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ISG Construction Ltd

Millwood SEN School – New Classroom Block Surface Water Destination Considerations

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1 Introduction

The following report has been prepared to support the planning application associated with the building of a new teaching and classroom extension to the existing Millwood SEN School on School Street Radcliffe.

This report has been prepared for the sole benefit, use, and information of the client. The liability of Bradshaw, Gass and Hope LLP with respect to the information contained in the report will not extend to any third party.

The inspection undertaken by BGH was purely visual, and not intrusive.

The ground conditions at Millwood school do not support the use of a soakaway system, as such the current drainage design philosophy uses an on-site SUDs system to release surface water at a low/controlled rate into the surface water drain in school street.

It has been suggested by united utilities that the surface water outfall destination should be either:

1. The adjacent (disused) Manchester, Bolton and Bury Canal
2. A watercourse crossing the above canal.

The system has been designed as a gravity fed system, rather than a pumped system for the following reasons:

- **Energy Efficiency:** Gravity relies on the natural downward flow of water, eliminating the need for pumps and the associated energy consumption. In contrast, pumped drainage systems require continuous energy input to move water against gravity, leading to higher operational costs and environmental impacts.
- **Lower Operating Costs:** Gravity systems typically have lower operating and maintenance costs since they don't require electricity or fuel to power pumps. Gravity-fed systems are more straightforward and have fewer components that can fail, reducing the need for frequent repairs.
- **Reliability:** Gravity systems are inherently more reliable because they are less complex. Pumps have moving parts that can wear out or malfunction, leading to system failures. Gravity systems, relying on natural slopes and topography, are less prone to mechanical breakdowns.
- **Simplicity in Design and Installation:** Gravity drainage systems are generally simpler to design and install. They often involve less equipment and infrastructure, making them more cost-effective and easier to maintain. This simplicity can be especially advantageous in rural or remote areas with limited resources.
- **Risk of Power Outages:** Power outages tend to occur during storm events, which in turn results in the most significant amount of rainfall. If a pump system were to be installed and a power outage were to occur (deeming the pump to be redundant) there is a significant risk of flooding to the existing school site and neighbouring land and properties.
- **Resilience to Power Outages:** Gravity systems continue to function even during power outages, ensuring continuous drainage. In contrast, pumped systems may be rendered ineffective during power failures unless there is a backup power source in place.
- **Environmental Impact:** Pumped drainage systems contribute to energy consumption and may have environmental consequences, particularly if the power source is non-renewable. Gravity systems, being energy-efficient, have a smaller environmental footprint.
- **Reduced Risk of Contamination:** Gravity systems promote better drainage and reduce the risk of stagnant water, which can lead to contamination. In contrast, pumped systems may be

more prone to issues like clogging, which can result in standing water and increased contamination risks.

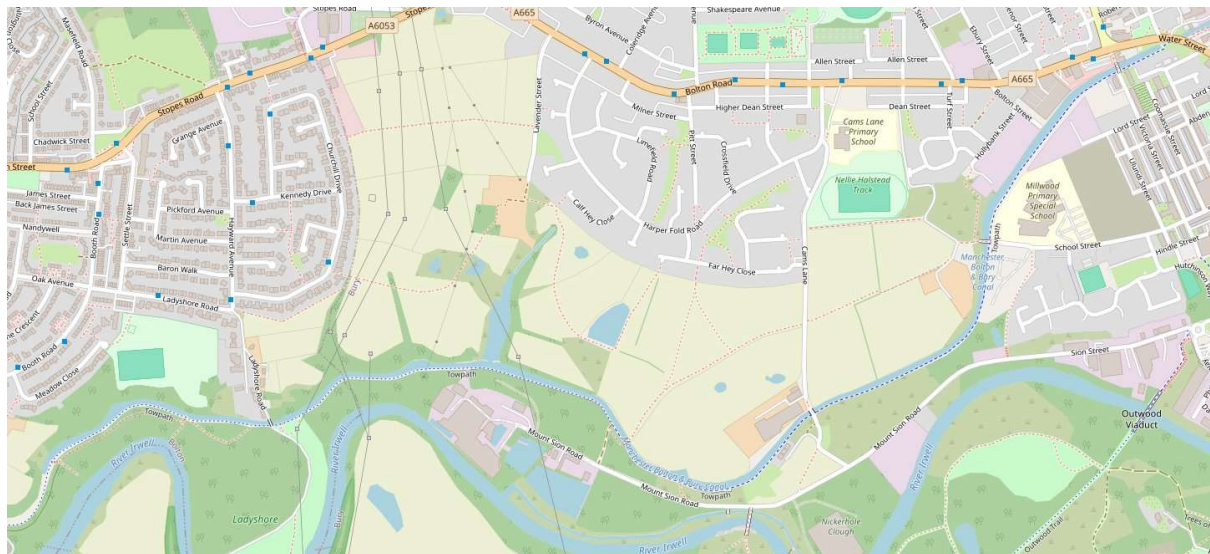
- **Longer Lifespan:** Gravity systems are generally more durable and have a longer lifespan due to their simplicity and fewer components. Pumped systems, with their mechanical components, may require more frequent replacements and upgrades.

2 Narrative on Adjacent Canal

The derelict and disused Manchester, Bolton and Bury canal runs adjacent to the site.

This canal was constructed between 1791 and 1808, it was built to link Bolton and Bury with Manchester. When fully opened the canal was approximately 24km long. It was accessed via a junction with the River Irwell in Salford. The canal had a total of Sixteen locks and six aqueducts which allowed the canal to transverse the land and rivers as required.

This canal has a main trunk which directly connected Bolton and Manchester and had an arm at Prestolee which ran to Bury.



Map Extract from © Openstreetmap via the Open Database Licence

It is this branch which passes adjacent to the Millwood School site and was taken out of use following a breach in 1936. This occurred close to Prestolee (approx. 2.6km southwest of the site) and saw a large section of the canal bank collapse into the River Irwell below. This left an approx. 600m section of the canal drained and dry and this has remained this way ever since. This was the direct cause of this section of the canal becoming disused/derelect.

The canal has been partially infilled approx. 430m north-east along the canal to allow passage of the A665 Water street through Radcliffe.

As such the section of the canal adjacent to the site is an isolated section. A review of map data shows no apparent feeder streams entering this section of the canal. The only feed into this section appears to come from the small opening to Dingle Reservoir roughly located between Radcliffe and Little Leaver.

During the warmer summer months this full section of the canal is covered with Algae. Due to potential copyright infringement the Google Earth aerial imagery could not be included within this report, however a review of this information shows that in June 2023 the full length of this section is completely covered with an Algal bloom.

Typically, algae would be expected to die off during colder winter months, however large sections of the Canal display an Algae covering as witnessed in Jan 2024.

Appendix A shows some key features of the canal in its current condition appendix B shows a series of sample Photo locations demonstrating the current condition.

The only overflow of this section of the canal to the river Irwell occurs adjacent the collapsed section of the canal approx. 2.6km southwest of the school site.

As demonstrated by the above this section of canal has been isolated and disused for approximately 88 years, during this time (despite the effort of local volunteers) the canal has fallen into a continuing state of disrepair.

We have contacted the Canal and River trust for comment on this matter:

The response from their "Infrastructure Services, Works Engineer" Gareth Taylor comments:
"your proposal is to discharge to a non-navigable canal, although in water it has its difficulties. The canal is not operated like one of our navigable canals in terms of the water control and maintenance. So having additional water could present a flood risk or increased man hours to draw down water."

"Additionally, your proposal is further complicated by the need to construct an outfall within our wash wall (masonry walled bank), have apparatus within our towpath (outfall pipe) that would need DEFRA approval and the simple fact that the site is somewhat at a higher level to our towpath / canal and ultimate the point of discharge."

If surface water from the school site were to discharge to the canal, the water level within the canal will continue to rise as there are no nearby overflows or management and maintenance regime to release the surplus of water. Therefore, eventually the water is to overtop the canal sides and increase flood risk to neighbouring land and properties.

As such we do not consider the canal to be a suitable destination for the surface water drainage.

3. Narrative on Adjacent Watercourse

A suggest outfall destination for the surface water drainage is an adjacent watercourse.

This watercourse passes over the adjacent Manchester, Bury and Bolton canal via a 1.1m diameter steel pipe.

This then changes direction within the adjacent footpath and heads south-east below numerous business premises, yards and gardens before ultimately discharging to the River Irwell.

The local topography of the area should be considered at this point, the level of the school field at the closest boundary to the proposed extension is 78.40 (from topographic survey). The adjacent footpath is approximately 1.0m higher.

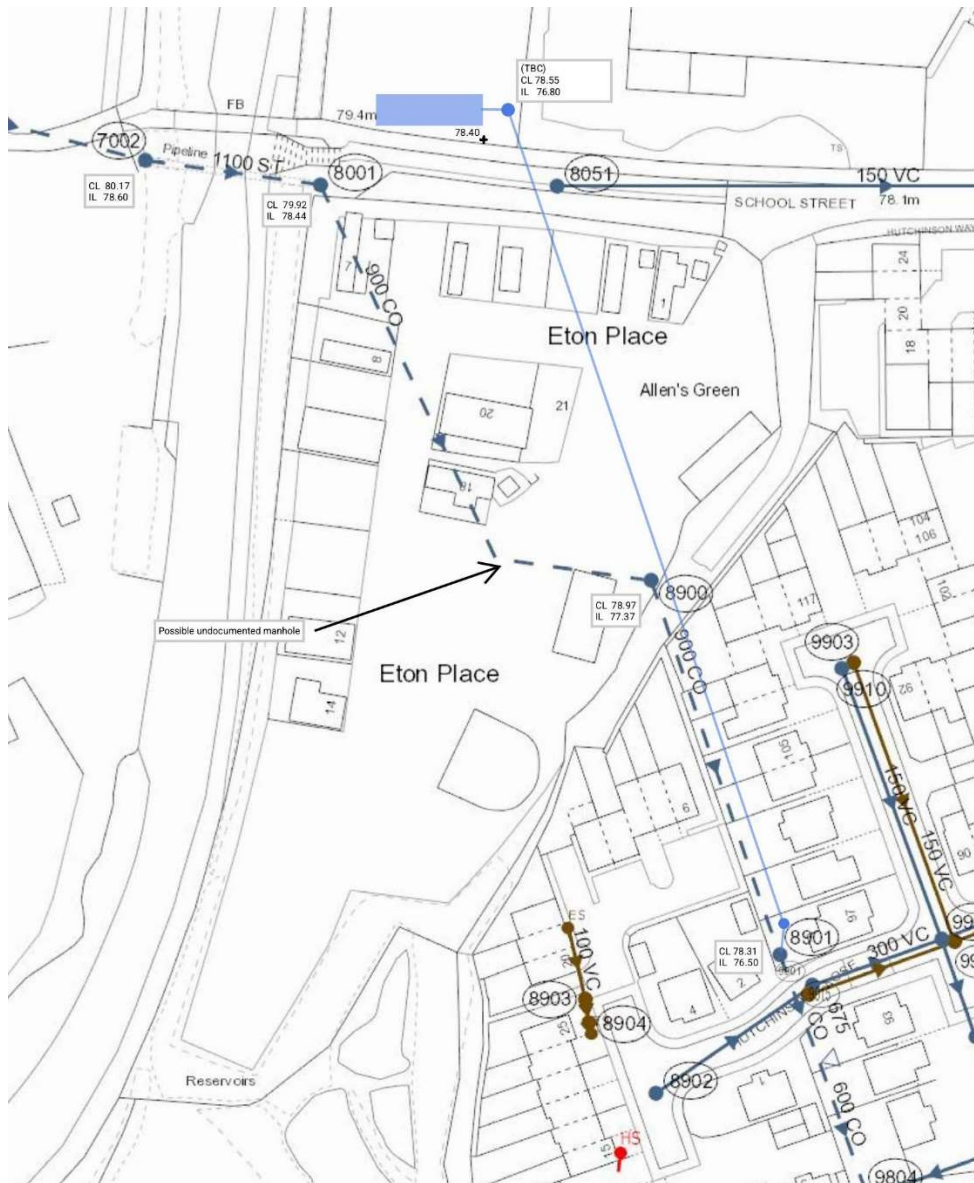
The closest manhole associated with the watercourse accepts the 1.1m dia pipe. The crown of this pipe is approximately 1.3m above the ground level of proposed site.

The invert level of this manhole (8001) is 78.44m (i.e. 40mm higher) than the proposed site ground level.

The proposed drainage system uses an attenuation tank and flow control device, in order to provide cover to the attenuation tank and the depth of the attenuation tank itself this gives an approx. invert level leaving site of 76.80 (TBC). As noted in section 1.0 a gravity fed system is considered the most sustainable solution for a surface water drainage system.

In order for our system to drain to gravity the outflow pipe would need to connect to the water course at a downstream section.

Please see marked up asset plan overleaf for the potential layout this would require.



Based on the invert levels shown on the United Utilities Asset plan the connection would need to be approx. 155m to the south-east of the site. The approx. arrangement of this is shown above.

This would require a run circa 155m long, passing through a public footpath, a business yard and the gardens of 8 No private properties.

For a new surface water pipe to cross over numerous land ownerships the network will have to become adopted. For the pipe to be adopted it will have to be in open spaces to allow 24-hour access. This cannot be achieved.

Given the issues surrounding this we would not consider this to be a suitable option.

As such the 150 dia surface water drain (MH 8501) within school street is considered the most suitable connection point.

Appendix A – Marking Plan – Key Features

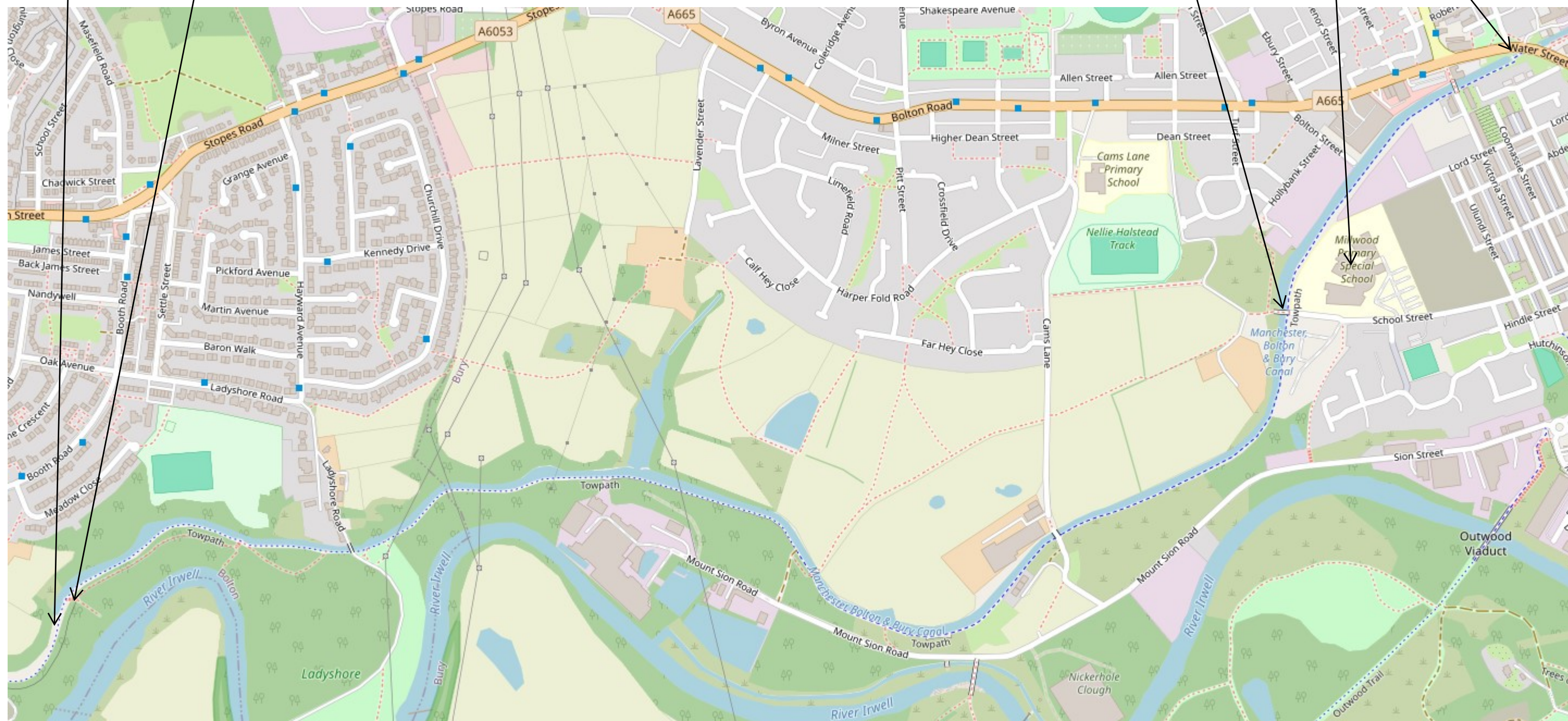
"1932 Breach" - Collapse of Bank into Irwell. Approx 600m stretch dry

Millwood SEN School

Overflow to River Irwell

Foot Bridge and Piped Watercourse

Water Street Infill



Key Features of Isolated Section of Manchester, Bolton & Bury Canal

Appendix B – Inspection Photographs



Photo 1 - Water Street Infill



Photo 2 - Site to Water Street



Photo 3 – View Towards bridge from Water Street



Photo 4 – Canal Bank Adjacent Site and Foot bridge



Photo 5 - Adjacent site, Note foot bridge and steel pipe



Photo 6 – Pipe interface, note steps and site boundary fence visible to left



Photo 7 - Raised Footpath adjacent to site boundary, note bridge and pipe crossing canal



Photo 8 - Canal Bank adjacent to bridge and pipe, note bank lowered to this immediate areas



Photo 9 – General photo of Canal Bank



Photo 10 – Typical example of overgrown canal



Photo 11 – Typical example of algal bloom (photo taken in January)



Photo 12 – Example of canal overgrown with weeds



Photo 13 – Further Example of Algal Bloom (during winter months)



Photo 14 – Further Example of Canal Condition



Photo 15 – Further Example of Canal Condition



Photo 16 - Further Example of Algal Bloom (during winter months)



Photo 17 – Manhole Adjacent 1932 Breach, indicates diversion into river Irwell, approx.