-based approach to the location of development, taking into account climate change and its impact to or by current or future flood risk. Subject to the type of development proposed and the relative flood zone (Zone 1 being the least risk and Zone 3b the greatest risk) in which the development site is located, there can be a requirement for a sequential test and an exception test.

2.1.3. The aim of the sequential test is to steer development to areas considered to be at the lowest risk from sources of flooding. If this is not possible then the exception test would be required demonstrating that the development would provide wider sustainability benefits to the community that would outweigh the flood risk and that the development would be safe for its lifetime taking into account the vulnerability of the users without increasing flood risk elsewhere and where possible reducing the current risk of flooding.

2.1.4. The NPPF also states that major developments should incorporate sustainable drainage systems (SuDS) unless there is clear evidence that this would be inappropriate.

### 2.2. Flood Risk and Coastal Change Planning Practice Guidance (PPG)

2.2.1. A FRA is required when developments are:

- Located within a Flood Zone 2 or 3 including minor development and change of use;
- More than 1 hectare (ha) in a Flood Zone 1;
- Less than 1 ha in a Flood Zone 1, including a change of use in development type to a more vulnerable class (for example from commercial to residential), where they could be affected by sources of flooding other than rivers and sea (for example surface water, reservoirs); or
- In an area within a Flood Zone 1 which has critical drainage problems as notified by the Environment Agency (EA).

2.2.2. Annex 3 of NPPF defines the various flood risk vulnerability classifications and identifies the different types of development within each category. Table 2.1 on the following page summarises the flood risk vulnerability and incompatibility as extracted from Paragraph 079 (Table 2) of the PPG in relation to the above flood zones.

*Table 2.1: Flood Vulnerability and Flood Zone 'Incompatibility' Table*

| Flood Zones | Flood Risk Vulnerability Classification | | | | |
|---|---|---|---|---|---|
| | Essential Infrastructure | Highly Vulnerable | More Vulnerable | Less Vulnerable | Water Compatible |
| Zone 1 | ✓ | ✓ | ✓ | ✓ | ✓ |
| Zone 2 | ✓ | Exception Test Required | ✓ | ✓ | ✓ |
| Zone 3a† | Exception Test required† | × | Exception Test Required | ✓ | ✓ |
| Zone 3b* | Exception Test required* | × | × | × | ✓* |

Key ✓Development is appropriate.

× Development should not be permitted.

† In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

* In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

## 2.3. Roles and Responsibilities

2.3.1. The EA are a statutory consultee for planning applications. The EA are responsible for managing the risk of flooding from main rivers, reservoirs, estuaries and the sea.

2.3.2. The roles of the LLFAs were established following the Flood Risk Regulations (2009) and the Flood and Water Management Act (2010). They are responsible for developing, maintaining and applying a strategy for local flood risk management in their areas and maintaining a register of flood risk assets. They also have lead responsibility for managing the risk of flooding from surface water, groundwater and ordinary watercourses.

## 2.4. Climate Change[3]

2.4.1. The NPPF sets out how the planning system should help minimise vulnerability and provide resilience to the impacts of climate change. The EA provide guidance on the climate change allowances which should be considered when assessing the future risk of flooding.

2.4.2. EA has produced a range of climate change allowances to be applied to the peak river flow and rainfall intensity based upon the river basin management catchment. Management catchments are sub-catchments of river basin districts. The site is located in the Irwell Management Catchment within the North West River Basin District. Table 2.2 shows the anticipated changes to peak flow, which should be considered for the area.

[3] EA Climate Change Allowances: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

2.4.3. The range of allowances is based upon a statistical analysis above the 50th percentile which is regarded as being the central category. The higher central is based upon the 70th percentile and the upper end is based on the 95th percentile.

*Table 2.2: Peak River flow allowances by Irwell Management Catchment within the North West river basin district (use 1961 to 1990 baseline)*

| Allowance Category | Total Potential Change Anticipated For The '2020s' (2015 to 2039) | Total Potential Change Anticipated For The '2050s' (2040 to 2069) | Total Potential Change Anticipated For The "2080s" (2070 to 2115) |
|---|---|---|---|
| Central | 12% | 19% | 35% |
| Higher central | 15% | 26% | 46% |
| Upper end | 24% | 46% | 75% |

2.4.4. Climate change allowances should be applied to the peak rainfall intensities. EA has produced updated rainfall allowances for both 1% and 3.3% annual exceedance rainfall events for each Management Catchment. Table 2.3 and Table 2.4 show the anticipated change in extreme rainfall intensity in small and urban catchments. The upper end allowances for both the 1% and 3.3% annual exceedance probability events should be applied for Flood Risk Assessments to assess the range of impact.

*Table 2.3: EA Peak Rainfall Intensities (3.3% annual exceedance probability)*

| | Total Potential Change Anticipated For The '2050s' (2040 to 2069) | Total Potential Change Anticipated For The "2080s" (2070 to 2115) |
|---|---|---|
| Central | 25% | 30% |
| Upper end | 35% | 40% |

*Table 2.4: EA Peak Rainfall Intensities (1% annual exceedance probability)*

| | Total Potential Change Anticipated For The '2050s' (2040 to 2069) | Total Potential Change Anticipated For The "2080s" (2070 to 2115) |
|---|---|---|
| Central | 25% | 30% |
| Upper end | 40% | 45% |

## 3.0 LOCAL POLICIES AND GUIDANCE

3.1.1. The following documents have been reviewed to inform this assessment:

- Bury Metropolitan Borough Council (October 2018) Local Plan Policy Directions
- Bury Metropolitan Borough Council (October 2018) Local Plan Topic 6 – Flood Risk
- Greater Manchester Combined Authority (March 2019) Level 1 Strategic Flood Risk Assessment (SFRA) for Greater Manchester
- Greater Manchester Combined Authority (October 2020) Level 2 Hybrid Strategic Flood Risk Assessment (SFRA) for Greater Manchester
- Bury Metropolitan Borough Council (May 2011) Preliminary Flood Risk Assessment (PFRA)
- Greater Manchester Combined Authority (January 2012) Stage 1 - Surface Water Management Plan (SWMP)
- Greater Manchester Combined Authority (January 2013) Stage 2 - Surface Water Management Plan (SWMP) Water Street
- North West Regional Flood & Coast Committee (April 2020) North West SuDS Pro-Forma
- North West Regional Flood & Coast Committee (April 2020) North West SuDS Pro-Forma: Guidance

### 3.2. Local Flood Risk Policy

3.2.1. The site is within the jurisdiction of Bury Metropolitan Borough Council (BMBC) and the Greater Manchester Combined Authority (GMCA). Bury Metropolitan Borough Council is responsible for the Local Plan which covers the 2018 – 2037 timeframe and has a number of policies relating to both flood risk and water, which guide planning and development decisions.

3.2.2. The following policies should be considered when assessing flood risk and surface water management of the site:

- Policy OP1 – Sustainable Development
- Policy OP3 – Climate Change
- Policy OP5 – Flood Risk Management
- Policy NE4 – Water Resources

### 3.3. Strategic Flood Risk Assessment

3.3.1. A Level 1 SFRA was prepared by JBA Consulting for Greater Manchester Combined Authority in March 2019. The following sources of flood risk were identified within the study area:

- Fluvial
- Surface Water
- Groundwater
- Canal and Reservoir

3.3.2. A Level 2 SFRA was prepared by JBA Consulting for Greater Manchester Combined Authority in October 2020 and aligns closely with the Greater Manchester Spatial framework. The Level 1 SFRA helped identify high risk sites to be assessed through this Level 2 SFRA, and the GMCA Strategic Flood Risk Management Framework (2019). The Framework helped provide a broad spatial framework for flood risk management across Greater Manchester, highlighting the key strategic flood risks and recommending key priorities for intervention.

3.3.3. Applicable maps and extracts are contained in Appendix B.

### 3.4. Surface Water Management Plan

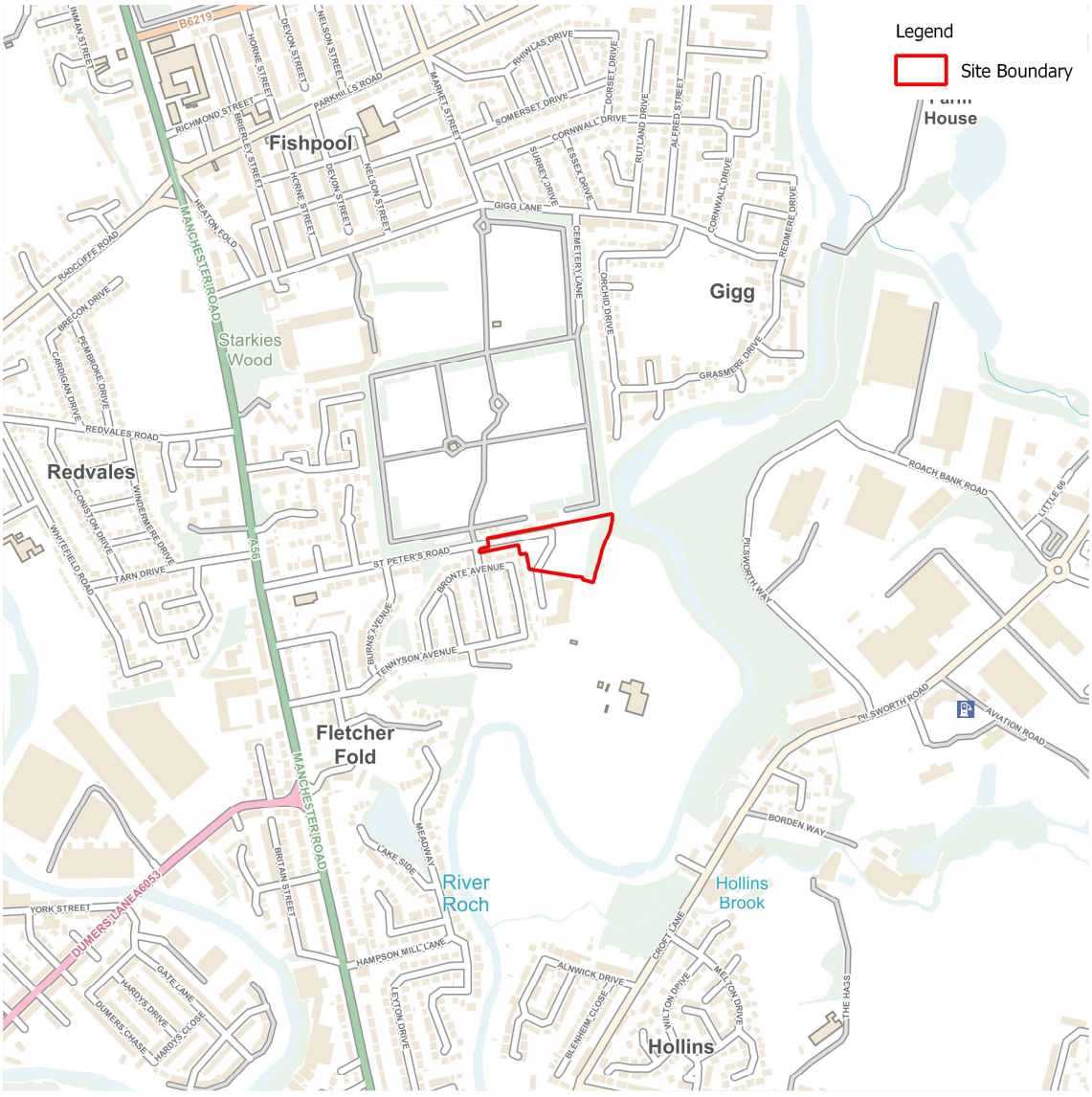
3.4.1. The Greater Manchester SWMP was completed in January 2013 and comprises two stages. Stage One considered Greater Manchester as a whole and Stage Two developed area specific SWMPs, one of which relates to Water Street in Radcliffe. Stage one and two provide:

- A strategic overview of surface water flood risk in Greater Manchester and the interrelationships between districts
- A more detailed assessment of surface water risk in Water Street
- Evidence to inform Bury's Local Flood Risk Management Strategy
- Good practice guidance to inform future strategic, area or site based surface water management planning activities within the Borough.

## 4.0 SITE CONTEXT

### 4.1. Site Location

4.1.1. The site is located at Kemp Heaton Avenue, Bury, as illustrated in Figure 3.1 below. The nearest postcode for the site is BL9 9GQ and the National Grid Reference for the approximate centre of the site is 380987 E, 409022 N.




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*Figure 4.1: Site Boundary*

4.1.2. Bury Metropolitan Borough Council are the Local Planning Authority (LPA) for the site and act as the LLFA for the area.

4.1.3. The existing site is currently occupied by undeveloped land in the east and Kemp Heaton Avenue in the West. The site is bound to the north by Bury Cemetery to the east by playing fields and to the south and west by residential developments. The River Roch, and EA main river, flows along the eastern boundary of the site adjacent to the area of open space directly

to the east. The wider area is comprised of further residential developments, Sporting facilities such as Bury cycleway and football foundation and public open space.

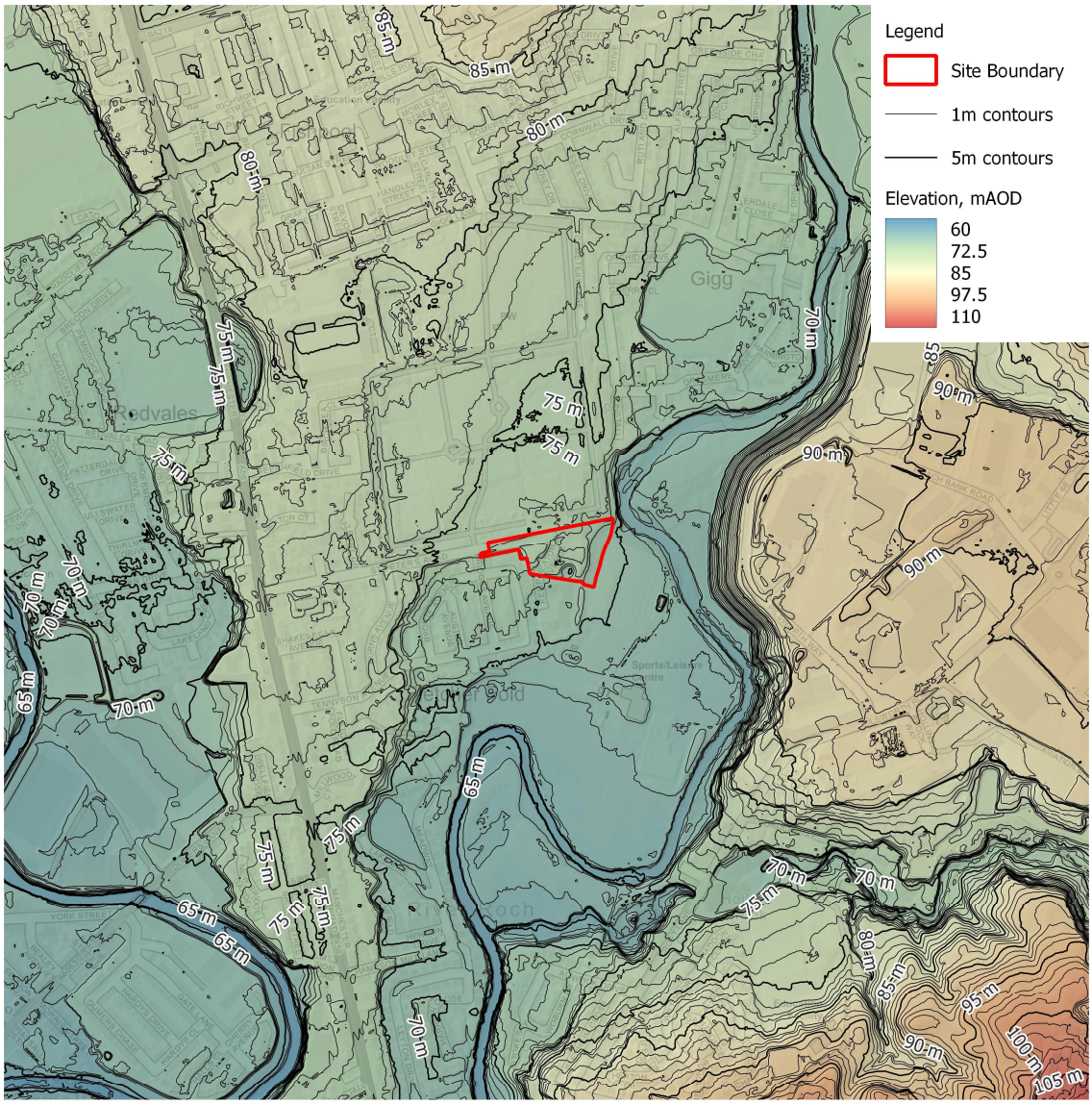
## 4.2. Site History

4.2.1. A Groundsure Report completed in June 2022 suggests that the site remained free from significant development until the 1970s when William Kemp Heaton Training Centre was shown to be present. The training centre was demolished in c.2017 and the site has remained undeveloped since. Historical Landfill is present towards the eastern site boundary associated with a former goit.

## 4.3. Topography

4.3.1. Lidar data has been obtained as part of this assessment and is shown in Figure 4.2 below.

4.3.2. A topographical survey was undertaken by DYWIDAG in September 2021 (ref: 2671T_Kemp_Heaton_Avenue_SU001) and is contained in Appendix C.




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*Figure 4.2: Lidar Data*

4.3.3. Available data indicates a high point in the north western corner of the site with levels falling gradually across the site towards the eastern boundary towards the watercourse beyond. Existing ground levels are shown to range from approximately 74.51 mAOD (above ordinance datum) in the north-west of the site to 70.13 mAOD in the north-east of the site.

## 4.4. Geology

4.4.1. The British Geological Survey (BGS) Online Geology Viewer[4] notes the underlain bedrock for the site as Trencherbone Rock (Sandstone, Sedimentary bedrock) and notes the superficial deposits as Head – Clay, Silt, sand and gravel and River Terrace Deposits.

4.4.2. Historical borehole logs within the vicinity of the site sourced from the British Geological Survey (BGS) website record topsoil overlying Made Ground, Alluvium, River Terrace Deposits and Glacial Till overlying Mudstone and Sandstone of the Pennine Lower Coal Measures (PLCM). The expected geology is summarised in Table 4.1.

*Table 4.1: Site Geology*

| Strata | Expected Thickness (m) | Generalised Description |
|---|---|---|
| Topsoil | 0.50 | Upper layer of soil and Grass. |
| Head/made Ground | 1.50 | The nature and composition of Made Ground materials present on site are currently unknown and are likely to be highly variable. |
| Alluvium | 1.00 | The Alluvium deposits are recorded typically comprising silt and organic-rich clay with beds and lenses of sand, gravel and peat. |
| River Terrace deposits | 1.00 | River Terrace Deposits are recorded up to 3m in thickness and comprise silt sand and gravel. |
| Glacial Till | 4.00 | Glacial Till comprises poorly sorted sandy, gravelly, silty clay to sandy, clayey gravel with clasts up to boulder size and material acquired from the underlying coal measures. |
| Pennine Lower Coal Measures (PLCM) | >32.00 | Bedrock of the PLCM underlie the superficial materials comprising interbedded siltstones, sandstone, mudstones, coal and seatearth. |

4.4.3. Further information can be found in the associated Geo-environmental and Geotechnical Desk Study Report (ref: 13753-CRH-XX-XX-RP-LQ-0001_Desk Study Report).

## 4.5. Hydrology

4.5.1. A desk-study review of ordnance survey mapping notes no surface water bodies on-site. A site walkover conducted by CampbellReith in July 2022 confirmed the absence of any waterbodies on-site and the associated photographs are contained within Appendix D.

4.5.2. The closest EA designated main river to the site is the River Roch which, at the narrowest point, lies approximately 12m from the eastern site boundary at a significantly lower elevation to the site.

## 4.6. Hydrogeology

4.6.1. The site is not located within a Source protection Zone (SPZ).

[4] British Geological Survey (BGS) Online Geology http://mapapps.bgs.ac.uk/geologyofbritain/home.html

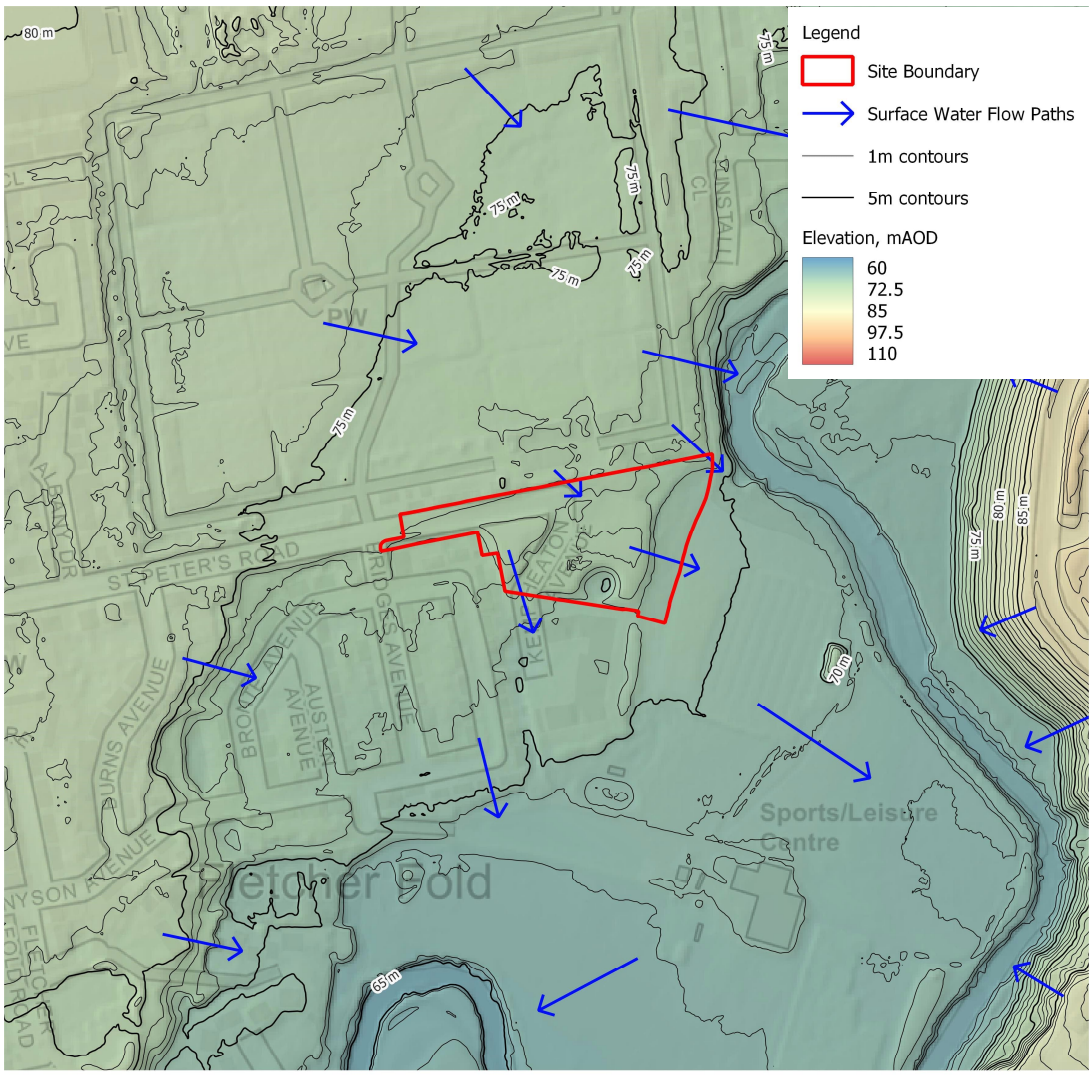
4.6.2. The site is situated above a Secondary A aquifer. The superficial deposits are classified as a Secondary A aquifer. The groundwater vulnerability for the site varies between Medium – Low in the West and Medium – High in the East.

4.6.3. The groundwater levels beneath the site are currently unknown and are subject to confirmation from further winter groundwater monitoring.

## 4.7. Existing Site Drainage

4.7.1. United Utilities are the incumbent sewerage utility provider for the area. A review of United Utilities' Records, contained in Appendix E, confirms an existing 1000mm dia combined sewer running from north to south through the site underneath Kemp Heaton Avenue. There is also an existing 750 mm dia surface water sewer running from west to east along the northern boundary of the site outfalling to the River Roch north east of the site boundary.

4.7.2. A CCTV survey conducted by Wayne For drains Ltd confirmed the presence, depth and location of the combined sewer running across the site. The CCTV survey results are contained within Appendix E.




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*Figure 4.3: Surface Water Flow Paths*

4.7.3. The natural surface water flow paths have been devised from reviewing the available Lidar and topographical data and are shown on Figure 4.3.

4.7.4. The greenfield runoff rates for the site were calculated using the Flood Estimation Handbook (FEH) method based on the developable area of 0.84 ha and a Hydrology of Soil Type (HOST) class of 17 and are summarised in Table 4.2.

*Table 4.2: Greenfield runoff rates*

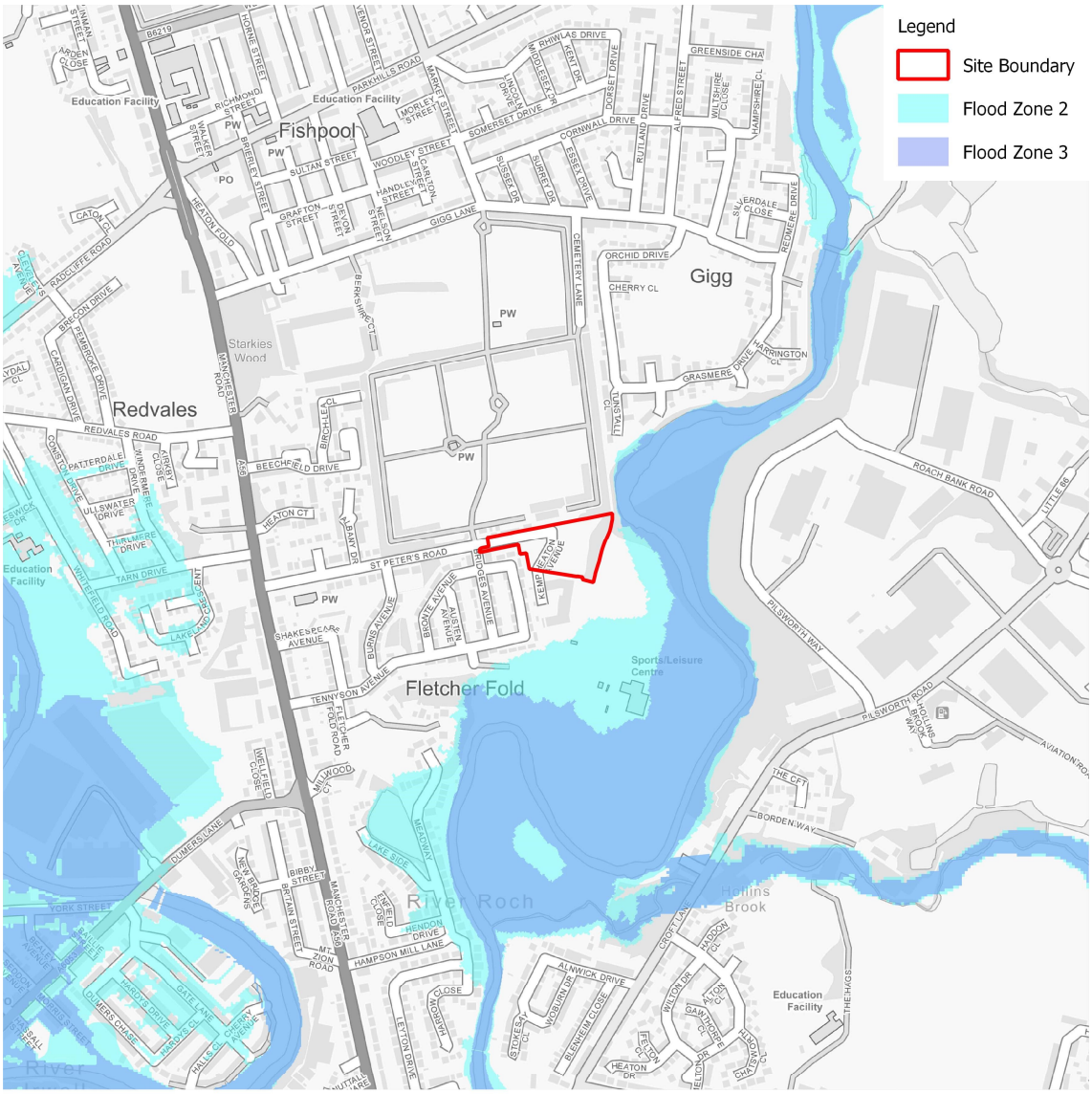
| Storm Event | Greenfield Runoff Rate (litres/second/ha) |
|---|---|
| $Q_{bar}$ | 6.17 |
| 1 in 1 Year | 5.37 |
| 1 in 30 Year | 10.49 |
| 1 in 100 Year | 12.83 |

## 5.0 EXISTING FLOOD RISK TO THE SITE

### 5.1. Fluvial Flood Risk

5.1.1. The EA Flood Zone Map shows the site is located within a Flood Zone 1 as shown in Figure 5.1. The EA defines Flood Zones from rivers or the sea in Paragraph 078 (Table 1) of the PPG, as follows:

- Flood Zone 1 (Low Probability): Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2, 3a and 3b).



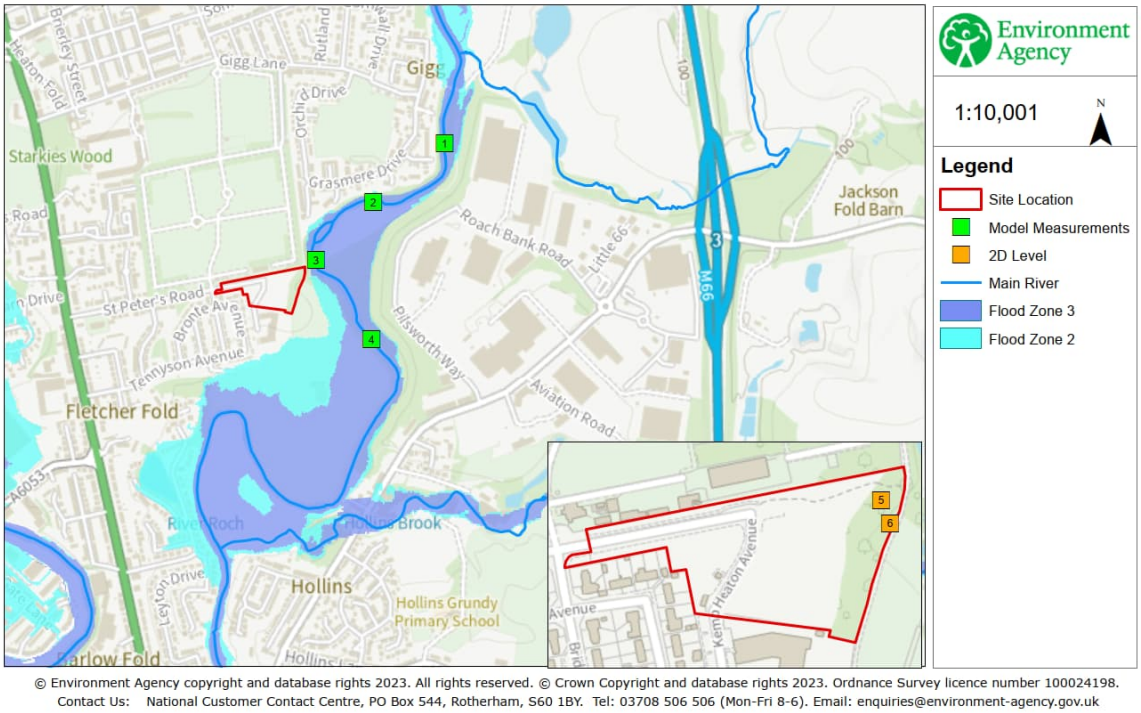

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*Figure 5.1: Environment Agency Flood Zones*

5.1.2. There is an area adjacent to the site which is classified as Flood Zone 2/3 which can be associated with the River Roch. However, the River Roch is at a significantly lower elevation

than the existing topography of the site and therefore at no further risk of flooding associated with the watercourse.

5.1.3. Site specific flood level data for the River Roch has been provided through the EA Product 4 report, contained in Appendix H. The EA has reported no instances of flooding within the site itself and deems the site to be at low risk from Fluvial flooding.




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*Figure 5.2: EA Detailed Flood Map Kemp Heaton Avenue, Bury.*

5.1.4. Nodes 5 and 6 are within the site itself and show a top water level of 70.45 mAOD in an undefended 1 in 1000 year + 30% CC. Current ground levels in this area are reported to be 70.50 mAOD and above therefore no fluvial flooding is predicted on this site up to and including this storm event which is surpassed the modelling requirements from the LLFA.

5.1.5. The risk of fluvial flooding is therefore deemed to be low.

## 5.2. Tidal Flood Risk

5.2.1. The site is not identified to be at risk from tidal flooding.

## 5.3. Flood Alert Area

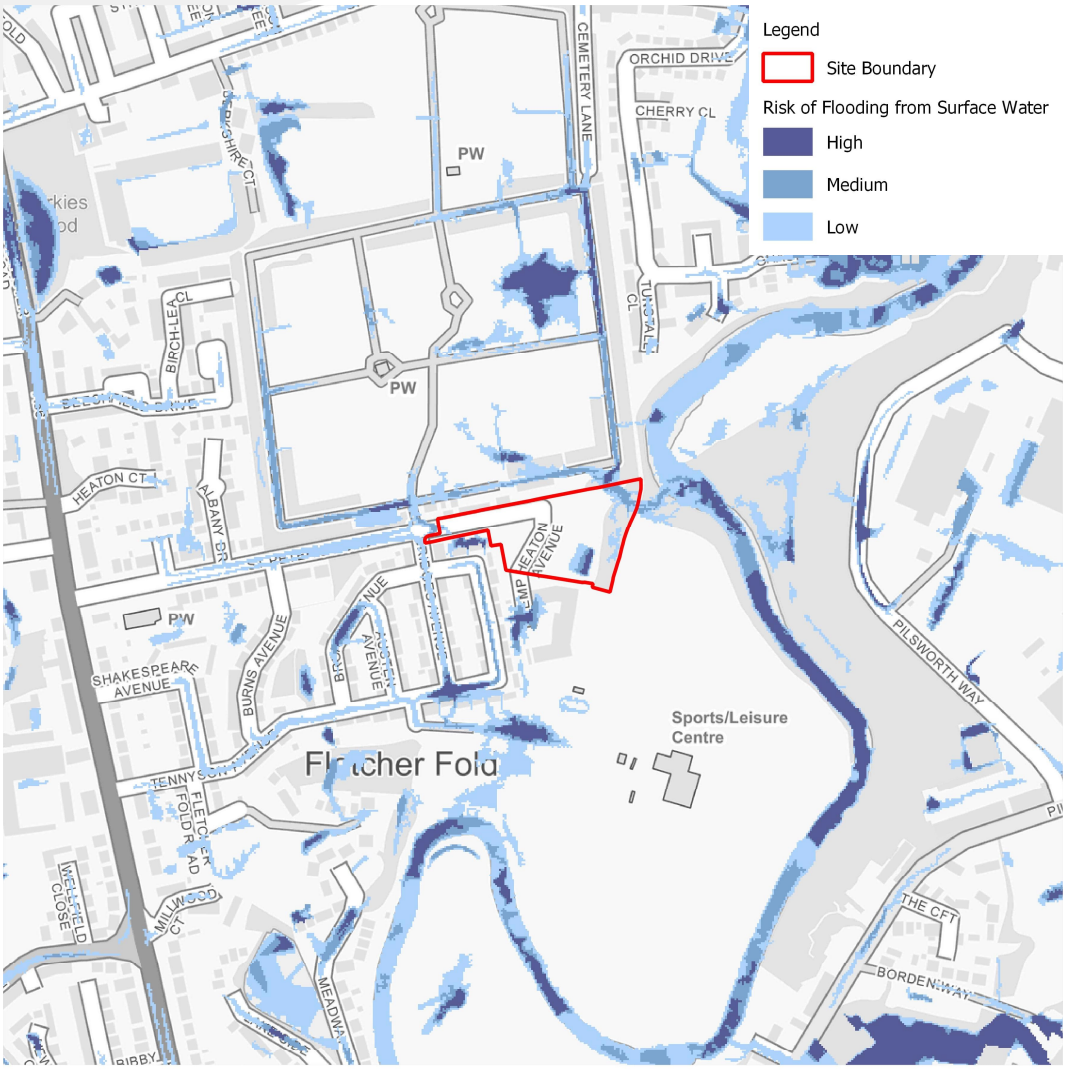
5.3.1. The site does not fall within a flood alert or flood warning area.

## 5.4. Surface Water Flood Risk

5.4.1. The EA classify surface water flood risk as follows:

- VERY LOW – the area has a chance of surface water flooding of less than 0.1%
- LOW – the area has a chance of surface water flooding of between 0.1% and 1%
- MEDIUM – the area has a chance of surface water flooding of between 1% and 3.3%
- HIGH - the area has a chance of surface water flooding of greater than 3.3%

5.4.2. The EA's Risk of Flooding from Surface Water (RoFSW) map is presented in Figure 5.2.




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*Figure 5.3: EA Updated Flood Map for Surface Water*

5.4.3. The surface water flood map shown in Figure 5.2 shows the site to be at predominantly very low risk, however a small number of areas are shown to be at medium to high risk of surface water flooding. The first area is localised in the north east of the site and looks to be the existing natural surface water flow path for the catchment to the north outfalling into the adjacent River Roch. This flow path is confined within the vegetated area in the corner of the site and is at low to medium risk.

5.4.4. A second area shown to be at medium/high risk from surface water flooding is a defined area in the south east portion of the site. As shown on the Topographical survey contained within Appendix C this is associated with a localised area of reduced levels on site where overland flows will pool.

5.4.5. The Greater Manchester Combined Authority SFRA Historic Flood Map records no incidents of surface water flooding on or within the vicinity of the site.

5.4.6. Surface Water Flow paths (shown in figure 4.2) show that the existing overland flows gravitate across the site towards the River Roch beyond the eastern boundary of the site. From the EA flood mapping it is clear that any and all excess surface water in the event of a flood is transported to and subsequently contained within the channel of the watercourse beyond the site boundary.

5.4.7. The overall risk of surface water flooding to the site is regarded as very low.

## 5.5. Groundwater Flood Risk

5.5.1. The Greater Manchester Combined Authority SFRA does not give any detailed information into the groundwater flood risk across the study area but notes that groundwater conditions will be very localised and may differ significantly across Greater Manchester.

5.5.2. The SFRA does however confirm that the site is not within a source protection zone (SPZ).

5.5.3. The bedrock geology of the site is Trencherbone Rock (Sandstone, Sedimentary bedrock) and is likely impermeable in nature. Further ground investigations and winter monitoring are recommended to confirm the groundwater level beneath the site.

5.5.4. The risk of groundwater flooding to the site is deemed to be low.

## 5.6. Sewer Flood Risk

5.6.1. The Greater Manchester Combined Authority SFRA Appendix A contains a mapped summary of the recorded incidents of sewer flooding across Greater Manchester. A review of the historic flood map contained within Appendix B does not show any recorded sewer flood events within the site itself however notes several incidents within the wider area.

5.6.2. UU are the incumbent sewerage provider for the area and are responsible for the maintenance and upkeep of all public sewers within Greater Manchester.

5.6.3. The risk of sewer flooding for the proposed development is deemed to be low.

## 5.7. Artificial Flood Risk

5.7.1. Information available from the EA for risk of inundation from reservoirs indicates that the site is at risk from flooding in the eventuality of reservoir collapse/failure both when river levels are normal and when there is also flooding from rivers. However, it should be noted that flooding from reservoirs is extremely unlikely.

5.7.2. Overall, the risk of artificial flooding to the site is deemed to be low.

## 5.8. Flood Risk Summary

*Table 5.1: Summary of existing flood risk*

| Flood Risk | Level of Risk |
|---|---|
| Fluvial | Very Low |
| Tidal | Very Low |
| Surface Water | Very Low |
| Groundwater | Low |
| Sewer | Low |
| Artificial | Low |

## 5.9. Climate Change Impact

5.9.1. Climate change must be considered as an integral part of any site specific FRA in order to minimise the impact of future flooding and allow adequate consideration for resilience to alleviate the burden on potential future users of the proposed development.

5.9.2. Following EA guidance, for residential development, the central fluvial climate change allowance should be assessed for Flood Risk Assessments. Consideration should also be given to higher central and upper end allowances to appraise the effects of those more extreme scenarios. In July 2021, the EA introduced bespoke climate change allowances for Management Catchments within the wider river basin district. Management Catchments assess climate change impacts on watercourses at a finer level of detail than the previous river basin allowances.

5.9.3. Under the new guidance the climate change allowance to be considered for the site should be 35%, 46% and 75% respectively for the central, higher central and upper end allowances. As noted within the guidance notes relating to the use of climate change allowances for peak river flood flows, other than for essential infrastructure, for all other categories of development, only the central allowance should be considered. Therefore, within all further calculations a 40% climate change allowance will be added to all rainfall events up to and including the 1 in 100 year event.

# 6.0 DEVELOPMENT PROPOSALS

## 6.1. Proposed Development Description

6.1.1. The development incorporates approximately twenty five residential dwellings ranging between one and two bedroom as well as eighteen supported living apartments within a low rise complex. The development also includes access, infrastructure, gardens and landscaping.

6.1.2. The proposed development masterplan is contained in Appendix F.

## 6.2. Vulnerability of Development

6.2.1. Annex 3 of NPPF defines the different categories of development in terms of flood risk vulnerability. Residential development is classified as 'More Vulnerable' in terms of flood risk. As indicated in Table 2.1, 'More Vulnerable' development is appropriate in Flood Zones 1.

## 6.3. Urban Creep Allowance

6.3.1. New developments should factor in the effect urban creep. This is the increase in impermeable area on developments due to conservatories/extensions/driveways etc.

6.3.2. For new housing, an additional increase of 10% to the proposed impermeable areas is considered the minimum allowance for urban creep where development density is less than 25 dwellings per hectare. Urban creep is not applicable to non-residential properties or flats and apartment blocks. In this instance 50% of each catchment area has been assumed as impermeable area to factor in the current site layout as well as additional future proofing in terms of urban creep to adopt a conservative approach for design.

## 6.4. Sequential Test

6.4.1. The site is fully contained within Flood Zone 1 therefore does not need a sequential test.

## 6.5. Exception Test

6.5.1. As the sequential test is not required, an exception test is not necessary.

## 7.0 SURFACE WATER MANAGEMENT

### 7.1. Overview

7.1.1. The surface water drainage system has been designed in accordance with the NPPF and the accompanying Guidance and Technical Standards for SuDS. It also complies with the requirements under Building Regulations Part H.

7.1.2. In line with the SuDS hierarchy under paragraph 56 of the PPG, surface water should be managed by:

1. Infiltration to the maximum extent that is practical – where it is safe and acceptable to do so
2. Discharge to watercourses
3. Discharge to surface water sewer, highway drain or another drainage system
4. Discharge to combined sewers (last resort)

7.1.3. Surface water should be managed in line with the SuDS hierarchy under paragraph 56 of the PPG. In addition, there should be a preference for green over grey features, in line with the following drainage hierarchy:

1) rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation)

2) rainwater infiltration to ground at or close to source

3) rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens)

4) rainwater discharge direct to a watercourse (unless not appropriate)

5) controlled rainwater discharge to a surface water sewer or drain

6) controlled rainwater discharge to a combined sewer.

### 7.2. Discharge Hierarchy

Infiltration:

7.2.1. Ground Investigations have been undertaken by Dunelm Geotechnical and Environmental in August 2023. Due to the presence of contaminated made ground (in excess of 3m across the site) and the associated risk of mobilising ground contamination infiltration has been ruled out as a viable means of surface water disposal. Additionally on this bases all SuDS features within the ground will be fully tanked/lined to prevent the ingress of contamination from the ground.

Discharge to Watercourses:

7.2.2. As previously discussed, the River Roch lies approximately 25m beyond the east of the site boundary. A direct connection to the river would cross third party land and go through an area of Flood Zone 2/3 as well as the root protection zone of the treeline along the eastern boundary of the site. Therefore, a direct connection has been ruled out.

7.2.3. However, a culverted watercourse to the north of the site boundary running west to east towards the River Roch has been agreed, via pre development enquiry with United Utilities, as the outfall location for surface water across the site. The surface water from the two

catchments will be discharged at greenfield runoff rate to an existing UU manhole along the line of the culverted water course which leads to the River Roch. Due to the presence of an existing gas main (and the associated vertical easement requirements 2m above and below the asset) which the outfall pipe is required to cross a gravity connection cannot be achieved to the culverted watercourse and as such, a surface water package pump station has been introduced.

7.2.4. Refer to CRH drawings: 13753-CRH-ZZ-XX-DR-C-5500 to 5502 for location of outfall point.

## 7.3. Site Constraints

7.3.1. A review of the site characteristics has informed the following site constraints:

- Existing Public Combined Sewer running across the site (including associated easements)
- Existing High pressure Gas Main running along the northern boundary of the site (including the associated 2m vertical easement)
- Area of Historic Landfill along Eastern boundary of the site

## 7.4. Existing and Proposed Impermeable and Permeable Areas

7.4.1. The existing and proposed impermeable and permeable areas are presented in Table 6.1.

*Table 7.1: Existing and Proposed Impermeable and Permeable Areas*

| | Permeable (ha) | Impermeable (ha) |
|---|---|---|
| Existing | 1.20 | 0.23 |
| Proposed | 1.01 | 0.42 |

## 7.5. Proposed Surface Water Runoff Rates

7.5.1. As previously mentioned in 4.7.4. the surface water catchment has been analysed and the Greenfield runoff rate (Qbar) calculated. The proposed discharge rates for the development should be restricted to Qbar at 6.17 l/s.

## 7.6. Surface Water Volume

7.6.1. When limited to Qbar, the required surface water attenuation volume for the site has been calculated to be 404 $m^3$/ha in the 1 in 100 year storm + 40% climate change. Based upon the proposed site layout and impermeable areas, with allowance for urban creep and a discharge rate of 6.17 l/s/ha, the total required storage volume would be circa 302.2 $m^3$ for the proposed developed site. Within the two proposed cellular attenuation tanks 304.1 $m^3$ of storage has been provided with additional storage not accounted for within potential permeable paving and the pipe network itself.

## 7.7. SuDS Strategy

7.7.1. The proposed drainage strategy layout presented in Appendix G, illustrates the SuDS features proposed to manage the surface water runoff from the site. The site has been split into two sub-catchments to help quantify local storage and deliver water quality requirements.

7.7.2. The surface water drainage strategy aims to control runoff from impermeable areas at source and attenuate through SuDS features.

7.7.3. As noted in section 4.4, due to the geology on site, infiltration is not considered to be a viable option to drain the surface wate runoff generated from site.

7.7.4. The following SuDS features have been considered within the proposed surface water drainage strategy:

- Permeable Paving;
- Filter Drains;
- Cellular Storage Tanks.

7.7.5. The overall drainage strategy seeks to keep the assisted living apartment block and the rest of the residential development separate to allow for separate construction and maintenance of the systems.

7.7.6. Runoff from the main portion of the development will be intercepted at source where possible using permeable paving before being routed to an underground attenuation tank within the car park to the south of the development. Cellular Attenuation Tank 1 has a capacity of approximately 152 $m^3$. Cellular Attenuation Tank 3 has a capacity of approximately 38 $m^3$.

7.7.7. A controlled discharge at 4.1 l/s would be made from this area of the development.

7.7.8. The runoff from the apartment block will be routed to a cellular attenuation tank underneath the adjacent rear gardens with a capacity of approximately 57 $m^3$ and a second cellular attenuation tank to the rear of the block with a capacity of approximately 30.4 $m^3$. From here flows will be restricted to 1.1 l/s and 1 l/s respectively.

7.7.9. At this point all restricted flows combine in SW MH 13 shown on sheet 3 of the drawing prior to discharge into the proposed surface water package pump station. Flows from the pump station are restricted to Greenfeld runoff rate prior to discharge into the existing surface water manhole to the north of the site. In order to connect into the existing surface water sewer to the north of the site the outfall pipe crosses an existing gas main. Following consultation with the asset owner a vertical clearance of 2m was required both above and below the asset. Due to the depth of the gas main and additional clearance requirements a gravity connection from the site could not be made into the existing surface water sewer therefore a surface water package pump station has been incorporated into the design.

7.7.10. The pump station operates on a duty standby basis so is unlikely to completely fail. However, In the event of total pump failure surface water runoff would initially back up within the below ground surface water network where circa 38m3 of storage is provided in Cellular Attenuation Tank 3 located upstream of the pump station. Subsequently, if the system continues to surcharge. Water will exit via the cover level of SWMH13 adjacent to the pump station (which is the lowest cover level on the site) Exceedance flows will then follow the natural topography and will be directed into the river adjacent to the eastern site boundary.

7.7.11. The package pump station provider, APS – (All Pump Solutions), also provide a “Failure Prevention Maintenance Programme” and high-tech telemetry monitoring services. The specified package pump system from APS also features a built-in high-level alarm system which will alert the monitoring company in the event of pump failure.

7.7.12. The proposed surface water drainage system can effectively control all runoff generated within the site and maintain pre-development Greenfield runoff, without increasing flood risk elsewhere.

7.7.13. The maintenance of SuDS is vital ensuring that they work as efficiently as they set out to do and is discussed in Chapter 10.

## 7.8. Exceedance Flows

7.8.1. Building FFL's have been set at a minimum of 150mm above external ground level to protect against flooding in the event that the drainage system surcharges above cover level. Where external ground levels cannot be set 150mm below building FFL (Due to Part M access requirements), ground level falls away from building FFL at a minimum gradient of 1:80.

7.8.2. Possible exceedance flow routes as a result of both a blockage and or rainfall event over and above the 1:100yr+CC event have been considered.

7.8.3. Exceedance flow paths direct surface water away from the buildings and into either highway drainage or overland into the nearby River Roch in the northeastern corner of the site.

## 7.9. Surface Water Quality

7.9.1. The SuDS components within the surface water drainage strategy have been designed in accordance with the guidance set-out in the SuDS Manual.

7.9.2. Treatment within SuDS components is essential for frequent low intensity and duration rainfall events, where urban contaminants are being mobilised and washed off urban surfaces and the aggregated contribution to the total pollutant load to the receiving surface water body is potentially high. For rainfall events greater than the 1 in 1 return period, the pollutants become diluted and the environmental risks will be reduced which means that the SuDS treatment process becomes less crucial. Treatment effectiveness is strongly linked to the hydraulic control of runoff, in particular velocity control and retention time.

7.9.3. Table 26.2 of the CIRIA SuDS Manual provides the pollution hazard indices for different land use classifications as shown in the table below.

*Table 7.2: CIRIA Pollution hazard indices for different land use classifications*

| Land Use | Pollution Hazard Level | Total Suspended Solids (TSS) | Metals | Hydro-carbons |
|---|---|---|---|---|
| Residential Roofs | Very Low | 0.2 | 0.2 | 0.05 |
| Individual property driveways, residential car parks, low traffic roads, car parks with infrequent change | Low | 0.5 | 0.4 | 0.4 |

7.9.4. Taking into account the proposed land use, the level of pollution associated with the proposed development is regarded as Low and Very Low.

7.9.5. Table 7.3 below summarises the treatment efficiency of different SuDS components discharging to surface waters as detailed in Chapter 26 of the SuDS Manual.

*Table 7.3: CIRIA Indicative SuDS Mitigation Indices for Discharges to surface water*

| | Mitigation Indices | | |
|---|---|---|---|
| Type of SuDS Component | Total Suspended Solids (TSS) | Metals | Hydro-carbons |
| Filter Drain | 0.4 | 0.4 | 0.4 |
| Swale | 0.5 | 0.6 | 0.6 |
| Permeable Pavement | 0.7 | 0.6 | 0.7 |

7.9.6. Where multiple drainage features are used, the efficiency of the secondary system to treat water is reduced. By using a swale discharging into permeable paving the combined mitigation indices is as follows:

*Table 7.4: Mitigation Indices for Proposed Combined Drainage System*

| | Mitigation Indices | Total Mitigation |
|---|---|---|
| TSS | 0.5 + 0.5(0.7) | 0.85 |
| Metals | 0.6 + 0.5(0.6) | 0.90 |
| Hydrocarbons | 0.6 + 0.5(0.7) | 0.95 |

## 7.10. Foul Water Strategy

7.10.1. As noted in section 4.7, the incumbent foul drainage provided is United Utilities.

7.10.2. There is an existing 900mm dia public combined sewer running from north to south through the centre of the site as well as a smaller 300mm running along Kemp Heaton Avenue from West to East which meets the larger diameter sewer at the centre point of the northern boundary.

7.10.3. Following guidance within the Sewerage Sector's Design and Construction Guidance (DCG), a daily peak load of 4,000 L/prop/day can be used to calculate a total peak foul flow rate for 43 dwellings at 1.99 l/s.

7.10.4. A 150mm diameter pipe laid at minimum gradient to achieve self-cleansing velocity has a carrying capacity in excess of 13l/s.

7.10.5. Taking into account the topography of the site and location and invert levels of the existing public combined sewer, it is anticipated that foul water can connect via a gravity system.

7.10.6. Subject to detailed design it is anticipated that the foul drainage from the development site can be discharged into the existing United Utilities combined sewer network at the same or through a smaller diameter pipe, subject to a Section 106 agreement.

7.10.7. A single foul water outfall is proposed from the entirety of the development to the existing manhole in the north of the site. Foul flows from the dwelling in the west and south of the site will be collected via a series of manhole and sewer and piped towards the outfall. Flows from th

apartment block will meet this wider foul drainage system and one connection will be made into the existing drainage asset from the site.

7.10.8. Following changes brought by Ofwat, where the proposed development site can communicate directly to an existing public sewer system at no more than the existing pipe diameter, there is no requirement to undertake any capacity survey and the proposed new connection would be subject to the infrastructure charges.

7.10.9. United Utilities publishes their revised infrastructure charges annually and this would have to be agreed with United Utilities at the time of the application, together with the proposed development delivery schedule.

7.10.10. The foul water strategy and calculations are presented in the Proposed Drainage Strategy and is contained in Appendix G.

## 8.0 FLOOD RISK FROM THE PROPOSED DEVELOPMENT

### 8.1. Fluvial Flood Risk

8.1.1. All proposed development is located outside of the current and future flood zones. Surface water runoff from the proposed development is to be controlled to no more than Qbar in all storm events up to and including the 1 in 100 year plus climate change. Therefore, the proposed development is unlikely to increase the fluvial flood risk on or off the site.

### 8.2. Tidal Flood Risk

8.2.1. The proposed development will not increase the tidal flood risk to the site.

### 8.3. Surface Water Flood Risk

8.3.1. The majority of the site is in an area currently at very low risk from surface water flooding.

8.3.2. The drainage strategy has been devised to best mimic natural flow paths across the site and to suit the existing topography. Surface water from the development will be managed in a dedicated SuDS network and is to be restricted to no more than Qbar in all storm events up to and including the 1 in 100 year plus 40% climate change.

8.3.3. In the event of pump failure systems have been put in place to minimise surface water flooding on site through flood resilient design and development of exceedance flow paths. The pump station lies at a lower topography than the majority of the site with a clear flow path to the adjacent River Roch.

8.3.4. Therefore, the proposed development is not considered likely to increase the surface water flood risk on or off the site.

### 8.4. Groundwater Flood Risk

8.4.1. The proposed development is for residential development which would have little to no impact to natural groundwater movements. The proposed development will therefore not increase the groundwater flood risk to the site off site.

### 8.5. Sewer Flood Risk

8.5.1. The proposed development is unlikely to increase the sewer flood risk to the site.

### 8.6. Artificial Flood Risk

8.6.1. The proposed development will not increase the artificial flood risk to the site.

### 8.7. Climate Change Impact

8.7.1. The impact of climate change has been adequately factored into the proposed drainage design in line with all current best practice and guidance.

# 9.0 SCHEDULE OF MAINTENANCE

## 9.1. Introduction

9.1.1. The maintenance of SuDS features is vital ensuring that they work as efficiently as they set out to do. Maintenance activities can be broadly defined as:

- Regular maintenance – basic tasks carried out regularly;
- Occasional maintenance – tasks that are required periodically but on a much less frequent basis; and
- Remedial maintenance – tasks required when a fault needs rectifying and often includes unforeseen events.

9.1.2. The proposed drainage system for the assisted living apartments is to remain private and maintained by a third party management company to be set up post-construction. However, the remainder of the main drainage will be proposed for adoption.

9.1.3. Maintenance requirements for each SuDS feature has been outlined below.

## 9.2. Permeable Paving

*Construction*

9.2.1. Construction vehicles and equipment not directly involved in the construction of the pervious pavements will be kept away from these areas. Silt fences, staged excavation works and temporary drainage swales/bunds to divert runoff away from exposed areas will be utilised, as appropriate, to manage the risks associated with, and to intercept the discharge of sediment laden runoff. Landscaping activities will be carefully designed and carried out to prevent deposition of topsoil, turf and other materials on the surface of the pavement. Infiltration surfaces will not be compacted and will be protected at all times. Excavations for the pervious pavement installation should aim to be undertaken in times of dry weather, when possible, to prevent mobilisation of sediments from exposed surfaces during rainfall events. Surfaces exposed as part of the pervious paving installation works should be stabilised as soon as possible. Perimeter controls should be installed prior to construction to protect watercourses.

*Maintenance Schedule*

9.2.2. The table below shows the operation and maintenance requirements for the pervious pavements which are in accordance with the CIRIA C753 SuDS Manual.

*Table 9.1: Operation and maintenance requirements for pervious pavements (CIRIA C753, 2015)*

| Maintenance Schedule | Required Action | Typical Frequency |
|---|---|---|
| Regular maintenance | Brushing and vacuuming (standard cosmetic sweep over whole surface) | Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surfaces from adjacent impervious areas as these areas are most likely to collect the most sediment |

| | | |
|---|---|---|
| Occasional maintenance | Stabilise and mow contributing and adjacent areas | As required |
| | Removal of weeds or management using Glyphosate applied directly onto the weeds by an applicator rather than spraying | As required – once per year on less frequently used pavements |
| Remedial Actions | Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving | As required |
| | Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material | As required |
| | Rehabilitation of surface and upper substructure by remedial sweeping | Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging) |
| Monitoring | Initial inspection | Monthly for three months after installation |
| | Inspect for evidence of poor operation and/or weed growth - if required, take remedial action | Three-monthly, 48 hrs after large storms in first six months |
| | Assess silt accumulation rates and establish appropriate brushing frequencies | Annually |
| | Monitor inspection chambers | Annually |

## 9.3. Attenuation Tanks

*Construction*

9.3.1. Construction vehicles and equipment not directly involved in the construction of the attenuation tank will be kept away from these areas. Silt fences, staged excavation works and temporary drainage swales/bunds to divert runoff away from exposed areas will be utilised, as appropriate, to manage the risks associated with, and to intercept the discharge of, sediment laden runoff prior to its discharge to nearby watercourses. Excavations for the attenuation tank should aim to be undertaken in times of dry weather, when possible, to prevent mobilisation of sediments during rainfall events. Perimeter controls should be installed prior to construction to protect watercourses.

*Maintenance Schedule*

9.3.2. The table below shows the operation and maintenance requirements for the Attenuation tanks, taken from the CIRIA C753 SuDS Manual.

*Table 9.2: Operation and maintenance requirements for attenuation storage tanks (CIRIA C753, 2015)*

| Maintenance Schedule | Required Action | Typical frequency |
|---|---|---|
| Regular maintenance | Inspect and identify any areas that are not operating correctly. If required, take remedial action | Monthly for 3 months, then annually |
| | Remove debris from the catchment surface (where it may cause risks to performance) | Monthly |
| | Remove sediment from catchpits/ gullies/ sumps. | Annually, or as required |
| Occasional Maintenance | Removal of sediment from tank via vacuum pumping (if appropriate) | As required |
| Remedial actions | Repair/rehabilitate inlets, outlets, overflows and vents | As required |
| Monitoring | Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed | Annually |
| | Survey inside of tank for sediment build-up and remove if necessary | Every 5 years or as required |

## 9.4. Proprietary Treatment Systems

9.4.1. The proprietary treatment systems include conventional pipework, gullies, catchpits, manholes, channels and headwalls.

*Construction*

9.4.2. During construction the principal contractor must ensure that preventative measures have been put in place as to not allow the construction runoff drain into the system. Measures must be taken to ensure debris from the construction site does not block the components. Routine inspections should be undertaken ensuring that the drainage is functioning properly. Outfalls must be constructed to the correct level and all joints must be correctly sealed. During construction backfill should be correctly installed as specified as per the manufactures' recommendations.

*Maintenance Schedule*

9.4.3. The maintenance schedule for the aforementioned SuDS has been adopted from the SuDS Manual C753 and are summarised in the table below.

*Table 9.3: Maintenance and Operation of Proprietary Treatment Systems (CIRIA C753, 2015)*

| Maintenance Schedule | Required Action | Typical Frequency |
|---|---|---|
| Regular maintenance | Remove litter and debris | Monthly (or as required) |
| | Monitoring | Inspect monthly |
| Occasional maintenance | Sediment management | Annually or as required |
| Remedial maintenance | Structure rehabilitation/repair | As required |

## 9.5. Package Pump Station

### Construction

9.5.1 Construction vehicles and equipment not directly involved in the construction/installation of the package pump station to be kept away from the installation area. Silt fences, staged excavation works and temporary drainage swales/bunds to divert runoff away from exposed areas will be utilised, as appropriate, to manage the risks associated with, and to intercept the discharge of sediment laden runoff. Care to be taken during excavation and installation to prevent damage to the pump station, electrical connections, control equipment and associated pipework. Package pump station to be installed in accordance with the manufacturer's requirements.

### Maintenance Schedule

9.5.1. The maintenance schedule for the package pump station has been taken from the manufacturers guidance and is summarised in the table below. Refer to the All Pump Solutions Operations and Maintenance manual contained in Appendix I for further details.

Table 9.4: Maintenance and Operation of Package Pump Station

| Maintenance Schedule | Required Action | Typical frequency |
|---|---|---|
| Regular maintenance | Inspect and identify any areas that are not operating correctly. If required, take remedial action. | Bi-annually |
| | Test high-level alarm system and pump controls. | Bi-annually |
| Occasional Maintenance | Removal of sediment or debris from pump station via vacuum pumping (if appropriate). | As required |
| Remedial actions | Repair/rehabilitate inlets, outlets, damaged pumps, valves, pipework or control equipment. | As required |
| Monitoring | Full inspection of package pump station to manufacturers specifications – see manufacturers maintenance manual (Appendix I). | Annually |

## 10.0 CONCLUSION

10.1.1. CampbellReith has been commissioned to prepare a Flood Risk Assessment and Drainage Strategy in accordance with the National Planning Policy Framework to inform the proposed development located at Kemp Heaton Avenue, Bury.

10.1.2. The development incorporates approximately twenty five residential dwellings ranging between one and two bedroom as well as eighteen supported living apartments within a low rise complex. The development also includes access, infrastructure, gardens and landscaping.

10.1.3. No surface water bodies are present on site however, the River Roch, an ordinary watercourse, lies just beyond the eastern boundary of the site. The entirety of the site is contained within Flood Zone 1 and is considered to be at low risk from fluvial flooding. Surface water flood risk will be mitigated and managed on site through levels design and as such is considered to be a low residual risk. The site is not deemed to be at risk from groundwater flooding. The site is at low or very low risk of flooding from all other sources.

10.1.4. Available data indicates that the site is currently underlain by Clay, Silt, Sand and Gravel over layers of Sandstone. Further Ground Investigations are required to determine the Groundwater levels on site and assess infiltration.

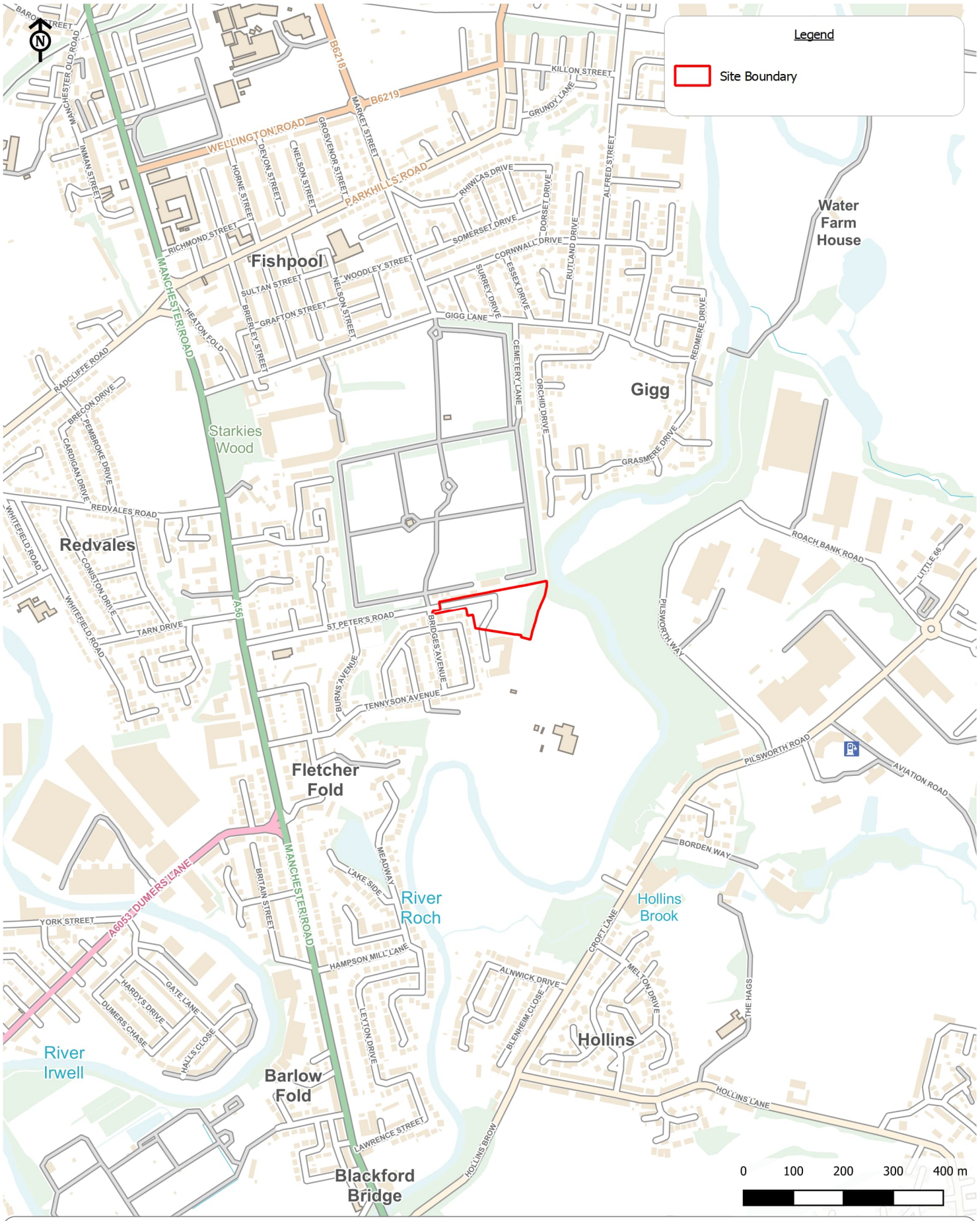
10.1.5. The proposed SuDS strategy involves the use of permeable paving and cellular storage tanks to manage surface water runoff generated from site. Surface water will be captured via the aforementioned SuDS features and conveyed towards the four attenuation tanks where it will be stored prior to discharging via a surface water package pump station at no more than Qbar to the existing public surface water sewer in the north eastern corner of the site. This stems from a gravity connection being proven not to be feasible due to an existing gas main running across the outfall location and its associated vertical easements.

10.1.6. Foul water will drain via a gravity system which will outfall to the existing public combined sewers present on site.

10.1.7. The maintenance of SuDS is vital to ensuring that they work as efficiently as they are intended to.

10.1.8. The proposed drainage strategy will not increase flood risk from any sources on or off the site and is considered appropriate for the proposed development in its current location.

# Appendix A: Site Location




Kemp Heaton Avenue, Bury

Client: Great Places Housing Group

Site Location

| | |
|---|---|
| Scale: | 1:10000@A4 |
| CampbellReith OS Copyright: | © Crown copyright. All rights reserved. Licence number 100020027 |
| Contains Ordnance Survey data © Crown copyright and database right 2023. | |
| Job Number: | 13753 |
| Drawn by - Checked by: | RP - IC |
| Drg No - Status/Revision: | 13753-CRH-XX-XX-FG-G-7009 - P1 |
| File location: | N:\13750 - 13999\13753 M - Kemp Heaton Avenue\Project_Workspaces\FRA (pdf in Outputs) |
| Date (Revision History): | 31/05/2023 (P1, First Issue, 31/05/23, RP) |

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# Appendix B: SFRA Map Extracts

Level 1 Strategic Flood Risk Assessment Index Map
Detailed Map 22 – Flood Zones, Historic Flooding, Reservoir Extent (EA) and Risk of Flooding from Surface Water

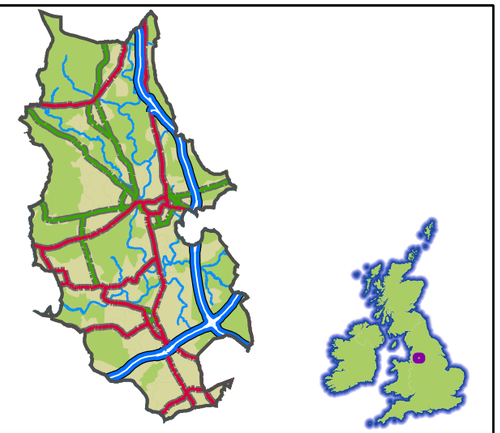
North

Map 1
Map 2
Map 3
Map 4
Map 5
Map 6
Map 7
Map 8
Map 9
Map 10
Map 11
Map 12
Map 13
Map 14
Map 15
Map 16
Map 17
Map 18
Map 19
Map 20
Map 21
Map 22
Map 23
Map 24
Map 25
Map 26
Map 27
Map 28
Map 29
Map 30
Map 31
Map 32
Map 33
Map 34
Map 35
Map 36

SUMMERSEAT
TOTTINGTON
AINSWORTH

0 1.5 3 4.5 6 Kilometres

Index



**LEVEL 1**
**STRATEGIC FLOOD RISK ASSESSMENT**

For

Bury Metropolitan Borough Council

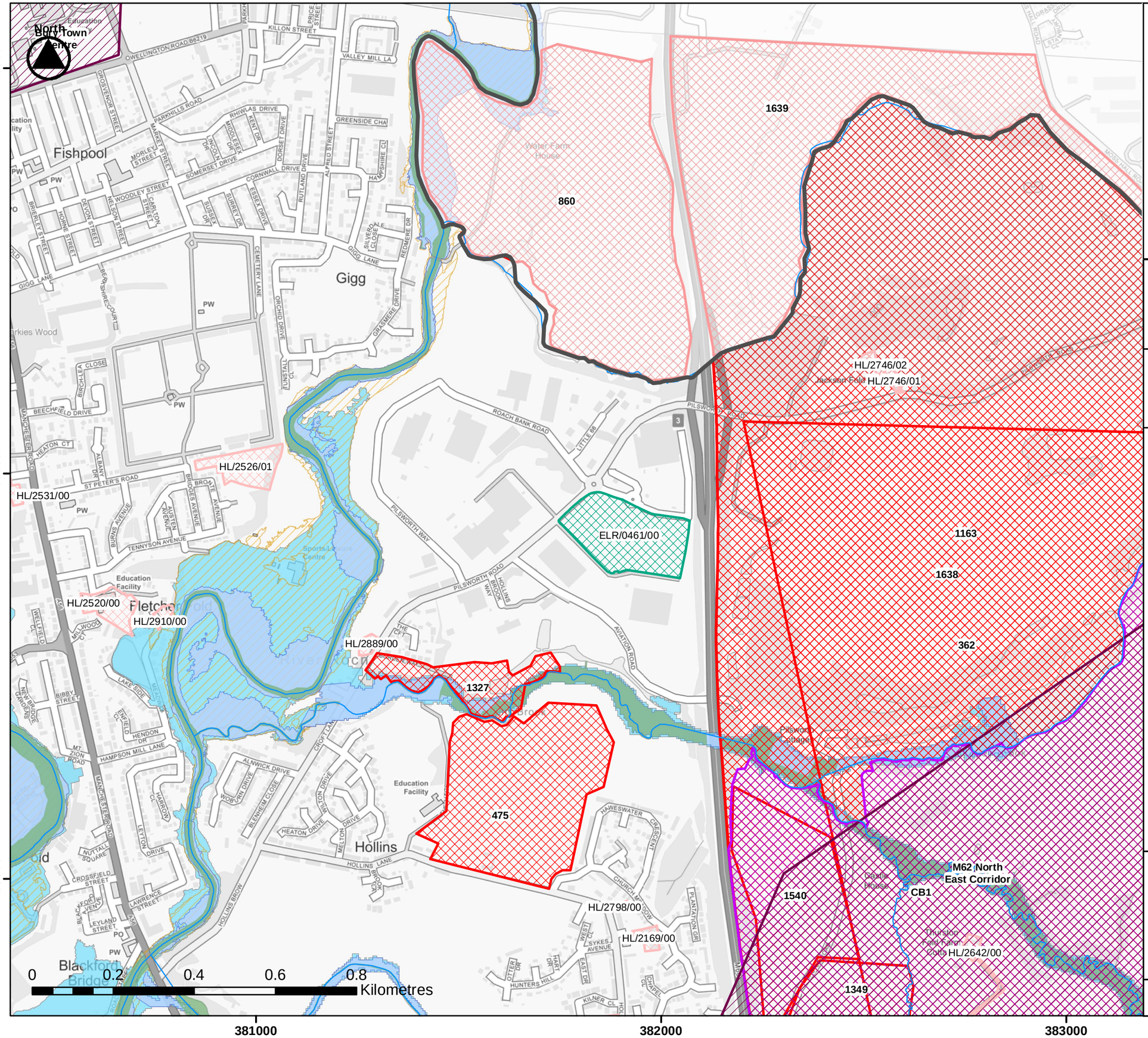
Select an index map tile to view a detailed map of the area.

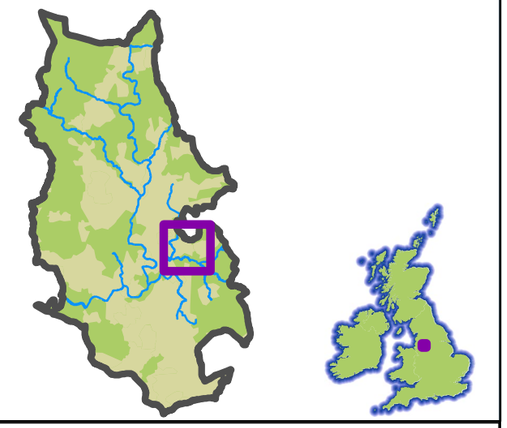
- Index Map Tile
- Council Boundary
- Motorway
- A Road
- B Road
- Canal
- Watercourse
- Urban Area

JBA consulting

Bury COUNCIL

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**LEVEL 1**
**STRATEGIC FLOOD RISK ASSESSMENT**
For
BURY BOROUGH COUNCIL

Please select a data type from the dropdown menu below that you wish to view:

Flood Zones

Watercourse

**Proposed Development Sites**

GMSF 2019 Strategic Locations

2018 Call for Sites

| 2018 Baseline Land Supply | 2019 GMSF Allocations |
|---|---|
| Residential | Residential |
| Industry / Warehousing | Industry / Warehousing |
| Offices | Mixed Use |

Flood Zone 3b

Flood Zone 3a

Climate Change Outlines (+70%)

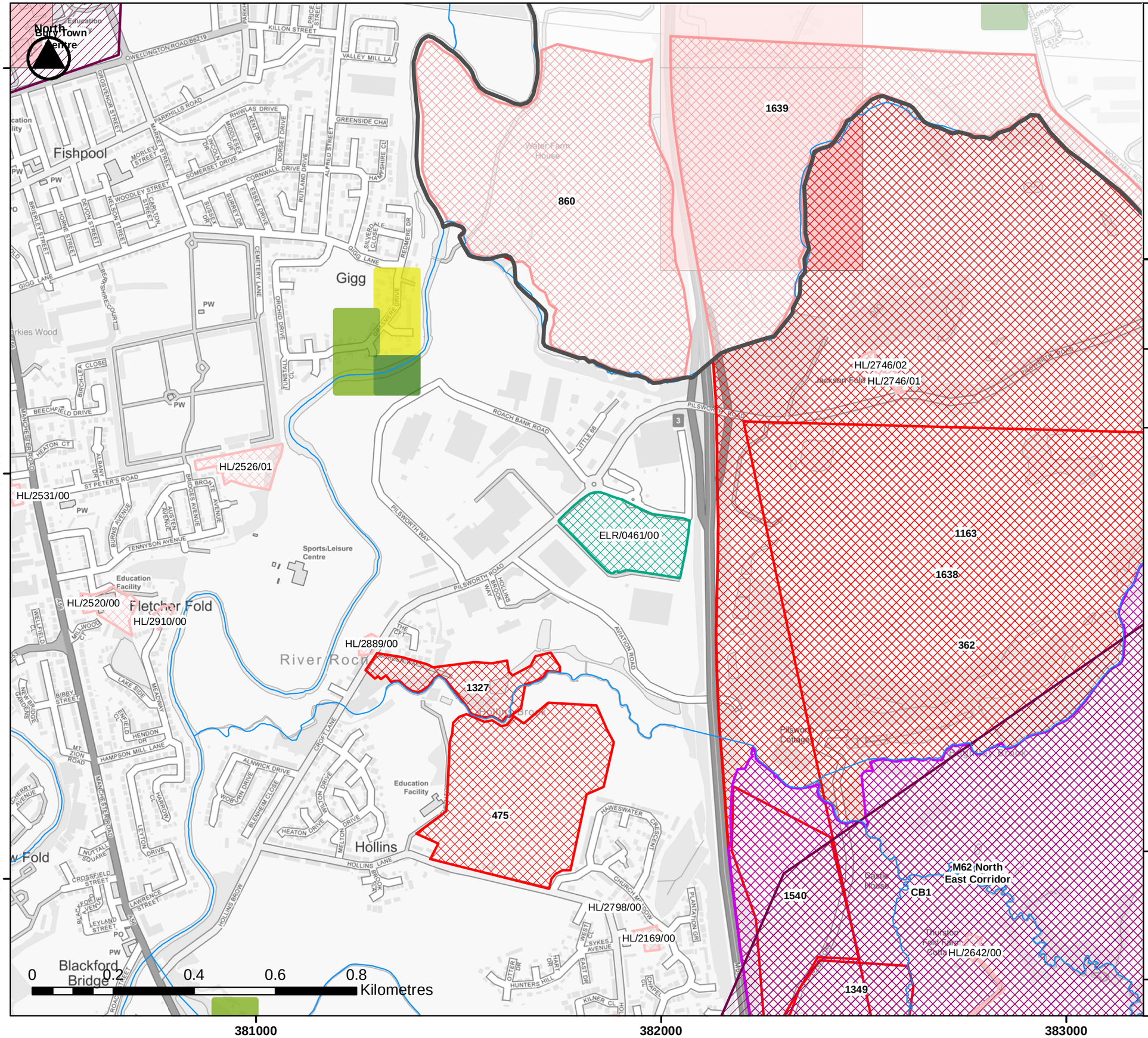
Flood Zone 2

☑ Show Site Reference Labels

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**LEVEL 1**
**STRATEGIC FLOOD RISK ASSESSMENT**
For
BURY BOROUGH COUNCIL

Please select a data type from the dropdown menu below that you wish to view:

Historic Flooding

Watercourse

**Proposed Development Sites**

GMSF 2019 Strategic Locations

2018 Call for Sites

| 2018 Baseline Land Supply | 2019 GMSF Allocations |
|---|---|
| Residential | Residential |
| Industry / Warehousing | Industry / Warehousing |
| Offices | Mixed Use |

Historic Flood Map (EA)
Historical Surface Hotspots (Council)
Surface Water Hotspots (GM SWMP 2013)
Historic canal overtopping (C&RT)
Historic canal breach (C&RT)

**Incidents of sewer flooding (UU)**

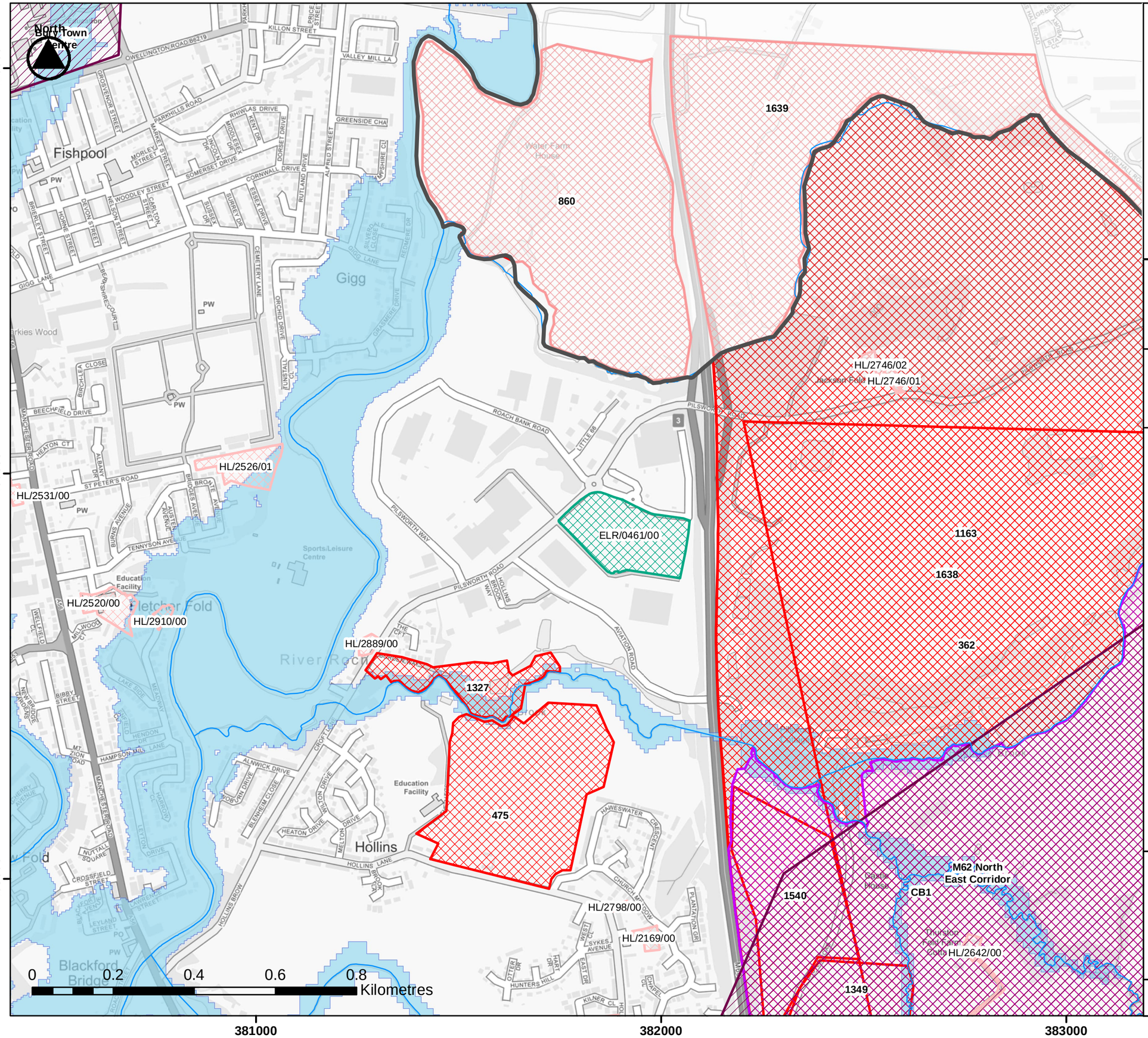
295
208
41-60
21-40
11-20
6-10
2-5
1

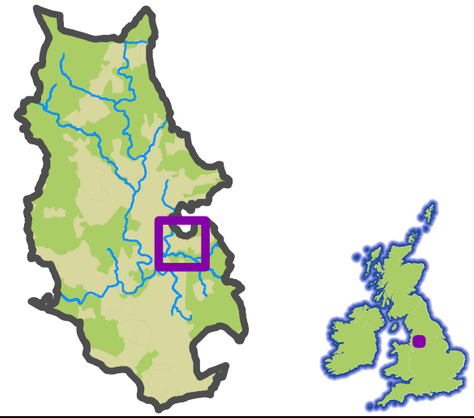
☑ Show Site Reference Labels

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**LEVEL 1**
**STRATEGIC FLOOD RISK ASSESSMENT**
For
BURY BOROUGH COUNCIL

Please select a data type from the dropdown menu below that you wish to view:

Reservoir Extent (EA)

Watercourse

**Proposed Development Sites**

GMSF 2019 Strategic Locations

2018 Call for Sites

| 2018 Baseline Land Supply | 2019 GMSF Allocations |
|---|---|
| Residential | Residential |
| Industry / Warehousing | Industry / Warehousing |
| Offices | Mixed Use |

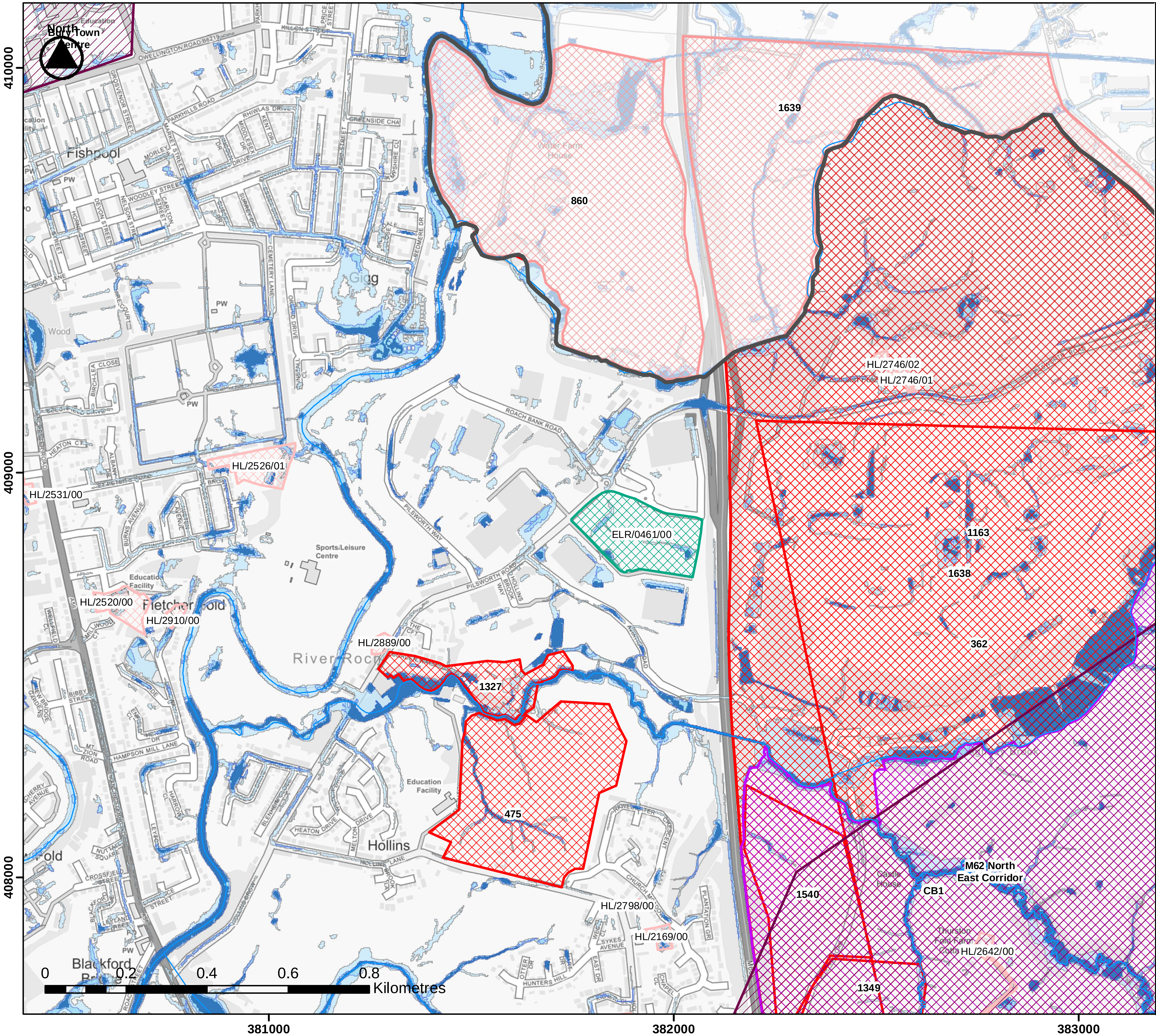
Reservoir Extent (EA)

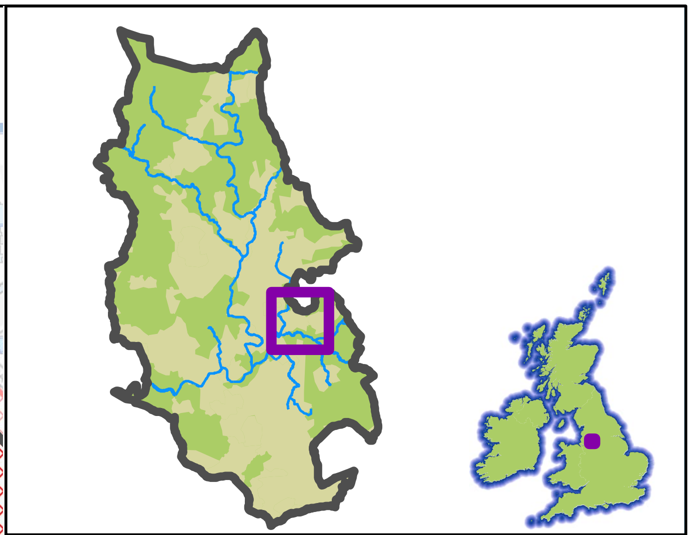
☑ Show Site Reference Labels

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**LEVEL 1**

**STRATEGIC FLOOD RISK ASSESSMENT**

For

BURY BOROUGH COUNCIL

Please select a data type from the dropdown menu below that you wish to view:

Risk of Flooding from Surface Water

Watercourse

**Proposed Development Sites**

GMSF 2019 Strategic Locations

2018 Call for Sites

| **2018 Baseline Land Supply** | **2019 GMSF Allocations** |
|---|---|
| Residential | Residential |
| Industry / Warehousing | Industry / Warehousing |
| Offices | Mixed Use |

High Risk

Medium Risk

Low Risk

☑ Show Site Reference Labels

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# Appendix C: Topographical Survey

DYWIDAG Topographical Survey Ref: 2671T_Kemp_Heaton_Avenue_SU001

409100N

380800E

380850E

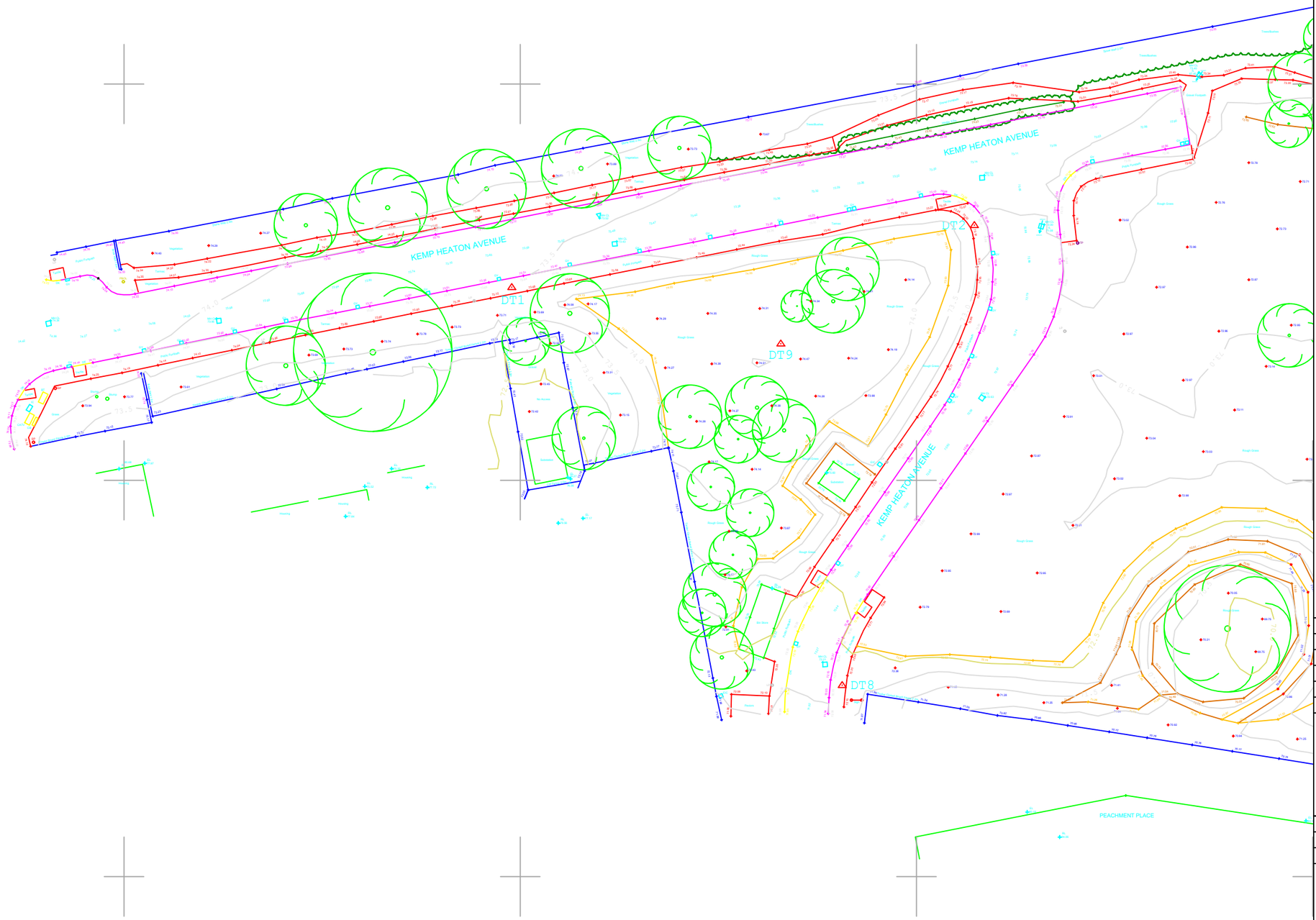
380900E

380950E

409050N

409000N

408950N




N

All levels related to OSGB36(15)

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| DT2 | 380957.3060 | 409032.1455 | 73.1371 |
| DT3 | 381015.0207 | 409045.7664 | 72.7857 |
| DT4 | 381068.7122 | 409058.4632 | 70.7013 |
| DT5 | 381053.9361 | 409015.3275 | 70.5534 |
| DT6 | 381036.6488 | 408956.7852 | 70.5384 |
| DT7 | 381003.3422 | 408972.6199 | 72.1254 |
| DT8 | 380940.6208 | 408974.1097 | 72.2854 |
| DT9 | 380932.8781 | 409017.2013 | 74.4906 |

- Buildings
- Beam
- Bridge
- Canopy
- Platform
- Tactile Strip
- Girder
- Walls
- Pillar
- Tunnel
- Drop Kerb
- Fence
- Gate
- Hedge
- Vegatation
- Path
- Channel
- Water
- Vegatation

**Abbreviations**

**BB = Belisha Beacon**
**BD = Badger Set**
**BH = Bore hole**
**BT = BT Cover**
**CL = Cover Level**
**CP = Catch Pit**
**ER = Earth Rod**
**GY = Gulley**
**IC = Inspection Cover**
**IL = Invert Level**
**MH = Manhole**
**OLE = Overhead Line**
**RE = Rodding Eye**
**RWP = Rainwater Pipe**
**SOFF = Soffit level**
**SP = Sign Post**
**WV = Water valve**
**GV = Gas Valve**
**TL = Traffic Light**
**TLP = Trial Pit**
**TP = Telegraph Pole**

**EP = Electric Pole**
**ToW = Top of Wall**
**PBol = Bollard**
**LP = Lamp Post**
**RL = Ridge Level**
**EL = Eaves Level**
**MPG = Marker Post Gas**

DYWIDAG

| REV. | DATE | DESCRIPTION OF REVISION | DATE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |


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Fax.+44(0)161 797 5522
Web : www.dywidaggroup.com


| | | | |
|---|---|---|---|
| SURVEYED BY | Peter Walsh | DATE | 16/09/2021 |
| DRAWN BY | Peter Walsh | DATE | 20/09/2021 |
| CHECKED BY | Ian Williamson | DATE | 21/09/2021 |

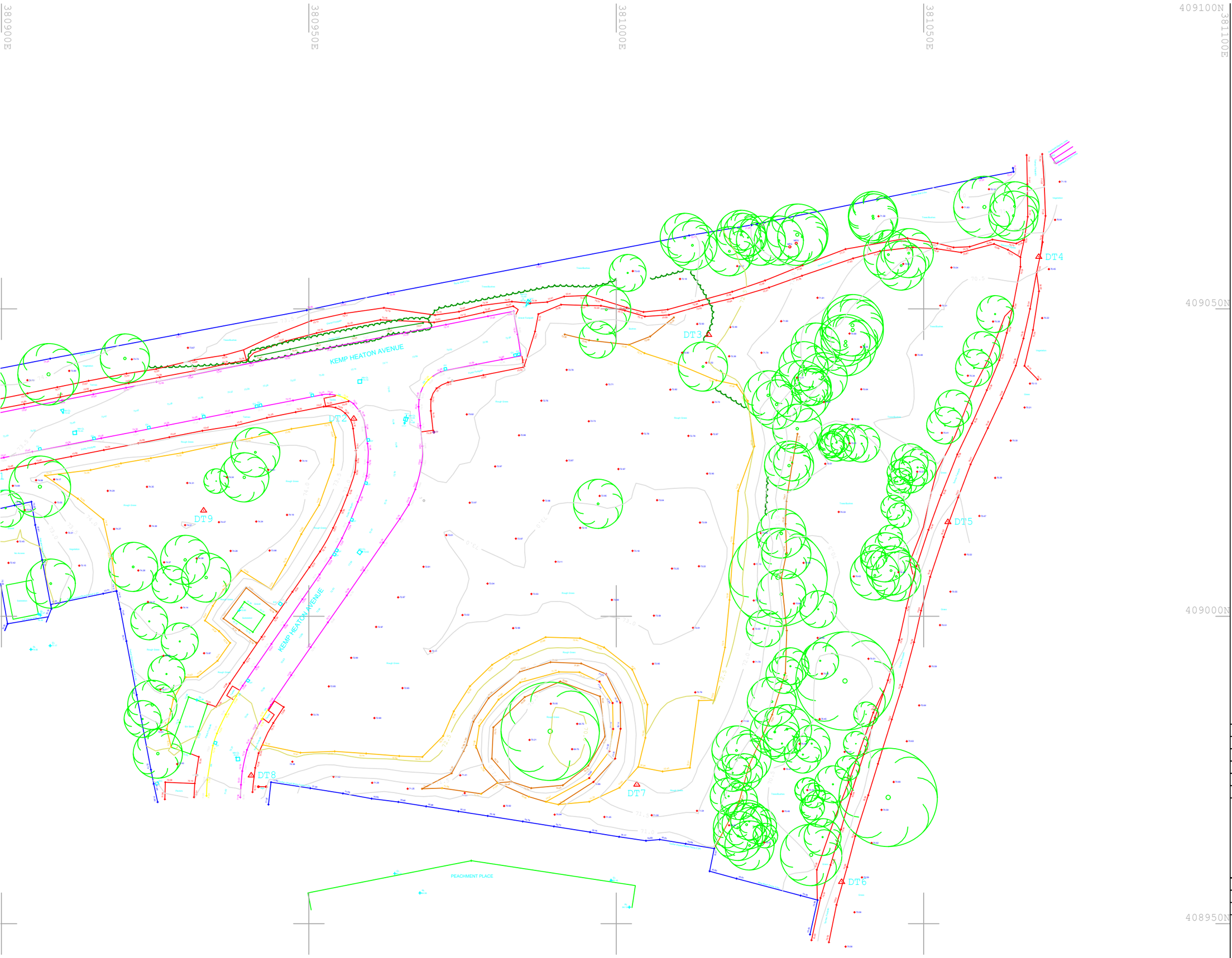
Topographical Survey

# Kemp Heaton Avenue

Sheet 1 of 2

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| | | |
|---|---|---|
| SCALES | 1:200 | ORIGINAL - A0 |
| PROJECT No. | 2671T | |
| DRAWING No. | 2671T_Kemp_Heaton_Avenue_SU001 | |




N

All levels related to OSGB36(15)

| | | | |
|---|---|---|---|
| DT1 | 380898.9290 | 409024.3210 | 73.6750 |
| DT2 | 380957.3060 | 409032.1455 | 73.1371 |
| DT3 | 381015.0207 | 409045.7664 | 72.7857 |
| DT4 | 381068.7122 | 409058.4632 | 70.7013 |
| DT5 | 381053.9361 | 409015.3275 | 70.5534 |
| DT6 | 381036.6488 | 408956.7852 | 70.5384 |
| DT7 | 381003.3422 | 408972.6199 | 72.1254 |
| DT8 | 380940.6208 | 408974.1097 | 72.2854 |
| DT9 | 380932.8781 | 409017.2013 | 74.4906 |

- Buildings
- Beam
- Bridge
- Canopy
- Platform
- Tactile Strip
- Girder
- Walls
- Pillar
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- Drop Kerb
- Fence
- Gate
- Hedge
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- Path
- Channel
- Water
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**LP = Lamp Post**
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**EL = Eaves Level**
**MPG = Marker Post Gas**

DYWIDAG

| REV. | DATE | DESCRIPTION OF REVISION | DATE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |


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Fax.+44(0)161 797 5522
Web : www.dywidaggroup.com


| | | | |
|---|---|---|---|
| **SURVEYED BY** | Peter Walsh | **DATE** | 16/09/2021 |
| **DRAWN BY** | Peter Walsh | **DATE** | 20/09/2021 |
| **CHECKED BY** | Ian Williamson | **DATE** | 21/09/2021 |

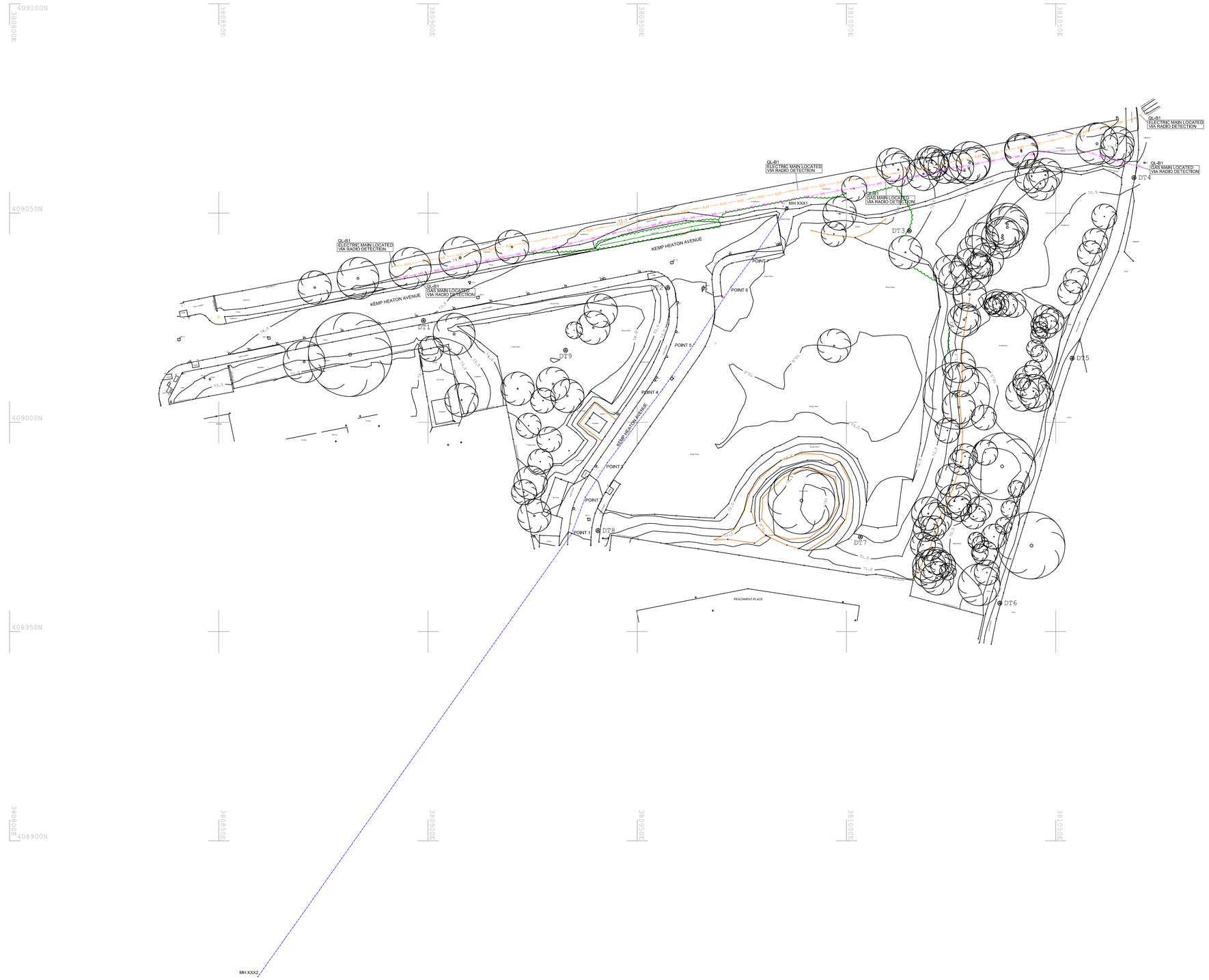
Topographical Survey

# Kemp Heaton Avenue

Sheet 2 of 2

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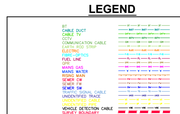
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|---|---|---|
| **SCALES** | 1:200 | **ORIGINAL - A0** |
| **PROJECT No.** | 2671T | |
| **DRAWING No.** | 2671T_Kemp_Heaton_Avenue_SU001 | |




N

SURVEY ORIENTATED TO REAL TIME GPS

## LEGEND




BD BACKDROP PIPE
BLK BLOCKED
UNI UNIDENTIFIED TRACE
OSA OUT OF SURVEY AREA
NPH NO FURTHER SPR CONTACTS
NVP NO VISIBLE PIPE
SUR SURVEYED MANHOLE
TPR TRACE FROM RECORDS
TOP TOP OF PIPE
SUR SURVEYED
UTL UNABLE TO LIFT
UTP UNABLE TO PASS SONDE FURTHER
UTT UNABLE TO TRACE
EOT SYMBOL

UNIDENTIFIED - A buried feature or utility that has been located, but we are unable to state what it is.

SURVEYED - The assumed location of a record feature or utility, usually taken from records, but not found during the utility trace due to various conditions.

FAULTED - Electric and water cables, even when they are live, are unable to be detected on occasion.

### UNDERGROUND UTILITIES SERVICES DISCLAIMER

We have endeavoured to locate existing services using records provided by Statutory Authorities as a guide. Some apparatus and ancillaries details have therefore been taken from Utility Record Drawings, which may be of poor quality. Consequently we cannot guarantee accuracy of information taken from such records.

Where indicated, no allowance has been made for over-surface entry into manholes, other chambers or confined spaces below ground level. Personnel working internally in manholes, have not been taken from the surface and no such work is recommended.

We have endeavoured to supply you with the most reliable, data obtained by using services and equipment that are at the forefront of industry. We have been careful in the selection of detectors and buried fixtures, but as with all methods of detecting underground or buried utilities the information provided is based on results received from electromagnetic techniques and we cannot be liable for distortion or errors beyond the reasonable control of the operator or the instruments.

It is the responsibility of the user under Health & Safety (CDM2015) guidelines to satisfy himself of the subsurface location of any services prior to excavation of the services shown.

### NOTE 1

This utility survey has been undertaken using a Radiodetection RD8200 + TX3 & Mini Geoscience Ground Probing Radar

### NOTE 2

Paper carrying features shown on this drawing are shown as an individual service line. This does not necessarily mean the number of cables actually present and it is possible that there are far more numbers of cables making up each service.

Communications transmission cables. Following the sonde throughout the survey area, it was found that the sonde signal from the sewer cables being located by signal emitted from the enclosed sewer could be at different depths, the below signal from the sewer cables being picked up signal emitted from the enclosed service above. Cable runs could also be present running parallel to the edge line shown.

There are two main reasons that GPR can be inaccurate when planning as they are a conductive soils and the second is, the electrical constant conductive soils.

The example of a conductive soil would be clay.

This has a high amount of ferrous material in it, hence clay is considered a conductive soil type, due to the soil's conductive nature, the GPR wave gets 'whittered' before it can return to the antenna. Other examples of conductive soils would be damp or wet soils that have a high salt content often over sources of salt or saturated water. The less fines the soils consists, a much more conductive soil and limits the GPR wave's resolution.

Dielectric constant:

A clear explanation would be that the dielectric constant is a measure of how permissive the soil and the targets in the soil are to the radar wave being passed into the ground. It is much more complicated than this but to not over complicate, we will work with this explanation.

So if you have a damp/moist soil with a concrete pipe and a metal pipe in it, the GPR wave will enter the soil at a certain rate and that rate will change as it goes through differing soil layers or differing pipe structures. A metal pipe is 100% reflective so it will stand out in the image. Most utilities are actually be reflective in a sandier soil because the radar wave meets little resistance in this soil with it into the utilities. However, on our concrete pipe or structure, as this has a dielectric constant that is closer to the surrounding soil, the result is that pipe or structure will fade into the background of the GPR image.

Below is some of the...

| Issue / Purpose | Author | Check |
|---|---|---|
| Survey Complete | -- | -- |
| Issued for Comment | -- | -- |
| Issued for Comment | -- | -- |
| Issued for Comment | -- | -- |
| Issued for Comment | -- | -- |
| Issued for Comment | -- | -- |
| Issued for Comment | -- | -- |

## REVISIONS

| REV | DESCRIPTION | SURVEYED | DRAWN | DATE |
|---|---|---|---|---|
| A | SWS COORDINATES PROVIDED ALTERED TO TIE INTO EXISTING MANHOLES | -- | JC | 30.03.2023 |


JLP Surveying

JLP Surveying Consultants Ltd,
Suite 45 Rodney House,
King Street,
Wigan
WN1 1BT
Tel - 01942 243313
Fax - 01942 492230
Mobile - 07710 428498
EMAIL:- peterhouston@jlpsurveys.com


**PROJECT**

Heaton Avenue
Bury

**DRAWING TITLE**

Utility Survey

| SCALE | SHEET SIZE | No. of SHEETS | DATE | REVISION |
|---|---|---|---|---|
| 1 : 500 | A1 | 1 | 13.03.2023 | A |

**DRAWING NUMBER**

S23-0219

# Appendix D: Site Walkover Photographs



Photograph 1: view of Kemp Heaton Avenue from the east



Photograph 2: Soft Landscaping in the east of the site

Kemp Heaton Avenue, Bury

Client: Great places Housing Group Plc

Site Photographs
1 - 2

| | |
|---|---|
| Job Number: | 13753 |
| Date: | 07/07/2022 |
| Drawn by: | BR |
| Checked by: | PK |
| Drg No: | 13753 |
| Status/Revision: | A |
| File location: | \\man-data1\Jobs\13500-13999\13753 - Kemp Heaton Avenue\Docs\CR Docs\Reports\DTS\Appendix C |
| Revision History: | A |

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Photograph 3: view to the south west of site



Photograph 4: view of the south of site

Kemp Heaton Avenue, Bury

Client: Great places Housing Group Plc

Site Photographs
3 - 4

| | |
|---|---|
| Job Number: | 13753 |
| Date: | 07/07/2022 |
| Drawn by: | BR |
| Checked by: | PK |
| Drg No: | 13753 |
| Status/Revision: | A |
| File location: | \\man-data1\Jobs\13500-13999\13753 - Kemp Heaton Avenue\Docs\CR Docs\Reports\DTS\Appendix C |
| Revision History: | A |

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Photograph 5: layby in the north of site



Photograph 6: substation on Kemp Heaton Avenue

Kemp Heaton Avenue, Bury

Client: Great places Housing Group Plc

Site Photographs
5 - 6

| | |
|---|---|
| Job Number: | 13753 |
| Date: | 07/07/2022 |
| Drawn by: | BR |
| Checked by: | PK |
| Drg No: | 13753 |
| Status/Revision: | A |
| File location: | \\man-data1\Jobs\13500-13999\13753 - Kemp Heaton Avenue\Docs\CR Docs\Reports\DTS\Appendix C |
| Revision History: | A |

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BRISTOL 0117 916 1066 • www.campbellreith.com

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Photograph 7: depressed ground surrounding tree in the south of site



Photograph 8:slope down to the substation

Kemp Heaton Avenue, Bury

Client: Great places Housing Group Plc

Site Photographs
7 - 8

Job Number: 13753
Date: 07/07/2022
Drawn by: BR
Checked by: PK
Drg No: 13753
Status/Revision: A
File location: \\man-data1\Jobs\13500-13999\13753 - Kemp Heaton Avenue\Docs\CR Docs\Reports\DTS\Appendix C
Revision History: A

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Photograph 9: southern site boundary



Photograph 10: trees on eastern site boundary

Kemp Heaton Avenue, Bury

Client: Great places Housing Group Plc

Site Photographs
9 - 10

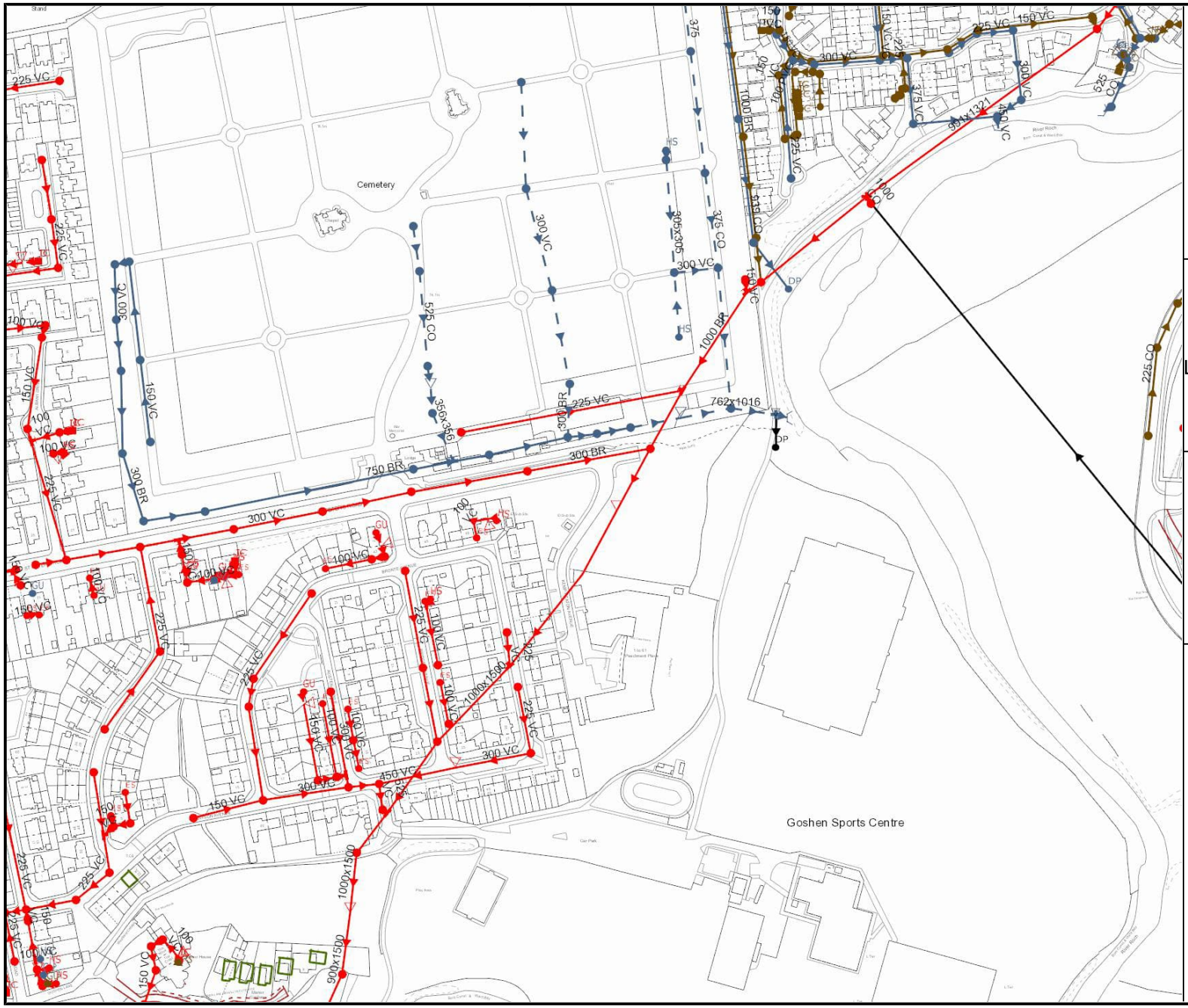
| | |
|---|---|
| Job Number: | 13753 |
| Date: | 07/07/2022 |
| Drawn by: | BR |
| Checked by: | PK |
| Drg No: | 13753 |
| Status/Revision: | A |
| File location: | \\man-data1\Jobs\13500-13999\13753 - Kemp Heaton Avenue\Docs\CR Docs\Reports\DTS\Appendix C |
| Revision History: | A |

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# Appendix E: Existing Site Drainage

United Utilities Sewer Records
JLP Surveying Consultant Ltd Utilities Survey Ref: S23-0219
Waynes For Drains Ltd Drainage Survey Report
Greenfield Runoff Rate Calculations




United Utilities
Water for the North West

# SEWER RECORDS

**Address or Site Reference**

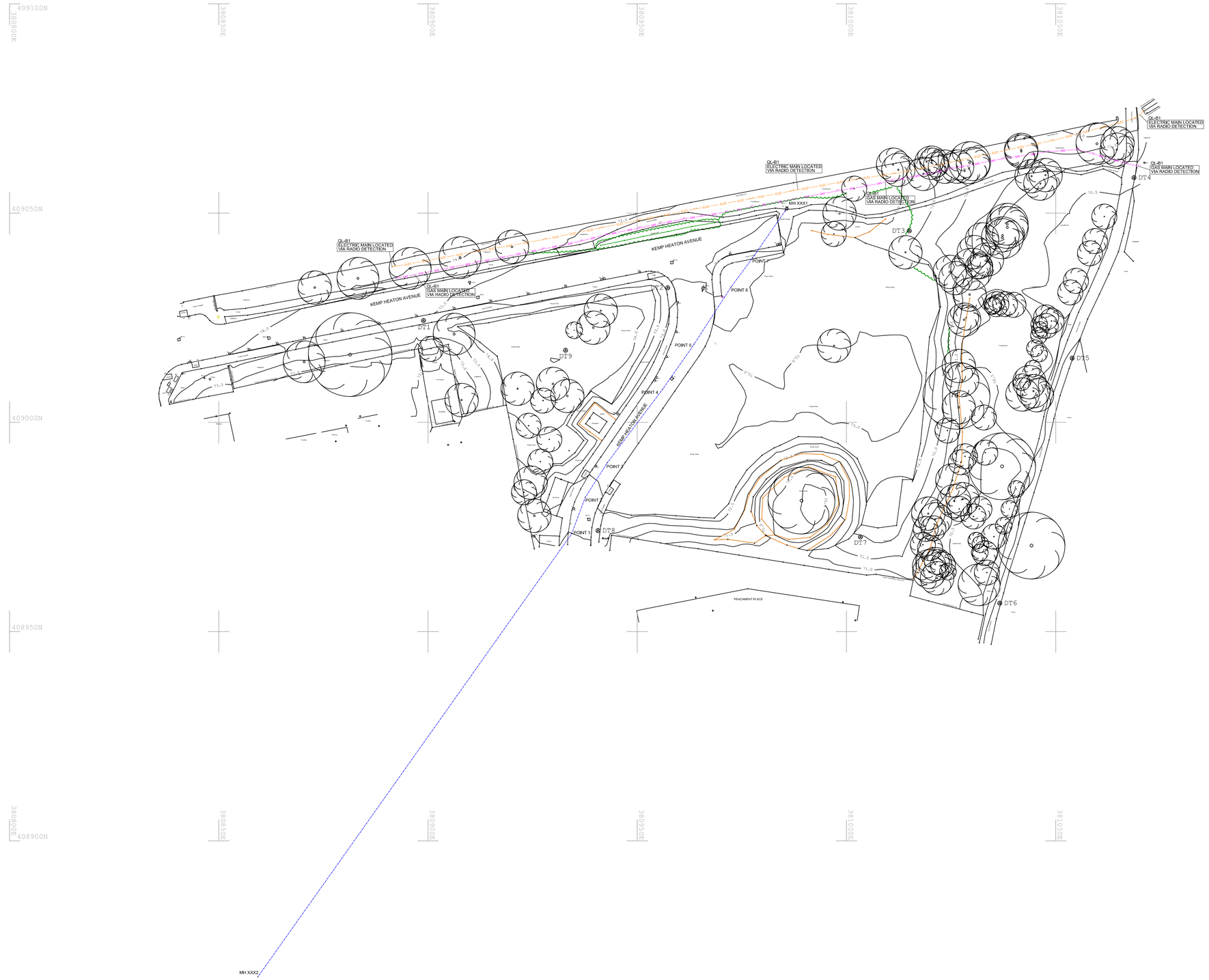
Land at Kemp Heaton Avenue Bury Lancashire BL9 9RN,

**Scale:** 1:2500
**Date:** 31/08/2022

**Printed by:** Property Searches

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

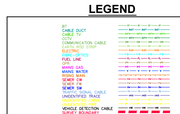
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N

SURVEY ORIENTATED TO REAL TIME GPS

## LEGEND




BD BACKDROP PIPE
BLK BLOCKED
UNI UNIDENTIFIED TRACE
OSA OUT OF SURVEY AREA
NPH NO FURTHER SPR CONTACTS
NVP NO VISIBLE PIPE
SUR SURVEYED MANHOLE
TPR TRACE FROM RECORDS
TOP TOP OF PIPE
SUR SURVEYED
UTL UNABLE TO LIFT
UTP UNABLE TO PASS SONDE FURTHER
UTT UNABLE TO TRACE
EOT SYMBOL

UNIDENTIFIED - A buried feature or utility that has been located, but we are unable to state what it is.

SURVEYED - The assumed location of a record feature or utility, usually taken from records, but not found during the utility trace due to various conditions.

FAULTED - Electric and water cables, even when they are live, are unable to be detected on occasion.

### UNDERGROUND UTILITIES SERVICES DISCLAIMER

We have endeavoured to locate existing services using records provided by Statutory Authorities as a guide. Some apparatus and ancillaries details have therefore been taken from Utility Record Drawings, which may be of poor quality. Consequently we cannot guarantee accuracy of information taken from such records.

Where indicated, no allowance has been made for over-surface entry into manholes, other chambers or confined spaces below ground level. Personnel working internally in manholes, have not been taken from the surface and no such work is recommended.

We have endeavoured to supply you with the most reliable, data obtained by using services and equipment that are at the forefront of industry. We have been careful in the selection of detectors and buried fixtures, but as with all methods of detecting underground or buried utilities the information provided is based on results received from electromagnetic techniques and we cannot be liable for distortion or errors beyond the reasonable control of the operator or the instruments.

It is the responsibility of the user under Health & Safety (CDM2015) guidelines to satisfy himself of the subsurface location of any services prior to excavation of the services shown.

### NOTE 1

This utility survey has been undertaken using a Radiodetection RD8200 + TX3 & Mini Geoscience Ground Probing Radar

### NOTE 2

Paper carrying features shown on this drawing are shown as an individual service line. This does not necessarily mean the number of cables actually present and it is possible that there are far more numbers of cables making up each service.

Communications transmission cables. Following the sonde throughout the survey area, it was found that the sonde signal from the sewer cables being located by signal emitted from the enclosed sewer could be at different depths, the below signal from the sewer cables being picked up signal emitted from the enclosed service above. Cable runs could also be present running parallel to the edge line shown.

There are two main reasons that GPR can be inaccurate when planning as they are a conductive soils and the second is, the electrical constant conductive soils.

The example of a conductive soil would be clay.

This has a high amount of ferrous material in it, hence clay is considered a conductive soil type, due to the soil's conductive nature, the GPR wave gets 'whittered' before it can return to the antenna. Other examples of conductive soils would be damp or wet soils that have a high salt content often over sources of salt or saturated water. The less fines the soils consists, a much more conductive soil and limits the GPR wave's resolution.

Dielectric constant:

A clear explanation would be that the dielectric constant is a measure of how permissive the soil and the targets in the soil are to the radar wave being passed into the ground. It is much more complicated than this but to not over complicate, we will work with this explanation.

So if you have a damp/moist soil with a concrete pipe and a metal pipe in it, the GPR wave will enter the soil at a certain rate and that rate will change as it goes through differing soil layers or differing pipe structures. A metal pipe is 100% reflective so it will stand out in the image. Most utilities are actually be reflective in a sandier soil because the radar wave meets little resistance in this soil with it into the utilities. However, on our concrete pipe or structure, as this has a dielectric constant that is closer to the surrounding soil, the result is that pipe or structure will fade into the background of the GPR image.

Below is some of the...

| Issue / Purpose | Author | Check |
|---|---|---|
| Survey Complete | -- | -- |
| Issued for Comment | -- | -- |
| Issued for Comment | -- | -- |
| Issued for Comment | -- | -- |
| Issued for Comment | -- | -- |
| Issued for Comment | -- | -- |
| Issued for Comment | -- | -- |

## REVISIONS

| REV | DESCRIPTION | SURVEYED | DRAWN | DATE |
|---|---|---|---|---|
| A | SWS COORDINATES PROVIDED ALTERED TO TIE INTO EXISTING MANHOLES | -- | JC | 30.03.2023 |


JLP Surveying

JLP Surveying Consultants Ltd,
Suite 45 Rodney House,
King Street,
Wigan
WN1 1BT
Tel - 01942 243313
Fax - 01942 492230
Mobile - 07710 428498
EMAIL:- peterhouston@jlpsurveys.com


**PROJECT**

Heaton Avenue
Bury

**DRAWING TITLE**

Utility Survey

| SCALE | SHEET SIZE | No. of SHEETS | DATE | REVISION |
|---|---|---|---|---|
| 1 : 500 | A1 | 1 | 13.03.2023 | A |

**DRAWING NUMBER**

S23-0219

# WAYNE FOR DRAINS LTD

9th March 2023

CampbellReith
1 Marsden Street
Manchester
M2 1HW

FAO: Peter Kenny

Re: Kemp Heaton Avenue, Hollins, Bury.
Ref: United Utilities Culvert Location Tracing/GPS

Peter,

Please find as follows our report.

Survey date: Monday 6th March - Weather / Light Rain

We attended site. MH XXX1 was located and the cover lifted. We noted that the flows within the culvert, were quite high and fast flowing. We did attempt to insert the CCTV camera into the culvert, but due to the high flows, I had concerns about camera safety and aborted the survey.

MH XXX1 was recorded to a depth of approx 5.80m from ground surface level to the water level within the culvert. We can assume a further 500-700mm of depth, below the water level.

MH XXX2 was recorded to a depth of approx 3.00m from ground surface level to the water level within the culvert. We can assume a further 500mm of depth, below the water level.

Survey date: Wednesday 8th March – Weather / Dry

MH XXX1 cover was lifted. The flows had reduced but remained at a high level of flow. This visit, we brought along a floatation aid, which we can securely attach the sonde to. The sonde transmits a radio frequency, which can be located using a receiver at ground level. The floatation aid was lowered into the culvert and attached to securing line. At approx 100m, downstream of MH XXX1 the floatation aid would not progress any further, at this moment in time we cannot advise as to why this occurred. We then commenced with the GPS readings and successfully managed to record six locations of the culvert positioning.

Please be advised that a man-entry into MH XXX1 was attempted but immediately aborted due to a gas strike on the monitor. The culvert was vented for 20 minutes, and a further reading attempted, again the monitor alarmed and identified a high level of Carbon Dioxide.

The United Utilities sewer asset plan identifies the culvert to be 1500mm (height) x 1000mm (width) in size, but without a man entry into MH XXX1, we are unable to confirm the size.

I trust this report meets your approval. If you have any questions, please do not hesitate to contact me.

# WAYNE FOR DRAINS LTD




Location of MH XXX1




Wayne for Drains Ltd
3 Willow Grove, Boroughbridge, North Yorkshire, YO51 9FX
CRN: 10587558  VAT: 261881685  UTR: 23040 23183

# WAYNE FOR DRAINS LTD




Internal view of MH XXX1

Wayne for Drains Ltd
3 Willow Grove, Boroughbridge, North Yorkshire, YO51 9FX
CRN: 10587558  VAT: 261881685  UTR: 23040 23183

# WAYNE FOR DRAINS LTD

## GPS Points




| ID NAME | GRID REFERENCE | X | Y |
|---|---|---|---|
| MH XXX1 | SD 80988 09054 | 380987.830 | 409054.398 |
| POINT 1 | SD 80933 08981 | 380933.092 | 408980.730 |
| POINT 2 | SD 80940 08985 | 380940.410 | 408985.437 |
| POINT 3 | SD 80946 08992 | 380945.707 | 408992.466 |
| POINT 4 | SD 80955 09007 | 380955.236 | 409006.627 |
| POINT 5 | SD 80966 09021 | 380966.119 | 409021.234 |
| POINT 6 | SD 80978 09038 | 380978.292 | 409037.691 |

Disclaimer:

Wayne for Drains Ltd have provided the above coordinates but cannot accept or confirm 100% accuracy of the data and the culvert location, due to the assumed size of the culvert. The floatation aid used for the survey measures 300mm in diameter and the culvert width is to be assumed as 1000mm.

Wayne for Drains Ltd
3 Willow Grove, Boroughbridge, North Yorkshire, YO51 9FX
CRN: 10587558  VAT: 261881685  UTR: 23040 23183

# WAYNE FOR DRAINS LTD

Yours sincerely



Wayne Martin
Director

Wayne for Drains Ltd
3 Willow Grove, Boroughbridge, North Yorkshire, YO51 9FX
CRN: 10587558  VAT: 261881685  UTR: 23040 23183

hr wallingford

# Greenfield runoff
# estimation for s

www.uksuds.com | Greenfield runc

| | |
|---|---|
| **Calculated by:** | Isabel Clements |
| **Site name:** | Kemp Heaton Avenue |
| **Site location:** | Bury |

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

## Site Details

| | |
|---|---|
| **Latitude:** | 53.57738° |
| **Longitude:** | 2.28816° |
| **Reference:** | 38908577 |
| **Date:** | May 31 2023 14: |

## Runoff estimation approach

FEH Statistical

## Site characteristics

| | |
|---|---|
| **Total site area (ha):** | 0.84 |

## Methodology

| | |
|---|---|
| **$Q_{MED}$ estimation method:** | Calculate from BFI and SAAR |
| **BFI and SPR method:** | Calculate from dominant HOST |
| **HOST class:** | 17 |
| **BFI / BFIHOST:** | 0.514 |
| **$Q_{MED}$ (l/s):** | 5.74 |
| **$Q_{BAR}$ / $Q_{MED}$ factor:** | 1.08 |

## Hydrological characteristics

| | Default | Edited |
|---|---|---|
| **SAAR (mm):** | 1048 | 1048 |
| **Hydrological region:** | 10 | 10 |
| **Growth curve factor 1 year:** | 0.87 | 0.87 |
| **Growth curve factor 30 years:** | 1.7 | 1.7 |
| **Growth curve factor 100 years:** | 2.08 | 2.08 |
| **Growth curve factor 200 years:** | 2.37 | 2.37 |

## Notes

### (1) Is $Q_{BAR}$ < 2.0 l/s/ha?

When $Q_{BAR}$ is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

### (2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

### (3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

## Greenfield runoff rates

| | Default | Edited |
|---|---|---|
| $Q_{BAR}$ (l/s): | 6.17 | 6.17 |
| 1 in 1 year (l/s): | 5.37 | 5.37 |
| 1 in 30 years (l/s): | 10.49 | 10.49 |
| 1 in 100 year (l/s): | 12.83 | 12.83 |
| 1 in 200 years (l/s): | 14.62 | 14.62 |

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

# Appendix F: Proposed Development Masterplan




N

0 5 10 20 30m

Scale @ 1:500

Scale Bars TO BE USED ONLY AS GUIDANCE

| | | | | | | |
|---|---|---|---|---|---|---|
| 1:100 | mm | 1000 | 3000 | 5000 | | |
| 1:200 | mm | 5000 | 8000 | | | |
| 1:500 | M | 5 | 15 | 25 | | |
| 1:1250 | M | 10 | 30 | 50 | 70 | |

## NOTES

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This drawing contains the following model files: -

12551-AEW-XX-XX-M3-A-0001

## CDM 2015

Client notified of duties: **Date**

Principal Designer: **Name/Company**

Unless noted below, all known hazards have been highlighted on the drawing:

### Schedule of Accommodation

| | |
|---|---|
| 8 x | 2B3P Bungalows |
| 7 x | 2B4P Homes |
| 18 x | Apartments (15 x 1B1P & 3 x 2B2P) |
| 10 x | 1B2P Cottage Flats |

**Total number of dwellings: = 43**

Total number of parking spaces: 50

18no. Supported Living Parking Spaces (Including 2no. Accessible Bays)

| Rev | Date | Description | Drawn by | Checked By |
|---|---|---|---|---|
| P07 | 18/07/23 | Revised Parking | JS | DS |
| P06 | 01/06/23 | Revised site layout | JS | DS |
| P05 | 23/05/23 | Revised site layout following design team feedback | JS | DS |
| P04 | 28/11/22 | Revised following planners' feedback | DB | DS |
| P03 | 07/11/22 | Updated Layout Plan | DB | DS |
| P02 | 27/07/22 | Layout revised following planners feedback | DS | BR |
| P01 | 05/04/22 | Initial Issue | JFS | DS |

Status: S2 — Purpose of Issue: For Information

drawing stage: **Developed Design**

client: **Great Places**

project: **Kemp Heaton Ave. Bury**

drawing title: **Proposed Site Plan**

date 05/04/22 drawn JFS

scale @ A1 1 : 500 checked DS

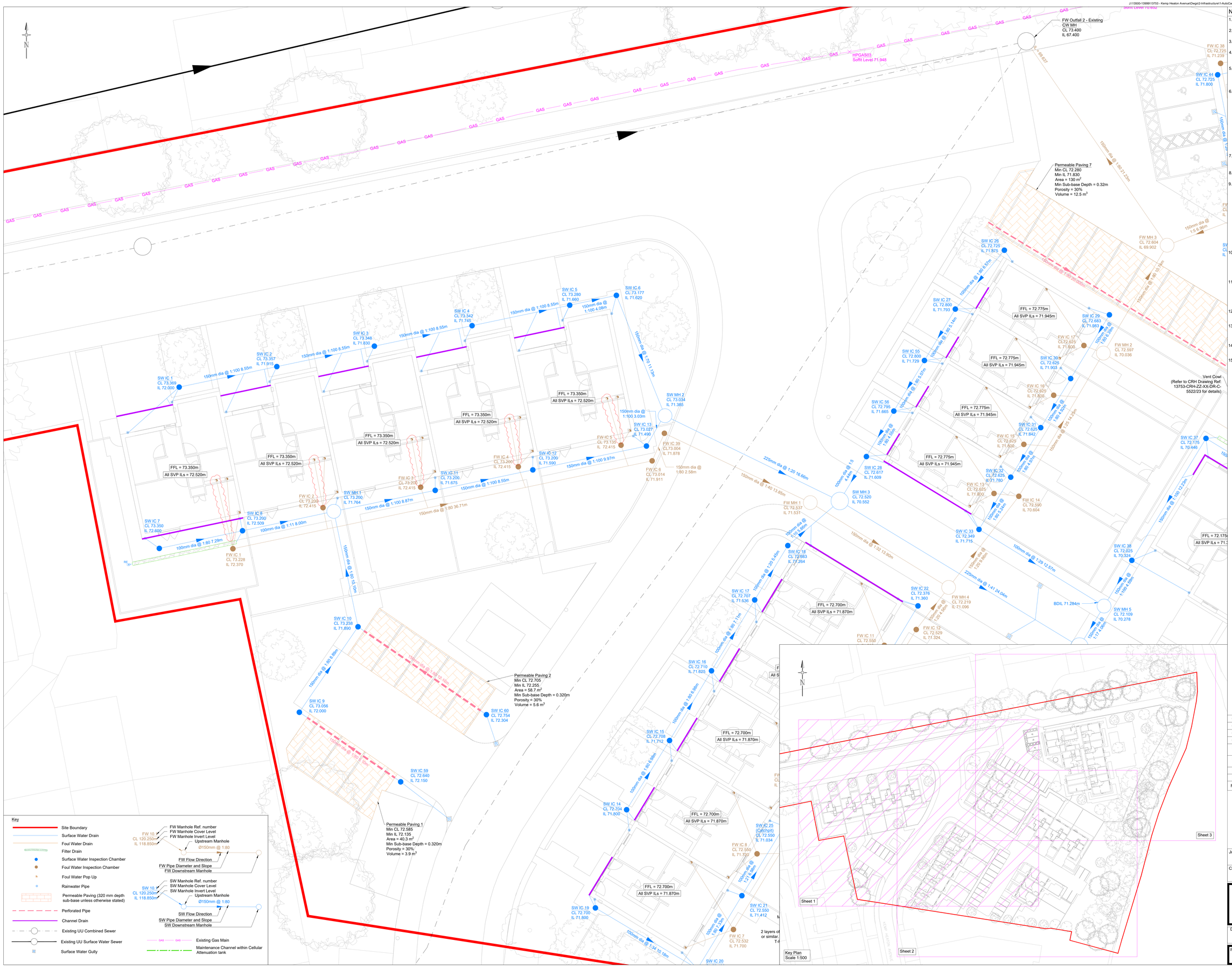
Rev **P07**

Dwg No **12551-AEW-XX-XX-DR-A-0503**

aew architects
0161 214 4370
www.aewarchitects.com

# Appendix G: Proposed Drainage Strategy and Supporting Calculations

13753-CRH-ZZ-XX-DR-C-5500-C4 Proposed Drainage Layout (Sheet 1 of 3)
13753-CRH-ZZ-XX-DR-C-5501-C6 Proposed Drainage Layout (Sheet 2 of 3)
13753-CRH-ZZ-XX-DR-C-5502-C5 Proposed Drainage Layout (Sheet 3 of 3)
Catchment 1 – Storage Estimate
Catchment 2 – Storage Estimate
13753-CRH-XX-XX-CA-0001-P1 FW Flows Calc Sheet




## Notes

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   **P: Preliminary** Evolving drawings for approvals, tenders, billings etc.
   **C: Contractual** Drawings authorized and approved for stage completion.
6. Drawing status:
   Work in progress
   **S0** - Initial status
   Shared (Non-contractual)
   **S1** - Suitable for coordination, **S2** - Suitable for information, **S3** - Suitable for review and comment, **S4** - Suitable for stage approval.
   Published (For contractors purposes)
   **A1**, **An** etc - Authorised and accepted ('n' relates to work stages)
   **B1**, **Bn** etc - Partial sign-off (with comments)
   **CR** - As constructed record document (Final Construction ONLY. Any deviations to that which is on site is not the liability of CampbellReith)
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8. Only drawings with **revision Cn and status A5 to be used for Construction**.
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   The positions of Statutory Undertakers mains & services shown on this drawing have been based on information extracted from records obtained from various Utilities Companies. These must regarded as approximate only.The accuracy or completeness of the information or the location of such apparatus as shown on this drawing is not guaranteed and no warranty is given or implied regarding the position, depth, size, gradient thereof. The Contractor must make their own enquires of the Utilities Companies and Public Authorities and satisfy themselves as to the exact position of services and depth, sizes, gradient thereof. In the interests of safety, the approximate position of underground cables should be obtained by use of electronic cable locator and this position confirmed by careful trial-holing using hand-dug methods.
10. Proposed Masterplan based on 12551-AEW-SI-XX-DR-A-1000-S2-C01-Proposed Site Plan (Received from AEW Architects on 11/06/2025). This Masterplan has been inserted based on their setting out points and no guarantee as to the accuracy of the layout is given or implied. Masterplan shown for information only.
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13. All control stations and dimensions shall be checked and verified prior to commencement of works and any other discrepancies shall be reported to the engineer.
14. Refer to Design Risk Register ref. 13753-CRH-ZZ-XX-IE-C-0002 for reference. D1
15. Refer to Designers Risk Assessment ref. 13753-CRH-ZZ-XX-HS-C-0004 for reference. R1

| Rev | Description | Date | By |
|---|---|---|---|
| C4 | Additional SVP's Added t Bungalows (Plots 1-5) | 28/08/25 | IC |
| C3 | Plots 1-5 Foul Drainage Updated | 30/07/25 | IC |
| C2 | Drainage Updated as per Hargreaves Comments | 20/06/25 | IC |
| C1 | Issued for Construction | 30/05/25 | IC |
| P4 | Drainage Updated based on Landscape Architects Updates | 13/12/24 | ZA |
| P3 | Drainage Updated based on Landscape Architects Comments and Private Cellular Tanks Updated | 24/09/24 | IC |
| P2 | Drainage Updated | 06/09/24 | IC |
| P1 | Issued for Information | 29/08/24 | IC |

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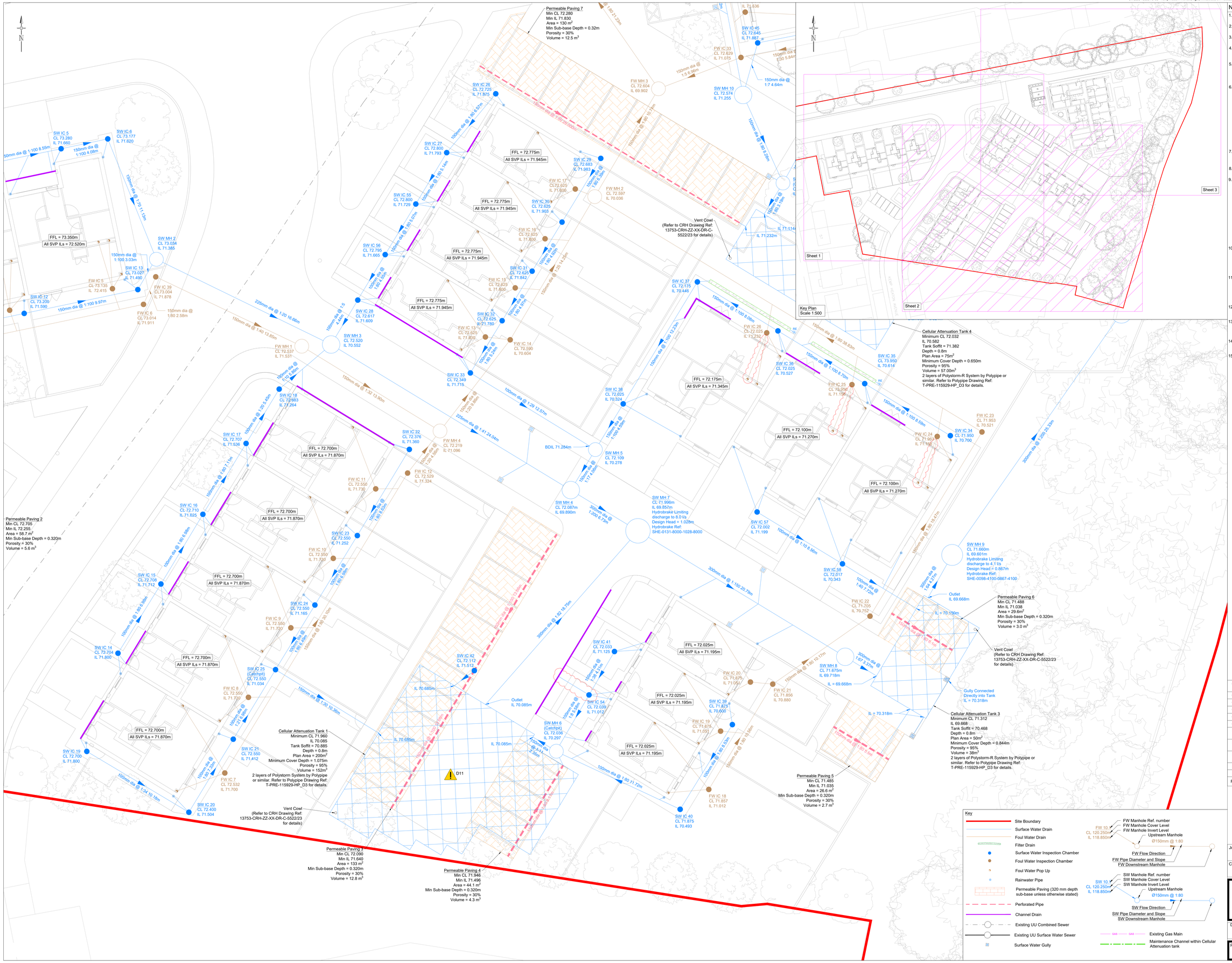
Client: Great Places Housing Group

# Proposed Drainage Layout (Sheet 1 of 3)

| Drawn by | Date made | Scale @ A0 | Checked by | Suitability | CR Project |
|---|---|---|---|---|---|
| IC | 28/08/24 | 1:100 | LM | A5 | 13753 |

| Project No | Orig. | Funct. | Spatial | Form | Disc. | Number | Rev |
|---|---|---|---|---|---|---|---|
| 13753 | CRH | ZZ | XX | DR | C | 5500 | C4 |

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   **P: Preliminary** Evolving drawings for approvals, tenders, billings etc.
   **C: Contractual** Drawings authorized and approved for stage completion.
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   Work in progress
   **S0** - Initial status
   Shared (Non-contractual)
   **S1** - Suitable for coordination, **S2** - Suitable for information, **S3** - Suitable for review and comment, **S4** - Suitable for stage approval.
   Published (For contractors purposes)
   **A1**, **An** etc - Authorised and accepted ('n' relates to work stages)
   **B1**, **Bn** etc - Partial sign-off (with comments)
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7. Work Stages:
   **2** - Concept, **3** - Definition, **4** - Design, **5** - Build & commission, **6** - Handover
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   The positions of Statutory Undertakers mains & services shown on this drawing have been based on information extracted from records obtained from various Utilities Companies. These must regarded as approximate only.The accuracy or completeness of the information or the location of such apparatus as shown on this drawing is not guaranteed and no warranty is given or implied regarding the position, depth, size, gradient thereof. The Contractor must make their own enquires of the Utilities Companies and Public Authorities and satisfy themselves as to the exact position of services and depth, sizes, gradient thereof. In the interests of safety, the approximate position of underground cables should be obtained by use of electronic cable locator and this position confirmed by careful trial-holing using hand-dug methods.
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11. All existing survey information shown or referred to is based upon topographical survey prepared by DYWIDAG, Dwg No 2671T_Kemp_Heaton_Avenue_SU001, dated September 2021 as supplied to CampbellReith - no warranty as to the accuracy of the information is given or implied.
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14. Refer to Design Risk Register ref. 13753-CRH-ZZ-XX-IE-C-0002 for reference. D1
15. Refer to Designers Risk Assessment ref. 13753-CRH-ZZ-XX-HS-C-0004 for reference. R1

| Rev | Description | Date | By |
|---|---|---|---|
| C6 | Channel Drain Outfall Connection Amended and Additional SVP's added to Bungalows | 28/08/25 | IC |
| C5 | Channel Drain Added to Parking Area | 13/08/25 | IC |
| C4 | Plots 1-5 Foul Drainage Updated | 30/07/25 | IC |
| C3 | Tank Inlet and Outlet IL's Updated/Added | 25/07/25 | IC |
| C2 | Drainage Updated as per Hargreaves Comments | 20/06/25 | IC |
| C1 | Issued for Construction | 30/05/25 | IC |
| P5 | Surface Water Drainage Updated based on Survey of Existing SW MH | 10/03/25 | IC |
| P4 | Drainage Updated based on Landscape Architects Updates | 13/12/24 | ZA |
| P3 | Drainage Updated based on Landscape Architects Comments and Private Cellular Tanks Updated | 24/09/24 | IC |
| P2 | Drainage Updated | 06/09/24 | IC |
| P1 | Issued for Information | 29/08/24 | IC |

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Job Title: Kemp Heaton Avenue, Bury

Client: Great Places Housing Group

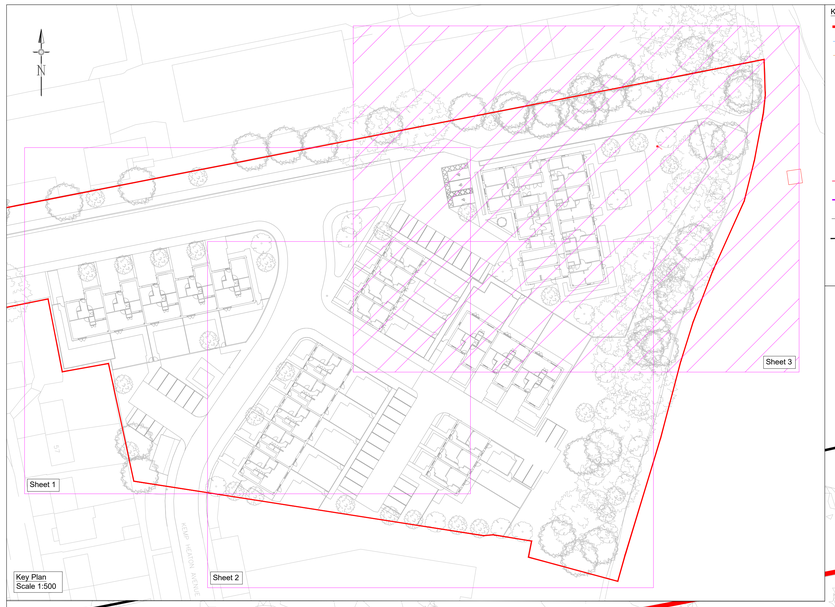
# Proposed Drainage Layout (Sheet 2 of 3)

| Drawn by | Date made | Scale @ A0 | Checked by | Suitability | CR Project |
|---|---|---|---|---|---|
| IC | 28/08/24 | 1:100 | LM | A5 | 13753 |

| Project No | Orig. | Funct. | Spatial | Form | Disc. | Number | Rev |
|---|---|---|---|---|---|---|---|
| 13753 | CRH | ZZ | XX | DR | C | 5501 | C6 |

Key
- Site Boundary
- Surface Water Drain
- Foul Water Drain
- Filter Drain
- Surface Water Inspection Chamber
- Foul Water Inspection Chamber
- Foul Water Pop Up
- Rainwater Pipe
- Permeable Paving (320 mm depth sub-base unless otherwise stated)
- Perforated Pipe
- Channel Drain
- Existing UU Combined Sewer
- Existing UU Surface Water Sewer
- Surface Water Gully
- FW Manhole Ref. number / FW Manhole Cover Level / FW Manhole Invert Level / Upstream Manhole / Ø150mm @ 1:80 / FW Flow Direction / FW Pipe Diameter and Slope / FW Downstream Manhole
- SW Manhole Ref. number / SW Manhole Cover Level / SW Manhole Invert Level / Upstream Manhole / Ø150mm @ 1:80 / SW Flow Direction / SW Pipe Diameter and Slope / SW Downstream Manhole
- Existing Gas Main
- Maintenance Channel within Cellular Attenuation tank

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Key

- Site Boundary
- Surface Water Drain
- Foul Water Drain
- Filter Drain
- Surface Water Inspection Chamber
- Foul Water Inspection Chamber
- Foul Water Pop Up
- Rainwater Pipe
- Permeable Paving (320 mm depth sub-base unless otherwise stated)
- Perforated Pipe
- Channel Drain
- Existing UU Combined Sewer
- Existing UU Surface Water Sewer
- Surface Water Gully

FW Manhole Ref. number / FW Manhole Cover Level / FW Manhole Invert Level (e.g. FW 10, CL 120.250m, IL 118.850m)
Upstream Manhole Ø150mm @ 1:80
FW Flow Direction
FW Pipe Diameter and Slope
FW Downstream Manhole

SW Manhole Ref. number / SW Manhole Cover Level / SW Manhole Invert Level (e.g. SW 10, CL 120.250m, IL 118.850m)
Upstream Manhole Ø150mm @ 1:80
SW Flow Direction
SW Pipe Diameter and Slope
SW Downstream Manhole

- Existing Gas Main
- Maintenance Channel within Cellular Attenuation tank

## Notes

1. Do not scale from this drawing on print or electronically. Work from figured dimensions only.
2. No deviation from the details on this drawing is allowed without CampbellReith's prior permission in writing.
3. Read this drawing with all Architect's, Service Engineer's and CampbellReith's relevant details, specifications and drawings.
4. All work is to be done in accordance with the relevant specifications issued by CampbellReith, British Standard Codes of Practice, Statutory Requirements and the Contract Documents.
5. Drawing revision:
   **P: Preliminary** Evolving drawings for approvals, tenders, billings etc.
   **C: Contractual** Drawings authorized and approved for stage completion.
6. Drawing status:
   Work in progress
   **S0** - Initial status
   Shared (Non-contractual)
   **S1** - Suitable for coordination, **S2** - Suitable for information, **S3** - Suitable for review and comment, **S4** - Suitable for stage approval.
   Published (For contractors purposes)
   **A1**, **An** etc - Authorised and accepted ('n' relates to work stages)
   **B1**, **Bn** etc - Partial sign-off (with comments)
   **CR** - As constructed record document (Final Construction ONLY. Any deviations to that which is on site is not the liability of CampbellReith)
7. Work Stages:
   **2** - Concept, **3** - Definition, **4** - Design, **5** - Build & commission, **6** - Handover
8. Only drawings with **revision Cn and status A5 to be used for Construction**.
9. Utilities:
   The positions of Statutory Undertakers mains & services shown on this drawing have been based on information extracted from records obtained from various Utilities Companies. These must regarded as approximate only. The accuracy or completeness of the information or the location of such apparatus as shown on this drawing is not guaranteed and no warranty is given or implied regarding the position, depth, size, gradient thereof. The Contractor must make their own enquires of the Utilities Companies and Public Authorities and satisfy themselves as to the exact position of services and depth, sizes, gradient thereof. In the interests of safety, the approximate position of underground cables should be obtained by use of electronic cable locator and this position confirmed by careful trial-holing using hand-dug methods.
10. Proposed Masterplan based on 12551-AEW-SI-XX-DR-A-1000-S2-C01-Proposed Site Plan (Received from AEW Architects on 11/06/2025). This Masterplan has been inserted based on their setting out points and no guarantee as to the accuracy of the layout is given or implied. Masterplan shown for information only.
11. All existing survey information shown or referred to is based upon topographical survey prepared by DYWIDAG, Dwg No 26711T_Kemp_Heaton_Avenue_SU001, dated September 2021 as supplied to CampbellReith - no warranty as to the accuracy of the information is given or implied.
12. All details in this drawing shall be read in conjunction with Building Regulations 2015 Approved Document H.
13. All control stations and dimensions shall be checked and verified prior to commencement of works and any other discrepancies shall be reported to the engineer.
14. Refer to Design Risk Register ref. 13753-CRH-ZZ-XX-IE-C-0002 for reference. D1
15. Refer to Designers Risk Assessment ref. 13753-CRH-ZZ-XX-HS-C-0004 for reference. R1

SW Outfall - Existing
UU SW MH
CL 71.786m
IL 68.686

IL = 68.886
150mm dia @ 1:80 3.90m
SW MH 14
CL 71.700m
IL 68.935m

HPGAS02
Soffit Level 70.651

R7

Gas Main crossing northern extents of site.
Diameter 409mm.
Depth information supplied by Hargreaves in August 2025. Alignment take from Utilities Survey Ref: S23-0219 Utility Survey 2D Rev A undertaken by JLP Surveying in March 2023. And updated with information received from Hargreaves in August 2025.

Surface Water Rising Main passing underneath Gas Main with required 2m clearance (as stipulated by Cadent Gas). Assumed dia 90mm (subject to detailed design by APS).
IL @ Head of Run 67.415
IL @ Crossing Point with Gas Main 68.152
IL @ End of Run/Existing Manhole 68.935

1m Flat Hardstanding required around perimeter of Package Pump Station for maintenance requirements (Refer to APS Maintenance Requirements for further details).

NOTE: Electrical Duct and Pump Station Kiosk location TBC by M&E.

D17&18
R11

1.00m
1.00m

APS Vertical Package Pump Station (V-12-2500-STD-GP)
CL 70.914m
Inlet IL 69.172m
Outlet IL 67.415m
Overall Depth 3500mm
Chamber Size 1200mm dia
Static Head 1.520m (Total Head 4.932m)
Rising Main Length 20.0m
Rising Main Diameter 90mm
Discharge Rate Restricted to 6.17 l/s
Refer to APS Design/Specification for details

Cellular Attenuation Tank 2
Minimum CL 72.450
IL 70.800
Tank Soffit = 71.600
Depth = 0.8m
Plan Area = 40m²
Minimum Cover Depth = 0.850m
Porosity = 95%
Volume = 30.4m³
2 layers of Polystorm Lite System by Polypipe or similar. Refer to Polypipe Drawing Ref: T-PRE-115929-HP_D3 for details.

300mm dia @ 1:80 13.78m

SW MH 13
CL 70.595m
IL 69.342m

SW IC 53 - Turtle Oriflo Chamber (Ref: OFCP 450/2)
CL 72.419
IL 70.770
Orifice Plate limiting discharge to 1.0 l/s
Design Depth = 0.930m
Diameter = 0.023m

150mm dia @ 1:7 8.56m

150mm dia @ 1:135 1.25m

Outlet
IL 70.800m

Vent Cowl
(Refer to CRH Drawing Ref: 13753-CRH-ZZ-XX-DR-C-5522/23 for details)

IL = 70.995m
SW IC 50
CL 72.614
IL 71.527
150mm dia @ 1:4 1.96m

FW Outfall 2 - Existing
CW MH
CL 73.400
IL 67.400

IL = 69.837

HPGAS03
Soffit Level 71.948

HPGAS01
Soffit Level 70.652

FW IC 38
CL 72.725
IL 71.239

150mm dia @ 1:80 6.53m

SW IC 43
CL 72.635
IL 71.882

FW IC 37
CL 72.609
IL 71.890

FW IC 40
CL 72.639
IL 71.815

150mm dia @ 1:72 18.50m

FW IC 36
CL 72.635
IL 71.715

FW IC 35
CL 72.527
IL 71.495

150mm dia @ 1:80 7.41m

SW IC 52
CL 72.609
IL 71.781

SW IC 51
CL 72.635
IL 71.874

SW IC 44
CL 72.725
IL 71.800

SVP IL 71.92
(FFL-730mm)

150mm dia @ 1:80 13.14m

150mm dia @ 1:28 15.57m

150mm dia @ 1:61 15.44m

FW IC 34
CL 72.643
IL 71.636

FFL = 72.650m
All SVP ILs = 71.745m
(Unless Stated Otherwise)

SW IC 45
CL 72.645
IL 71.887

FW IC 33
CL 72.629
IL 71.075

FW IC 32
CL 72.630
IL 71.270

150mm dia @ 1:30 5.84m

150mm dia @ 1:5 6.96m

FW IC 31
CL 72.643
IL 71.653

FW IC 30
CL 72.638
IL 71.708

SVP IL 71.92
(FFL-730mm)

150mm dia @ 1:7 4.64m

SW MH 10
CL 72.574
IL 71.255

FW MH 3
CL 72.604
IL 69.902

Permeable Paving 7
Min CL 72.280
Min IL 71.830
Area = 130 m²
Min Sub-base Depth = 0.32m
Porosity = 30%
Volume = 12.5 m³

150mm dia @ 1:80 21.22m

150mm dia @ 1:80 10.74m

150mm dia @ 1:80 20.00m

SW IC 46
CL 72.581
IL 71.800

150mm dia @ 1:68 8.99m

FW IC 29
CL 72.631
IL 71.464

150mm dia @ 1:9 3.91m

150mm dia @ 1:80 10.45m

Bin Store Gully

SW MH 11
(Catchpit)
CL 72.453
IL 71.152

FW IC 28
CL 72.634
IL 71.464

150mm dia @ 1:80 1.16m

FW IC 27
CL 72.505
IL 71.475

150mm dia @ 1:16 3.52m

FW IC 26
CL 72.449
IL 71.696

IL 71.114m

IL 71.232m

SW IC 49
CL 72.606
IL 71.740

SVP IL 71.92
(FFL-730mm)

150mm dia @ 1:80 10.45m

SW IC 48
CL 72.623
IL 71.871

Outlet
IL 70.582m

SW IC 47 - Turtle Oriflo Chamber (Ref: OFCP 450/1.5)
CL 72.344
IL 70.569
Orifice Plate limiting discharge to 1.1 l/s
Design Depth = 0.813m
Diameter = 0.024m

150mm dia @ 1:22 21.59m

SW MH 12
CL 70.836m
IL 69.475m

Cellular Attenuation Tank 4
Minimum CL 72.032
IL 70.582
Tank Soffit = 71.382
Depth = 0.8m
Plan Area = 75m²
Minimum Cover Depth = 0.650m
Porosity = 95%
Volume = 57.00m³
2 layers of Polystorm-R System by Polypipe or similar. Refer to Polypipe Drawing Ref: T-PRE-115929-HP_D3 for details.

300mm dia @ 1:200 16.60m

Vent Cowl
(Refer to CRH Drawing Ref: 13753-CRH-ZZ-XX-DR-C-5522/23 for details)

FFL = 72.775m
All SVP ILs = 71.945m

SW IC 27
CL 72.800
IL 71.783

100mm dia @ 1:80 5.14m

SW IC 29
CL 72.683
IL 71.983

100mm dia @ 1:80 8.39m

FW IC 17
CL 72.625
IL 71.806

FW MH 2
CL 72.597
IL 70.036

SW IC 55
CL 72.800
IL 71.729

100mm dia @ 1:80 5.97m

SW IC 30
CL 72.625
IL 71.903

150mm dia @ 1:80 4.58m

SW IC 56
CL 72.795
IL 71.665

100mm dia @ 1:80 6.85m

FW IC 16
CL 72.625
IL 71.806

SW IC 31
CL 72.625
IL 71.842

150mm dia @ 1:25 14.29m

FW IC 15
CL 72.625
IL 71.606

SW IC 28
CL 72.617
IL 71.609

100mm dia @ 1:5 3.44m

SW IC 32
CL 72.625
IL 71.780

100mm dia @ 1:80 4.97m

FW IC 13
CL 72.625
IL 71.800

SW MH 3
CL 72.520
IL 70.552

FW IC 14
CL 72.590
IL 70.604

150mm dia @ 1:80 5.24m

SW IC 33
CL 72.349
IL 71.715

150mm dia @ 1:32 13.90m

100mm dia @ 1:26 12.57m

100mm dia @ 1:20 9.66m

225mm dia @

SW IC 37
CL 72.175
IL 70.446

150mm dia @ 1:100 8.08m

150mm dia @ 1:100 12.22m

FW IC 26
CL 72.025
IL 71.232

150mm dia @ 1:80 38.83m

SW IC 35
CL 73.950
IL 70.614

SW IC 36
CL 72.025
IL 70.527

150mm dia @ 1:100 8.70m

SW IC 38
CL 72.025
IL 70.324

FW IC 25
CL 73.950
IL 71.159

150mm dia @ 1:100 8.59m

FW IC 23
CL 71.953
IL 70.621

FFL = 72.175m
All SVP ILs = 71.345m

| Rev | Description | Date | By |
|---|---|---|---|
| C5 | Plant Room Pop Up Added to Assisted Living Block, Surface Water Package Pump Station and Rising Main Added. | 03/09/25 | IC |
| C4 | Plots 1-5 Foul Drainage Updated | 30/07/25 | IC |
| C3 | Tank Inlet and Outlet IL's Updated/Added | 25/07/25 | IC |
| C2 | Drainage Updated as per Hargreaves Comments | 20/06/25 | IC |
| C1 | Issued for Construction | 30/05/25 | IC |
| P6 | Surface Water Drainage Updated based on Survey of Existing SW MH | 10/03/25 | IC |
| P5 | Drainage Updated based on Landscape Architects Updates | 13/12/24 | ZA |
| P4 | Drainage Updated based on Landscape Architects Comments and Private Cellular Tanks Updated | 24/09/24 | IC |
| P3 | Bin Store Gully Added | 06/09/24 | IC |
| P2 | Drainage Updated | 06/09/24 | IC |
| P1 | Issued for Information | 24/08/24 | IC |

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Bristol 0117 916 1066 ☐ ☐ Birmingham 01675 467 484
www.campbellreith.com

Job Title: Kemp Heaton Avenue, Bury

Client: Great Places Housing Group

# Proposed Drainage Layout (Sheet 3 of 3)

| Drawn by | Date made | Scale @ A0 | Checked by | Suitability | CR Project |
|---|---|---|---|---|---|
| IC | 28/08/24 | 1:100 | LM | A5 | 13753 |

| Project No | Orig. | Funct. | Spatial | Form | Disc. | Number | Rev |
|---|---|---|---|---|---|---|---|
| 13753 | CRH | ZZ | XX | DR | C | 5502 | C5 |

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| | | | | |
|---|---|---|---|---|
| 13753 - Kemp Heaton Avenue:<br>Storage Estimate<br>Catchment 1<br>P1 | Date:<br>09/08/2023 | | | CampbellReith<br>consulting engineers |
| | Designed by:<br>IC | Checked by:<br>LM | Approved By: | |
| Report Details:<br>Type: Inflows<br>Storm Phase: Phase | CampbellReith:<br>1 Marsden Street<br>Manchester<br>M2 1HW | | | |



**Catchment Area**

Type : Catchment Area

| | |
|---|---|
| Area (ha) | 0.30 |

## Dynamic Sizing

| Runoff Method | Time of Concentration |
|---|---|
| Summer Volumetric Runoff | 0.750 |
| Winter Volumetric Runoff | 0.840 |
| Time of Concentration (mins) | 5 |
| Percentage Impervious (%) | 100 |

| | | | | |
|---|---|---|---|---|
| 13753 - Kemp Heaton Avenue:<br>Storage Estimate<br>Catchment 1<br>P1 | Date:<br>09/08/2023 | | | CampbellReith |
| | Designed by:<br>IC | Checked by:<br>LM | Approved By: | |
| Report Details:<br>Type: Stormwater Controls<br>Storm Phase: Phase | CampbellReith:<br>1 Marsden Street<br>Manchester<br>M2 1HW | | | |

**Cellular Storage**

Type : Cellular Storage

## Dimensions

| | |
|---|---|
| Exceedance Level (m) | 75.000 |
| Depth (m) | 1.000 |
| Base Level (m) | 73.000 |
| Number of Crates Long | 23 |
| Number of Crates Wide | 10 |
| Number of Crates High | 1 |
| Porosity (%) | 95 |
| Crate Length (m) | 1 |
| Crate Width (m) | 1 |
| Crate Height (m) | 1 |
| Total Volume (m³) | 219.500 |

## Inlets

### Inlet

| | |
|---|---|
| Inlet Type | Point Inflow |
| Incoming Item(s) | Catchment Area |
| Bypass Destination | (None) |
| Capacity Type | No Restriction |

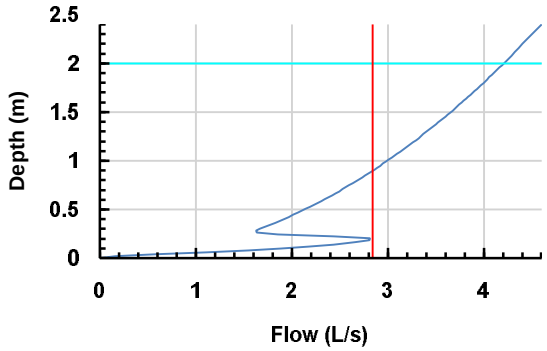
## Outlets

### Outlet

| | |
|---|---|
| Outgoing Connection | Pipe |
| Outlet Type | Hydro-Brake® |

| | |
|---|---|
| Invert Level (m) | 73.000 |
| Design Depth (m) | 2.000 |
| Design Flow (L/s) | 4.2 |
| Objective | Minimise Upstream Storage Requirements |
| Application | Surface Water Only |
| Sump Available | ☐ |

| | |
|---|---|
| Unit Reference | CHE-0079-4200-2000-4200 |



| | | | | |
|---|---|---|---|---|
| 13753 - Kemp Heaton Avenue:<br>Storage Estimate<br>Catchment 1<br>P1 | Date:<br>09/08/2023 | | | CampbellReith<br>consulting engineers |
| | Designed by:<br>IC | Checked by:<br>LM | Approved By: | |
| Report Title:<br>Rainfall Analysis Criteria | CampbellReith:<br>1 Marsden Street<br>Manchester<br>M2 1HW | | | |

| | |
|---|---|
| Runoff Type | Dynamic |
| Output Interval (mins) | 5 |
| Time Step | Default |
| Urban Creep | Apply Global Value |
| Urban Creep Global Value (%) | 0 |
| Junction Flood Risk Margin (mm) | 300 |
| Perform No Discharge Analysis | ☐ |

## Rainfall

### FEH

Type: FEH

| | |
|---|---|
| Site Location | GB 381100 409100 SD 81100 09100 |
| Rainfall Version | 2022 |
| Summer | ☑ |
| Winter | ☑ |

## Return Period

| Return Period (years) | Increase Rainfall (%) |
|---|---|
| 100.0 | 40.000 |

## Storm Durations

| Duration (mins) | Run Time (mins) |
|---|---|
| 15 | 30 |
| 30 | 60 |
| 60 | 120 |
| 120 | 240 |
| 240 | 480 |
| 360 | 720 |
| 480 | 960 |
| 960 | 1920 |
| 1440 | 2880 |

| | | | | |
|---|---|---|---|---|
| 13753 - Kemp Heaton Avenue:<br>Storage Estimate<br>Catchment 1<br>P1 | Date:<br>09/08/2023 | | | CampbellReith<br>consulting engineers |
| | Designed by:<br>IC | Checked by:<br>LM | Approved By: | |
| Report Details:<br>Type: Stormwater Controls Summary<br>Storm Phase: Phase | CampbellReith:<br>1 Marsden Street<br>Manchester<br>M2 1HW | | | |

**Critical Storm Per Item: Rank By: Max. Avg. Depth**

| Stormwater Control | Storm Event | Max. US Level (m) | Max. DS Level (m) | Max. US Depth (m) | Max. DS Depth (m) | Max. Inflow (L/s) | Max. Resident Volume (m³) | Max. Flooded Volume (m³) | Total Lost Volume (m³) | Max. Outflow (L/s) | Total Discharge Volume (m³) | Percentage Available (%) | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cellular Storage | FEH: 100 years: +40 %: 1440 mins: Winter | 74.943 | 74.943 | 1.943 | 1.943 | 11.2 | 219.473 | 0.000 | 0.000 | 4.1 | 369.726 | 0.012 | OK |

| | | | | |
|---|---|---|---|---|
| 13753 - Kemp Heaton Avenue:<br>Storage Estimate<br>Catchment 2<br>P1 | Date:<br>09/08/2023 | | | CampbellReith<br>consulting engineers |
| | Designed by:<br>IC | Checked by:<br>LM | Approved By: | |
| Report Details:<br>Type: Inflows<br>Storm Phase: Phase | CampbellReith:<br>1 Marsden Street<br>Manchester<br>M2 1HW | | | |



**Catchment Area**

Type : Catchment Area

| | |
|---|---|
| Area (ha) | 0.12 |

## Dynamic Sizing

| Runoff Method | Time of Concentration |
|---|---|
| Summer Volumetric Runoff | 0.750 |
| Winter Volumetric Runoff | 0.840 |
| Time of Concentration (mins) | 5 |
| Percentage Impervious (%) | 100 |

| | | | | |
|---|---|---|---|---|
| 13753 - Kemp Heaton Avenue:<br>Storage Estimate<br>Catchment 2<br>P1 | Date:<br>09/08/2023 | | | CampbellReith |
| | Designed by:<br>IC | Checked by:<br>LM | Approved By: | |
| Report Details:<br>Type: Stormwater Controls<br>Storm Phase: Phase | CampbellReith:<br>1 Marsden Street<br>Manchester<br>M2 1HW | | | |

**Cellular Storage**

Type : Cellular Storage

## Dimensions

| | |
|---|---|
| Exceedance Level (m) | 75.000 |
| Depth (m) | 1.000 |
| Base Level (m) | 73.000 |
| Number of Crates Long | 11 |
| Number of Crates Wide | 8 |
| Number of Crates High | 1 |
| Porosity (%) | 95 |
| Crate Length (m) | 1 |
| Crate Width (m) | 1 |
| Crate Height (m) | 1 |
| Total Volume (m³) | 84.600 |

## Inlets

### Inlet

| | |
|---|---|
| Inlet Type | Point Inflow |
| Incoming Item(s) | Catchment Area |
| Bypass Destination | (None) |
| Capacity Type | No Restriction |

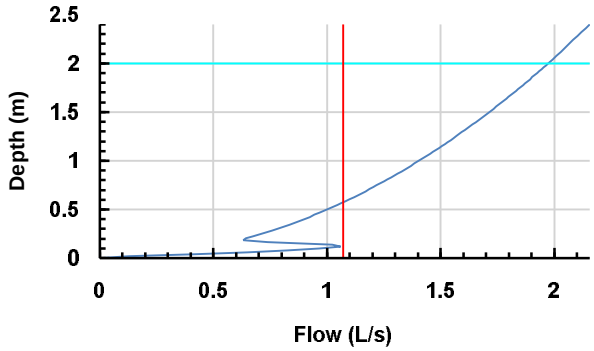
## Outlets

### Outlet

| | |
|---|---|
| Outgoing Connection | Pipe |
| Outlet Type | Hydro-Brake® |

| | |
|---|---|
| Invert Level (m) | 73.000 |
| Design Depth (m) | 2.000 |
| Design Flow (L/s) | 1.97 |
| Objective | Minimise Upstream Storage Requirements |
| Application | Surface Water Only |
| Sump Available | ☐ |

| | |
|---|---|
| Unit Reference | CHE-0054-1970-2000-1970 |



| 13753 - Kemp Heaton Avenue: | Date: | | | |
|---|---|---|---|---|
| Storage Estimate<br>Catchment 2<br>P1 | 09/08/2023 | Designed by:<br>IC | Checked by:<br>LM | Approved By: |
| Report Title:<br>Rainfall Analysis Criteria | CampbellReith:<br>1 Marsden Street<br>Manchester<br>M2 1HW | | | |

| | |
|---|---|
| Runoff Type | Dynamic |
| Output Interval (mins) | 5 |
| Time Step | Default |
| Urban Creep | Apply Global Value |
| Urban Creep Global Value (%) | 0 |
| Junction Flood Risk Margin (mm) | 300 |
| Perform No Discharge Analysis | ☐ |

## Rainfall

### FEH

Type: FEH

| | |
|---|---|
| Site Location | GB 381100 409100 SD 81100 09100 |
| Rainfall Version | 2022 |
| Summer | ☑ |
| Winter | ☑ |

## Return Period

| Return Period (years) | Increase Rainfall (%) |
|---|---|
| 100.0 | 40.000 |

## Storm Durations

| Duration (mins) | Run Time (mins) |
|---|---|
| 15 | 30 |
| 30 | 60 |
| 60 | 120 |
| 120 | 240 |
| 240 | 480 |
| 360 | 720 |
| 480 | 960 |
| 960 | 1920 |
| 1440 | 2880 |

| | | | |
|---|---|---|---|
| 13753 - Kemp Heaton Avenue:<br>Storage Estimate<br>Catchment 2<br>P1 | Date:<br>09/08/2023 | | |
| | Designed by:<br>IC | Checked by:<br>LM | Approved By: |
| Report Details:<br>Type: Stormwater Controls Summary<br>Storm Phase: Phase | CampbellReith:<br>1 Marsden Street<br>Manchester<br>M2 1HW | | |

**Critical Storm Per Item: Rank By: Max. Avg. Depth**

| Stormwater Control | Storm Event | Max. US Level (m) | Max. DS Level (m) | Max. US Depth (m) | Max. DS Depth (m) | Max. Inflow (L/s) | Max. Resident Volume (m³) | Max. Flooded Volume (m³) | Total Lost Volume (m³) | Max. Outflow (L/s) | Total Discharge Volume (m³) | Percentage Available (%) | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cellular Storage | FEH: 100 years: +40 %: 1440 mins: Winter | 73.990 | 73.990 | 0.990 | 0.990 | 4.5 | 82.756 | 0.000 | 0.000 | 1.4 | 151.827 | 2.179 | OK |

| CALCULATION & DESIGN NOTES SHEET | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CampbellReith consulting engineers | Project Title: | Kemp Heaton Avenue | | | | | | |
| | Calculations by | I.Clements | | Date | 09/12/2021 | | | |
| | Checked by: | G.Taylor | | Date | 06/06/2023 | | | |
| Project Number | CR Office and Code | Volume / System | Level / Area | Document Type | Role | Number | Status | Revision |
| 13753 | Manchester | XX | XX | CA | C | 0001 | S1 | P1 |
| Description | **Foul Water Flow Rates** | | | | | | | |

Foul flows calculated in accordance with section B3.1 of Design and Construction Guidance (DCG):

## B3 HYDRAULIC DESIGN

### B3.1 Foul Sewers and Lateral Drains

1. The peak design flow rates for dwellings should, at the discretion of the designer, be either:

a) calculated in accordance with BS EN 12056-2 System II (this method is recommended for this application in BS EN 16933-2); or

b) 4000 litres per dwelling per day (0.05 litres per second per dwelling). Note: This is a design peak flow rate not a daily average water usage, and represents the peak flow rate from a number of appliances. Reducing daily water usage does not necessarily reduce the peak flow rate.

Proposed residential units: 43
Proposed non-residential units: n/a

Assumed daily flow: 4000 l/dwelling/day

Total flow = 43 x 4000
= 172000 l/day

Peak flow = **1.99** l/s

*Should a pumped connection be required, a minimum flow rate of 5 l/s has been assumed.
Pumping stations to be designed by specialist.

| Project Number | CR Office and Code | Volume / System | Level / Area | Document Type | Role | Number | Status | Revision |
|---|---|---|---|---|---|---|---|---|
| 13753 | Manchester | XX | XX | CA | C | 0001 | S1 | P1 |
| Calculations: | **Foul Water Flow Rates** | | | | | | | |

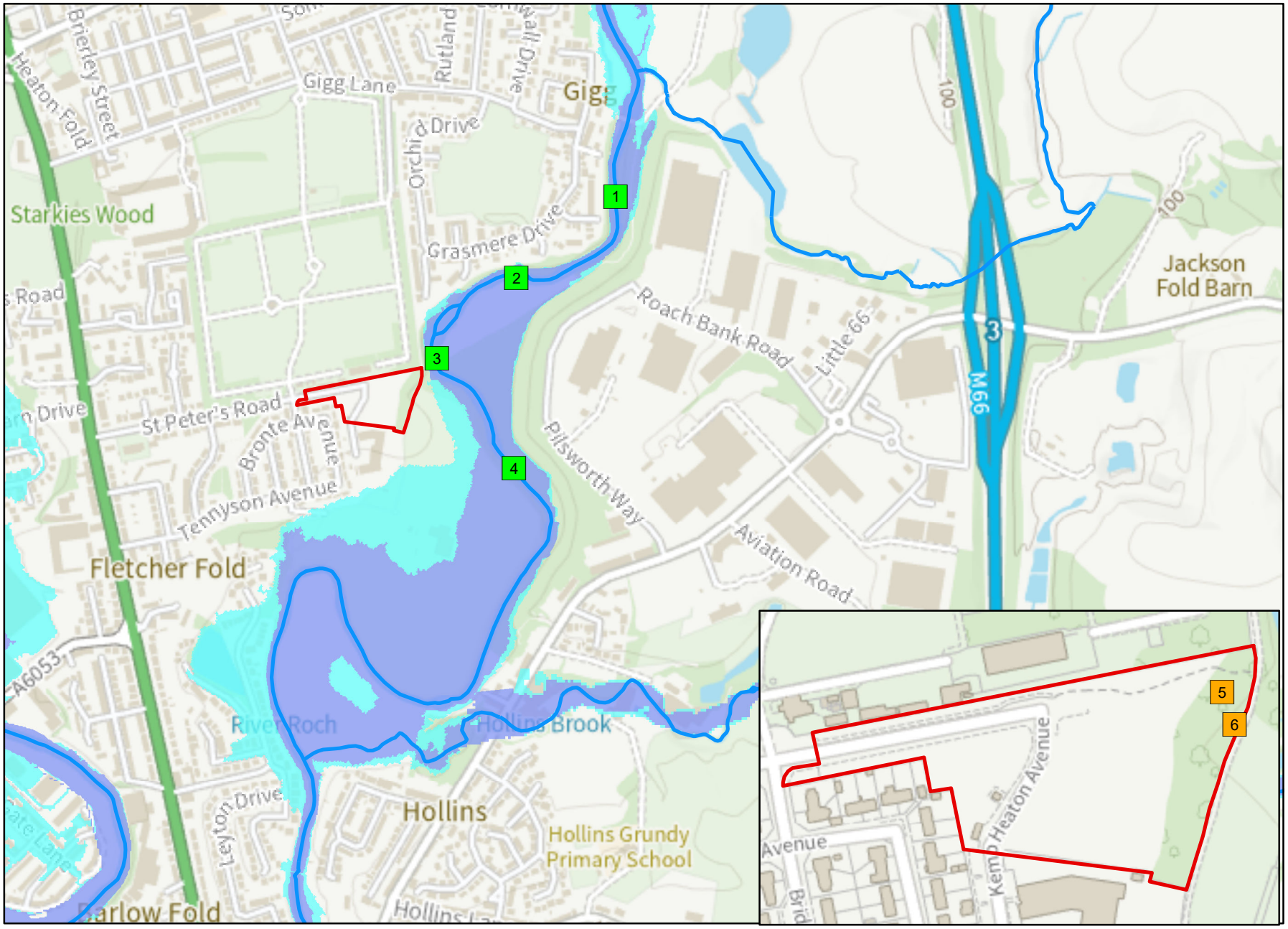
| Project Number | CR Office and Code | Volume / System | Level / Area | Document Type | Role | Number | Status | Revision |
|---|---|---|---|---|---|---|---|---|
| 13753 | Manchester | XX | XX | CA | C | 0001 | S1 | P1 |
| Calculations: | **Foul Water Flow Rates** | | | | | | | |

| Project Number | CR Office and Code | Volume / System | Level / Area | Document Type | Role | Number | Status | Revision |
|---|---|---|---|---|---|---|---|---|
| 13753 | Manchester | XX | XX | CA | C | 0001 | S1 | P1 |
| Calculations: | **Foul Water Flow Rates** | | | | | | | |

# Appendix H: EA Product 4 Report

Detailed Flood Map
Tabulated Data

# Detailed Flood Map Centred on Kemp Heaton Avenue, Bury, BL9 9GQ.
# Created 21/06/2023 [GMMC314459JM]




Environment Agency

1:10,001

N

## Legend

- Site Location
- Model Measurements
- 2D Level
- Main River
- Flood Zone 3
- Flood Zone 2

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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

| | | | | | Undefended | | | | | | | | | | | Defended | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Map Reference | Model Node Reference | Easting | Northing | Data | 50 % AEP (1 in 2 year) | 20 % AEP (1 in 5 year) | 10 % AEP (1 in 10 year) | 5 % AEP (1 in 20 year) | 4 % AEP (1 in 25 year) | 2 % AEP (1 in 50 year) | 1.33 % AEP (1 in 75 year) | 1 % AEP (1 in 100 year) | 1 % AEP (1 in 100 year) + 30% increase in flow | 1 % AEP (1 in 100 year) + 35% increase in flow | 1 % AEP (1 in 100 year) + 70% increase in flow | 0.5 % AEP (1 in 200 year) | 0.1 % AEP (1 in 1000 year) | 0.1 % AEP (1 in 1000 year) + 30% increase in flow | 50 % AEP (1 in 2 year) | 20 % AEP (1 in 5 year) | 10 % AEP (1 in 10 year) | 5 % AEP (1 in 20 year) | 4 % AEP (1 in 25 year) | 2 % AEP (1 in 50 year) | 1.33 % AEP (1 in 75 year) | 1 % AEP (1 in 100 year) | 1 % AEP (1 in 100 year) + 30% increase in flow | 1 % AEP (1 in 100 year) + 35% increase in flow | 1 % AEP (1 in 100 year) + 70% increase in flow | 0.5 % AEP (1 in 200 year) | 0.1 % AEP (1 in 1000 year) | 0.1 % AEP (1 in 1000 year) + 30% increase in flow |
| 1 | ROCH01_03535 | 381423 | 409389 | Modelled Water Level (m aodN) | 69.11 | 69.38 | 69.54 | 69.70 | 69.75 | 69.89 | 69.98 | 70.02 | 70.29 | 70.34 | 70.64 | 69.98 | 70.49 | 70.87 | 69.29 | 69.58 | 69.77 | 69.95 | 70.00 | 70.19 | 70.30 | 70.37 | 70.77 | 70.84 | 71.28 | 70.60 | 71.07 | 71.62 |
| | | | | Modelled Flow (cumecs) | 57.88 | 73.87 | 85.85 | 99.29 | 102.50 | 117.29 | 127.95 | 132.87 | 172.86 | 180.84 | 228.89 | 155.64 | 208.84 | 268.34 | 57.88 | 73.87 | 85.80 | 99.29 | 102.51 | 117.30 | 127.97 | 134.23 | 172.88 | 179.84 | 229.20 | 155.64 | 204.17 | 265.72 |
| 2 | ROCH01_03255 | 381240 | 409238 | Modelled Water Level (m aodN) | 68.72 | 69.00 | 69.18 | 69.34 | 69.39 | 69.54 | 69.62 | 69.66 | 69.92 | 69.97 | 70.34 | 69.62 | 70.15 | 70.66 | 68.76 | 69.03 | 69.20 | 69.36 | 69.41 | 69.57 | 69.65 | 69.70 | 69.95 | 70.00 | 70.26 | 69.84 | 70.17 | 70.68 |
| | | | | Modelled Flow (cumecs) | 57.87 | 73.86 | 85.84 | 99.27 | 102.48 | 117.28 | 127.76 | 132.86 | 172.85 | 180.81 | 228.65 | 155.61 | 206.65 | 266.06 | 57.87 | 73.86 | 85.85 | 99.28 | 102.49 | 117.28 | 127.85 | 134.21 | 172.84 | 179.79 | 226.06 | 155.62 | 204.05 | 265.50 |
| 3 | ROCH01_03016 | 381094 | 409091 | Modelled Water Level (m aodN) | 67.99 | 68.32 | 68.54 | 68.71 | 68.76 | 68.91 | 68.99 | 69.04 | 69.37 | 69.44 | 70.00 | 68.99 | 69.76 | 70.41 | 68.22 | 68.55 | 68.75 | 68.92 | 68.97 | 69.12 | 69.20 | 69.27 | 69.58 | 69.64 | 70.11 | 69.44 | 69.99 | 70.46 |
| | | | | Modelled Flow (cumecs) | 57.85 | 73.83 | 85.81 | 98.24 | 102.44 | 117.21 | 127.10 | 132.68 | 170.53 | 177.52 | 211.83 | 154.68 | 198.34 | 234.22 | 57.86 | 73.85 | 85.82 | 98.25 | 102.46 | 117.23 | 127.23 | 134.10 | 172.67 | 179.60 | 225.41 | 155.52 | 203.28 | 264.80 |
| 4 | ROCH01_02761 | 381236 | 408887 | Modelled Water Level (m aodN) | 67.51 | 67.87 | 68.08 | 68.27 | 68.32 | 68.48 | 68.58 | 68.64 | 69.08 | 69.19 | 69.97 | 68.58 | 69.61 | 70.34 | 67.69 | 68.04 | 68.26 | 68.44 | 68.49 | 68.62 | 68.70 | 68.76 | 69.11 | 69.20 | 69.86 | 68.93 | 69.61 | 70.31 |
| | | | | Modelled Flow (cumecs) | 57.84 | 73.81 | 85.58 | 94.91 | 97.21 | 102.85 | 105.75 | 107.10 | 114.79 | 115.92 | 122.60 | 112.66 | 122.28 | 131.02 | 57.84 | 73.82 | 85.58 | 95.55 | 98.51 | 108.59 | 115.20 | 119.57 | 141.60 | 144.95 | 160.11 | 132.72 | 157.15 | 172.64 |

| | | | | Undefended |
|---|---|---|---|---|
| Map Reference | Model Node Reference | Easting | Northing | Data | 0.1 % AEP (1 in 1000 year) + 30% increase in flow |
| 5 | 2D Levels | 381050 | 409050 | Modelled Water Level (m aodN) | 70.45 |
| 6 | | 381056 | 409035 | Modelled Water Level (m aodN) | 70.45 |

Model data taken from Lower Roch 2017

AEP - Annual Exceedence Probability

m aodN - metres above ordnance datum Newlyn

cumecs - cubic metres per second

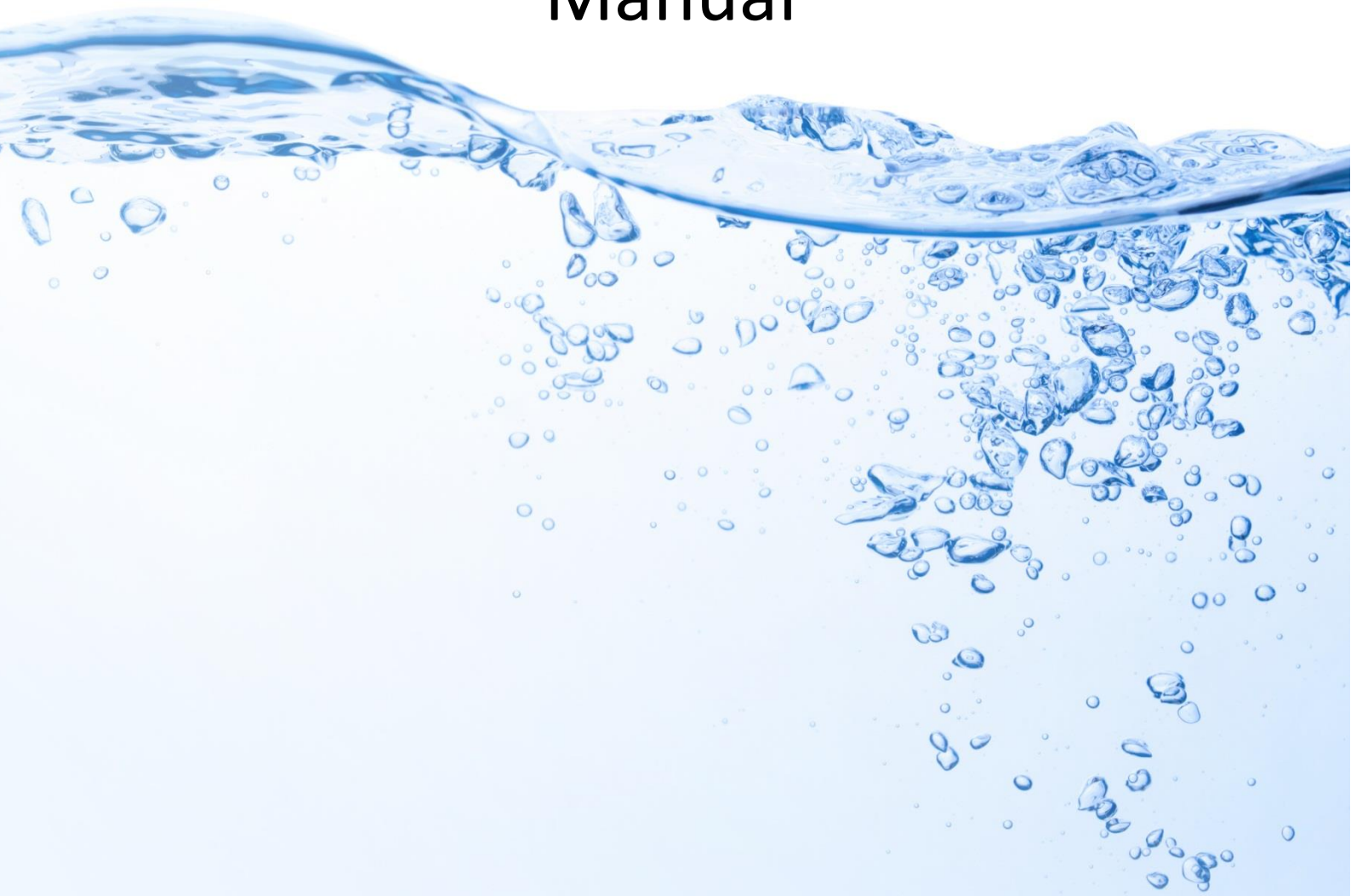
Notes:

*Climate Change Scenario - 30%, 35% and 70% increases in flow calculated for the 2080's (2070 - 2115). Please see https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances for more information regarding the new climate change guidance. The location of the site and the type (vulnerability) of development determine the climate change allowances to consider in any flood risk assessment.

# Appendix I: O&M – Private Pump Station

0.0 O & M Contents
1.0 Approved Chamber Drawing
1.1 GRP Chamber Specification
2.0 Pump Data Sheet
3.0 Friction Loss Calculation
4.0 Control Panel Wiring Drawing 2.5-4Amps
5.0 Float Level Switch Data Sheet
7.0 Advanced Telemetry System
9.0 Ball Valve Data sheet
10.0 Gate Valves Data Sheet
11.0 Chains
12.0 Commissioning Certificate
13.0 Certificate of Conformity V3
14.0 APS Certificate of Warranty
15. Serverpump Brochure
16. Serverpump Application Form
17. Pumping Station Care & Maintenance
18. Pumping Station Care & Maintenance Poster

# Operations and Maintenance Manual



**Company Name: C S Civils and Groundworks Ltd**

**Project Title: Kemp Heaton Avenue, Bury**


all pump solutions

**T:** 01743 465463 | **F:** 01743 465050 | **E:** service@allpumpsolutions.com | **W:** www.allpumpsolutions.com

**Head Office:** Dale House | Ennerdale Road | Shrewsbury | Shropshire | SY1 3LD

**SHREWSBURY | LONDON | SYDNEY**

## Contents


1. Approved Pump Chamber Drawing
2. Pump Data Sheet
3. Friction Loss Calculation
4. Control Panel Wiring Diagram
5. Float Level Switch Data Sheet
6. Beacon Data Sheet – N/A
7. Advanced Telemetry System
8. Kiosk – N/A
9. Ball Valve Data Sheet
10. Gate Valve Data Sheet
11. Chains
12. Commissioning Certificate
13. Pump Certificate of Conformity
14. APS Certificate of Warranty
15. ServerPump Brochure
16. ServerPump Application Form
17. Pumping Station Care & Maintenance
18. Pumping Station Care & Maintenance Poster
19. Warranty Registration Form


Your first annual service is due June 2027

Please complete the ServerPump Application to ensure that your Pumping Station is serviced, guaranteeing the optimum performance of your investment and taking advantage of our reduced call out rates.

Kind Regards,

Giles Pocock

All Pump Solutions LLP

all pump solutions
FLUID EXPERTISE

Tel: 01743465463
Fax:01743452050
Email:
sales@allpumpsolutions.com

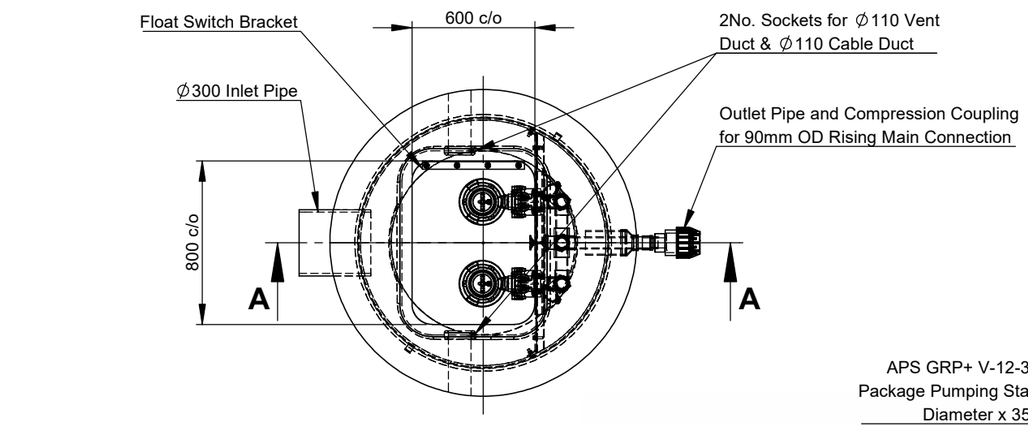
| | | | |
|---|---|---|---|
| Client: | **Not Specified** | Contractor: | **C S Civils and Groundworks Ltd** |
| Consulting Engineer: | **Campbell Reith (Manchester)** | Contract: | **Kemp Heaton Avenue, Bury** |
| Title: | **APS GRP+ V-12-3500-HVY-GP Vertical Surface Water Packaged Pumping Station** | Works Order Number: | **WO12354** |
| Drawing Number: | **EQ6502-154727-100** | Quote Reference: | **APS6502 - 00154727(1)** |

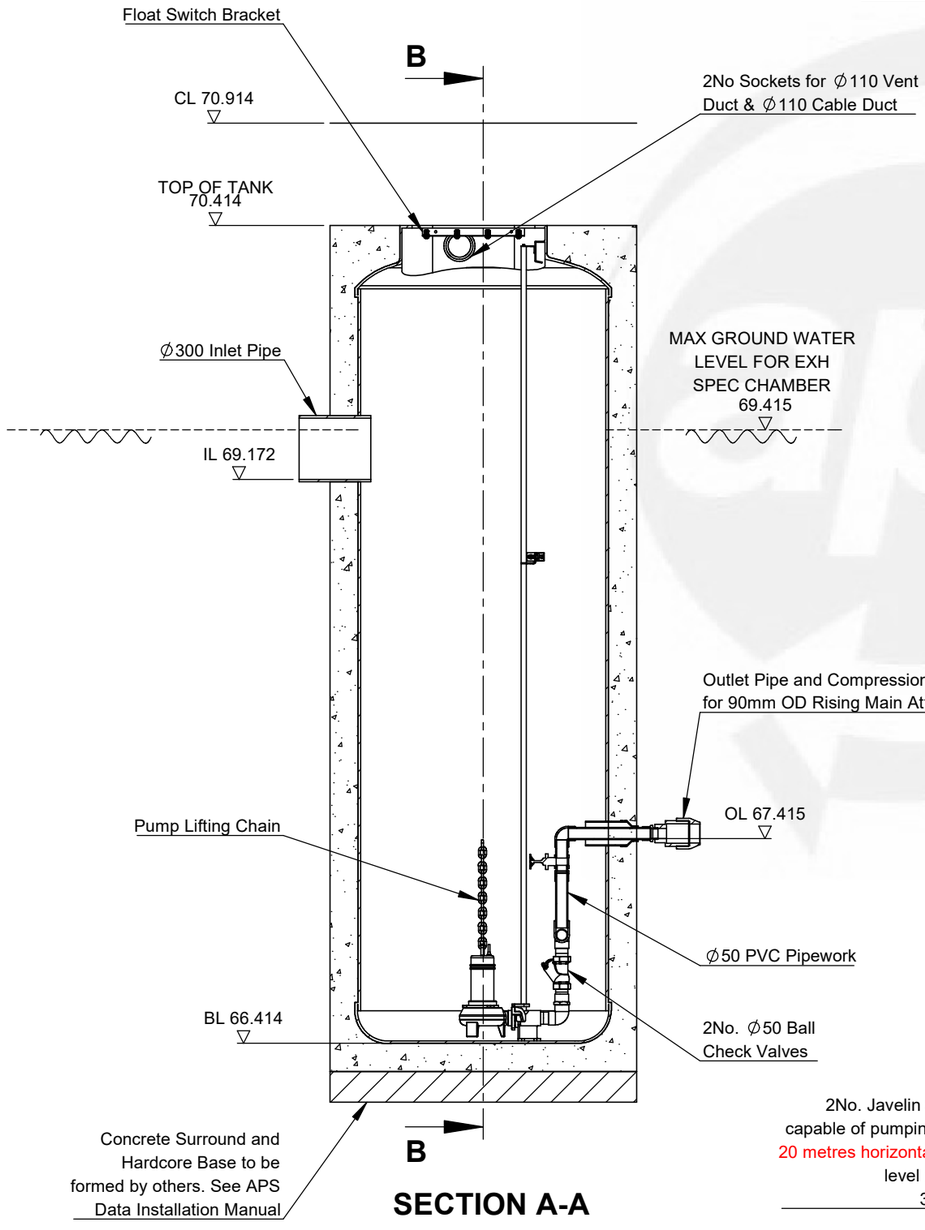
| Issue: | Reviewed by: | Comments: | Amendments: | Hours: | Cost Impact: | Lead-time Impact: | Date: | Auth: |
|---|---|---|---|---|---|---|---|---|
| A | APS | Drawing For Approval | - | - | - | - | 21/01/26 | RT |
| B | C&G | Outlet Level at 67.415 mAOD | Outlet Level and Tank Depth Updated | 0.5 | Y | N | 26/01/26 | RT |
| | | | | | | | | |
| | | | | | | | | |

IMPORTANT NOTES:
Please check the drawing very carefully, and ensure any comments are clearly marked on the drawing or by reply to the approval e-mail.
Once checked please **return signed & dated** in the top right hand corner on the drawing page.

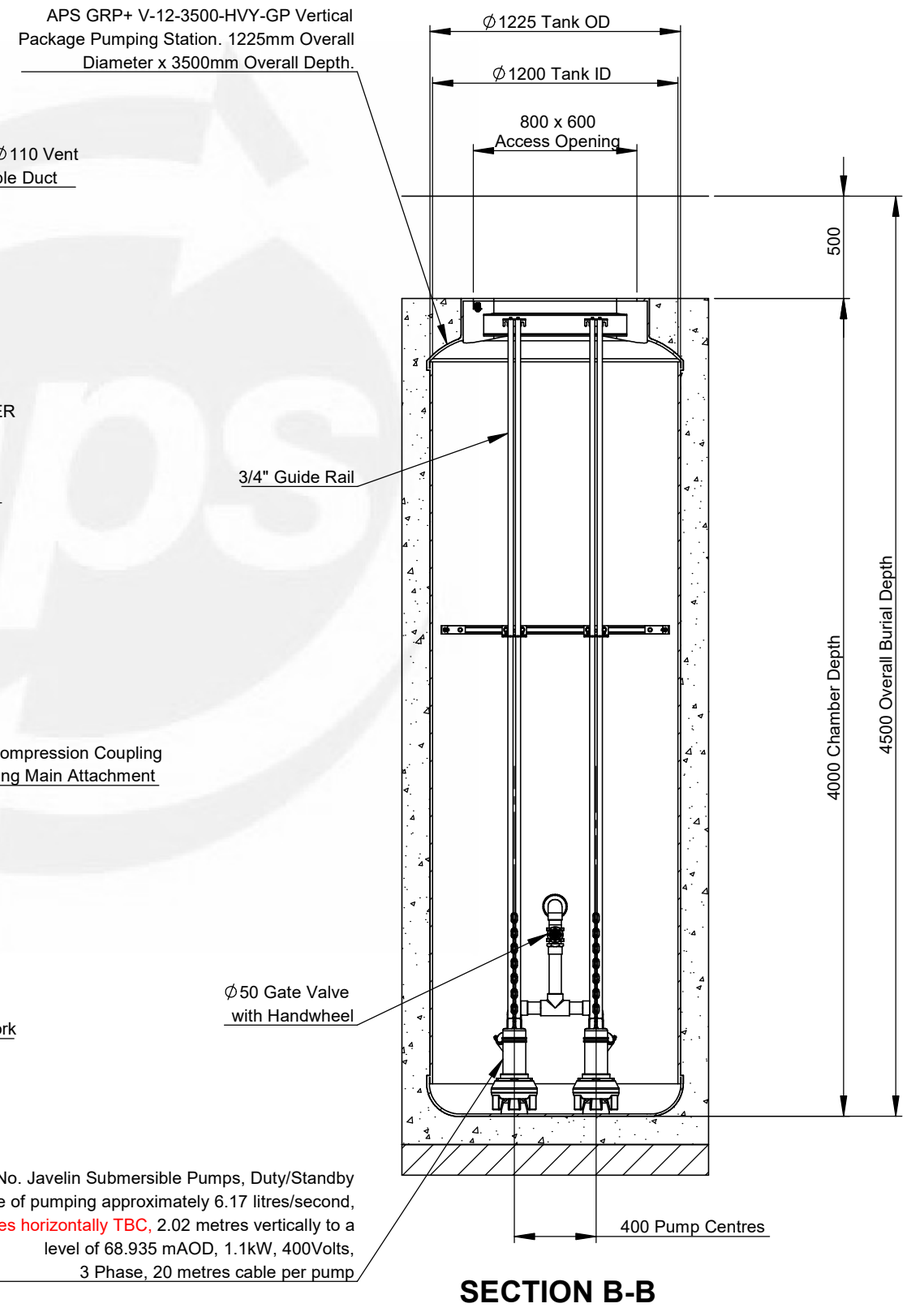
Please note that the availability is from receipt of drawing approval/payment.
We have allowed for the provision of Site Specific Drawings for approval, in accordance with the information received to date.

**All changes that have resulted in an impact on the project costs will be captured in a re-quote at the point of approval.**




**SECTION A-A**




**SECTION B-B**

Approved by:

Date: | Signed:

Dimensions are subject to Dimensional Tolerances. If critical, check physically prior to installation. All Dimensions in mm unless stated otherwise.

The customer must check tank specification is compatible with ground water table level (in winter) and burial depth. Refer to burial depth graph.

Pumpwell delivered with pumps not installed to avoid damage in transit. Read operating and installation guidelines before installing.

This drawing is confidential and must not be reproduced, copied or passed to a third party without the written permission from **All Pump Solutions**

**Material Specification**

| | |
|---|---|
| Bolts: | ZP |
| Pipework: | UPVC |
| Guide Rail: | GALV |
| Tank Specification: | EXH |
| Laminate Specification: | GP |

**Notes**

1. Flow calculations based on 90mm OD SDR11 Rising Main
2. Pump Chamber considered as "No Zone" Non Hazardous Area
3. All details/levels marked as TBC MUST be confirmed prior to drawing approval to avoid any delay in lead time.

| Issue: | Description: | Date: | Auth: |
|---|---|---|---|
| B | Outlet Level and Tank Depth Updated | 26/01/26 | RT |
| A | Drawing for Approval | 21/01/26 | RT |

Tel: 01743465463
Fax:01743452050
Email: sales@allpumpsolutions.com
all pump solutions
FLUID EXPERTISE

Title: **APS GRP+ V-12-3500-HVY-GP Vertical Surface Water Packaged Pumping Station**

Contract: **Kemp Heaton Avenue, Bury**

Contractor: **C S Civils and Groundworks Ltd**

Consulting Engineer: **Campbell Reith (Manchester)**

Works Order Number: **WO12354**

| Size: | Scale: | Drawn: | Checked: | Approved: |
|---|---|---|---|---|
| A3 | 1:30 | RT | GR | GR |

Drawing Number: **EQ6502-154727-100** | Date: **21/01/26**

Internal Reference: **APS 6502** | Issue: **B**

# GRP Chamber Specification



This process produces not only circumferential strength as found in helical wound tanks, but also longitudinal strength. The interlaminar shear strength permits tanks to be cut for manholes and pipework without any undue loss in strength. The manufacturing process is carefully monitored with a digital read out system. Chopping glass, winding glass, the resin-rich inner layer and main laminate resins are kept within specification parameters thus minimising human error. Each tank has a smooth moulded resin-rich corrosion barrier inner layer and an external resin-rich water penetration barrier. These layers can incorporate special resins to meet specific applications where the contents are highly corrosive or a potable water approved resin system is required or where surrounding soil is heavily contaminated.

Designed in accordance with BS 4994 / BS EN 976, the underground tanks are manufactured for many applications and in a wide range of specifications to handle such substances as water, sewage, farm effluent, petroleum products and chemicals. The underground tanks are filament wound by the technically advanced chop hoop filament winding process (patented) which was chosen after careful investigation proved it produced the most desirable GRP underground tanks.
Quality control procedures require each tank to be carefully inspected and tested. Ultrasonic thickness readings, material content weights, etc are checked and recorded against the tank's unique serial number.
Additional periodic laminate testing is carried out by independent testing facilities including stress and strain analysis and also physical property tests to meet specific design criteria.
Being manufactured in glass reinforced plastics, the underground tanks are light, easy to handle and easy to install. They are not susceptible to rust, exhibit excellent corrosion resistant properties and have a life expectancy in excess of 50 years. The smooth internal moulded finish provides good flow characteristics and enables easy desludging and cleaning operations.
The underground tank shell carries a 25 year warranty.

## Process

The underground tanks are manufactured by the chop hoop filament winding process developed in the US and specifically designed for underground tanks by the Products,

## GRP laminate

Design and specification for the underground tanks
The underground tanks have been designed with reference to BS 4994:1987, BS EN 976-1, 978 and BS EN 858-1:2002.
The quality and strength of glass reinforced plastic (GRP) laminates depends upon the following factors:
• The design criteria, e.g. Chemical resistance, temperature, internal and/or external loading.
• The efficiency and consistency of the manufacturing process and the high level of control to maintain resin and reinforcements within strict design parameters.
• The laminate construction from resinrich corrosion resistant internal surface, resin-rich glass reinforced corrosion barrier, main laminate and the external resinrich water penetration barrier providing excellent corrosion resistance from internal contents and complete sealing of laminate from ingress of water and/or contaminants externally.
Prior to determining the laminate construction and thickness using equations 15 and 16 to meet specific requirements, actual specimens were taken from filament wound laminates and independently tested. For tanks under external pressure the equations contain a factor of F which 'shall be taken as 4' (Section 14.4.1 'Cylindrical shells' of BS 4994). This covers long term reduction of F to half its value over many years giving a factor of safety of 2. The tank calculations contain an F factor of 4.
The design of GRP laminates is clearly different from, for example, a steel structure where the material and loadings are clearly defined.
The underground tanks designed and manufactured in glass reinforced plastics – using advanced technology for high strength to weight ratio and exceptional long term performance under the most adverse conditions.
Tank manufacturers can cut their quality and price without obviously infringing BS 4994.
The underground tank laminates are designed to meet specific requirements, for example, hydrostatic load on tanks surrounded either in concrete or a free flowing pea gravel.

With experience gained in the United States high quality underground tanks do not suffer from degradation to the degree envisaged in the British Standard, in fact, tests carried out on laminates taken from underground tanks in the US after 25 years use have shown very little loss of strength.
The important factors are the construction and composition of the laminate to resist the corrosive action of the internal chemicals and the water or contaminated underground water externally.
BS EN 978 – Tests to this Standard determine the alpha and beta, 'the long term deterioration due to creep and the effects of water or chemicals on the plastics'. Tests have been carried out, on pieces of shell cut from the tank barrel, by an independent test laboratory. The results are used in the equations (BS EN 976-1) to determine the stability of underground GRP horizontal cylindrical tanks for the non-pressure storage of liquid petroleum based fuels.

## Chemical resistance and long term degradation

Further independent tests have been carried out in accordance with BS EN 858-1:2002 Section 8.1.4 'Chemical resistance of internal surfaces'. The tests involve full immersion of three test specimens for 1000 hours in four solutions; demineralised water at 40°C, fuel oil at 23°C, unleaded fuel at 23°C, caustic solution at 40°C.
The requirement in Section 6.2.7.1.3. 'Plastic materials' (BS EN 858-1) is for the glass reinforced test specimens under test to retain 80% of their strength when compared with the control specimen. The results of tests for tensile strength and flexural modulus have shown very little reduction, if any, in performance. In each case there was a reduction in flexural strength but an increase in modulus. Initially this might seem odd but it is possible that this could be part explained by at least two samples being immersed at 40°C hence a post cure compared to the control. All samples appeared to have passed seeing they came within the 80% retention of the control specimen.

## Quality control

The chop hoop filament winding process specially developed for underground tanks is carefully monitored to Work Instructions. All materials are fully documented (digital readout of resin and glass reinforcements) against each unique serial numbered tank shell.
All items are cured in accordance with the resin supplier's instructions. Where required e.g. highly chemical resistant linings, the tank is post cured in accordance with the Work Instructions.
Ultrasonic thickness checks are made on all shells together with Barcol hardness checks.
The acetone test is included where applicable.
The laminate is inspected visually to ensure proper laminate consolidation and surface finish.

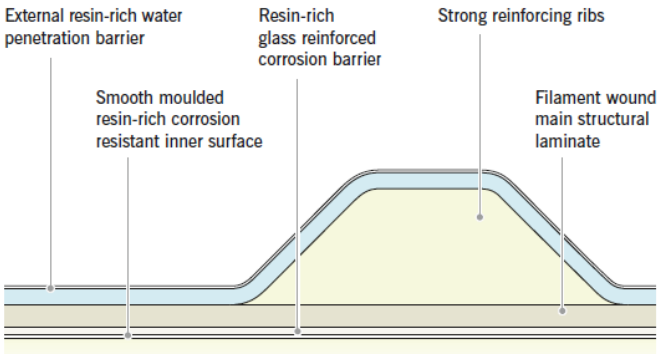
## Workshop conditions, Health & Safety and Environmental considerations.

Included in process controls is work shop temperature, fume extraction to keep within Health & Safety occupational exposure limits and odour control to meet the strict Environmental Protection Act 1990 Part 1 requirements as dictated by the Local Authority 'Authorisation' requirements. The record maintained since 1989, when the chop-hoop filament winding process was introduced, is that no tank has failed due to a design or manufacturing fault. Since 1989 thousands of underground tanks have been manufactured. The few tanks damaged were due to faulty installation or handling.
With this exceptional track record we are fully satisfied and confident that we have a specification and process control that produces exceptionally high quality laminates that have a life expectancy well in excess of 50 years. The underground tank shell carries a 25 year warranty.

## Materials, construction, application categories and type codes

### GP – General purpose applications.

Constructed throughout with orthophalic polyester resin and glass reinforcement.
Applications – potable water, sewage, surface water and mild chemicals.




### CR – Chemical resistant lined tanks.

The smooth moulded resin-rich corrosion resistant internal surface and the resin-rich glass reinforced corrosion barrier are constructed from isophthalic polyester resin or terephthalic NPG polyester resin.
Applications – suitable for silage effluent, chemicals (acidic) and hydrocarbon materials.

### HCR – Highly chemical resistant.

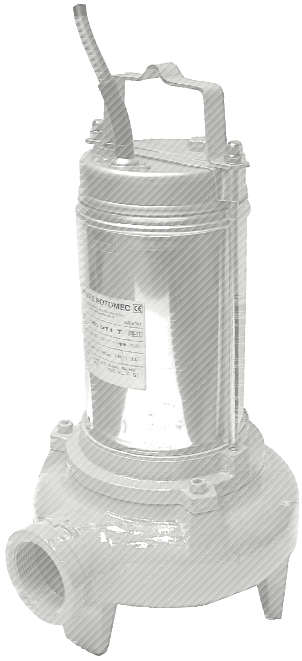
Aggressive chemicals and/or high temperatures.
The smooth moulded resin-rich corrosion resistant internal surface and the resin-rich glass reinforced corrosion barrier are constructed from vinyl ester resins dependent upon chemical resistance and/or high temperatures.
Applications – transformer oil dump tanks, highly aggressive chemical process or holding tanks, and accidental chemical spillage containment tanks.

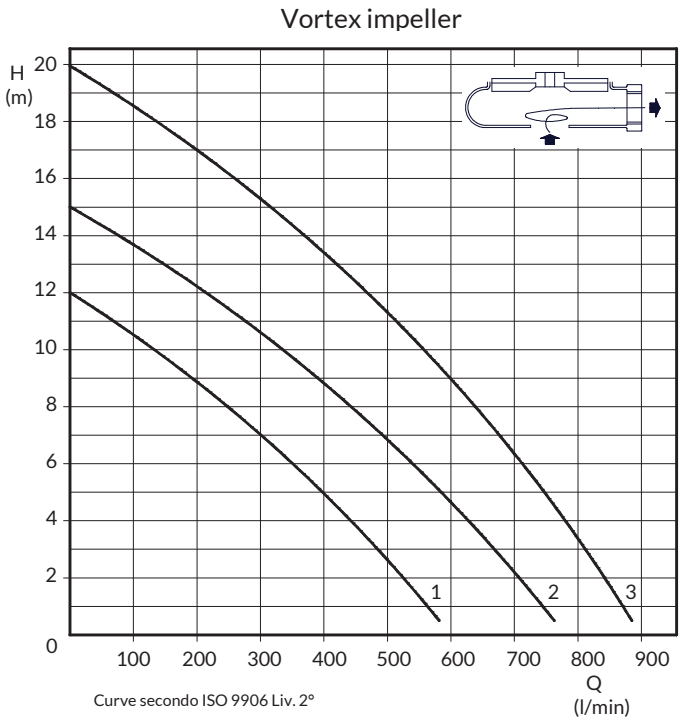
### Suffix CG – Contaminated ground conditions.

The external resin-rich water penetration barrier can also be in chemical resistant or highly chemical resistant where tanks are to be installed in contaminated ground.

| **Filament wound shell** | **GP** | **CR** | **HCR** | **Suffix CG** |
|---|---|---|---|---|
| Resin-rich corrosion resistant internal surface | Orthophalic polyester resin | Isophthalic polyester resin | Vinyl ester resin | |
| Resin-rich glass reinforced corrosion barrier | Orthophalic polyester resin | Isophthalic polyester resin | Vinyl ester resin | |
| Main laminate | Orthophalic polyester resin | Isophthalic polyester resin | Orthophalic or isophthalic polyester or vinyl ester resin | |
| External resin-rich water penetration barrier | Orthophalic polyester resin | Isophthalic polyester resin | Orthophalic polyester resin | Isophthalic polyester or vinyl ester resin |
| **Tank end domes** | **GP** | **CR** | **HCR** | **Suffix CG** |
| Gelcoat internal surface or resin-rich glass reinforced internal surface | Isophthalic polyester gelcoat | Isophthalic polyester gelcoat | Vinyl ester resin | |
| Resin-rich glass reinforced corrosion barrier | | Isophthalic polyester resin | Vinyl ester resin | |
| Main laminate | Orthophalic polyester resin | Orthophalic polyester resin | Orthophalic or isophthalic polyester or vinyl ester resin | |
| External resin-rich water penetration barrier | Orthophalic polyester resin | Isophthalic polyester resin | Orthophalic or isophthalic polyester or vinyl ester resin | Isophthalic polyester or vinyl ester resin |
| **Reinforcement materials for shell and end domes** | **GP** | **CR** | **HCR** | **Suffix CG** |
| Resin-rich corrosion resistance internal surface | C-glass surfacing tissue (shell only) | C-glass surfacing tissue (shell only) | C-glass surfacing tissue or synthetic veil | |
| Resin-rich glass reinforced corrosion barrier | E-glass chopping roving | E-glass chopping roving | E-glass chopping roving | |
| Main laminate | E-glass chopping roving | E-glass chopping roving | E-glass chopping roving | |
| Filament wound shell | Plus E-glass winding roving | Plus E-glass winding roving | Plus E-glass winding roving | |
| External resin-rich water penetration barrier | No reinforcement | No reinforcement | No reinforcement | No reinforcement |

# Submersible Pumps VR






## Description

Submersible electric pumps with vortex open impeller, pump body in cast iron, impeller in stainless steel AISI 304, motor in liquid refrigerant bath, dielectric, not pollutant; thermal protection switch incorporated for single-phase version.

## Application

Small lifting services for sewage, domestic and industria effluents, rain waters.

## Electrical data

| Curve N° | Pump type | R.P.M. | kW (Pn) | Voltage V. 50 HZ | Rated current A. | Capacitor F | Cable H07RNF mt | Free Passage mm | Weight Kg |
|---|---|---|---|---|---|---|---|---|---|
| 1 | VR 511 | 2900 | 1,1 | 3 ~ 400 | 3 | - | 10 | 50 | 20 |
| | VR 511 M - MG | | | 1 ~ 230 | 7,5 | 40 | | | |
| 2 | VR 515 | | 1,5 | 3 ~ 400 | 3,4 | - | | | 22 |
| | VR 515 M - MG | | | 1 ~ 230 | 10,5 | 45 | | | |
| 3 | VR 522 | | 2,2 | 3 ~ 400 | 5,6 | - | | 45 | 25 |

Pn = Power rating.
M = With capacitor, plug and motor protection built-in
MG = With capacitor, motor protection built - in and level float - switches included

## Materials

Pump volute : Cast Iron G25

Motor body : Stainless steel AISI 304

Impeller : Cast Iron G25(VR 522)
Stainless steel AISI 304 (VR 511-515)

Shaft : Stainless steel AISI 420

Screws : Stainless steel AISI 304

## Bearings

Single-rowe deep groove ball bearings.

## Shaft seal

VR 511 - 515

Motor side : Silicon carbide - Liquid side : seal Ring
VR 522

Motor side : Graphite - Alumina - Liquid side : Silicon carbide

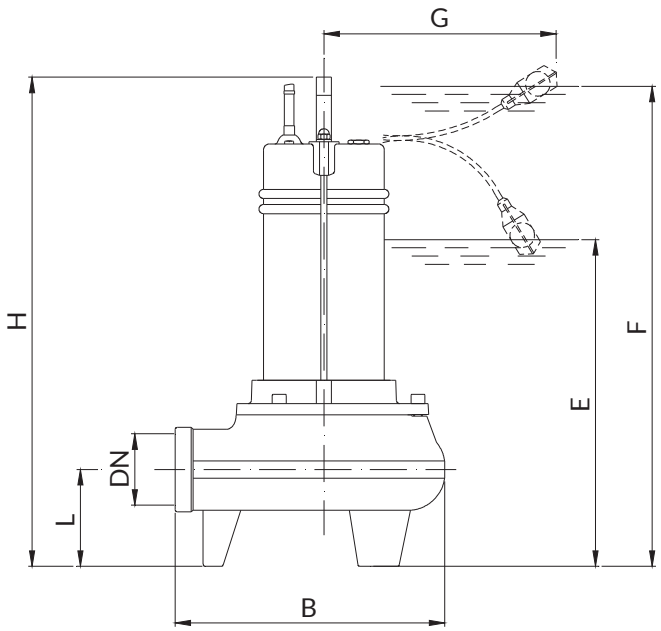
## Motor

Threephase / single-phase motor

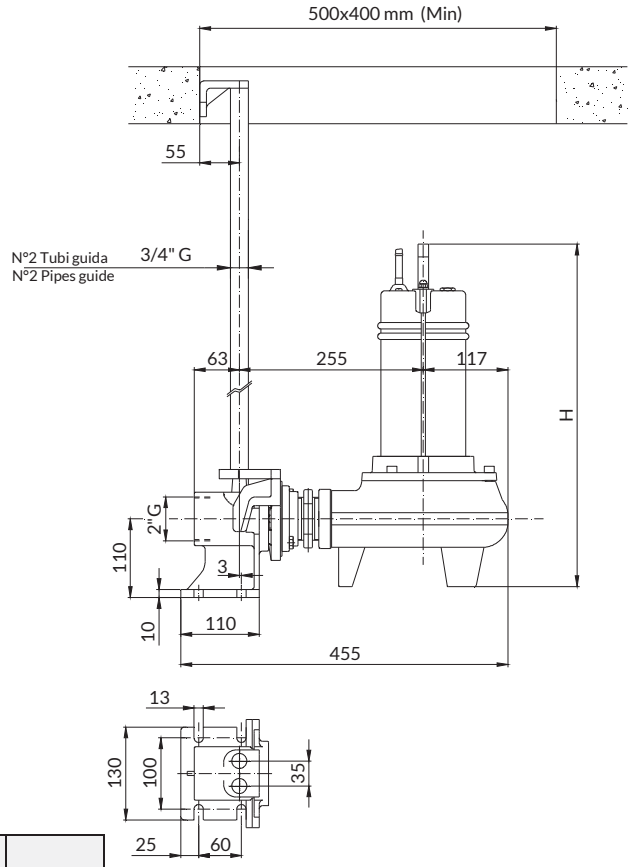
Class F insulating

Thermal protection switch incorporated in all single-phase motors.

## Mobile




## Fixed installation
## Discharge Bracket DN 50/2GNVR




| TIPO - Type | DN | A | E | F | G | H | L |
|---|---|---|---|---|---|---|---|
| VR 511 | 2" G | 260 | 320 | 520 | 350 | 460 | 88 |
| VR 515 | | | | | | 480 | |
| VR 522 | | | | | | 500 | |


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Shrewsbury
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# FRICTION LOSS AND PUMP SELECTION DATASHEET

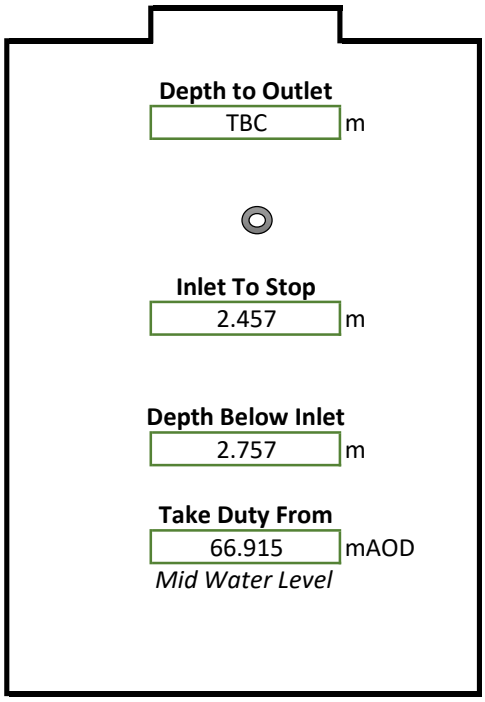
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Email: sales@allpumpsolutions.com

| | |
|---|---|
| **Project Name** | Kemp Heaton Avenue, Bury |
| **Project No** | 6502 |
| **Organization** | |
| **Pump Station Ref** | N/A |

| | |
|---|---|
| **Adopting Authority** | N/A |
| **Pump Station Type** | Private |
| **Liquid Handled** | Surface |
| **No. of Dwellings - DCG** | N/A |
| **No. of Pumps** | 2 |
| **No. of Duty Pumps** | 1 |
| **Pump Operation** | Duty/Standby |

| **Design Flow / Rising Main** | | |
|---|---|---|
| Peak Flow (DCG Calc) | N/A | L/s |
| Pump Rate (DCG Calc) | N/A | L/s |
| Pump Rate | 6.90 | L/s |
| Rising Main I.D. | 72.9 | mm |
| Velocity in Rising Main | 1.653 | m/s |
| Surge Analysis | NOT REQUIRED | |

| | | |
|---|---|---|
| **Cover Level** | 70.914 | mAOD |
| **VC Outlet** | TBC | mAOD |
| **Storage IL** | 69.172 | mAOD |
| **Inlet IL** | 69.172 | mAOD |
| **HLA** | 67.215 | mAOD |
| **Pump 2 Start** | N/A | mAOD |
| **Pump 1 Start** | 67.115 | mAOD |
| **Mid Water** | 66.915 | mAOD |
| **Stop Level** | 66.715 | mAOD |
| **Dead Area** | 300 | m |
| **Base Level** | 66.415 | mAOD |




**High Point** 68.935 mAOD

**Discharge IL** 68.935

**Dist. To High Point** 20 m

**Static Head** 2.020

**Rising Main Length** 20 m

**Notes**

The static head is based on the mid-point of the duty pump stop and start levels in the wet well.
The flowrate is set based on achieving cleansing velocity in 90mm OD SDR11 rising main.
Discharge IL unit is in mAOD, Static Head unit is in m.

| **Wet Well** | | |
|---|---|---|
| Orientation | Vertical | |
| Material | GRP | |
| Laminate | GP | |
| Diameter | 1200 | mm |
| Depth | 4000 | mm |
| Total Depth | 4499 | mm |

| **Retention Calculations** | | |
|---|---|---|
| DWF Inflow Per Day | TBC | L |
| Rising Main Volume | TBC | L |
| Combined Volume | TBC | L |
| No. of Cycles | TBC | |
| Retention @ Full Usage | TBC | Hr |
| Retention @ Half Usage | TBC | Hr |

| **Private Storage Requirement** | | |
|---|---|---|
| Total | 0 | L |

| **Adoptable Storage Required** | | |
|---|---|---|
| Domestic | N/A | $m^3$ |
| Industrial | N/A | $m^3$ |
| Total | N/A | $m^3$ |

| **Calc Duty Point** | | |
|---|---|---|
| Design Flow | 6.90 | L/s |
| Static Head | 2.020 | m |
| Friction Head | 2.784 | m |
| Total Head | 4.804 | m |

| **Pump Selection - Actual Duty** | | |
|---|---|---|
| Model | VR 511 | |
| Actual Flow | 6.90 | L/s |
| Actual Head | 4.804 | m |
| Size | 50 | mm |

| **Adoptable Storage Availability** | | |
|---|---|---|
| Wet Well | N/A | $m^3$ |
| Network | N/A | $m^3$ |
| Offline | N/A | $m^3$ |
| Total | N/A | $m^3$ |

Please note: The information provided is based on the data received and assumptions aligned with industry norms. Pump manufacturers typically allow a 5-10% tolerance in published data due to potential manufacturing variances.

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# FRICTION LOSS AND PUMP SELECTION DATASHEET

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| | |
|---|---|
| Design Pump Rate (L/s) | 6.90 |

## PIPE SECTION

| PVCu DN50 Individual Discharge Pipe | |
|---|---|
| Velocity (m/s) | 3.05794472 |
| Reynolds Number (Re) | 143777.05 |
| Diameter (m) | 0.0536 |
| Friction Factor, f | 0.01785217 |
| Individual Discharge Pipe Length (m) | 0.3 |

| PVCu DN50 Common Discharge Pipe | |
|---|---|
| Velocity (m/s) | 3.05794472 |
| Reynolds Number (Re) | 143777.05 |
| Diameter (m) | 0.0536 |
| Friction Factor, f | 0.01785217 |
| Common Discharge Pipe Length (m) | 3.5 |

| 90mm OD SDR11 Rising Main Pipe | |
|---|---|
| Velocity (m/s) | 1.65311913 |
| Reynolds Number (Re) | 105712.618 |
| Diameter (m) | 0.0729 |
| Friction Factor, f | 0.01847073 |
| Rising Main Length - Discharge (m) | 20 |
| Rising Main Length - Highest Point (m) | 20 |

## FITTINGS SECTION

| PVCu DN50 Individual Discharge Side | K | Qty | Total |
|---|---|---|---|
| Discharge Connection | 0.3 | 1 | 0.3 |
| Elbow | 0.3 | 1 | 0.3 |
| Non-return Valve | 0.9 | 1 | 0.9 |
| T-piece | 0.8 | 0 | 0.0 |
| Valve | 0.2 | 0 | 0.0 |

| PVCu DN50 Common Discharge Side | K | Qty | Total |
|---|---|---|---|
| Elbow | 0.3 | 1 | 0.3 |
| Non-return Valve | 0.9 | 0 | 0.0 |
| T-piece | 0.8 | 1 | 0.8 |
| Valve | 0.2 | 1 | 0.2 |
| Other/Custom | 0.0 | 0 | 0.0 |

| 90mm OD SDR11 Rising Main Side | K | Qty | Total |
|---|---|---|---|
| Elbow | 0.3 | 0 | 0.0 |
| Non-return Valve | 0.9 | 0 | 0.0 |
| T-piece | 0.8 | 0 | 0.0 |
| Valve | 0.2 | 0 | 0.0 |
| Outlet | 1.0 | 1 | 1.0 |
| Other/Custom | 0.0 | 0 | 0.0 |

## FRICTION LOSSES

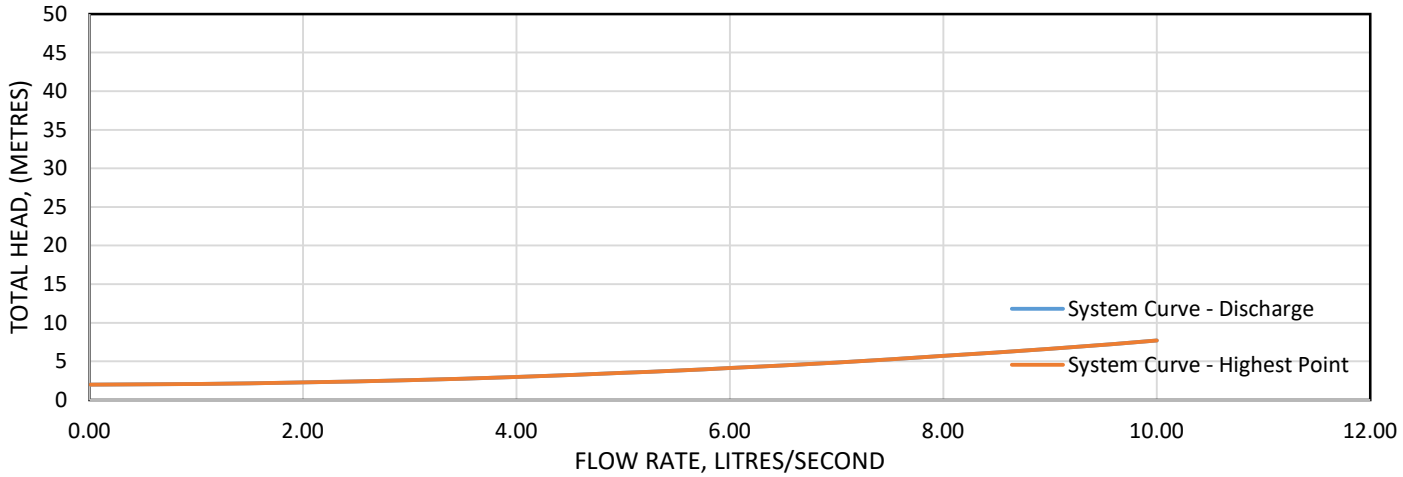
| | |
|---|---|
| Individual Discharge Pipe Fitting Friction Loss (m) | 0.7151545 |
| Individual Discharge Pipe Friction Loss (m) | 0.0476383 |
| Common Discharge Pipe Fitting Friction Loss (m) | 0.6198005 |
| Common Discharge Pipe Friction Loss (m) | 0.5557799 |
| Rising Main Fitting Friction Loss (m) | 0.1393342 |
| Rising Main Pipe Friction Loss - Discharge (m) | 0.7060642 |
| Rising Main Pipe Friction Loss - Highest Point (m) | 0.7060642 |

## GEODETIC HEAD

| | |
|---|---|
| Static Lift - Discharge (m) | 2.02 |
| Static Lift - Highest Point (m) | 2.02 |

## SUMMARY

| | |
|---|---|
| Total Head - Discharge (m): | 4.803772 |
| Total Head - Highest Point (m): | 4.803772 |
| Effective Total Head (m): | 4.803772 |




Please note: The information provided is based on the data received and assumptions aligned with industry norms. Pump manufacturers typically allow a 5-10% tolerance in published data due to potential manufacturing variances.

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**FRICTION LOSS AND PUMP SELECTION DATASHEET**

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## Other Calculation Assumptions

| | |
|---|---|
| Pumped fluid: | Water, Surface |
| Viscosity: | 1.14 $mm^2/s$ |
| Number of Pumps: | 2 |
| Nature of System: | Single Head Pump |
| Layout: | Wet Well Installation |
| Calculation Model: | Swamee-Jain |

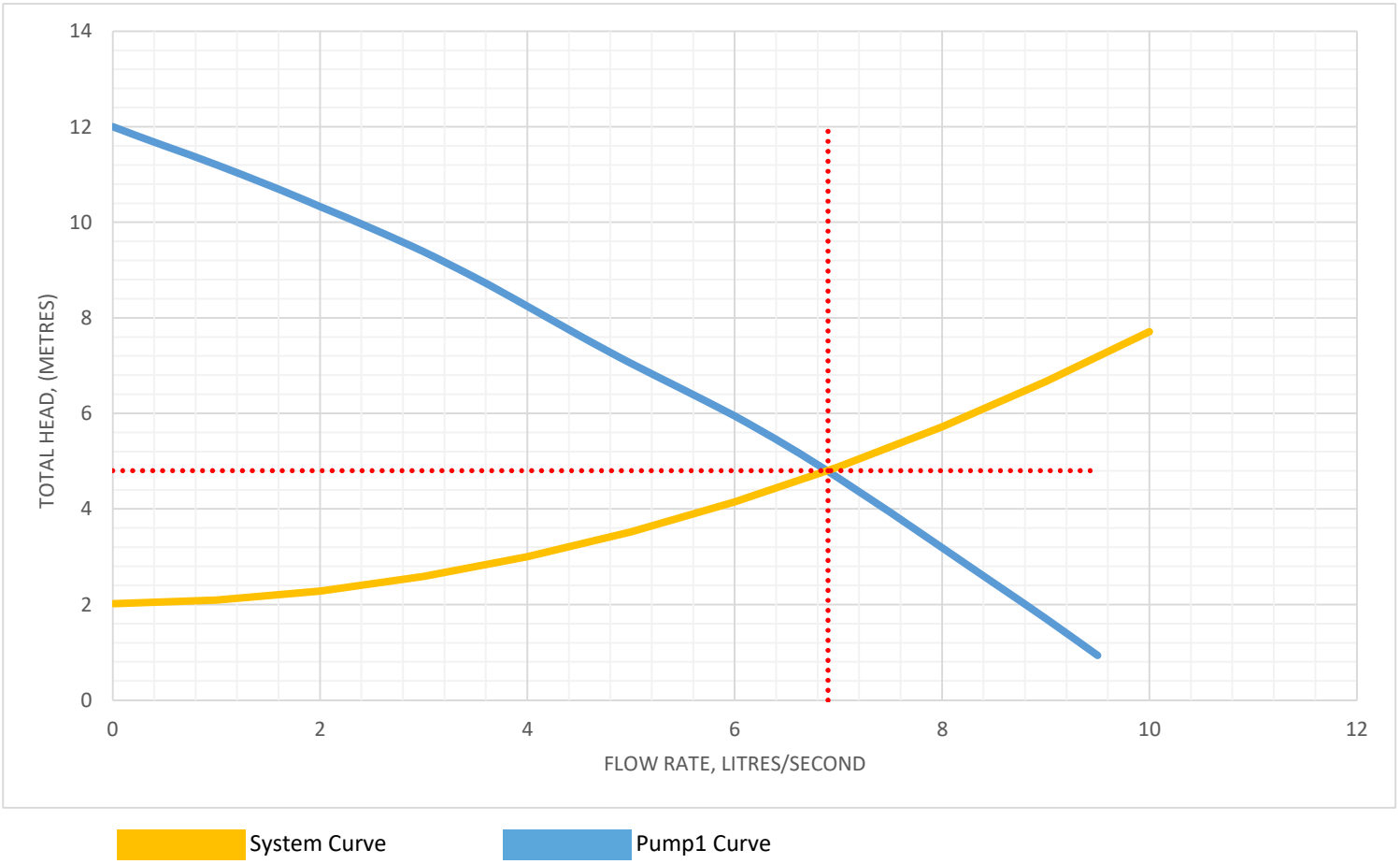



## Pump Technical Data

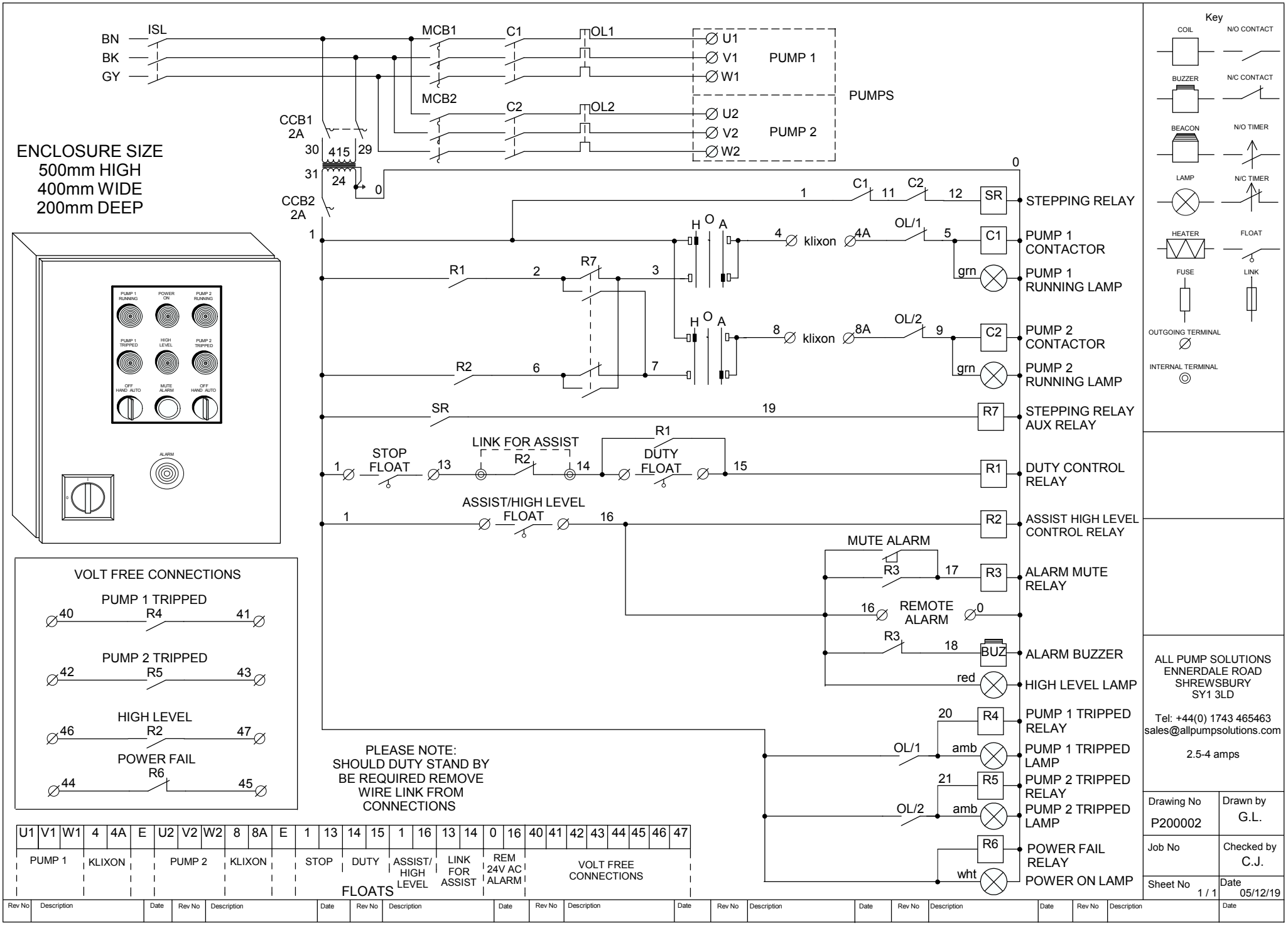
| | |
|---|---|
| Manufacturer: | Javelin |
| Model: | CPPMPSJV40064520 |
| Discharge Diameter: | DN50 |
| Rated Power: | 1.1 kW |
| Rated Current: | 3 A |
| Rated Voltage | 400 V |
| Phase: | 3~ Phase |
| Method of Start: | DOL |

## Duty Point

| ***Flow:*** | ***Head:*** |
|---|---|
| 6.9 L/s | 4.8 m |




Please note: The information provided is based on the data received and assumptions aligned with industry norms. Pump manufacturers typically allow a 5-10% tolerance in published data due to potential manufacturing variances.





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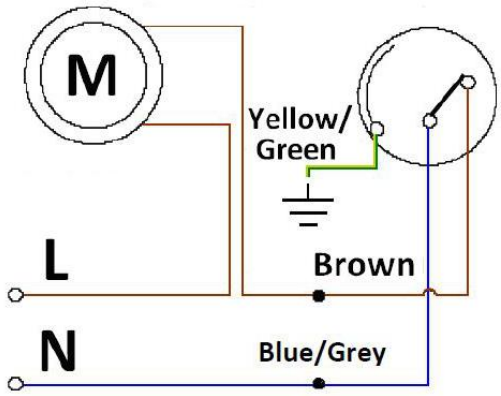

2.5-4 amps

| Drawing No | Drawn by |
|---|---|
| P200002 | G.L. |
| Job No | Checked by C.J. |
| Sheet No 1 / 1 | Date 05/12/19 |

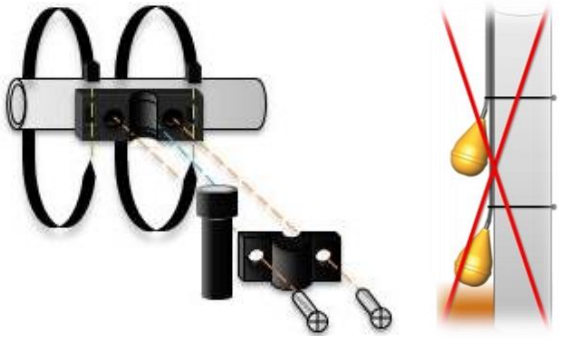
| Rev No | Description | Date |
|---|---|---|

| LEVEL REGULATOR INSTRUCTIONS<br>Terminal Connections Table | | | |
|---|---|---|---|
| | | | |
| Yellow/Green | Brown | Blue/Grey | Black |

(Fig.1)

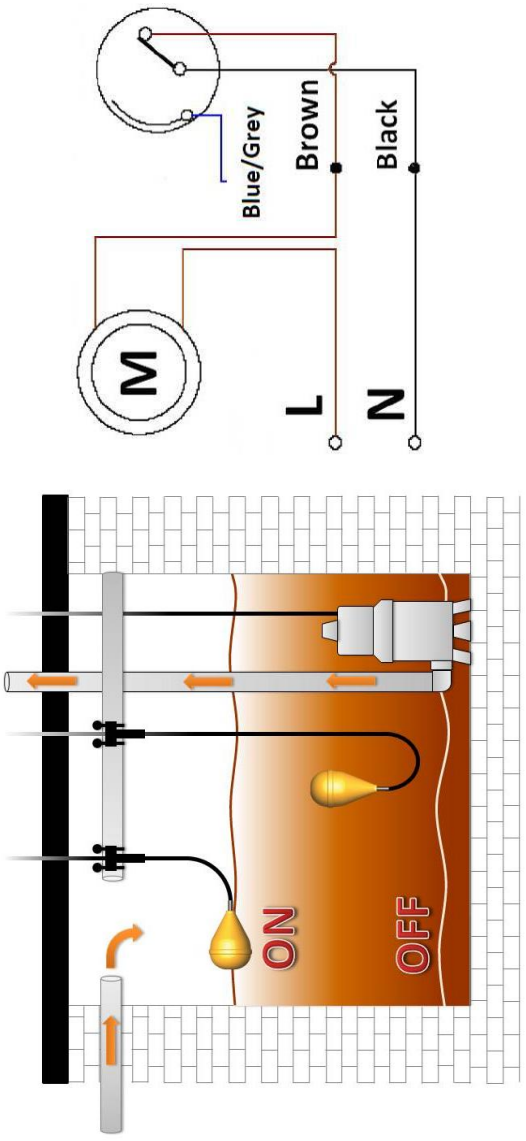



(Fig.4)



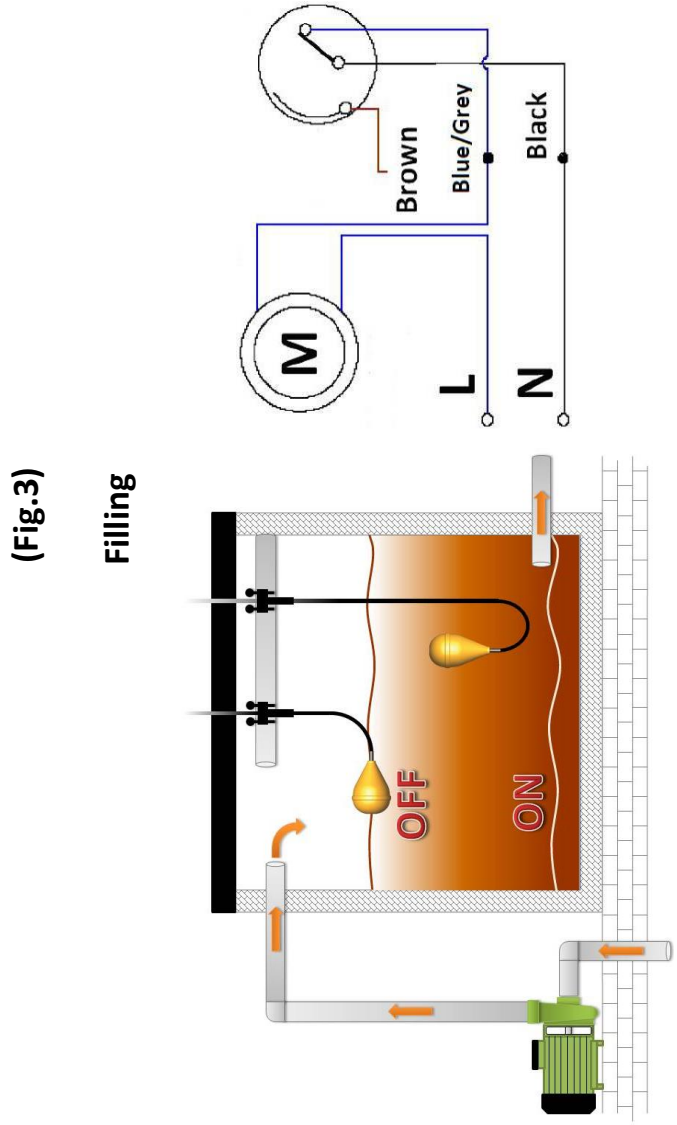
(Fig.2)

Emptying




(Fig.3)

Filling

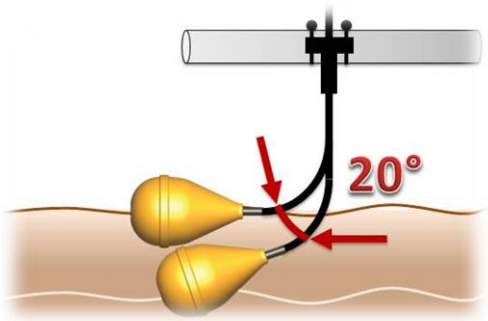


## TECHNICAL FEATURES:

- 20A resistive load - 8A motor load
  (Max absorption with 20m of cable: 10A)
- Wire gauge: 8,8mm (0,35in)
- Operating temperature:

With H07 RNF cable: min.-15°C (-59°F) – max.+60°C (+140°F)
With VVF A07 cable: min.+5°C (+41°F) – max.+60°C (+140°F)

- Max depth: 40m (131,2ft)
- Protection Grade: IP68
- Specific weight: 0,95 - 1,05 kg/dm³




**Activation angle: 20°**

## TERMINAL CONNECTIONS:

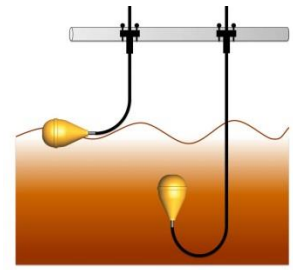
**Please follow the Figure of the terminal connections table**

**The upstream circuit must protect the electric wires from the overcurrent. WARNING: lack of protection shall null and void the warrany in the event the float breaks.**

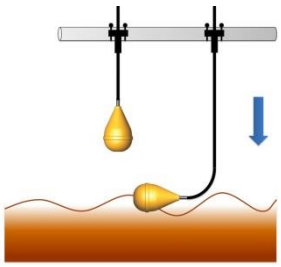
- **Mod.01:** single function - only emptying or only filling **(Fig.1)**. The grounding wire is always yellow and green.
- **Mod.02 – Mod.03** double function (choice of the fitter on installing):
  **Emptying: (Fig.2)** use black and brown wires. Note: the blue/grey wire must be insulated.
  **Filling: (Fig.3)** use black and blue/grey wires. Note: the brown wire must be insulated.
  **High Level Alarm: (Fig.2)** use black and brown wires. Note: the blue/grey wire must be insulated.
  **Low Level Alarm: (Fig.3)** use black and blue/grey wires. Note: the brown wire must be insulated.

## USE:

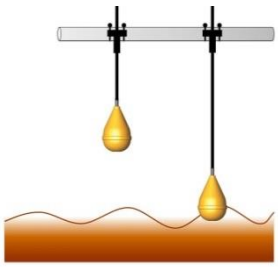
Unlike normal floats, the level regulator is used in pairs of two of the same type to regulate water levels to a certain height: one regulates the minimum level and the other regulates the maximum level. A third and fourth regulator can also be used for minimum and maximum alarm respectively. To avoid damaging the cable, we recommend the Fixing Kit **(Fig.4)**



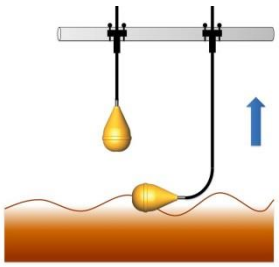
High level starts the pump



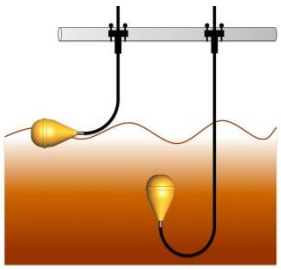
The tank drains



Low level stops the pump



The tank fills...



...and high level starts the pump again

## NOTES: DO NOT TAMPER THE FLOAT SWITCH

- Before any operation on the float remember to disconnect the power supply from the main power.
- Check that the maximum motor power does not exceed the float's electrical values.
- The electrical cable is part of the floating switch, thus in case of cable damage, the float itself has to be replaced.
- Fixing Kit are available on request as accessories.

**No joints should be made on the float switch cable, as immersion of such joints could cause short circuits or electrical shocks.**

# Allview

## Micro GSM RTU

USER MANUAL

Version 1.8



# allview telemetry user manual

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# 1 Safety & notices

## 1.1 Safety

For AC supply variants:

The AC supply should be isolated prior to opening the enclosure and should not be reconnected until the enclosure lid is secured.

Isolate from Mains before removing cover.

## 1.2 Qualified users

Users should ensure they are suitably trained and qualified prior to working on the ALLVIEW.

Installation should be carried out in accordance with local procedures and company safety and operational guidelines.

## 1.3 Notices

| | | |
|---|---|---|
| Battery |  | Do not attempt to charge the battery – risk of explosion. Do not short circuit, crush, disassemble or heat above 100°C, incinerate or expose contents to water. |
| AC Supply<br>(only applies to AC powered models) |  | Isolate from Mains before removing cover.<br>100-240V AC<br>50-60Hz<br>100mA rated current |
| DC Supply<br>(only applies to DC powered models) |  | 12-24V DC<br>500mA rated current |
| Disposal |  | Battery and ALLVIEW unit should be disposed of in accordance with local regulations. |

## 1.4 Versions

This document describes the current build version and software functionality of the ALLVIEW product. Earlier versions and software releases may differ. Please consult All Pump Solutionsh for earlier versions of this document.

# 2 ALLVIEW RTU Description

## 2.1 Applications

The ALLVIEW RTU (Remote Terminal Unit) is a telemetry device that is suitable for use in fixed site alarm monitoring and control applications.

The ALLVIEW provides monitoring and control of equipment via digital inputs, counter inputs, analogue inputs, control outputs and RS485 (using Modbus RTU). Typical applications include:

- LV substation monitoring and control.
- Pump and pump station monitoring.
- Wind farm site monitoring.
- General plant alarm panel monitoring.
- Tank level monitoring.
- Circuit breaker operation monitoring.
- Fault Passage Indicator monitoring.

## 2.2 Central iHost User Interface

The ALLVIEW is remotely monitored from the All Pump Solutionsh "iHost" system. Users access iHost via a unique username and password. The iHost system stores and displays equipment status and alarm data, along with related event history and statistics. It also provides remote ALLVIEW configuration tools. Data is displayed in lists, record details, maps, diagrams, tables and graphs.

For larger customers, a dedicated private iHost System can be installed at their own premises on their own servers.

The functionality of the iHost User Interface is beyond the scope of this document.

## 2.3 Communications

The ALLVIEW includes an in-built, quad-band GPRS wireless modem and antenna. There are 3G and 4G factory options available for different regions – please contact All Pump Solutionsh to discuss your requirements.

# 3 ALLVIEW RTU Set-up Requirements

## 3.1 Auxiliary power supply

The ALLVIEW requires an auxiliary AC or DC supply (factory set option).

**AC powered units**

The ALLVIEW requires a two (2) wire AC supply. Observe correct polarity.

It is the users' responsibility to ensure local wiring regulations are complied with during installation.

AC powered units may be fitted with a long life, non-rechargeable, lithium battery to power the unit when the AC supply is off.

Suitable batteries and replacements are available from All Pump Solutionsh.

**DC powered units**

The ALLVIEW requires a 12-24V DC supply. Observe correct polarity.

It is the users' responsibility to ensure local wiring regulations are complied with during installation.

DC powered units may be fitted with a long life, non-rechargeable, lithium battery to power the unit when the DC supply is off.

Suitable batteries and replacements are available from All Pump Solutionsh.

## 3.2 Battery Operation

The ALLVIEW monitors its auxiliary power supply. When the auxiliary supply is lost, provided a battery is connected, the unit will continue to operate as follows:

| Condition | Behaviour |
|---|---|
| First 1 minute after loss of auxiliary supply | Normal operation.<br>Modem is switched off once the loss of supply is reported to the Host. |
| 1 minute to 12 hours (configurable) after loss of auxiliary supply | Low power mode:<br>Modem switched off, will be turned on for communications as required.<br>Analogue and Digital Inputs scan rate reduced to 250ms.<br>RS485 Modbus polling stops. |
| 12 hours (configurable) after loss of supply | Conserve battery:<br>Unit auto powers off.<br>Unit will restart when auxiliary supply returns. |

## 3.3 USB Port / Field Support Kit

The ALLVIEW is normally shipped with the customer's default parameter values already configured.

The ALLVIEW provides a USB interface to allow the user to configure operational parameters from a laptop/PC. Parameters are stored in non-volatile memory (they are retained during power outages).

The NX Field Support Kit (FSK) is a software application that enables users to interrogate the status and settings of the RTU and to inspect the archived logs.

The principle use of the FSK is to set the connection details that enable communication between the RTU and the iHost system via a mobile network. This entails configuring the SIM card(s) within the RTU. Once connection has been established, the ALLVIEW RTU may be reconfigured remotely from the iHost system.

The NX FSK is described in a separate document.

# 4 ALLVIEW RTU Firmware Functions

The features below describe the functionality offered by the latest version of ALLVIEW firmware at the time of writing.

## 4.1 Clock

The RTU has an internal Real Time Clock (RTC). The clock is synchronised with the iHost system clock on a regular basis.

Date/time stamping in Event and System logs is recorded to 10ms in granularity.

## 4.2 Inputs / Outputs

There are 16 digital inputs. These can be individually configured to operate as either a Binary Input or as 16-bit Counter Input.

There are 8 analogue inputs with 8-bit resolution.

There are 8 output lines.

The RS485 serial port is used to collect additional data from external devices via the Modbus RTU protocol – contact All Pump Solutionsh for a list of supported devices.

## 4.3 Auxiliary Supply On/Off

The incoming auxiliary supply line is monitored. The default setting is to date/time stamp changes of state (loss / restoration) and to immediately report them to the iHost system.

A configurable debounce timer can be used to extend the period that the auxiliary supply must change state before an event is logged and reported.

## 4.4 Binary Inputs

The following features are supported and remotely configured for each input individually:

| | |
|---|---|
| Enabled | The input is monitored. |
| Status | Closed or Open. Status is reported to the iHost during every communication. |
| Debounce | How long the input must be open (or closed) before a change of state is confirmed. |
| Log Open | Yes = create a date/time log entry when the input changes from Closed to Open. |
| Log Close | Yes = create a date/time log entry when the input changes from Open to Closed. |
| Report on Open | Yes = initiate an immediate iHost communication as soon as an Open event is generated. |
| Report on Close | Yes = initiate an immediate iHost communication as soon as a Close event is generated. |

In ideal conditions, the processor detects changes of state within 10ms.

## 4.5 Counter Inputs

The following features are supported and remotely configured for each input individually:

| | |
|---|---|
| Enabled | The input is monitored. |
| Current Value | A 16-bit number which is converted to a 32-bit number with scaling at the iHost system. The current value is reported to the iHost system during every communication. When the 16-bit maximum is reached the counter rolls back to zero and continues. |
| Debounce | How long the input must be open (or closed) before a change of state is confirmed. |
| Increment on Open | Yes = increment the current value by 1 when the input changes from Closed to Open. |
| Increment on Close | Yes = increment the current value by 1 when the input changes from Open to Closed. |
| 30-min Datalogging | Yes = create a data log entry for the input with how many counts the current value increased by for each 30-minute period of the day. The 30-minute data logs are reported to the iHost system during routine communications. |

In ideal conditions, the processor detects changes of state within 10ms.

## 4.6 Analogue Inputs

The following features are supported and remotely configured for each input individually:

| | |
|---|---|
| Enabled | The input is monitored. |
| Level | An 8-bit value. The Level is reported to iHost during every communication. |
| Routine Datalogging | Yes = Take a date/time stamped routine level reading at the frequency specified (1 min to 24 hours). Date/time entries are reported during the next iHost communication. |
| Dead band Crossing Logging | Each input has a dead-band percentage. When the level changes by an amount exceeding the dead-band, the RTU adds a date/time stamped entry in the analogue input log. |
| Threshold Crossing Logging | Each input has 4 threshold levels providing 5 zones. When the level crosses a threshold, the RTU adds a date/time stamped entry in the analogue input log. |
| Report on Dead band | Yes = initiate an immediate iHost communication as soon as a dead-band-crossed event is generated. |
| Report on Threshold | Yes = initiate an immediate iHost communication as soon as a threshold-crossed event is generated. |
| Debounce | How long the input must be in a new zone (or dead-band) before a threshold crossing (or dead-band crossing) is confirmed. |

In ideal conditions the processor scans the analogue inputs every 10ms.

## 4.7 Output Channels

The following features are supported and remotely configured for each switched output channel. It is expected that applications will use the Output Channels to drive external relays:

| | |
|---|---|
| Energise | Energises the output. Has no effect if output is already energised. |
| De-energise | De-energises the output. Has no effect if output is already de-energised. |
| Energise Pulse | Energises, pauses, then de-energises the output. |
| De-energise Pulse | De-energises, pauses, then energises the output. |
| Pulse Duration | Configurable pulse width from 50ms to 12.75 seconds in 50ms increments. |

## 4.8 RS485 Modbus

The ALLVIEW uses the Modbus RTU protocol to poll for data from connected Slave devices. Modbus I/O mappings are loaded into the ALLVIEW using a script file. Please contact All Pump Solutionsh for assistance configuring the Modbus interface.

## 4.9 RTU / Communication Events

GSM signal strength is reported to the iHost system. Communication failures are date/time stamped, logged and reported to the iHost system.

The PCB temperature within the RTU is also reported to the iHost system.

## 4.10 Data Log Sizes

Data logs are stored in non-volatile memory and include local date/time stamps.

- Binary Input Log – 1024 date/time stamped entries.
- Counter Input Log – 1024 date/time stamped entries.
- Analogue Input Log – 1024 date/time stamped entries.
- RTU Events Log – 1024 date/time stamped entries.
- Counter 30-minute Data Logs – 256 date/time stamped entries.

When a log entry fills, a "buffer overrun" event is logged (to identify a loss of data) and then the log loops back and overwrites the oldest data. Buffer overrun log entries are themselves date/time stamped and reported to the iHost system.

## 4.11 Input monitoring during iHost calls

Inputs continue to be monitored during calls to the iHost system. Depending upon the log configuration, this may result in an immediate new call to the iHost system.

## 4.12 Connection between the RTU and iHost

During contact with the iHost system, the RTU performs the Slave function, serving information upon request from the iHost system, which performs the Master function. Data is transferred, in each direction, using a secure protocol.

Information from the RTU is stored in the iHost database, where it may be viewed by users.

## 4.13 Reconfiguration of the RTU settings

The operational behaviour of the RTU, including which inputs are enabled and how data is reported and stored, is configurable from the iHost system and hence does not require a site visit.

When an iHost User makes changes to these settings, the new settings will be loaded into the RTU during the next contact between the iHost system and the RTU.

# 5 ALLVIEW RTU Operation

## 5.1 Cold Start

The RTU is configured to monitor for a processor power-up event, occurring after periods without mains and battery back-up power. This is known as a "Cold Start". The RTU will then initiate communication with the iHost system.

## 5.2 LED Indicators

The processor LEDs are used to indicate both the operational state and the communication state of the RTU.

| Diagnostic LED | Condition | Meaning |
|---|---|---|
| LED1 (top) | Steady Flashing | Processor working. |
| LED1 | On for 5 seconds | Communication to host successfully completed. |
| LED1 | Quick Flash | TX Host/Modem Data. |
| LED2 | Steady Flashing | Last communication failed. In retry sequence. |
| LED2 | On for 5 seconds | Communication to host failed. |
| LED2 | Quick Flash | RX Host/Modem Data. |
| LED3 | Quick Flash | RS485 TX Data. |
| LED4 | Quick Flash | RS485 RX Data. |
| Led 5 (bottom) | various | Driven directly by the modem. |

## 5.3 RTU connection to the iHost system

The ALLVIEW RTU connects to the iHost system when:

- An event that is configured to initiate a connection occurs.
- The "Next Routine Call" date/time is reached or exceeded.
- The user presses the test button (PCB identifier SW1).

A configurable "Routine Health Check Interval" is configured by the iHost system. Typically, this is set between 1 hour and 3 hours, however the range for the interval setting is from 1 minute to 28 days.

An event configured to cause an immediate communication to the iHost system will do so regardless of when the next routine health check is due.

## 5.4 Call Retry Algorithm

If a connection to the iHost system fails, then the RTU enters its retry sequence.

The RTU retries in a block of 10 attempts, approximately 1 minute apart. Then it waits a (re)configurable time before starting another block of 10 attempts. This repeats until communications is restored.

During this period, if any new events configured as "Immediate Contact Host" occur, then the RTU will immediately start attempting to contact the iHost system.

Failed communication attempts are date/time stamped by the RTU, along with the reason for the failure. These logs are reported to the iHost system upon the next successful contact.

# 6 Installation

## 6.1 Qualified Users

Users should ensure that they are suitably trained and qualified prior to working on the RTU.

## 6.2 AC Powered Models

The AC supply should be isolated prior to opening the enclosure and should not be reconnected until the enclosure lid is secured.

The AC Power Supply should be rated at 230 Volts or 115 Volts, operating at a frequency of 50Hz.

The power supply to the RTU should be:

- Connected via a switch or circuit breaker.
- Close to the RTU and within easy reach of an operator.
- Marked as the disconnection device for the RTU.

## 6.3 DC Powered Models

The DC Power Supply should be rated at 12 Volts or 24 Volts.

## 6.4 Procedure

The following steps must be completed in the order set out below.

1. Configure the ALLVIEW prior to installation (this may be done at the factory).
2. Connect the external equipment to be monitored to the I/O terminals on the ALLVIEW.
3. Connect the auxiliary power supply (do not switch it on yet).
4. Connect the battery (if one is required).
5. Secure the ALLVIEW lid (for units with an enclosure).
6. Switch on auxiliary power. Confirm that the ALLVIEW RTU successfully communicates with the iHost system.
7. Test the unit by confirming that all inputs and outputs report the correct status and events.
8. Confirm that at least two calls to the iHost system are successful (this ensures that the settings are synchronised).
9. If a lithium battery is included:
    - Remove the auxiliary supply and confirm that the RTU continues to operate using battery power.
    - Restore the auxiliary supply.

## 6.5 Circuit Board Layout

The Printed Circuit Board (PCB) hardware is manufactured as shown in the diagram below.

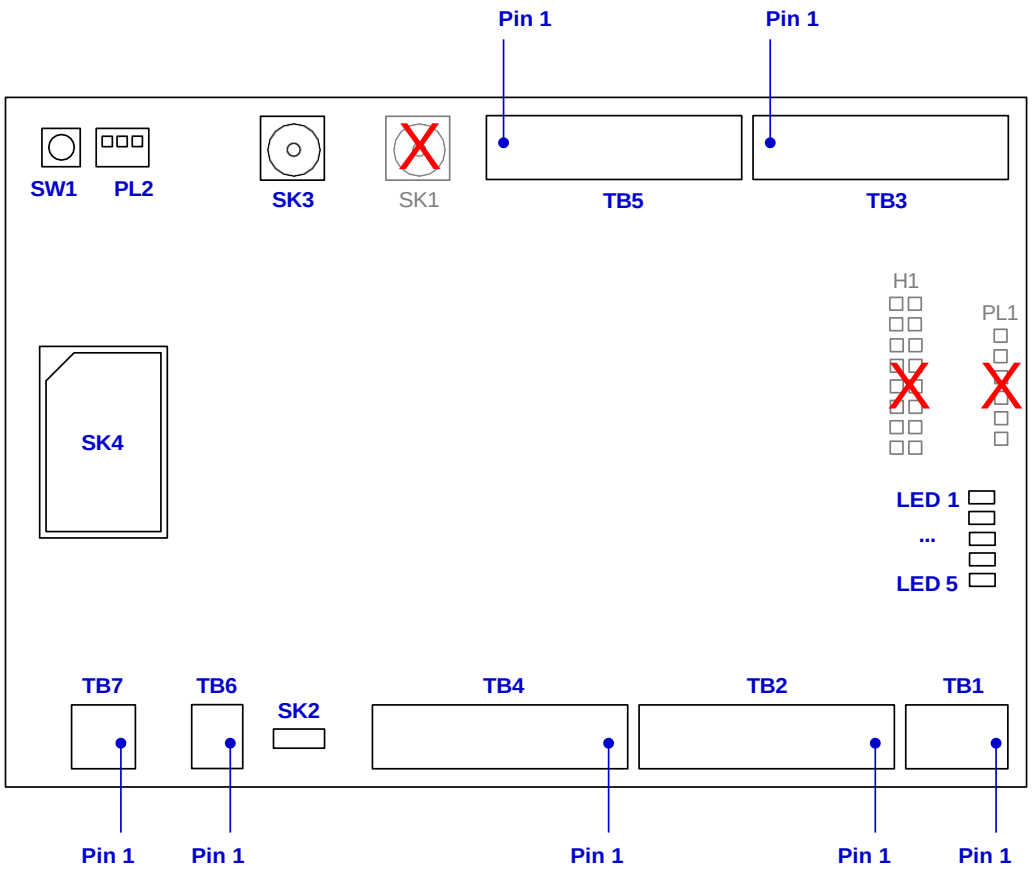
Ensure that the correct auxiliary supply is provided for the model being used. Where fitted, the battery should be plugged in.

Digital Inputs should be volt-free dry contacts.

Analogue Inputs should be 4-20mA (factory option for 0-10V).

Output channels can switch up to 100mA.

ALLVIEW Terminal Blocks, Sockets, Plugs




## 6.6 PCB Connections

| PCB Ref. | Pin | Function | Comment |
|---|---|---|---|
| TB7 | 1 | AC Supply Live (110-230V AC) | Unit is factory set as either AC powered or DC powered unit. |
| TB7 | 2 | AC Supply Neutral | |
| | | | |
| TB6 | 1 | DC supply +ive (12-24V DC) | |
| TB6 | 2 | DC supply 0V | |
| | | | |
| PL2 | - | Lithium battery | |
| | | | |
| SW1 | - | User button | |

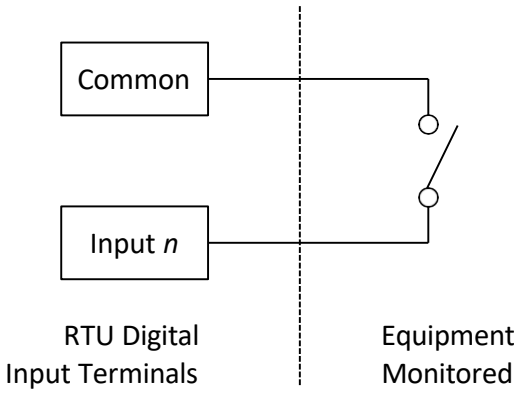
| PCB Ref. | Pin | Function | Comment |
|---|---|---|---|
| | | | |
| SK2 | - | Micro USB | |
| SK3 | - | GSM SMA antenna connector | |
| SK4 | - | SIM card carrier | |
| | | | |
| TB4 | 1 | Not connected | |
| TB4 | 2 | Digital Input #8 | |
| TB4 | 3 | Digital Input #7 | |
| TB4 | 4 | Digital Input #6 | |
| TB4 | 5 | Digital Input #5 | |
| TB4 | 6 | Digital Input #4 | |
| TB4 | 7 | Digital Input #3 | |
| TB4 | 8 | Digital Input #2 | |
| TB4 | 9 | Digital Input #1 | |
| TB4 | 10 | Common | |
| | | | |
| TB2 | 1 | Not connected | |
| TB2 | 2 | Digital Input #16 | |
| TB2 | 3 | Digital Input #15 | |
| TB2 | 4 | Digital Input #14 | |
| TB2 | 5 | Digital Input #13 | |
| TB2 | 6 | Digital Input #12 | |
| TB2 | 7 | Digital Input #11 | |
| TB2 | 8 | Digital Input #10 | |
| TB2 | 9 | Digital Input #9 | |
| TB2 | 10 | Common | |
| | | | |
| TB3 | 1 | Do not use | |
| TB3 | 2 | Analogue Input #8 | |
| TB3 | 3 | Analogue Input #7 | |
| TB3 | 4 | Analogue Input #6 | |
| TB3 | 5 | Analogue Input #5 | |
| TB3 | 6 | Analogue Input #4 | |
| TB3 | 7 | Analogue Input #3 | |
| TB3 | 8 | Analogue Input #2 | |
| TB3 | 9 | Analogue Input #1 | |
| TB3 | 10 | Common | |
| | | | |

| PCB Ref. | Pin | Function | Comment |
|---|---|---|---|
| TB5 | 1 | Not connected | |
| TB5 | 2 | Digital Output #8 | |
| TB5 | 3 | Digital Output #7 | |
| TB5 | 4 | Digital Output #6 | |
| TB5 | 5 | Digital Output #5 | |
| TB5 | 6 | Digital Output #4 | |
| TB5 | 7 | Digital Output #3 | |
| TB5 | 8 | Digital Output #2 | |
| TB5 | 9 | Digital Output #1 | |
| TB5 | 10 | Common | |
| | | | |
| TB1 | 1 | RS485 TX/RX +ive | |
| TB1 | 2 | RS485 TX/RX -ive | |
| TB1 | 3 | RS485 + wake up | Not implemented |
| TB1 | 4 | RS485 Ground/Common | |
| | | | |
| PL1 | 1-6 | Programming port | Do not use |
| H1 | 1-16 | Expansion header | |
| SK1 | - | Not used | |

## 6.7 Wiring Connection Diagrams

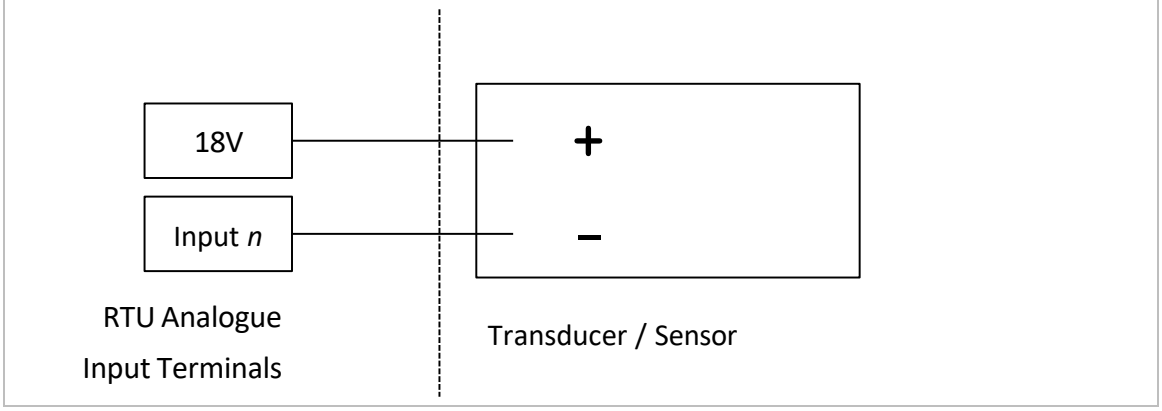
### 6.7.1 Digital Inputs

Connecting the RTU to a volt-free dry contact input

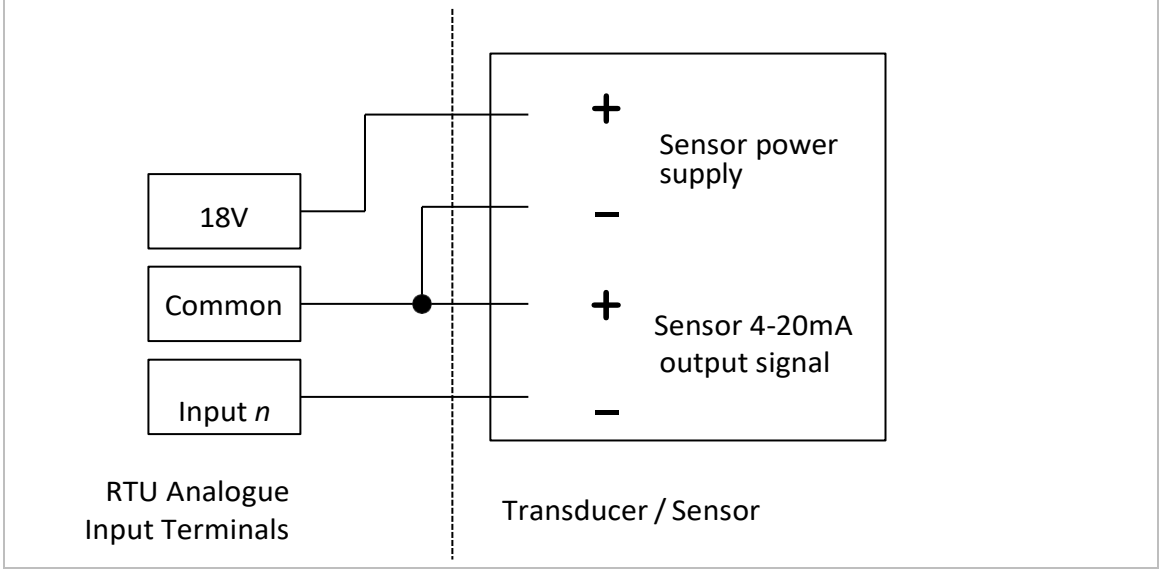


### 6.7.2 Analogue Inputs

Connecting the RTU to a 2-wire sensor (4-20mA)



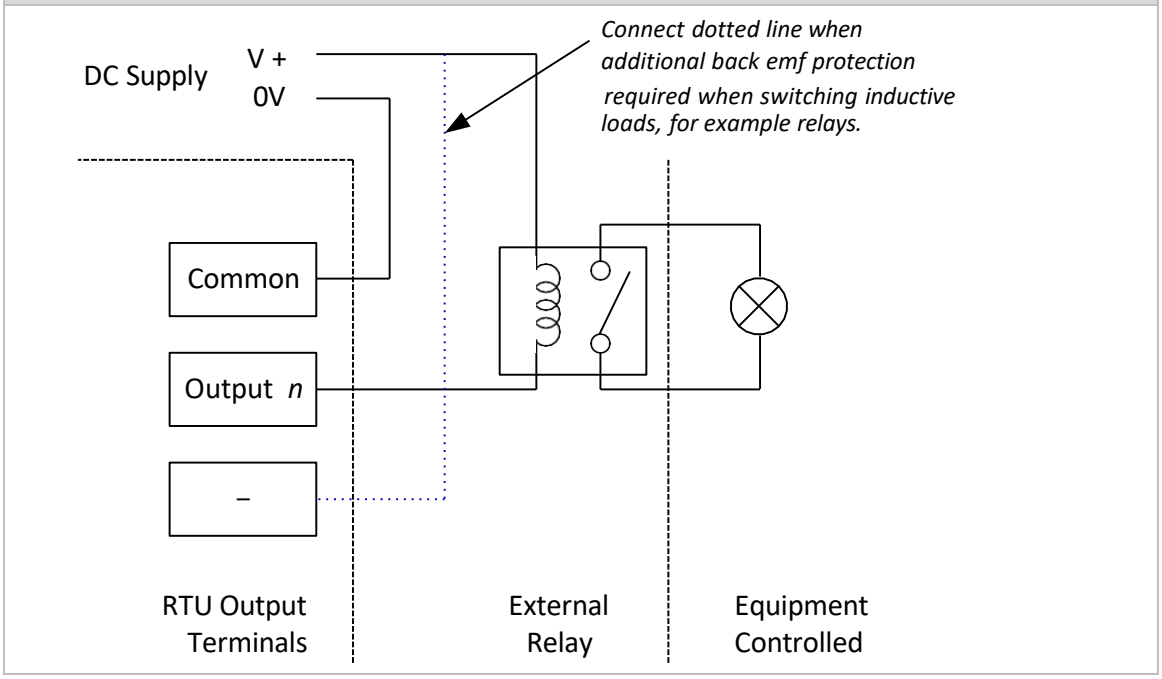

Connecting the RTU to a 4-wire sensor (4-20mA)



### 6.7.3 Output Channels

Outputs switch 100mA.

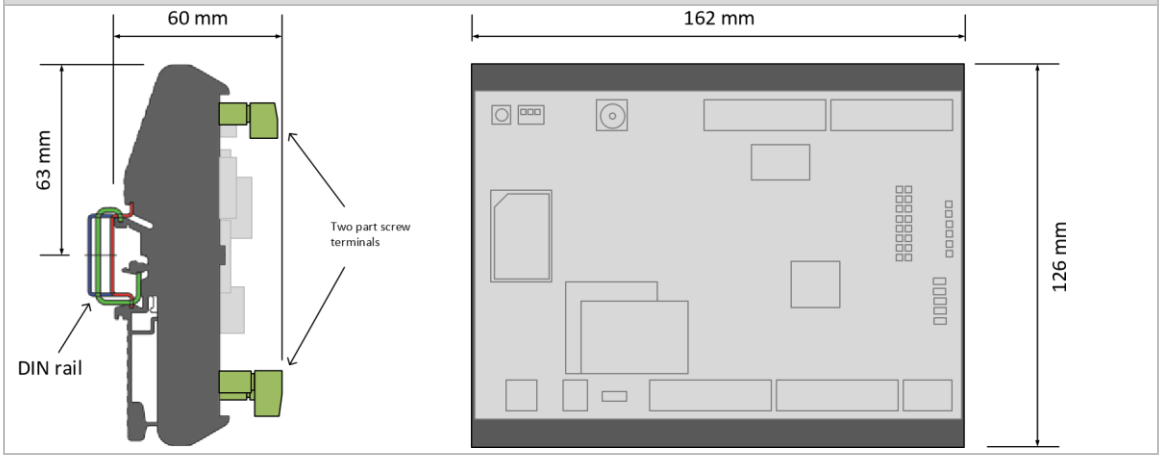
Example connecting the RTU to an external relay



## 6.8 Enclosure and mounting

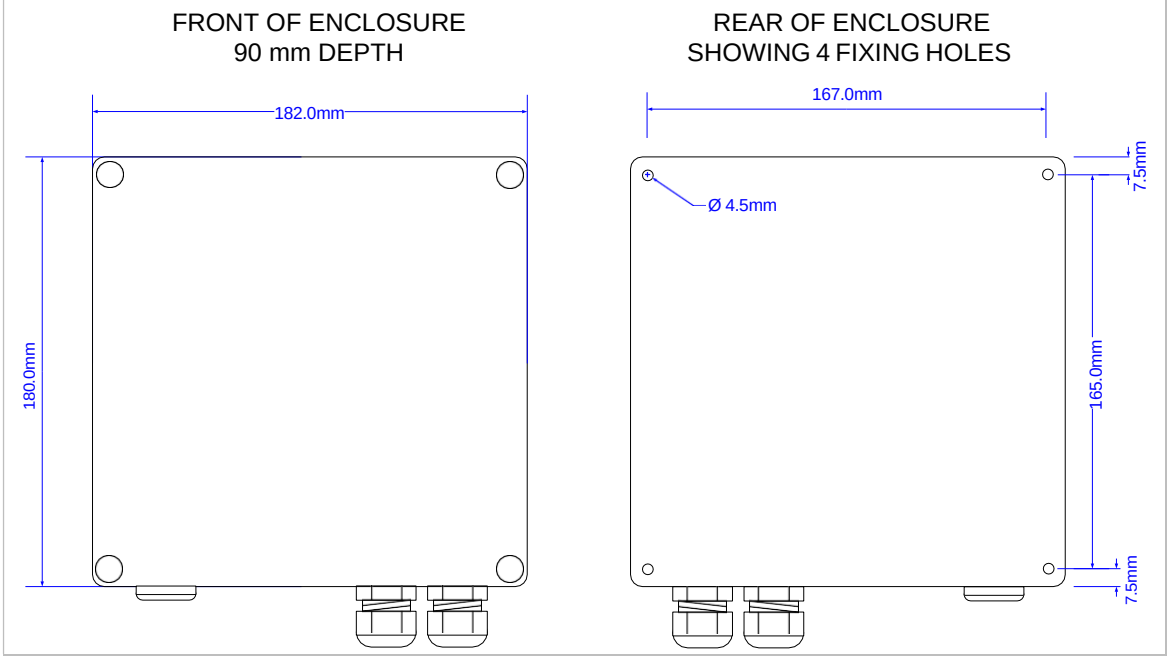
### 6.8.1 DIN Rail option

ALLVIEW supplied as a DIN rail mountable unit




### 6.8.2 Enclosure option

ALLVIEW supplied in an IP54 polycarbonate enclosure



# 7 Maintenance

The Auxiliary supply should be isolated prior to opening the enclosure and should not be reconnected until the enclosure lid is secured.

## 7.1 Technical assistance

In case of technical assistance please contact either the supplier of the ALLVIEW or All Pump Solutionsh. If a malfunction occurs, please contact All Pump Solutions.

## 7.2 Communications test

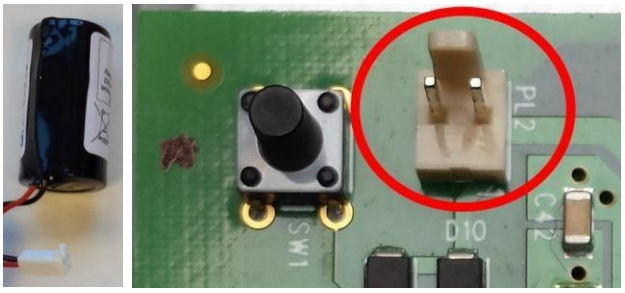
Press the button (SW1) at the top left of the PCB. Confirm that the RTU communicates successfully with the iHost system.

## 7.3 I/O tests

For each input connected to the ALLVIEW, confirm that the correct status data and the desired date/time events are being reported to the iHost system.

## 7.4 Replacing the Battery

When replacement is necessary, contact All Pump Solutionsh for a replacement part. There are two types of battery, depending on the PCB hardware version:

| 2 pin battery connectors | |
|---|---|
| ALLVIEW's with 2 pin battery connectors require 3.6V lithium battery:<br>▪ Part number: ACC-0751 |  |

| 3 pin battery connectors | |
|---|---|
| ALLVIEW's with 3 pin battery connectors require 7.2V lithium battery:<br>▪ Part number ACC-1010 |  |

To replace the battery, unplug the old battery pack and plug in the new pack.

Re-test the ALLVIEW unit for correct operation.

## 7.5 Recycling

After replacing the internal battery, dispose of the old lithium battery responsibly, in accordance with local rules.

ALLVIEW units can be returned to All Pump Solutionsh for recycling at the end of their life.

# 8 Specification Data

## 8.1 General

| | |
|---|---|
| AC supply<br>(AC powered units only) | 100-240V AC, 50-60Hz.<br>100mA rated current.<br>See additional information below. |
| DC supply<br>(DC powered units only) | 12-24V DC.<br>500mA rated current. |
| Battery<br>(where connected) | Lithium-thionyl chloride (Li-$SOCl_2$).<br>Nominal 5.8Ah.<br>3.6V single cell pack. Lithium content approx. 3.4g.<br>7.2V twin cell pack. Lithium content approx. 6.8g.<br>Maintenance interval 10 years or when exhausted. |
| Local Indication | Surface mount LEDs. |
| Hardwired Digital Inputs | Qty 16. Configurable as alarm or counter inputs. |
| Hardwired Digital Outputs | Qty 8. Transistor outputs. |
| Hardwired Analogue Inputs | Qty 8. 0-25mA inputs. Configurable alarm thresholds. |
| Additional I/O | Additional I/O is achieved via the RS485 Modbus interface. |
| Local Serial Data | Modbus over 3 wire RS485. |
| Remote Indication | GSM modem with SMA antenna. NEXUS protocol, supported on the iHost system. |

## 8.2 AC powered units

The ALLVIEW requires a two (2) wire AC supply. Connect with the correct polarity.

It is the users' responsibility to ensure that local wiring regulations are complied with during installation.

It is recommended that a Ferrite be fitted to the AC power cable (suitable part Wurth Elektronik, PN 742 700 44).

The power supply to the RTU should be:

1. Connected via a switch or circuit breaker.
2. Close to the RTU and within easy reach of an operator.
3. Marked as the disconnection device for the RTU.

## 8.3 DC powered units

The ALLVIEW requires a DC supply. Connect with the correct polarity.

It is the users' responsibility to ensure that local wiring regulations are complied with during installation.

## 8.4 EMC

The ALLVIEW has been designed and manufactured to meet the following standards.

Emissions EN61326-1: 2006 Class B Emissions, Industrial locations

- EN55011 Mains terminal disturbance voltage
- EN55011 Electromagnetic radiation disturbance
- EN61000-3-2 Harmonic current emissions
- EN61000-3-3 Flicker (not applicable)

Immunity EN61326-1:

- EN61000-4-2 ESD
- EN61000-4-3 EM Field
- EN61000-4-4 Burst
- EN61000-4-6 Conducted RF
- EN61000-4-8 Power Frequency Magnetic Field
- EN61000-4-11 Voltage Dips and Interruptions

## 8.5 Environmental

| | | |
|---|---|---|
| Enclosure Rating: | IP54 | |
| Humidity: | 0-95% non-condensing | |
| Temperature: | PCB: | -20 to +70 degrees C. |
| | Battery: | -60 to +85 degrees C. |
| | GSM modem: | -40 to +85 degrees C. |

Storage: The ALLVIEW should be stored in an environment that is dry, corrosive-free, and not in direct sunlight.

Correct storage prevents premature component failures caused by environmental factors such as moisture or corrosive gases. Exposure to high humidity or corrosive environments will prematurely degrade the electronic components in any electronic device regardless of its use or manufacturer.

# BALL CHECK VALVES

## APPLICATIONS

Pumping stations for clean,sewage water and loaded or viscous fluids.

## TECHNICAL DATA

Range:

- Threaded ends from 1"to3"(DN25 to DN80).
- Flanged ends from (DN40toDN500).
- Connections:
- Threaded type"BSP"accto ISO228-1 and NFE03-005.
- Flanged type:for mounting between flanges PN10 (standard) and PN16, ANSI 150#,BStable D&E on request.
- Maximum working pressure 10bars.(limits accto material)
- Operating temperatures 10ºC+70ºC.
- Seating accto category A standard ISO5208.
- Minimum back pressure for tightness:0,3 to 0,5bars.
- Face to face dimensions for flanged type according to EN-558-1serie 48(DIN3202F-6).

## TECHNICAL PERFORMANCES

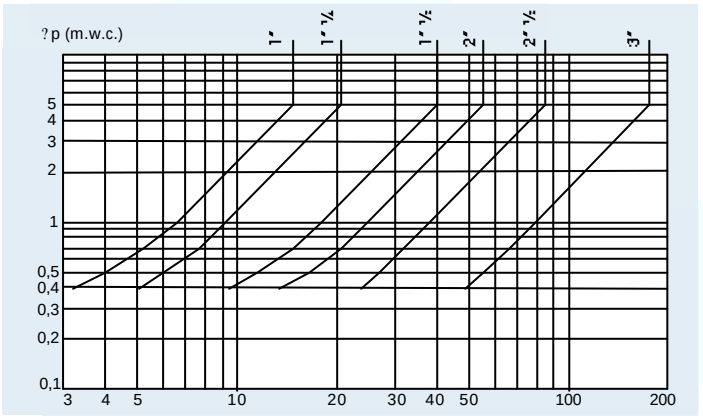
- Full bore ensured.
- Self cleaning ball.
- Low pressure drop.
- Silent.
- Removable bonnet for cleaning or changing the ball without disassembly out of the pipeline.
- Horizontal and vertical installation in the pipeline.
- Optional floating balls.

## TEST

- Seat:1,1 x nominal pressure.
- Body:1,5 x nominal pressure.

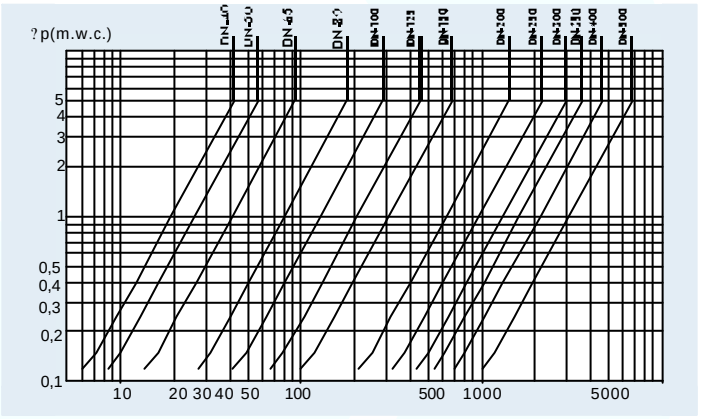
## PRESSURE DROP CURVE

THREADED




FLOW(m³/h)

FLANGED

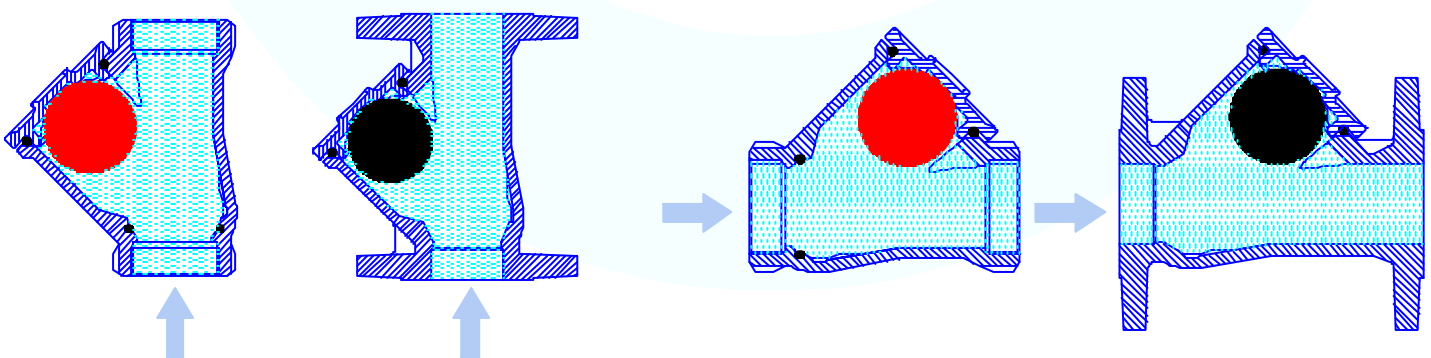



FLOW(m³/h)

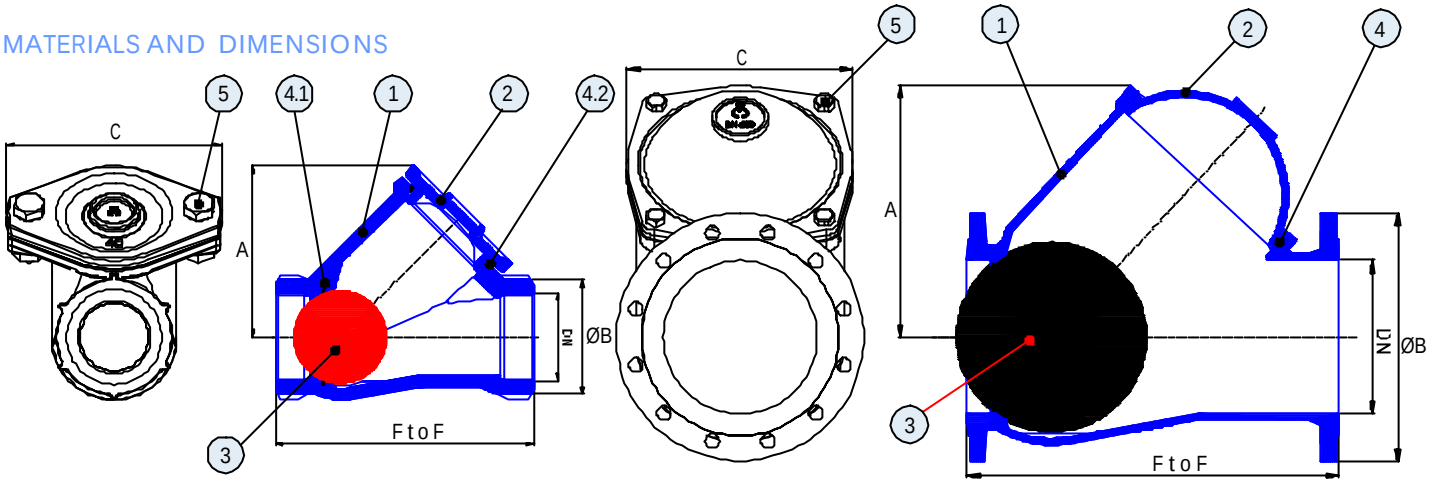
## MOUNTINGIN PIPELINE

VERTICAL INSTALLATION

HORIZONTAL INSTALLATION



## MATERIALS AND DIMENSIONS




### MATERIAL DESCRIPTION DN-25 TO DN-65 (THREADED)AND DN-40 TO DN-65(FLANGED)

| Nº | DESCRIPTION | STANDARD | OPTION |
|---|---|---|---|
| 1 | Body* | GG-25(EN-GJL-250) | GGG-40(EN-GJS-400-15) |
| 2 | Bonnet* | GG-25(EN-GJL-250) | GGG-40(EN-GJS-400-15) |
| 3 | Ball | Phenolic Resin | Floating Ball |
| 4.1 | Seal Gasket | Elastomer/NBR | Elastomer/Viton |
| 4.2 | Bonnet Gasket | Elastomer/NBR | Elastomer/Viton |
| 5 | Bolting | StainlessSteel | - |

*Paint epoxy blue RAL-5017

### MATERIAL DESCRIPTION DN-80(THREADED)AND DN-80TODN-500(FLANGED)

| Nº | DESCRIPTION | STANDARD | OPTION |
|---|---|---|---|
| 1 | Body*(DN80toDN200)<br>Body*(DN250uptoDN500) | GG-25(EN-GJL-250)<br>GGG-40(EN-GJS-400-15) | GGG-40(EN-GJS-400-15)<br>GG-25(EN-GJL-250)** |
| 2 | Bonnet*(DN80toDN200)<br>Bonnet*(DN250uptoDN500) | GG-25(EN-GJL-250)<br>GGG-40(EN-GJS-400-15) | GGG-40(EN-GJS-400-15)<br>GG-25(EN-GJL-250) |
| 3 | Ball(DN80uptoDN250)<br>Ball (DN300uptoDn400)<br>BallDN500 | Aluminium + Elastomer/EN-AC-AlSi12Cu1(Fe) + NBR<br>DuctileIron + Elastomer/GGG-40 + NBR<br>Poyiruetane | Floating ball or Reduced weight ball<br>Reduced weight ball<br>- |
| 4 | Bonnet Gasket | Elastomer/NBR | - |
| 5 | Bolting | Stainless Steel | - |

*Paint epoxy blue RAL-5017.
**maximum working pressure 6bars for GG-25DN250-300.

### DIMENSIONS THREADED

| DN | | A | ØB | C | FtoF | Kv | Weight |
|---|---|---|---|---|---|---|---|
| mm | " | mm | mm | mm | mm | m³/h | Kg |
| 25 | 1" | 85 | 57 | 110 | 141 | 21 | 2,2 |
| 32 | 1" ¼ | 85 | 57 | 110 | 141 | 29 | 2,2 |
| 40 | 1"½ | 90 | 64 | 120 | 150 | 57 | 2,8 |
| 50 | 2" | 115 | 77 | 140 | 175 | 78 | 3,9 |
| 65 | 2"½ | 135 | 95 | 155 | 214 | 120 | 6,5 |
| 80 | 3" | 160 | 108 | 185 | 248 | 250 | 8,1 |

### CRACKING PRESSURE THREADED TYPE(mm.w.c

| DN | | POSITION | |
|---|---|---|---|
| mm | " | ⬆ | ➡ |
| 25 | 1" | 24,0 | O FOR HORIZONTAL FLOW |
| 32 | 1"¼ | 14,6 | |
| 40 | 1"½ | 16,0 | |
| 50 | 2" | 21,0 | |
| 65 | 2"½ | 22,3 | |
| 80 | 3" | 67,0 | |

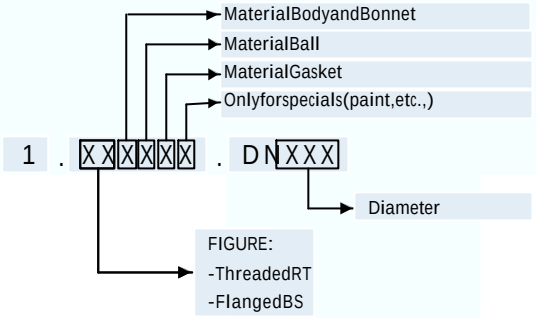
### DIMENSIONS FLANGED

| DN | | A | ØB | C | FtoF | Kv | Peso |
|---|---|---|---|---|---|---|---|
| mm | " | mm | mm | mm | mm | m³/h | Kg |
| 40 | 1"½ | 90 | 150 | 120 | 180 | 60 | 8,2 |
| 50 | 2" | 115 | 165 | 140 | 200 | 81 | 9,4 |
| 65 | 2"½ | 135 | 185 | 155 | 240 | 130 | 12,5 |
| 80 | 3" | 160 | 200 | 185 | 260 | 255 | 15,0 |
| 100 | 4" | 190 | 226 | 220 | 300 | 400 | 20,0 |
| 125 | 5" | 222 | 253 | 255 | 350 | 645 | 30,0 |
| 150 | 6" | 268 | 285 | 290 | 400 | 970 | 38,0 |
| 200 | 8" | 335 | 342 | 370 | 500 | 2000 | 70,0 |
| 250 | 10" | 420 | 403 | 380 | 600 | 3050 | 125,0 |
| 300 | 12" | 495 | 445 | 445 | 700 | 4150 | 180,0 |
| 350 | 14" | 580 | 505 | 520 | 800 | 5100 | 290,0 |
| 400 | 16" | 730 | 565 | 712 | 900 | 6600 | 420,0 |
| 500 | 20" | 900 | 670 | 772 | 1100 | 9700 | 580,0 |

### CRACKING PRESSURE FLANGED TYPE(mm.w.

| DN | | POSITION | |
|---|---|---|---|
| mm | " | ⬆ | ➡ |
| 40 | 1"½ | 16,0 | O FOR HORIZONTAL FLOW |
| 50 | 2" | 21,0 | |
| 65 | 2"½ | 22,3 | |
| 80 | 3" | 67,0 | |
| 100 | 4" | 87,1 | |
| 125 | 5" | 92,9 | |
| 150 | 6" | 122,9 | |
| 200 | 8" | 146,6 | |
| 250 | 10" | 118,4 | |
| 300 | 12" | 155,0 | |
| 350 | 14" | 168,5 | |
| 400 | 16" | 186,2 | |
| 500 | 20" | 49,4 | |

# CODIFICATION FOR ORDERS




## CODE

| FAMILY | FIGURE | BODY AND BONNET | BALL | SEAL | DIAMETER |
|---|---|---|---|---|---|
| 1. | RT(Threaded with bonnet) | G (Cast Iron) / N (Ductile Iron) | K (Phenolic Resin) / E (Floating ball) | S (Nitrile) / V (Viton) | . DN 1" |
| | RT (Threaded with bonnet) / BS (Flanged STD) PN-10/16 / BE (Special Flanged) Different drilling | | | | 1" 1/4 |
| | | | | | 1"1/2-40 |
| | | | | | 2"-50 |
| | | | | | 2"1/2-65 |
| | BS (Flanged STD) PN-10/16 / BE (Special Flanged) Different drilling | | A (Al + Nitrile) / F (Floating Al + NBR) | S (Nitrile) | 3"80 |
| | | | | | 100 |
| | | | | | 125 |
| | | | | | 150 |
| | BS (Flanged STD) PN-10 / B2 (Special Flanged) PN-16 / RF (Special Flanged) Different drilling | | | | 200 |
| | | N (Ductile Iron) / G (Cast Iron) | | | 250 |
| | | | | | 300 |
| | | | B (Cast Iron + NBR) / L (reduced weight) | | 350 |
| | | | | | 400 |
| | | N(DuctileIron) | P(Polyruetane) | | 500 |

Remarks Stainless steel construction with Viton coated ball available on demand Example:

1.RTGRS.DN2'' ———————— Threaded Ball Check valve 2"body and bonnet cast iron,ball phenolicresin and Gasket Nitrile.

Configuration STD

Configuration Special

all pump solutions FLUID EXPERTISE

# Ductile Iron Metal Faced Gate Valve Bs 5163 Series B + En1171:2002 Wras Approved Epoxy Coated.

Fig. B01



## FLANGES TO EN 1092-2: 1997 PN 16

**Use:**
Potable, Waste Water, Sewage

**Tests:**
Seat: 1.1 x PN
Body: 1.5 x PN
Temperature range -10°C to 70°C (Insulate at 0°C and below)

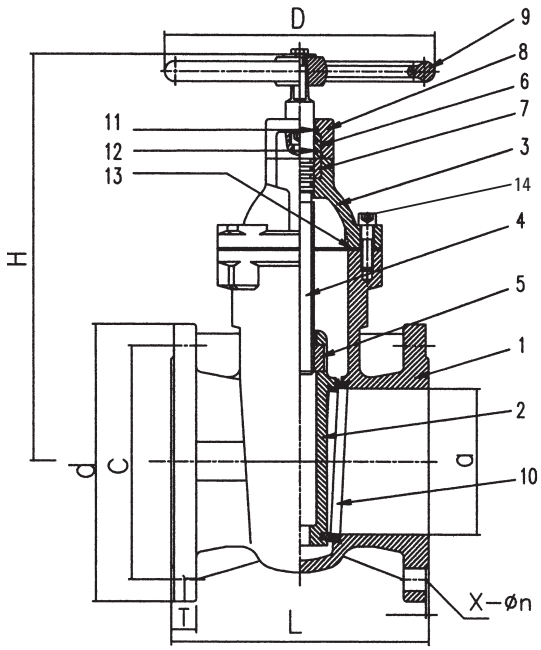
**Accessories:**
Cap top
Actuator mounting ISO Flange
Anti-clockwise close
Chainwheel
PN25 Version
Extension Spindle
Locking Device

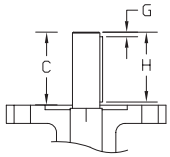
**Materials:**

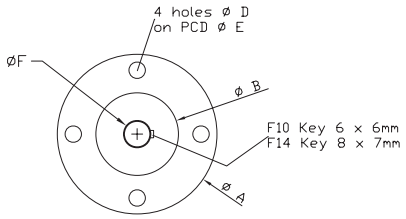
| | | |
|---|---|---|
| 1 Body | Ductile iron | EN-GJS-500-7 |
| 2 Wedge | Ductile iron | EN-GJS-500-7 |
| 3 Bonnet | Ductile iron | EN-GJS-500-7 |
| 4 Stem | Stainless steel | 431S29 |
| 5 Stem nut | Bronze | BSEN 1982 CC491K |
| 6 Sealing ring | Bronze | BSEN 1982 CC491K |
| 7 Holding ring | Bronze | BSEN 1982 CC491K |
| 8 Bonnet gland | Ductile iron | EN-GJS-500-7 |
| 9 Handwheel | Cast iron | BSEN GJL 200 |
| 10 Seat ring | Gunmetal | BSEN 1982 CC491K |
| 11 Wiper ring | EPDM rubber | |
| 12 Stem seals | EPDM rubber | |
| 13 Bonnet gasket | EPDM rubber | |
| 14 Bolting | Stainless steel GR 304 | |

Note: Actuators should be fitted with the valve stem in the vertical position

# Ductile Iron Metal Faced Gate Valve Bs 5163 Series B




| valve dia | Dimensions | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H |
| 80 | | | | | | | | |
| 100 | 125 | 70.5 | 51 | 12 | 102 | 20 | 5 | 45 |
| 150 | | | | | | | | |
| 200 | | | | | | | | |
| 250 | 175 | 100.5 | 51 | 18 | 140 | 30 | 5 | 45 |
| 300 | | | | | | | | |

dimensions are to ISO 5210/3 1982
80 to 150mm are F10 type B3
200 to 300mm are F14 type B3

Adaption for actuator mounting

**Dimensions: mm**

| Dia | a | C | d | T | f | L | x-n | D | H | Weight |
|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 50 | 125 | 165 | 19 | 3 | 178 | 4-Ø19 | 180 | 272 | 18 KG |
| 65 | 65 | 145 | 185 | 19 | 3 | 190 | 4-Ø19 | 180 | 308 | 19 KG |
| 80 | 80 | 160 | 200 | 19 | 3 | 203 | 8-Ø19 | 204 | 345 | 26 KG |
| 100 | 100 | 180 | 220 | 19 | 3 | 229 | 8-Ø23 | 204 | 370 | 31 KG |
| 150 | 150 | 240 | 285 | 19 | 3 | 267 | 8-Ø23 | 280 | 490 | 58 KG |
| 200 | 200 | 295 | 340 | 20 | 3 | 292 | 12-Ø23 | 320 | 570 | 87 KG |
| 250 | 250 | 355 | 405 | 22 | 3 | 330 | 12-Ø28 | 360 | 675 | 131 KG |
| 300 | 300 | 410 | 460 | 24.5 | 4 | 356 | 12-Ø28 | 450 | 780 | 188 KG |

| Size | Torque (N.m.) | No of turns |
|---|---|---|
| 50mm/2″ | - | 15.5 |
| 65mm/2.5 | - | 15.5 |
| 80mm/3″ | 50 | 8 |
| 100mm/4″ | 60 | 9.5 |
| 125mm/5″ | - | 12 |
| 150mm/6″ | 100 | 14 |
| 200mm/8″ | 150 | 18.5 |
| 250mm/10″ | 265 | 22 |
| 300mm/12″ | 380 | 27 |

Operating torque at 16 barg with no safety.

# William Hackett
## Chain Products Limited

**DUAL PURPOSE DOCUMENT**

**UKCA DECLARATION OF CONFORMITY** | **A**

I DECLARE THAT THE ITEMS DESCRIBED ON THIS DOCUMENT MEET THE ESSENTIAL SAFETY REQUIREMENTS OF THE SUPPLY OF MACHINERY (SAFETY) REGULATIONS 2008 & SECTION 6 OF THE HEALTH AND SAFETY AT WORK ACT 1974

**EC DECLARATION OF CONFORMITY** | **A**

I DECLARE THAT THE ITEMS DESCRIBED ON THIS DOCUMENT COMPLY WITH THE REQUIREMENTS OF THE MACHINERY DIRECTIVE 2006/42/EC

**MANUFACTURER'S CERTIFICATE** | **B**

CERTIFIED ON BEHALF OF THE COMPANY

I. Kelly

IAN KELLY 03/11/2022

**Delivery Address**

ALL PUMP SOLUTIONS LLP
DALE HOUSE
ENNERDALE ROAD
SHREWSBURY
SHROPSHIRE SY1 3LD

| | |
|---|---|
| **Supplied To:** | ALL007 |
| **Certificate Number:** | **P033649** |
| **Customer Order No:** | 20148 |
| **Date Received:** | 02/11/2022 |

PRODUCTS REQUIRING A DECLARATION OF CONFORMITY ARE INDICATED BY (A) THOSE REQUIRING JUST A MANUFACTURER'S CERTIFICATE BY (B)

| A/B | Batch | Lot No / Serial No | Product | Description | Qty | Working Load Limit | Proof Load | Min Breaking Load |
|---|---|---|---|---|---|---|---|---|
| A | P54045 | P033649.3-4 | HQP2.030.04M | 6mm Gr.4 Short Link Pump Lifting Chain fitted with 10mm x50mm x 110mm Master Link at each end and at 1m crs.E.W.L. 4mFinish: Hot Dip Galvanized. | 2 | 300 Kg | 600 Kg | |
| A | P54044 | P033649.1-2 | HQP2.030.10M | 6mm Gr.4 Short Link Pump Lifting Chain fitted with 10mm x50mm x 110mm Master Link at each end and at 1m crs.E.W.L. 10m Finish: Hot Dip Galvanized. | 2 | 300 Kg | 600 Kg | |

MAYPOLE FIELDS, CRADLEY, HALESOWEN, WEST MIDLANDS B63 2QE
Tel. + 44 (0) 1384 569431 Fax. + 44 (0) 1384 639157 Email: info@williamhackett.co.uk
Website: www.williamhackett.co.uk Co. Registration No. 09679024 VAT Reg. No. 217 3054 36

all pump solutions
FLUID EXPERTISE

# Commissioning Certificate

| | |
|---|---|
| Customer | C S Civils and Groundworks Ltd |
| Site | Kemp Heaton Avenue, Bury GRP (V) |
| Project title | Commissioning |
| Project Ref | 00012354 |
| Document date | 30/06/2026 |
| Address | Kemp Heaton Avenue |
| City | Bury |
| Postcode | BL9 9GQ |

| **Pumps** | | | |
|---|---|---|---|
| Pump Make | Javelin | Pump 1 Serial Number | Na |
| Pump Model | VR511 | Pump 2 Serial Number | Na |
| Power Rating | 1.1kW kW | | |
| **Controls** | | | |
| Power Supply Voltage | 400v | Level Settings (mm) | |
| Starting Method | DOL | Duty Start | 450 |
| Controls Duty Set Up | Duty Standby | Stby/Asst Start | 0 |
| Control System | Floats | Stop | 300 |
| Controls Panel Components Secure | Yes | High Level | 600 |
| Control Panel Suitably Installed | Yes | Telemetry Installed | N/A |
| **Operation** | | | |
| Insulation Resitance (Meg/Ohms) | | Overload Set Point (Amps) | |
| Pump 1 | Pump 2 | Pump 1 | Pump 2 |
| 1000 | 1000 | 3.3 | 3.3 |
| Continuity Of Windings (Ohms) | | Operational Current (Amps) | |
| Pump 1 | Pump 2 | Pump 1 | Pump 2 |
| U1 TO V1- 12.9 U1 TO W1- 12.6 W1 TO V1- 12.5 | U1 TO V1- 12.7 U1 TO W1- 12.7 W1 TO V1- 12.7 | 2 | 2.7 |
| Discharge Correct | | Pump Rotation | |
| Pump 1 | Pump 2 | Pump 1 | Pump 2 |
| Yes | Yes | Anti Clockwise | Anti Clockwise |
| Control Panel Left In Auto | Yes | All Alarms Operational | Yes |
| **Signatures** | | | |
| Print Name | Simon Gregory | Print Name | g turner |

# Commissioning Certificate

| | | | |
|---|---|---|---|
| Engineer Signature | | Clients Signature: |  |
| Date | 09/06/2026 | Date | 09/06/2026 |

# CERTIFICATE OF CONFORMITY

**Customer: C S Civils and Groundworks Ltd** **Date: 8th July 2026**

**Project Name: Kemp Heaton Avenue, Bury**

**Project Address:** **Kemp Heaton Avenue**
**Bury**
**BL9 9GQ**

**APS Order No: WO 00012354**

**Customer Order No: #56553**

**Description: Surface Water Pump Station**

**Associated Components:**

- **Javelin VR 511 - 1.1kW, 400 Volts, 3 Phase, 3A, 20m cable.**
- **5m Long, 300Kg WLL Certified Galvanised Lifting Chain.**
- **2.5-4A, 3 ph, Duty Standby, Control Panel.**
- **Float Switch Level Control c/w 20m cable.**
- **Allview Unit with remote reset.**

**Date of Commissioning: 9th June 2026**

---

It is hereby certified that the above system has been inspected and tested in accordance with the Company's Inspection Procedures and conforms in all respects to the specification relevant thereto. All parts are covered by aps warranty® for the period of 12 months unless covered by additional certificate.

**Signed**

*Giles Pocock*

**Project Manager**


**All Pump Solutions**

**T:** 01743 465463 | **F:** 01743 465050 | **E:** service@allpumpsolutions.com | **W:** www.allpumpsolutions.com

**Head Office:** Dale House | Ennerdale Road | Shrewsbury | Shropshire | SY1 3LD

**SHREWSBURY | LONDON | SYDNEY**

# Warranty

APS Underground Tank Shells

We warrant that our underground tank shells, if installed strictly in accordance with the company's relevant installation procedure, having in mind particularly:- ground conditions, invert depth, water table depth in winter, external loading, type and quality of backfill material, will

1. meet our published specifications and will be free from material defects in materials and workmanship for a period of one year following date of original delivery
2. not fail for a period of twenty-five years from date of original purchase due to external corrosion; and
3. not fail for a period of *twenty-five years* from date of original purchase due to internal corrosion provide the tank is solely used for;-

Rainwater Storage

Potable water at ambient temperatures

Fuel/oil contaminated surface rainwater

Domestic waste

For other applications the life expectancy will be determined by the contents, the operating conditions and the resin system/reinforcement specification used.

Our liability under this warranty shall be limited to, at our option,

1. repair of the defective tank
2. delivery of a replacement tank to the original site or
3. refund of the original purchase price.

We shall not be liable for any labour or other installation costs, indirect or consequential loss, damage or other damages in connection with such tanks.

Accessory warranties do not extend beyond the warranty period by our suppliers. This applies to such items as access covers and frames, monitoring equipment, Bauer type connections for emptying, pumping equipment or any accessories as defined in the company's official order acknowledgement/invoice

The Foregoing Constitutes our exclusive obligation and we make no express or implied warranties, or any warranty of merchantability or fitness for any particular purpose whatsoever, except as stated above.

all pump solutions | Ennerdale Road | Shrewsbury | Shropshire | SY1 3LD

Tel: 01743 465463

ServerPump

# Failure Prevention Maintenance Programme

for your pump stations




all pump solutions
FLUID EXPERTISE

Industry leaders in the design, manufacture, supply and maintenance of pump systems and pumping stations.

# ServerPump

## A comprehensive failure-prevention programme, tailored to guarantee the long life of your investment.

To ensure the longevity and smooth running of your pumps, it is essential that they are maintained on a regular basis. With ServerPump, you can be assured of increased reliability, reduced maintenance, and budgeted costs. Our three levels of service, Gold, Silver & Bronze, ensure every customer has a contract suited to their needs.

### During every service, our engineers complete a thorough checklist. Checks include:

- Clean pump
- Check stator case
- Check motor insulation and resistance
- Check cable condition and security
- Check wear ring
- Check oil
- Check impeller
- Check wear place/suction cover
- Check volute
- Run pump and check bearings
- Check control panel, contractors & sequence
- Check discharge connection for leaks
- Clean and check level control system
- Check pump fixings on guide rail
- Check lifting chains
- Check valves
- Check telemetry, whether it be in the Outer Hebrides or Penzance – APS monitor for your peace of mind – 24 hours/day, 365 days/year.*

# A team who care

We are proud of our dedicated, friendly and enthusiastic engineering team, carrying both mechanical and electrical quali ications, in addition to CSCS, SSSTS, Con ined Space and PASMA.





*Fantastic guys, would definitely recommend*

G F Tomlinson

*Good workmanship, clean and tidy*

Churngold

*Very friendly and efficient workers, 5 stars*

United Utilities

All Pump Solutions, Ennerdale Road, Shrewsbury, Shropshire, SY1 3LD.

# Going for Gold?

ServerPump has been developed in a way that every customer can have a contract suited to their needs. We offer 3 different levels of cover.

| Feature | Gold | Silver | Bronze | Details |
|---|---|---|---|---|
| Flexibility for health check visits | ✓ | | | Ask a coordinator for details about our Gold Flexi option |
| Complete health check/ mechanical & electrical service | ✓ | ✓ | ✓ | We can attend site to carry out a service up to 4 times a year. |
| Fully comprehensive service report | ✓ | ✓ | ✓ | Our engineers report will ensure you are aware of the overall condition of your station. |
| 24/7 Technical Support | ✓ | ✓ | ✓ | You have access to 24/7 access to technical assistance and customer support. |
| Discounted emergency call-outs | ✓ | ✓ | ✓ | In the unlikely event of pump station failure (which can be caused by rogue items or unforeseen circumstances) APS will endeavor to respond immediately. Callouts and parts are discounted at all levels. |
| Discounted commissioning rate | ✓ | ✓ | ✓ | If you take a contract out with the order for the pumping station, we will reduce the price of commissioning. |
| Remote monitoring* | ✓ | ✓ | | If you purchased Telemetry, our remote monitoring will let us know of your problems before you. |
| Routine maintenance spare parts | ✓ | ✓ | | To keep your pumping station going at optimum efficiency, we will replace any worn/wearing parts. |
| Planned upgrades | ✓ | ✓ | | We will agree what equipment will be upgraded during the course of the contract. |
| Free emergency call-out | ✓ | | | One free call-out per year, should you need it. |
| Replacement of parts up to £150 | ✓ | | | On top of any routine maintenance spare parts, we will replace any other damaged or broken parts, up to the value of £150. |
| Discount on parts | 30% | 20% | 10% | |

*Contract SIM upgrade is available; please speak to our Service department for more details.

T: +44 (0) 1743 465463 E: sales@allpumpsolutions.com

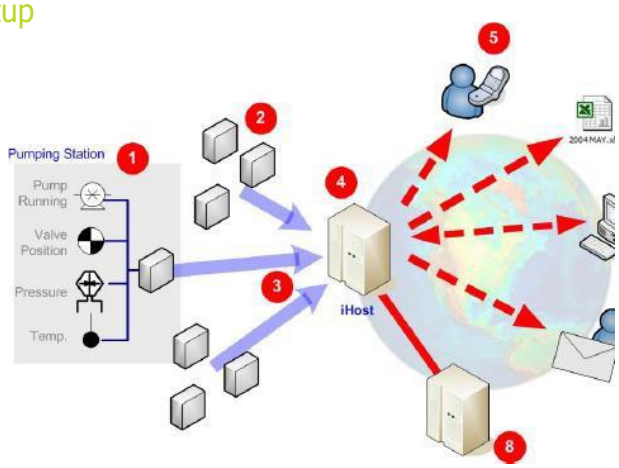
# ServerPump Telemetry Monitoring

Our telemetry monitoring service provides hassle free 24/7, 365 days a year monitoring of your pumping equipment for our Silver and Gold members. We offer different units to suit different budgets and monitoring specifications. The analysis and monitoring of these units by our inhouse engineers will allow for early diagnosis of any breakdowns before they occur.

## Monitoring Devices specifications that can be tailored to suit your requirements:

| Features | Standard Telemetry | Advanced Telemetry |
|---|---|---|
| 24 hour monitoring | X | X |
| Text Notification | X | X |
| Email Notification | | X |
| App Notification | X | X |
| Live Portal View | | X |
| Remote Reset * | X | X |
| Interactive Trending | | X |
| Map of Station Locations | | X |
| Remote Changes of Settings | | X |

## Advanced Telemetry Setup




1: Your Pump Station - Monitor key alarms and routine data from equipment within the station.
2: A Smart Box – Signals from pumps, flow meters, floats etc are wired into a Smart Box which provides local processing and off-site communications. There is no limit to the number of sites you can monitor.
3: GPRS network - Smaaart Boxes are compatible with all mobile phone operators.
4: iHost - At the centre of the system is the iHost Platform. iHost receives incoming data from pumping stations, automatically actions alarms, displays status conditions and provides long term data storage.
5: Email and SMS Notifications - Any alarms from pump stations can be forwarded to as many users as needed. The format of messages is configurable and typically include Site Name, Time and Alarm descriptions.
6: Web Access - Users can login to the iHost web-pages from any internet connected PC. You can see several screen shots from the system throughout this brochure.
7: Download Data -In case you need to keep a local copy of your data, or want to include graphs in your own reports, you can download all your data in spreadsheet format.
8: IT Systems - iHost is easily configurable to interface with your own Network Management Systems.
Please contact us for more information and advice on the most suitable setup for your system

*Contract SIM upgrade is available; please speak to our Service department for more details.

T: +44 (0) 1743 465463 E: sales@allpumpsolutions.com

# Why choose ServerPump

Our service & maintenance contracts are tailored to guarantee the long life of your pumps, and seal our quality-assured designs and installations with the confidence every client needs in today's construction.

- ✓ Safeguard against expensive failure
- ✓ Improves pump performance and reliability
- ✓ Allows annual maintenance costs to be budgeted in more detail
- ✓ Reduces life cycle costs
- ✓ Extends pump service life
- ✓ Insurance compliant company

## How it works

### It's simple.

Decide on a level of service, and how many times a year you would like us to visit, then fill in the application form on our website.

Following each service, you will receive a fully comprehensive Engineer's report. APS ServerPump contracts include full 12 month warranty on all parts and labour, on repairs or replacements carried out between services.

## What could happen

### Do your bit to look after the environment.

Avoid detrimental flooding and ensure minimal environmental damage, by having your pumping station regularly serviced.

### Ensure you're compliant with your insurance policy. Don't risk avoiding required maintenance.

## Nationwide Coverage

### 24/7 Technical Support & Assistance





ServerPump

all pump solutions
FLUID EXPERTISE

# Pumping Station Maintenance Application Form

## Company Details

Company Name: _____
Contact Name: _____
Contact Number: _____
Contact Email: _____
Company Address: _____
Company Reg No:

## Site Details

Contact Name: _____
Contact Number: _____
Contact Email: _____
Site Address: _____
_____
Post Code:

## Invoice/Accounts Details

Accounts Name: _____
Accounts Number: _____
Contact Email: _____
Invoice Address: _____
_____
Post Code:

## Pumping Station Details

Number of Pumping Stations: _____ Number of Pumps _____
Pump Manufacturer _____ Pump Model _____
Location of Chamber _____ Location of Control Panel _____
Installation Date _____ Last Service Date N/A

*If you require assistance to obtain this information do not hesitate to contact All Pump Solutions*

## Contract Cover Level

☐ **Bronze** - Station inspected and tested; reduced engineer rates

☐ **Silver** - Station inspected and tested; routine spare parts covered; reduced engineer rates

☐ **Gold** - Station inspected and tested; spare parts covered; 1st call out free; reduced engineer rates

## Service Frequency

☐ Annual ☐ Bi-Annual ☐ Quarterly

+VAT Price Quoted _____ PO/Order No _____

All Pump Solutions will service all makes of sewage and solid handling pumping and associated equipment subject to our terms and conditions. We reserve the right to inspect the pumping station and equipment prior to entering into a service agreement. The station must be in serviceable condition before the contract can commence.
By signing this form you are entering into a contract with all pump solutions and are bound by the ServerPump terms and conditions. This does not affect your statutory right.

| Signed | | Printed | | Date | |
|---|---|---|---|---|---|

All Pump Solutions LLP
T: 01743 465463 | F: 01743 465050 | E: service@allpumpsolutions.com | W: www.allpumpsolutions.com
Head Office: Dale House | Ennerdale Road | Shrewsbury | Shropshire | SY1 3LD
SHREWSBURY | LONDON | SYDNEY

ServerPump

all pump solutions
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## ServerPump Contract Terms and Conditions

When you complete an application form accompanied by your payment, an agreement is made subject to the terms and conditions below between All Pump Solutions LLP and the Customer (named in section 1 of the Application Form). The agreement is valid from the contract commencement date as notified to you by All Pump Solutions LLP and runs for a fixed period of three years from the contract commencement date. The quote is an annual costing, to be paid prior to each annum.

## General Terms & Conditions

1. As from the agreed contract commencement date All Pump Solutions LLP undertakes to service the pumps and specified associated equipment (as detailed on the Agreement Application Form and located at the specified site address) at intervals of approximately 12 months for Standard contracts, approximately 6 months for Dual contracts or approximately 3 months for Triple contracts. 2. The above intervals may be altered at any time during the currency of the agreement subject to agreement by both parties. 3. Until further notice as provided for in clause 4 a sum of monies as detailed on the Application Form will be payable by the customer 4. All Pump Solutions LLP shall be entitled to revise the charges as detailed on the Application Form to cover any increase in the cost providing that the service as a result in increased costs of labour and materials. Provided that: (i) Any additional charge to the customer under this clause shall not exceed the increased cost of servicing incurred by All Pump Solutions LLP. (ii) No additional charge will be payable under this clause unless notice has been given to the customer, in writing, of such increase at least one calendar month prior to the date when such additional charge is to be made. 5. In addition to the contract price, the customer shall pay the full cost of spare parts used and fitted by All Pump Solutions LLP during servicing or other visits unless otherwise covered under a Silver or Gold type contract. Silver contracts cover routine spare parts – O rings, oil, control panel lamps/switches & beacon. Gold contracts include replacement of parts up to £150 – bearings, impeller, pump cable, floats, control panel parts (relays/transformer/breakers etc.), chains, shackles & float bracket. 6. Tanker hire services, including emptying and cleaning, are not covered by the ServerPump agreement. 7. If a Tanker is recommended by an Engineer, this must be completed within 30 days to avoid incurring additional maintenance charges. All Pump Solutions LLP can arrange tanker hire on behalf of the Customer but must receive a written request within 30 days after point of Service. 8. All Pump Solutions LLP shall not be liable for any loss or damage of any kind whether resulted from negligence, vandalism, misuse or otherwise arising directly or indirectly from any failure or breakdown of the pumps and associated equipment except if such loss or damage is caused by the wilful default or negligence of All Pump Solutions LLP. If the loss or damage is caused by the wilful default or negligence of All Pump Solutions LLP the liability of All Pump Solutions LLP therefore shall not exceed £10,000 9. Further All Pump Solutions LLP shall have no responsibility or liability in respect of operation, default servicing or repair of any non-standard parts fitted to the pumps and associated equipment by persons other than All Pump Solutions LLP without All Pump Solutions LLP knowledge and consent. 10. Contract cover will terminate if all sums due under the agreement are not paid in accordance with the Application Form. 11. This agreement shall remain in force for a 36 month period from the date of commissioning and can only be terminated by either party on the third anniversary of the contract commencement date. 12. After expiry, the agreement shall continue unless and until terminated by either party giving no less than 3 months written notice. 13. Safe access must be provided to the equipment to be serviced subject to this contract and all statutory requirements must be met in this respect. The provision of any labour materials or equipment to ensure safe access to be the responsibility of the customer. The customer is responsibly under current statute to notify ALL known hazards in writing to All Pump Solutions LLP prior to commencement of work. 14. The equipment must be in full working and serviceable order prior to the commencement of the contract. All Pump Solutions LLP reserve the right to charge for additional works required to bring the equipment to a serviceable or otherwise agreed between both parties. Inspection if required will be at additional cost.


T: 01743 465463 | F: 01743 465050 | E: service@allpumpsolutions.com | W: www.allpumpsolutions.com
Head Office: Dale House | Ennerdale Road | Shrewsbury | Shropshire | SY1 3LD
SHREWSBURY | LONDON | SYDNEY

# PUMPING STATION CARE & MAINTENANCE

Inspection and maintenance intervals can vary depending on the application and are suited to each individual installation.

Carefully read the recommendations for preventative maintenance programs and/or service intervals for the actual pump, level sensors and control panel.
Ensure that the inside of the pump station, valves and pipes are kept as clean as possible as grease built-up, dirt and large items can damage the function of the level sensors and also cause a bad odour. This makes the station both unpleasant and risky for the operation staff and once settled can cause unnecessary and expensive sludge exhaustion.
The unique design of the bottom of the ***All Pump Solutions*** station significantly helps to maintain a problem-free pump operation. ***All Pump Solutions*** can also provide other ancillary equipment to further improve the operation;

- The Flush valve is developed specifically to be fitted on all standard wastewater pumps. At each pumping start cycle the valve is open and water is forced through the valve in a powerful jet-flushing stream. Water in the sump is immediately subject to intense turbulence and sludge deposits and floating solids are re-suspended before being pumped out.
- APF is a maintenance free control system simply connected to the main control system, which it overrides during cleaning cycles. It operates the pump down to a level where air is drawn into the pump. Any settled solids or floating debris will then be pumped out.

Check with your ***All Pump Solutions*** representative for more detailed information

The following points are important in connection with work on the pumping station and associated equipment:

- **Beware of the risk of injury caused by crushing.**
- **If entering the pump station beware of the risk of hazardous gases and always use breathing apparatus.**
- **Check regularly that the lifting equipment is in good condition.**
- **Make sure that all electrical equipment is insulated from the power supply and cannot be energized.**
- **Make sure that the equipment has been thoroughly cleaned.**
- **Beware of the risk of infection.**
- **Follow local safety regulations.**
- **Always wear goggles and rubber gloves.**
- **Always close and lock the cover before leaving the pump station.**

For any fault tracing - carefully follow the recommendations in the Installation, Operation & Maintenance Manuals for the actual pump.

# Accessing the Pumping Station Chamber

When workforces are required to access a manhole chamber, procedures should be carried out in accordance with confined space working regulations. ***All Pump Solutions*** disclaims all responsibility for work done by untrained, unauthorised personnel!

## Removing a Manhole Cover

Removing a manhole cover should only be done in an emergency and by experienced personnel.
To remove access covers, two people should insert the correct weighted keys into the lifting points and lift the lid, ensuring the surrounding area is clear in order to place the cover down.

## Removing a Pump from a Chamber

Removing a pump from a chamber should only be done in an emergency and by experienced personnel.
The method of removing a submersible pump from of a pumping station is by use of a winch or hoist attached to the pump chains.
The weight limitations are applicable for the winch / hoist so please see manufacturers guidelines.

# Bag It & Bin It...

## **Don't** Flush It!

**Sewers are not waste disposal units** even though we flush human waste down the toilet.

They are designed to take away rainwater from roads, waste water from sinks and baths, toilet paper and human waste flushed down the toilet.

100s of people cause blockages in sewers or damage to the environment by putting rubbish down the toilet.

## Your **disposables**

**To avoid blocked pipes, plumbing bills and damage to the environment, put the following in your bin:**

- Disposable nappies
- Wet wipes
- Plasters
- Contraceptives
- Incontinence pads
- Female hygiene products
- Colostomy bags and bandage

Wrap razor blades carefully in paper and put them in the bin and return medicines to your local pharmacy. Syringes and needles should be returned to a healthcare provider.

## Kitchen **fat**

Solidified fat is one of the biggest causes of blocked sinks and can lead to blockages in our sewers. Don't pour fat from cooking down the sink as it can cause blockages when it cools. **Let it cool and pour into a container before putting in the bin.**

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