

# St James CE Primary School, Clitheroe

## Drainage Strategy

### Final Report

May 2024

Prepared for:

Cassidy & Ashton Architects

Cassidy+  
Ashton

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## Contract

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This report describes work commissioned by the Cassidy & Aston Architects on behalf of the Diocese of Blackburn. The Client's representative for the contract was Alistair Baines. Mark Watson, Peter Barber, Edward Parker and Mark Bentley of JBA Consulting carried out this work.

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## Abbreviations

|           |                                    |
|-----------|------------------------------------|
| bgl.....  | Below Ground Level                 |
| BGS.....  | British Geological Society         |
| CC.....   | Climate Change                     |
| DS.....   | Drainage Strategy                  |
| EA.....   | Environment Agency                 |
| Ha.....   | Hectare                            |
| mAOD..... | Metres Above Ordnance Datum        |
| NGR.....  | National Grid Reference            |
| NPPF..... | National Planning Policy Framework |
| SUDS..... | Sustainable Urban Drainage         |
| yr.....   | Year                               |

## Executive Summary

JBA Consulting were commissioned by Cassidy & Aston Architects on behalf of the Diocese of Blackburn to carry out a Drainage Strategy (DS) for the reconfiguration and expansion of the St James' Primary School in Clitheroe. As part of the site development, a Drainage Strategy to attenuate future surface water runoff is proposed for the Infant School redevelopment.

This DS was produced to meet the requirements of the drainage related planning conditions 14, 16, 17 and 18 of the planning consent 3/2021/0731. This was to assess the impact and potential risks from the consented works and seeks to show how the consented development will not affect local drainage at the site and nearby.

The now consented proposals form a redevelopment to the Infant School building and grounds at Clitheroe. It is proposed to construct a new Infant School building to the rear of the existing school building, repurposing part of the existing building for the nursery school, then demolishing the rest of the older school building to be redeveloped into a new car park and recreational area to the north.

Local ground conditions do not support the use of infiltration techniques due to poor permeability of soils and lack of space for soakaways, therefore other options for development drainage were assessed in line with the Drainage Hierarchy.

The survey of the Existing site drainage confirmed that the existing Infant School building drains to the local public combined sewer to the north west of the building and the existing play area drains to the adjacent watercourse via surface land drain. These connections will be reused with a reduction of peak flows as a brownfield redevelopment.

Sufficient on-site surface water attenuation could be achieved by private cellular storage features within the site. The existing peak flow rate for the existing Infant School buildings was calculated to be 17.26 l/s, will be reduced by a minimum of 30% of the existing peak flow rate to a proposed total peak flow rate of 12.0 l/s, therefore compliant to brownfield drainage principles.

The site will be developed in stages and as the new Infant School building is creating additional hardstanding, a practical restricted outflow rate of 3.5 l/s, discharging to the adjacent Mearley Brook watercourse is proposed. The proposed 3.5 l/s combined with the peak flow rate of 8.5 l/s for the proposed car park redevelopment will discharge into the existing combined sewer connection to the northwest, thus the finalised site discharge will not increase from the peak flow rate from the overall site of 12 l/s.

# 1 Introduction

## 1.1 Background

JBA Consulting were commissioned by Cassidy & Aston Architects on behalf of the Diocese of Blackburn to carry out a Drainage Strategy (DS) for the reconfiguration and expansion of the St James' Primary School in Clitheroe.

## 1.2 Site Location and Description

St. James School is situated off Greenacre Street in Clitheroe, Lancashire, with coordinates NGR: 374,152mE 441,315mN. The school site is bisected by Mearley Brook, with classrooms, playgrounds, and facilities on both sides of the Brook. Access across the brook is provided by a footbridge located within the school premises.

Mearley Brook is classified as a Main River and falls under the responsibility of the Environment Agency (EA). The watercourse runs along its entire length of the school grounds and is fed by Plimlico Brook, Worston Brook, Page Brook, and Shaw Brook. It eventually joins Pendleton Brook (NGR: 373703 440643) approximately 800m downstream from the school. The location plan is shown in Figure 1-1.

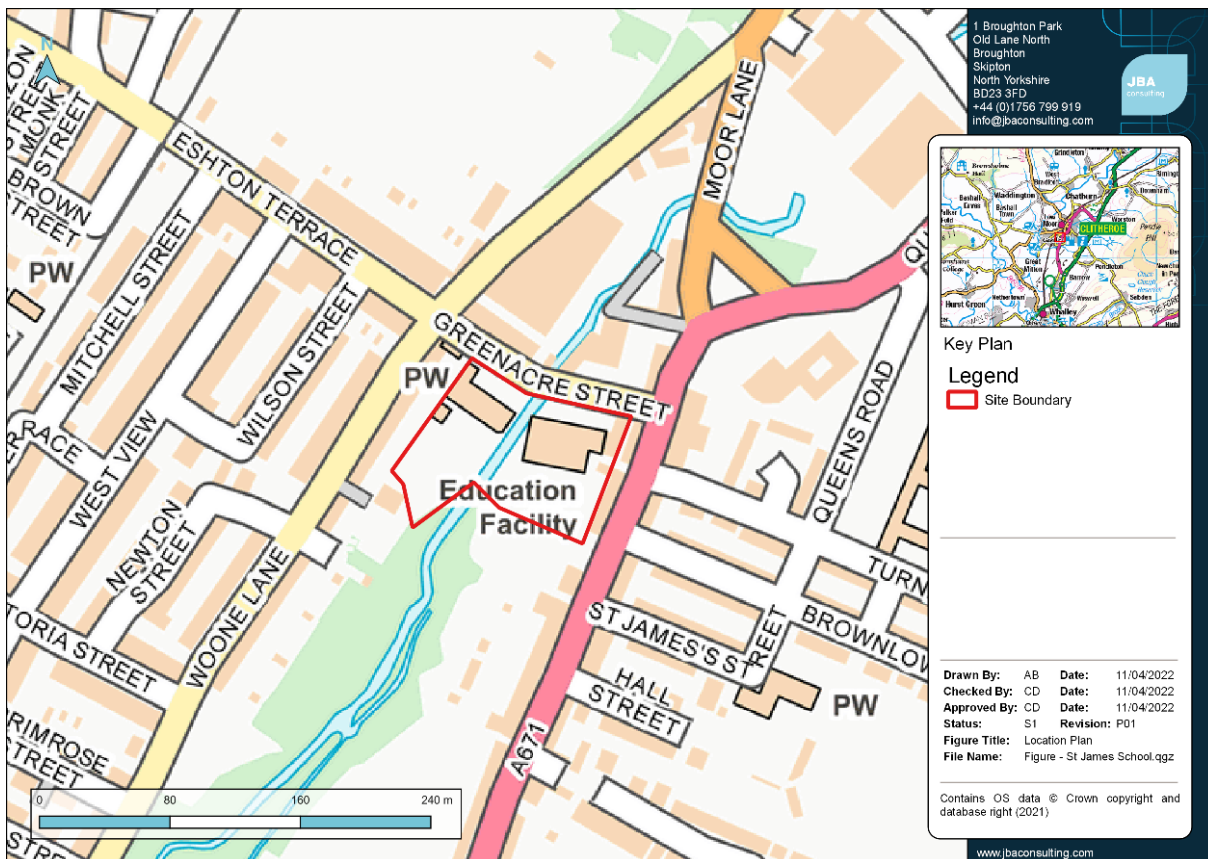


Figure 1-1: Location Plan

### 1.3 Proposed Development

The proposed new Infant school building will be situated on the right bank, adjacent to the existing playground (Appendix A). The new building will be orientated parallel to the school boundary wall at Woone Lane, with foot and wheelchair access from the playground. The proposed school building will feature; four classrooms, 11 toilet cubicles, covered walkway to retained building (nursery) and a canopy. Access to the proposed school building will be via a staircase or ramp that connects to the playground.

The current land use at the location of the proposed new building is greenfield space/grass. The grass land is banked and raised above the playground and other nearby school buildings.

In addition to the construction work, the existing Infant School to the north of the site along Greenacre Street is scheduled for demolition and being redeveloped as a new school entrance and car park, see Figure 1-2.

Works to the left bank are limited to internal modifications and are not to be changed in terms of drainage, therefore are not discussed within this report.

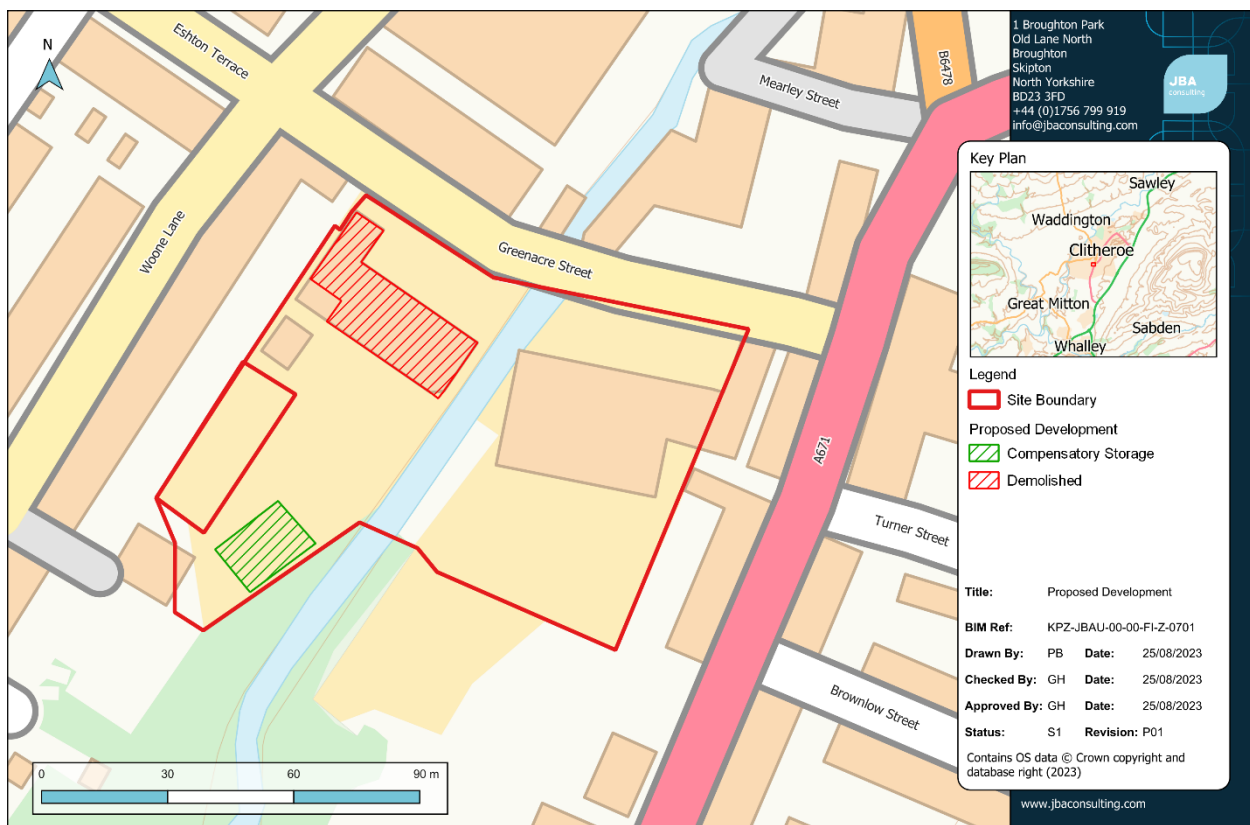


Figure 1-2: Proposed Development

## 1.4 Site Geology

A desktop survey of the available British Geology Society's website<sup>1</sup> have shown that the underlying strata would not be suitable for soakaways/infiltration trenches to be used for receiving and managing of development surface water runoff from the proposed development, as it shows Made Ground which is expected for the brownfield site.

The British Geology Society's Data on publicly available boreholes was consulted for the site geological information, the nearest borehole to the site was SD74SW34, grid reference 374275, 441451 which is to the north of the site close to the Mearley Brook at the B6478 Whalley Road. The recorded strata were Made Ground to a depth of 3.15mbgl down to light grey weathered Limestone to a depth of 3.40mbgl when the borehole ends.

The recorded Bedrock layer was noted to be Clitheroe Limestone Formation and Hodder Mudstone Formation. The Superficial layers was noted to be Alluvium - Clay, silt, sand and gravel and Till, Devensian.

## 1.5 Drainage Planning Conditions

This report is to provide the relevant information to meet the requirements of the drainage related planning conditions 14, 16, 17 and 18 of planning consent 3/2021/0731. This was to assess the impact and potential risks from the consented works and seeks to show how the consented development will not affect local drainage at the site and nearby. These conditions are listed below:

Table 1-1: Applicable Drainage Conditions

|                     | Summary                   | Wording                                                                                                                                                                            |
|---------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Condition 14</b> | Separate Drainage systems | <p>Foul and surface water shall be drained on separate systems.</p> <p>Reason: To secure proper drainage and to manage the risk of flooding and pollution on and off the site.</p> |

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1 GeoIndex Onshore, British Geology Society, 2023, <https://mapapps2.bgs.ac.uk/geoindex/home.htm>

|                            |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Condition 16</b></p> | <p>Detailed SW Drainage Strategy</p> | <p>No development shall commence in any phase until a detailed, final surface water sustainable drainage strategy for the site has been submitted to, and approved in writing by, the Local Planning Authority.</p> <p>The detailed surface water sustainable drainage strategy shall be based upon the site specific flood risk assessment and indicative surface water sustainable drainage strategy submitted and sustainable drainage principles and requirements set out in the National Planning Policy Framework, Planning Practice Guidance and Defra Technical Standards for Sustainable Drainage Systems. No surface water shall be allowed to discharge to the public foul sewer(s), directly or indirectly.</p> <p>The details of the drainage strategy to be submitted for approval shall include, as a minimum;</p> <p>a) Sustainable drainage calculations for peak flow control and volume control for the:</p> <ul style="list-style-type: none"> <li>i 100% (1 in 1-year) annual exceedance probability event;</li> <li>ii. 3.3% (1 in 30-year) annual exceedance probability event + 40% climate change allowance, with an allowance for urban creep;</li> <li>iii. 1% (1 in 100-year) annual exceedance probability event + 50% climate change allowance, with an allowance for urban creep</li> </ul> <p>Calculations must be provided for the whole site, including all existing and proposed surface water drainage systems.</p> <p>b) Final sustainable drainage plans appropriately labelled to include, as a minimum:</p> <ul style="list-style-type: none"> <li>i. Site plan showing all permeable and impermeable areas that contribute to the drainage network either directly or indirectly, including surface water flows from outside the curtilage as necessary;</li> <li>ii. Sustainable drainage system layout showing all pipe and structure references, dimensions and design levels; to include all existing and proposed surface water drainage systems up to and including the final outfall;</li> </ul> |
|----------------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



|                     | Summary                                    | Wording                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                            | <p>iii. Details of all sustainable drainage components, including landscape drawings showing topography and slope gradient as appropriate;</p> <p>iv. Drainage plan showing flood water exceedance routes in accordance with Defra Technical Standards for Sustainable Drainage Systems;</p> <p>v. Finished Floor Levels (FFL) in AOD with adjacent ground levels for all sides of each building and connecting cover levels to confirm minimum 150 mm+ difference for FFL;</p> <p>vi. Details of proposals to collect and mitigate surface water runoff from the development boundary;</p> <p>vii. Measures taken to manage the quality of the surface water runoff to prevent pollution, protect groundwater and surface waters, and delivers suitably clean water to sustainable drainage components;</p> <p>c) Evidence that a free-flowing outfall can be achieved. If this is not possible, evidence of a surcharged outfall applied to the sustainable drainage calculations will be required. The sustainable drainage strategy shall be implemented in accordance with the approved details.</p> <p>Reason: To ensure satisfactory sustainable drainage facilities are provided to serve the site in accordance with the Paragraphs 167 and 169 of the National Planning Policy Framework, Planning Practice Guidance and Defra Technical Standards for Sustainable Drainage Systems.</p> |
| <b>Condition 17</b> | Construction Surface Water Management Plan | <p>No development in any phase shall commence until a Construction Surface Water Management Plan, detailing how surface water and stormwater will be managed on the site during each phase of construction, including demolition and site clearance operations, has been submitted to and approved in writing by the Local Planning Authority.</p> <p>The details of the plan to be submitted for approval shall include method statements,</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|  | Summary | Wording                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |         | <p>scaled and dimensioned plans and drawings detailing surface water management proposals to include for each phase, as a minimum:</p> <p>a) Measures taken to ensure surface water flows are retained on-site during the construction phase(s), including temporary drainage systems, and, if surface water flows are to be discharged, they are done so at a restricted rate that must not exceed the equivalent greenfield runoff rate from the site.</p> <p>b) Measures taken to prevent siltation and pollutants from the site entering any receiving groundwater and/or surface waters, including watercourses, with reference to published guidance.</p> <p>The plan shall be implemented and thereafter managed and maintained in accordance with the approved plan for the duration of each phase of construction.</p> <p>Reason: To ensure the development is served by satisfactory arrangements for the disposal of surface water during each construction phase(s) so it does not pose an undue surface water flood risk on-site or elsewhere during any construction phase in accordance with Paragraph 167 of the National Planning Policy Framework.</p> |



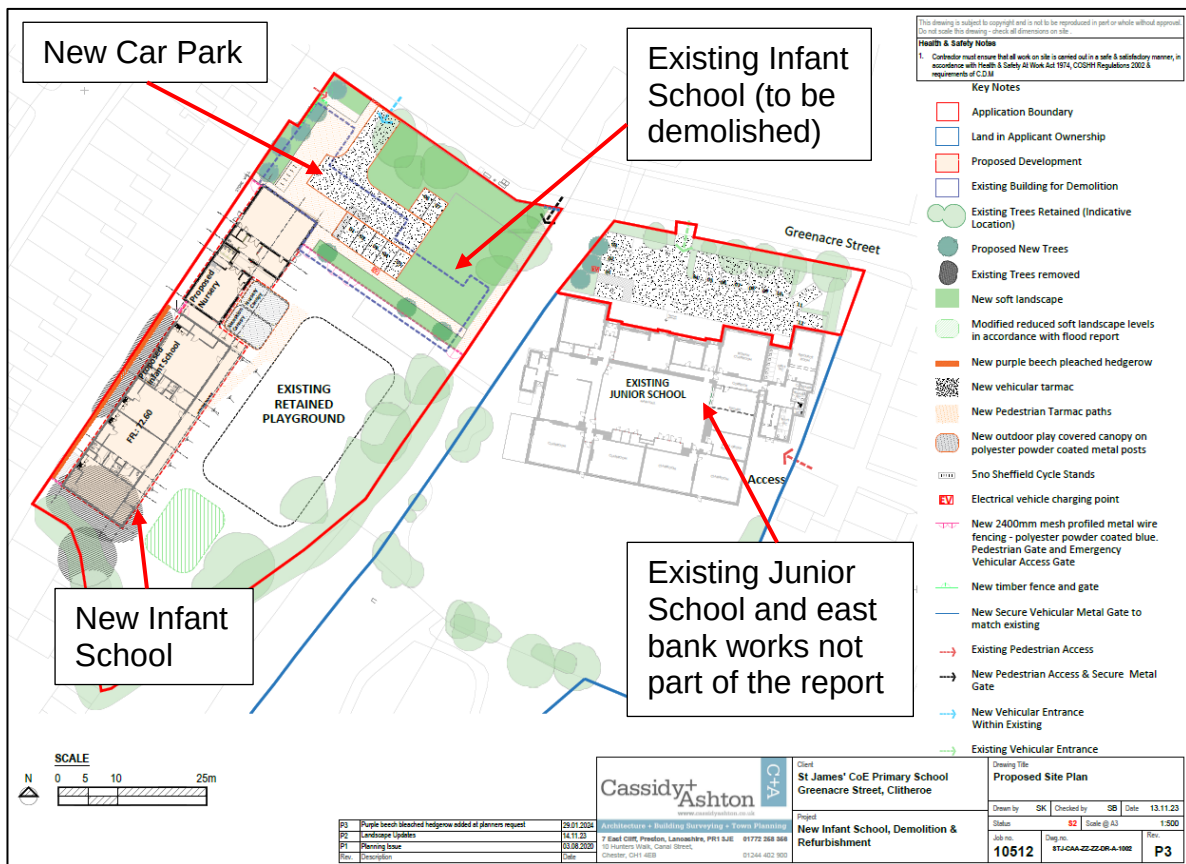
|                     | Summary          | Wording                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Condition 18</b> | Maintenance Plan | <p>The commencement of use of the development shall not be permitted until a site-specific Operation and Maintenance Manual for the lifetime of the development, pertaining to the surface water drainage system and prepared by a suitably competent person, has been submitted to and approved in writing by the Local Planning Authority.</p> <p>The details of the manual to be submitted for approval shall include, as a minimum:</p> <ul style="list-style-type: none"> <li>a) A timetable for its implementation;</li> <li>b) Details of the maintenance, operational and access requirement for all SuDS components and connecting drainage structures, including all watercourses and their ownership;</li> <li>c) Pro-forma to allow the recording of each inspection and maintenance activity, as well as allowing any faults to be recorded and actions taken to rectify issues;</li> <li>d) The arrangements for adoption by any public body or statutory undertaker, or any other arrangements to secure the operation of the sustainable drainage scheme in perpetuity;</li> <li>e) Details of financial management including arrangements for the replacement of major components at the end of the manufacturer's recommended design life;</li> <li>f) Details of whom to contact if pollution is seen in the system or if it is not working correctly; and</li> <li>g) Means of access for maintenance and easements.</li> </ul> <p>Thereafter the drainage system shall be retained, managed, and maintained in accordance with the approved details.</p> <p>Reason: To ensure that surface water flood risks from development to the future users of the land and neighbouring land are minimised, together with those risks to controlled waters, property, and ecological systems, and to ensure that the sustainable drainage system is subsequently maintained pursuant to the requirements of Paragraph 169 of the National Planning Policy Framework.</p> |

## 2 Site Drainage Assessment

### 2.1 Proposed Plan

The proposed site plan is shown in Figure 2-1. It is proposed to construct a new Infant School to the rear of the existing infant school on the western (right) bank of the site, with demolition of the existing Infant School building to be redeveloped into a new car parking area and road access.

Figure 2-1: Proposed Site Masterplan



### 2.2 Phasing of Works

The proposed works need to be phased to be able to provide sufficient teaching capacity and to continue as a fully functioning Infant School and the existing playground area will remain unchanged, therefore it is proposed that the works will be phased as below:

- Phase 1 - Construction of new Infant School to the rear of the existing building, conversion of part of the existing infant school to the new Nursery School. The rest of the Infant School to remain whilst construction is completed.
- Phase 2 - Demolition of Existing infant school and then construct new Car Park to the north.

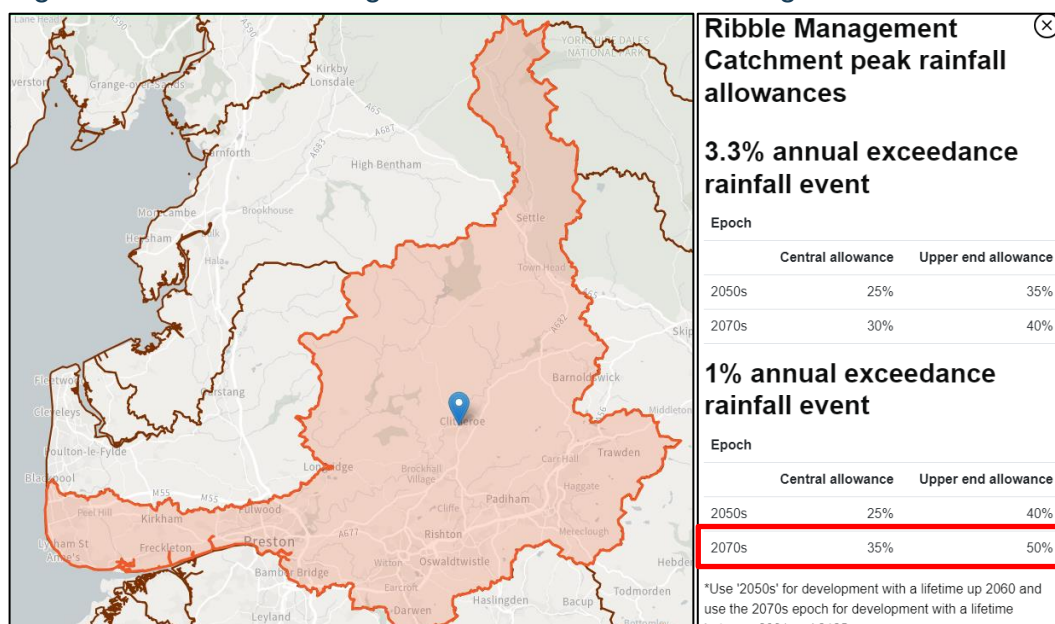
## 2.3 Climate Change Allowance

New updates to the NPPF in May 2022 introduced updated Flood Risk Classifications and upgraded allowances for climate change to be used for developments. The guideline recommendation is to use for flood risk assessments and strategic flood risk assessments, assess both the central and upper end allowances to understand the range of impact as stated in Table 2 of the guideline.

The Environment Agency's Table 1 shows anticipated changes in peak rainfall intensity in small catchments (less than 5km<sup>2</sup>), or urbanised drainage catchments.

As the proposed site is considered a 'More Vulnerable' development within Flood Zone 3 (as per the existing Flood Map for Planning), based on the latest climate change allowances and the anticipated 100yr lifespan of the development, this is an additional 50% for a design 1 in 100 year rainfall event.

Figure 2-2: Climate Change Allowances - Ribble Management Catchment



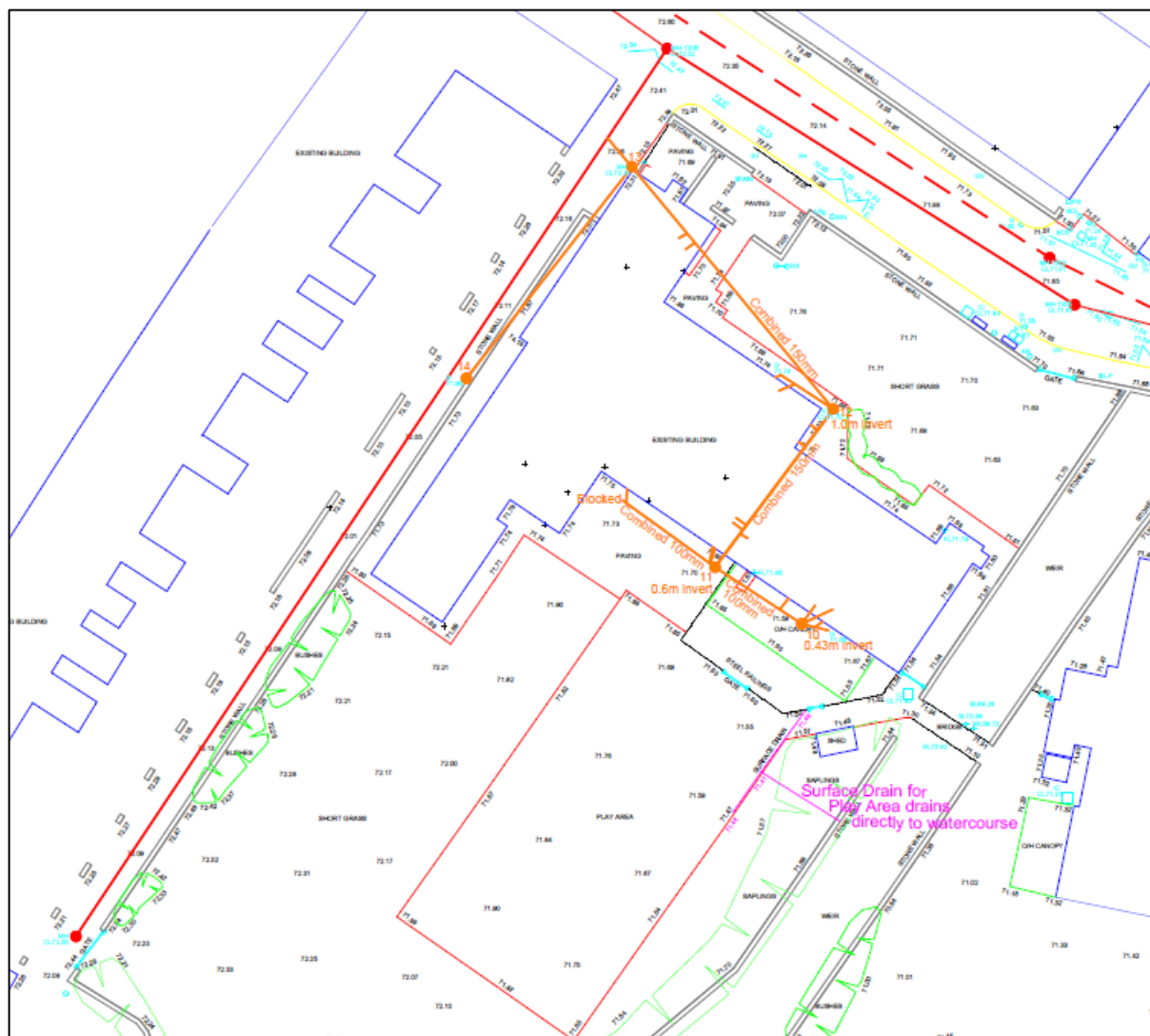
### 2.3.1 Urban Creep

As the site is not a residential development and increases in impermeable areas are not anticipated, Urban Creep is deemed not to be applicable to this development, therefore this has not been applied.

## 2.4 Runoff from Existing Site

The existing Infant School building and contributing area actively drains to the United Utilities combined sewer system to the north-west of the site. This has been confirmed by an onsite sewer CCTV survey by DTM Drainage Solutions, the full report is provided in Appendix B and a sketch of the current Infant School drainage is shown in Figure 2-3 below.

Figure 2-3: Sketch of Existing Infant School Drainage



The existing Infant School is considered as a Brownfield development. For the existing Infant School building and paved areas, a contributing area of 1241.4m<sup>2</sup> was shown to be draining to the combined sewer as a blind connection near manhole 1306 and the existing play area has a contributing area of 642.2m<sup>2</sup> drains directly to the existing surface drain into the Mearley Brook.

The existing play area is to remain unchanged therefore the existing drainage will remain in place with no change.

The existing brownfield runoff rate was calculated for the existing Infant School using the Modified Rational Method as per Equation 24.5 of The SUDS Manual<sup>2</sup>. The results used a contributing area of 1241.4m<sup>2</sup> (0.1241ha), a rainfall intensity of 50mm/hr to estimate a peak flow rate of 17.29 l/s for the existing Infant School hardstanding area to the combined sewer.

<sup>2</sup> The SUDS Manual C753, CIRIA 2015

Figure 2-4: Modified Rational Method equation

**EQ. 24.5 Modified rational method equation to determine peak flow rates**

$$Q = 2.78 C i A$$

where:

- $Q$  = design event peak rate of runoff (l/s)  
 $C$  = non-dimensional runoff coefficient which is dependent on the catchment characteristics

$$C = C_V C_R$$

- where  $C_V$  = volumetric runoff coefficient  
 $C_R$  = dimensionless routing coefficient

- $i$  = rainfall intensity for the design return period (in mm/hr) and for a duration equal to the "time of concentration" of the network

- $A$  = total catchment area being drained (ha)

Note: 2.78 is a conversion factor to address the rainfall unit being in mm/hr.

## 2.5 Options for Surface Water Disposal

It is a requirement of the H3 Building Regulations<sup>3</sup> that all new developments follow the preferred hierarchy for disposal of surface water disposal. Consideration should firstly be given to:

- Disposal via Infiltration (soakaway).
- Disposal to the nearest watercourse / sea.
- Disposal to a nearby public surface water sewer.
- Disposal to a nearby public combined sewer, in that priority order.

### 2.5.1 Disposal via Infiltration

As the first option for the drainage hierarchy, the option to discharge development runoff into the local ground via infiltration is assessed and determined if the underlying ground is suitable for infiltration.

A desktop survey of the available BGS website (Section 1.4) have shown that the underlying strata is not suitable for soakaways/infiltration trenches to be used to dispose of development surface water runoff from the proposed development, as it is formed of thick layers of Made Ground, therefore this option has been discounted.

### 2.5.2 Disposal via Watercourse

The second preferred option would be to discharge the surface water run-off from the development to a watercourse. As shown in Figure 2-3, the existing site drains to the nearby combined sewer for both foul and surface water from the existing Infant School

<sup>3</sup> Drainage and Waste Disposal, The Building Regulations 2015 H3, HM Government



and the existing play area drains directly into the adjacent Mearley Brook watercourse to the east of the boundary. As the site is adjacent to a nearby watercourse, new proposals should be directed towards the watercourse at a restricted rate.

### 2.5.3 Disposal via Sewers

A pre-planning enquiry has been submitted to the United Utilities which shows that the existing Infant School drains to the nearby combined sewer within the path to the west, connecting to the main combined sewer of the Greenacre Street. The site drainage survey found that there is an existing 150mm private combined sewer connecting to the public combined sewer at manhole 13.

As an existing connection remains, the site can benefit from utilising this drainage connection at a restricted brownfield drainage rate from the areas that were previously connected to the public combined sewer.

Table 2-1: Summary of Drainage Hierarchy

| Drainage Option                                  | Summary                               | Applicable? |
|--------------------------------------------------|---------------------------------------|-------------|
| Disposal via Infiltration (soakaway).            | Underlying Made Ground - unsuitable   | ✗           |
| Disposal to the nearest watercourse / sea.       | Adjacent to Mearley Brook             | ✓           |
| Disposal to a nearby public surface water sewer. | None Nearby - unsuitable              | ✗           |
| Disposal to a nearby public combined sewer.      | Existing Connection to Combined Sewer | ✓           |

## 2.6 Peak Flow Rate

NPPF requires that any development should not increase flood risk to others but should aim to contribute towards a reduction. As the site has an existing combined connection to the public combined sewer, the site should not increase flood risk or peak flow rates beyond that of the existing flow rate of 17.2l/s.

As per brownfield drainage principles, a minimum 30% reduction in existing peak flow rate is required, therefore the site peak flow rate will be reduced by 30% and will be restricted to 12.0 l/s, and this will be applied site wide as to not increase flow rates from the site at any phase of the development.

## 2.7 Phases of Development and Drainage Strategy

### 2.7.1 Phase 1 - Construction of New Infant School

The proposed Infant School will be constructed as a new building on an area that is currently an undeveloped grassed, this will be combined with the portion of the existing Infant School building that will be ultimately retained as the proposed Nursery

School, therefore the new building surface water runoff rate should be treated as a greenfield and therefore it is restricted to greenfield runoff rates.

The online greenfield runoff rates tool from HR Wallingford<sup>4</sup> was consulted to determine the greenfield runoff rate from the new Infant School proposed impermeable area of 704.6m<sup>2</sup> (minimum of 0.1ha used) generates a greenfield runoff rate of 0.92l/s. This is deemed to be too small for a practical flow control device restriction as the risk of blockage is too high for small apertures, therefore a practical minimum flow control rate of 3.5l/s is proposed for the proposed Infant School building and retained Nursery School.

To achieve a 3.5 l/s flow control, storage of excess runoff will be required within the proposed drainage system, this will be provided by geocellular crates, upstream of the 3.5l/s flow control and this will be designed to accommodate the 1 in 100 year plus 50% climate change allowance. The MicroDrainage calculations for the new Infant School found that a cellular crate storage of 7m x 7m x 0.5m depth gave a volume of 23.275m<sup>3</sup> (accounting for 95% porosity) was sufficient for all design flood events up to the 1 in 100 year plus 50% climate change allowance. The full hydraulic calculations are provided in Appendix E.

The new Infant School building and Nursery School drainage will be directed to the existing watercourse outlet connection, utilising the same outlet as the Play Area surface drainage system. A new manhole will be constructed onto the existing outlet pipe to connect the restricted flows from the Phase 1 works, downstream of the play area as to not alter flows from the play area.

The remaining Infant School building will continue to drain to the combined sewer as existing, however as the drainage from the Nursery School portion of the building will be diverted to the new Infant School drainage system, this is anticipated to be a reduced flow rate and volume of flows contributing to the combined sewer, therefore no increase in flow rate is anticipated from Phase 1 works.

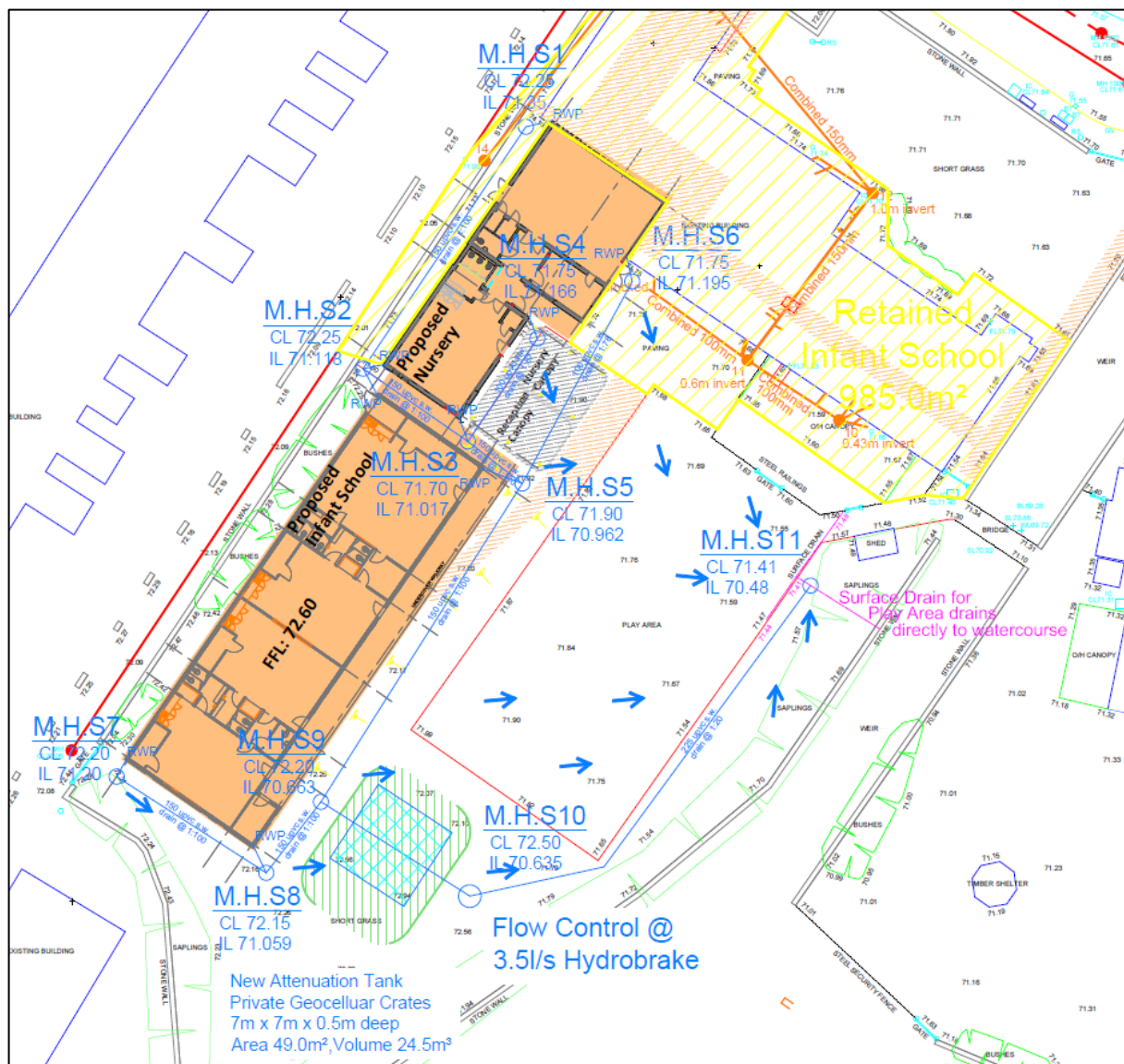
As the existing Play Area will be unchanged, this area will have no change in peak flow rate during Phase 1.

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4 Greenfield Runoff Rate Estimation Tool, HR Wallingford, 2024, <https://www.uksuds.com/tools/greenfield-runoff-rate-estimation>



Figure 2-5: Phase 1 Drainage Plan



## 2.7.2 Phase 2 - Demolition of the Existing Infant School and Construction of New Car Park Area.

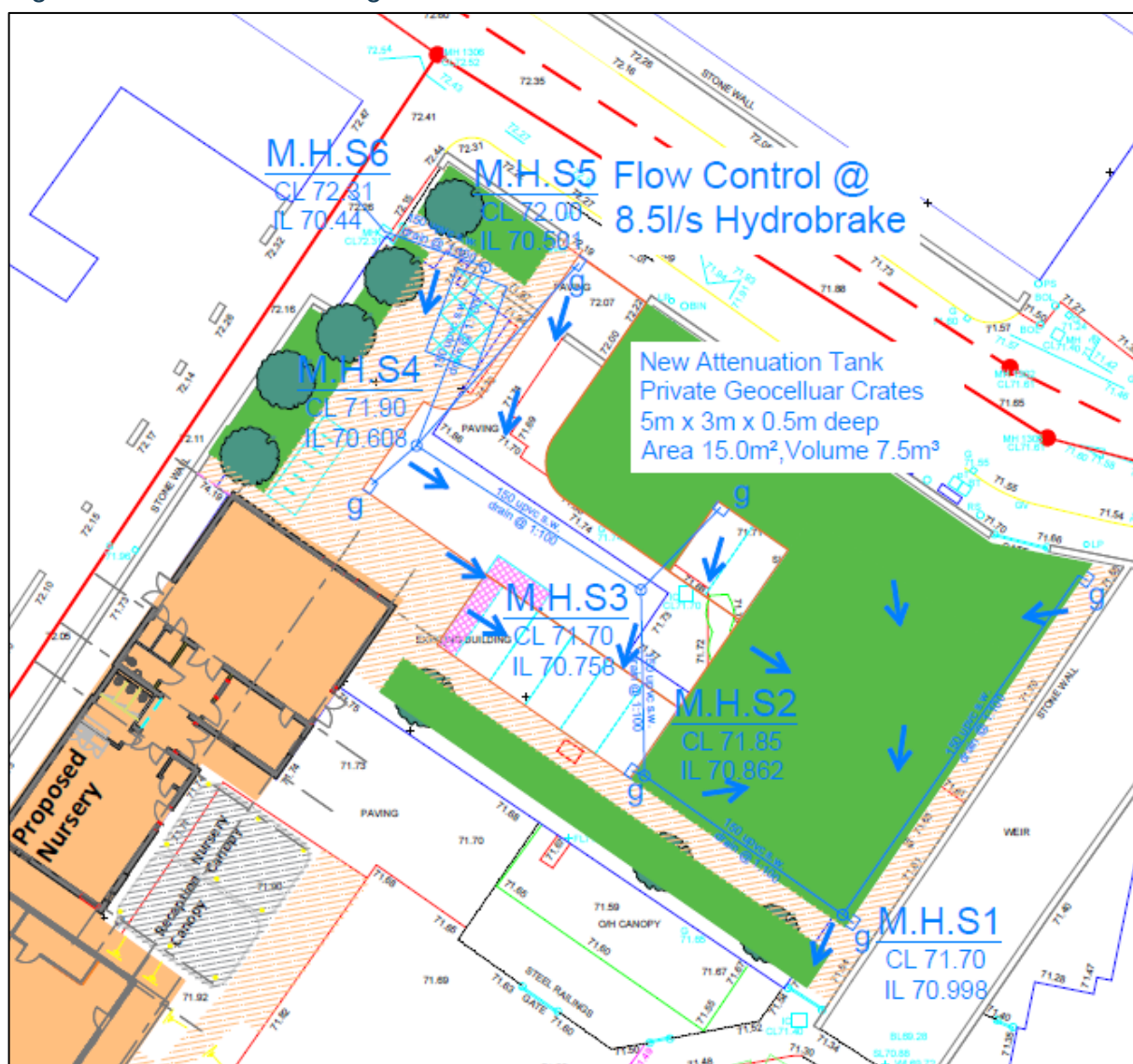
With the proposed Infant School now constructed and operational, the remaining existing infant school building will be demolished to make way for the proposed car park and access gate.

It is confirmed by the site drainage survey, this portion of the site benefits from an existing combined sewer connection to the local public combined sewer to the north-west of the site, therefore the remaining brownfield peak flow rate allowance will be used for this phase of the development, as per section 2.6. As Phase 1 will be restricted to the practical minimum flow rate of 3.5 l/s at a greenfield runoff rate, the remaining 8.5 l/s will be used for Phase 2 works.

The new car park and proposed pathways will be drained to the existing combined sewer as per the existing infant school connection at the restricted flow rate of 8.5 l/s, this represents a 51% reduction in flow rate to the public combined sewer and an overall reduction of 30% from the full site.

To impose a 8.5 l/s flow control, storage of excess runoff will be required within the proposed drainage system, this will be provided by geocellular crates, upstream of the 8.5l/s flow control and this will be designed to accommodate the 1 in 100 year plus 50% climate change allowance. The MicroDrainage calculations for the new Car Park found that a cellular crate storage of 5m x 3m x 0.5m depth gave a volume of 14.25m<sup>3</sup> (accounting for 95% porosity) was sufficient for all design flood events up to the 1 in 100 year plus 50% climate change allowance. The full hydraulic calculations can be seen in Appendix E.

Figure 2-6: Phase 2 Drainage Plan



### 2.7.3 MicroDrainage Calculations

As per the Lancashire County Council Drainage Systems (SUDS) Pro-forma, the MicroDrainage model uses a CV value of 1.0 (the software shows a default of 0.84 for winter although this was adjusted to 1.0 for both within the model build).

## 2.8 Summary of Drainage Design

A review of the drainage design is shown below in Table 2-2.

Table 2-2: Summary of Drainage Design

| Phase of Works              | Flow Control                                                                                     | Storage Size         |
|-----------------------------|--------------------------------------------------------------------------------------------------|----------------------|
| Phase 1 - New Infant School | 3.5 l/s Greenfield to watercourse, reduced flow from existing infant school, play area unchanged | 23.275m <sup>2</sup> |
| Phase 2 - New Car Park      | 8.5 l/s reduced flow rate to combined sewer                                                      | 14.25m <sup>2</sup>  |
| Finalised Design            | 8.5 l/s reduced flow rate to combined sewer, 3.5 l/s from Phase 1, play area unchanged           | 37.575m <sup>2</sup> |

## 2.9 Proposed Surface Water Pollution Control

Sufficient on-site surface water attenuation could be achieved by connecting the proposed rainwater downpipes and gulley features on the site. The proposed drainage features will also provide an benefit to mitigate the risk of pollution from the development runoff. CIRIA C758 provides the following information on pollution hazards and controls offered by the implemented drainage features.

Table 2-3: Pollution Hazards Indices - Table 26.2 CIRIA C758

| TABLE 26.2 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             |
| Other roofs (typically commercial/ industrial roofs)                                                                                                                                                                                                                                                                   | Low                    | 0.3                          | 0.2 (up to 0.8 where there is potential for metals to leach from the roof) | 0.05             |
| Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day                                                                               | Low                    | 0.5                          | 0.4                                                                        | 0.4              |
| Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways <sup>1</sup>                                                                                                                                 | Medium                 | 0.7                          | 0.6                                                                        | 0.7              |
| Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways <sup>1</sup> | High                   | 0.8 <sup>2</sup>             | 0.8 <sup>2</sup>                                                           | 0.8 <sup>2</sup> |

The Table 2-3 shows that the proposals will have a Low pollution hazard level for a low density scheme, therefore it is deemed that no site gulleys for car parking areas will be sufficient to control pollution from vehicular areas. A silt trap should be used upstream and downstream of the proposed geocellular crate to capture any sediments and pollutants, with easy access to remove these during operational maintenance.

## 3 SuDS Maintenance and Management

### 3.1 Proposed Site Drainage

The surface water drainage strategy for the proposed development utilises SuDS features to intercept and convey pluvial surface water runoff. The design of the system aims to attenuate runoff and encourage infiltration.

The proposed storm water system consists of the following SuDS components:

- Geocellular Tanks; and
- Gulleys.

### 3.2 Maintenance Categories

There are three categories of maintenance activities referred to in this report:

- **Regular maintenance** (including inspections and monitoring).
- Consists of basic tasks done on a frequent and predictable schedule, including vegetation management, litter and debris removal, and inspections.
- **Occasional maintenance**
- Comprises tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks (sediment removal is an example).
- **Remedial maintenance**
- Comprises intermittent tasks that may be required to rectify faults associated with the system, although the likelihood of faults can be minimised by good design. Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events, and as such timings are difficult to predict.

### 3.3 Management and Maintenance Team

As the site benefits from an existing maintenance team that maintains the existing school facility, landscaping and drainage needs, the existing team can also undertake management and maintenance responsibilities for the proposals and undertake this as part of its ongoing maintenance schedule and also utilise use of professional maintenance companies to clean/repair and aspects of the drainage system as and when required.



### 3.4 Operation and Maintenance Requirements

Regular inspection and maintenance is required to ensure the effective long-term operation of below-ground storage systems. Maintenance responsibility for systems should be placed with a responsible organisation. Table 21.3 (below) provides guidance on the type of operational and maintenance requirements that may be appropriate. The list of actions is not exhaustive, and some actions may not always be required.

Maintenance Plans and schedules should be developed during the design phase and will be specific to the type of tank that is adopted. Specific maintenance needs of the system should be monitored, and maintenance schedules adjusted to suit requirements.

Figure 3-1: Maintenance of Storage Tanks - CIRIA C753

| TABLE 21.3 Operation and maintenance requirements for attenuation storage tanks |                                                                                                                                                                                                        |                                     |
|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| 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                             |
|                                                                                 | For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary. | Annually                            |
|                                                                                 | Remove sediment from pre-treatment structures and/or internal forebays                                                                                                                                 | Annually, or as required            |
| Remedial actions                                                                | Repair/rehabilitate inlets, outlet, 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        |

Figure 3-2: Maintenance Checklist - CIRIA C753

| TABLE B.25 SuDS maintenance inspection checklist                                                                                                                                                                                                                                                                                                                                                         |         |     |                 |                |         |     |                 |                |                 |                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|-----------------|----------------|---------|-----|-----------------|----------------|-----------------|----------------|
| General information                                                                                                                                                                                                                                                                                                                                                                                      |         |     |                 |                |         |     |                 |                |                 |                |
| Site ID                                                                                                                                                                                                                                                                                                                                                                                                  |         |     |                 |                |         |     |                 |                |                 |                |
| Site location and co-ordinates (GIS if appropriate)                                                                                                                                                                                                                                                                                                                                                      |         |     |                 |                |         |     |                 |                |                 |                |
| Elements forming the SuDS scheme                                                                                                                                                                                                                                                                                                                                                                         |         |     |                 |                |         |     |                 |                |                 |                |
| Inspection frequency                                                                                                                                                                                                                                                                                                                                                                                     |         |     |                 |                |         |     |                 |                |                 |                |
| Type of development                                                                                                                                                                                                                                                                                                                                                                                      |         |     |                 |                |         |     |                 |                |                 |                |
| <div>Approved drawing reference(s)</div> <div>Approved specification reference</div> <div>Specific purpose of any parts of the scheme (eg biodiversity, wildlife and visual aspects)</div>                                                                                                                                                                                                               |         |     |                 |                |         |     |                 |                |                 |                |
| Inspection date                                                                                                                                                                                                                                                                                                                                                                                          |         |     |                 |                |         |     |                 |                |                 |                |
|                                                                                                                                                                                                                                                                                                                                                                                                          | Details | Y/N | Action required | Date completed | Details | Y/N | Action required | Date completed | Action required | Date Completed |
| General inspection items                                                                                                                                                                                                                                                                                                                                                                                 |         |     |                 |                |         |     |                 |                |                 |                |
| Is there any evidence of erosion, channelling, ponding (where not desirable) or other poor hydraulic performance?                                                                                                                                                                                                                                                                                        |         |     |                 |                |         |     |                 |                |                 |                |
| Is there any evidence of accidental spillages, oils, poor water quality, odours or nuisance insects?                                                                                                                                                                                                                                                                                                     |         |     |                 |                |         |     |                 |                |                 |                |
| Have any health and safety risks been identified to either the public or maintenance operatives?                                                                                                                                                                                                                                                                                                         |         |     |                 |                |         |     |                 |                |                 |                |
| Is there any deterioration in the surface of permeable or porous surfaces (eg rutting, spreading of blocks or signs of ponding water)?                                                                                                                                                                                                                                                                   |         |     |                 |                |         |     |                 |                |                 |                |
| Silt/sediment accumulation                                                                                                                                                                                                                                                                                                                                                                               |         |     |                 |                |         |     |                 |                |                 |                |
| Is there any sediment accumulation at inlets (or other defined accumulation zones such as the surface of filter drains or infiltration basins and within proprietary devices)?<br>If yes, state depth (mm) and extent.<br>Is removal required?<br>If yes, state waste disposal requirements and confirm that all waste management requirements have been complied with (consult environmental regulator) |         |     |                 |                |         |     |                 |                |                 |                |



**TABLE B.25 SuDS maintenance inspection checklist**

| Inspection date                      |                                                                                                                                                                        |     |                 |                |         |     |                 |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----------------|----------------|---------|-----|-----------------|
|                                      | Details                                                                                                                                                                | Y/N | Action required | Date completed | Details | Y/N | Action required |
|                                      | Is surface clogging visible (potentially problematic where water has to soak into the underlying construction or ground (eg underdrained swale or infiltration basin)? |     |                 |                |         |     |                 |
|                                      | Does permeable or porous surfacing require sweeping to remove silt?                                                                                                    |     |                 |                |         |     |                 |
| System blockages and litter build-up |                                                                                                                                                                        |     |                 |                |         |     |                 |
|                                      | Is there evidence of litter accumulation in the system?<br>If yes, is this a blockage risk?                                                                            |     |                 |                |         |     |                 |
|                                      | Is there any evidence of any other clogging or blockage of outlets or drainage paths?                                                                                  |     |                 |                |         |     |                 |
| Vegetation                           |                                                                                                                                                                        |     |                 |                |         |     |                 |
|                                      | Is the vegetation condition satisfactory (density, weed growth, coverage etc)? (Check against approved planting regime.)                                               |     |                 |                |         |     |                 |
|                                      | Does any part of the system require weeding, pruning or mowing? (Check against maintenance frequency stated in approved design.)                                       |     |                 |                |         |     |                 |
|                                      | Is there any evidence of invasive species becoming established?<br>If yes, state action required                                                                       |     |                 |                |         |     |                 |
| Infrastructure                       |                                                                                                                                                                        |     |                 |                |         |     |                 |
|                                      | Are the infiltration trenches/swales in good condition?                                                                                                                |     |                 |                |         |     |                 |
|                                      | Is there evidence of any accidental damage to the system (eg wheel ruts)?                                                                                              |     |                 |                |         |     |                 |
|                                      |                                                                                                                                                                        |     |                 |                |         |     |                 |
|                                      |                                                                                                                                                                        |     |                 |                |         |     |                 |

USE THIS FORM ON A5 SHEET 11...

**TABLE B.25 SuDS maintenance inspection checklist**

| Inspection date                                                                                                                                                                            |         |     |                 |                |         |     |                 |                |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|-----------------|----------------|---------|-----|-----------------|----------------|--|
|                                                                                                                                                                                            | Details | Y/N | Action required | Date completed | Details | Y/N | Action required | Date completed |  |
| Are there any other matters that could affect the performance of the system in relation to the design objectives for hydraulic, water quality, biodiversity and visual aspects? (Specify.) |         |     |                 |                |         |     |                 |                |  |
| Other observations                                                                                                                                                                         |         |     |                 |                |         |     |                 |                |  |
| Information appended (eg photos)                                                                                                                                                           |         |     |                 |                |         |     |                 |                |  |
| Suitability of current maintenance regime                                                                                                                                                  |         |     |                 |                |         |     |                 |                |  |
| Continue as current                                                                                                                                                                        |         |     |                 |                |         |     |                 |                |  |
| Increase maintenance                                                                                                                                                                       |         |     |                 |                |         |     |                 |                |  |
| Decrease maintenance                                                                                                                                                                       |         |     |                 |                |         |     |                 |                |  |
| Next inspection                                                                                                                                                                            |         |     |                 |                |         |     |                 |                |  |
| Proposed date for next inspection                                                                                                                                                          |         |     |                 |                |         |     |                 |                |  |

## 4 Summary and Conclusions

### 4.1 Existing Surface Water Runoff

The existing Infant School building and contributing area actively drains to the United Utilities combined sewer system to the north-west of the site. This has been confirmed by an onsite sewer CCTV survey by DTM Drainage Solutions.

Therefore the existing Infant School is considered as a Brownfield development. For the existing Infant School building and paved areas, a contributing area of 1241.4m<sup>2</sup> was shown to be draining to the combined sewer via a blind connection near manhole 1306. The existing play area has a contributing area of 642.2m<sup>2</sup> drains directly to the existing surface drain into the Mearley Brook. The existing play area is to remain unchanged.

The existing brownfield runoff rate was calculated to be a peak flow rate of 17.29 l/s for the existing Infant School hardstanding area that is currently discharged into the combined sewer.

### 4.2 Proposed Surface Water Design

The proposed Infant School will be constructed as a new building that is currently an undeveloped grassed area, this will be combined with the portion of the existing Infant School building that will be ultimately retained as the proposed Nursery School, therefore the new building should be treated as a new greenfield development and thus restricted to greenfield runoff rates.

The online greenfield runoff rates tool generates a greenfield runoff rate of 0.92l/s. This is deemed to be too small for a practical flow control device restriction as the risk of blockage is too high for small apertures, therefore a practical minimum flow control size with a maximum runoff rate of 3.5l/s is proposed for the proposed Infant School building and retained Nursery School. To implement a 3.5 l/s flow control, a cellular crate storage of 7m x 7m x 0.5m depth with a volume of 23.275m<sup>3</sup> provided sufficient attenuation storage for all design flood events up to the 1 in 100 year plus 50% climate change allowance.

It is confirmed by the site drainage survey that the existing infant school benefits from an existing combined sewer connection to the local public combined sewer to the north-west of the site, therefore the remaining brownfield peak flow rate allowance will be used for this phase of the development, as per section 2.6. As Phase 1 will be restricted to the practical minimum flow rate of 3.5 l/s as a greenfield development, the remaining 8.5 l/s will be used. To provide a flow control of 8.5 l/s, a cellular crate storage of 5m x 3m x 0.5m depth with a volume of 14.25m<sup>3</sup> provided sufficient attenuation storage for all design flood events up to the 1 in 100 year plus 50% climate change allowance.



## **A Site Plan**

This drawing is subject to copyright and is not to be reproduced in part or whole without approval.  
Do not scale this drawing - check all dimensions on site .

**Health & Safety Notes**

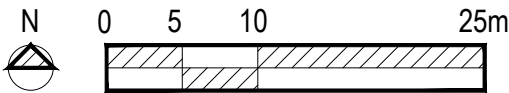
1. Contractor must ensure that all work on site is carried out in a safe & satisfactory manner, in accordance with Health & Safety At Work Act 1974, COSHH Regulations 2002 & requirements of C.D.M

**Key Notes**

- Application Boundary
- Land in Applicant Ownership
- Proposed Development
- Existing Building for Demolition
- Existing Trees Retained (Indicative Location)
- Proposed New Trees
- Existing Trees removed
- New soft landscape
- Modified reduced soft landscape levels in accordance with flood report
- New purple beech pleached hedgerow
- New vehicular tarmac
- New Pedestrian Tarmac paths
- New outdoor play covered canopy on polyester powder coated metal posts
- 5no Sheffield Cycle Stands
- Electrical vehicle charging point
- New 2400mm mesh profiled metal wire fencing - polyester powder coated blue. Pedestrian Gate and Emergency Vehicular Access Gate
- New timber fence and gate
- New Secure Vehicular Metal Gate to match existing
- Existing Pedestrian Access
- New Pedestrian Access & Secure Metal Gate
- New Vehicular Entrance Within Existing
- Existing Vehicular Entrance



**SCALE**



|      |                                                          |            |
|------|----------------------------------------------------------|------------|
| P3   | Purple beech bleached hedgerow added at planners request | 29.01.2024 |
| P2   | Landscape Updates                                        | 14.11.23   |
| P1   | Planning Issue                                           | 03.08.2020 |
| Rev. | Description                                              | Date       |

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10 Hunters Walk, Canal Street, Chester, CH1 4EB 01244 402 900

Client  
**St James' CoE Primary School**  
**Greenacre Street, Clitheroe**

Project  
**New Infant School, Demolition & Refurbishment**

|                                            |                                           |                   |                  |
|--------------------------------------------|-------------------------------------------|-------------------|------------------|
| Drawing Title<br><b>Proposed Site Plan</b> |                                           |                   |                  |
| Drawn by                                   | SK                                        | Checked by        | SB Date 13.11.23 |
| Status                                     | <b>S2</b>                                 |                   | Scale @ A3 1:500 |
| Job no.<br><b>10512</b>                    | Dwg.no.<br><b>STJ-CAA-ZZ-ZZ-DR-A-1002</b> | Rev.<br><b>P3</b> |                  |

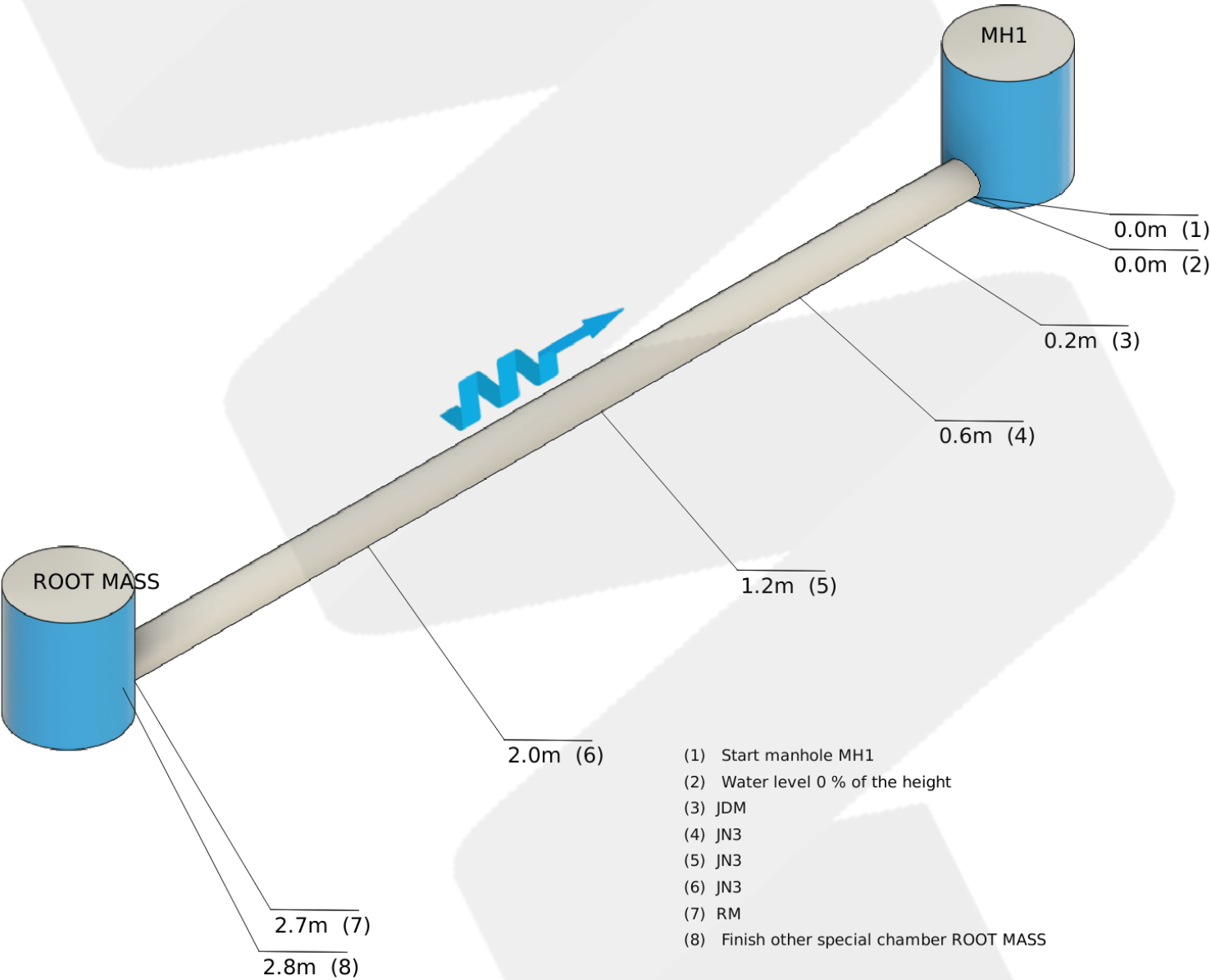


## **B DTM Drainage Survey Report**

|                                                                                  |                            |                                                                                             |
|----------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------|
|  | <b>Project Information</b> | St James Church of England Primary School ,<br>Greenarce Street ,<br>Clitheroe ,<br>BB7 1ED |
| Engineer:<br>DM                                                                  | Date:<br>26/03/24          | Reference:                                                                                  |

| Project Information  |                                           |
|----------------------|-------------------------------------------|
| Filename             | St_James_Church_of_England_Primary_School |
| Site Name/Number     | St James Church of England Primary School |
| Street               | Greenarce Street                          |
| Town/Village         | Clitheroe                                 |
| Postcode             | BB7 1ED                                   |
| Parking Restrictions | ok                                        |
| Client               | Cassidy And Ashton                        |
| Reference            |                                           |
| Drawing Number       |                                           |
| Reason               | Checking Drainage                         |
| Engineer             | DM                                        |
| Export Date          | 26/03/24                                  |
| Export Time          | 12:19                                     |
| Weather              | No rain or snow (D)                       |

|                                                                                  |                       |                            |                        |                                                                                             |
|----------------------------------------------------------------------------------|-----------------------|----------------------------|------------------------|---------------------------------------------------------------------------------------------|
|  |                       | <b>Section Information</b> |                        | St James Church of England Primary School ,<br>Greenarce Street ,<br>Clitheroe ,<br>BB7 1ED |
| Engineer:<br>DM                                                                  |                       | Date:<br>26/03/24          |                        | Reference:                                                                                  |
| Section Video:<br>mh1_z                                                          | Start:<br>MH1         | Direction:<br>Upstream     | End:<br>ROOT MASS      |                                                                                             |
| Material:<br>Vitrified Clay (VC)                                                 | Pipeline Size:<br>150 | Duty:<br>Combined (C)      | Invert Depth:<br>00.48 |                                                                                             |
| Date:<br>2024-03-26                                                              | Time:<br>09:49        | Comments:                  |                        |                                                                                             |



|                                                                                  |                            |                                                                                             |
|----------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------|
|  | <b>Section Information</b> | St James Church of England Primary School ,<br>Greenarce Street ,<br>Clitheroe ,<br>BB7 1ED |
| Engineer:<br>DM                                                                  | Date:<br>26/03/24          | Reference:                                                                                  |

| Additional Information    |                       |
|---------------------------|-----------------------|
| Invert Depth              | 00.48                 |
| End Depth                 | .                     |
| Method of Inspection      | Direct Inspection (A) |
| Pre-Cleaned               | Yes (Y)               |
| Pipeline Length Reference |                       |
| Pipe Shape                | Circular (C)          |

## Section Images

St James Church of England Primary  
School ,  
Greenarce Street ,  
Clitheroe ,  
BB7 1ED

Engineer:  
DM

Date:  
26/03/24

Reference:



Observation [3]:  
JDM



Observation [4]:  
JN3



Observation [5]:  
JN3



Observation [6]:  
JN3

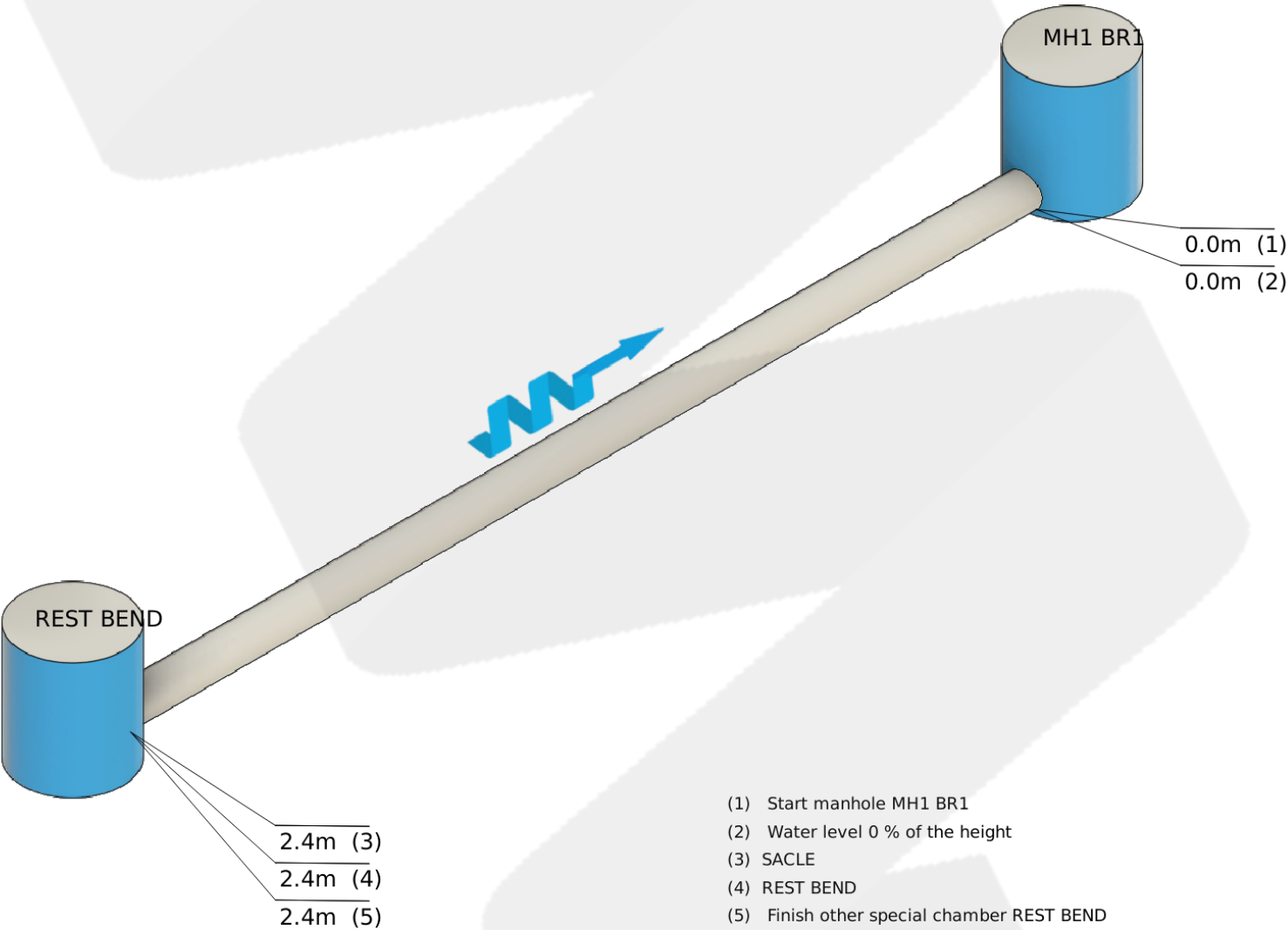
|                                                                                  |                       |                                                                                             |
|----------------------------------------------------------------------------------|-----------------------|---------------------------------------------------------------------------------------------|
|  | <b>Section Images</b> | St James Church of England Primary School ,<br>Greenarce Street ,<br>Clitheroe ,<br>BB7 1ED |
| Engineer:<br>DM                                                                  | Date:<br>26/03/24     | Reference:                                                                                  |



Observation [7]:  
RM



|                                                                                  |                       |                            |                        |                                                                                             |
|----------------------------------------------------------------------------------|-----------------------|----------------------------|------------------------|---------------------------------------------------------------------------------------------|
|  |                       | <b>Section Information</b> |                        | St James Church of England Primary School ,<br>Greenarce Street ,<br>Clitheroe ,<br>BB7 1ED |
| Engineer:<br>DM                                                                  |                       | Date:<br>26/03/24          |                        | Reference:                                                                                  |
| Section Video:<br>mh1_br1_root_mass                                              | Start:<br>MH1 BR1     | Direction:<br>Upstream     | End:<br>REST BEND      |                                                                                             |
| Material:<br>Vitrified Clay (VC)                                                 | Pipeline Size:<br>100 | Duty:<br>Combined (C)      | Invert Depth:<br>00.48 |                                                                                             |
| Date:<br>2024-03-26                                                              | Time:<br>10:03        | Comments:                  |                        |                                                                                             |



|                                                                                  |                            |                                                                                             |
|----------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------|
|  | <b>Section Information</b> | St James Church of England Primary School ,<br>Greenarce Street ,<br>Clitheroe ,<br>BB7 1ED |
| Engineer:<br>DM                                                                  | Date:<br>26/03/24          | Reference:                                                                                  |

| Additional Information    |                       |
|---------------------------|-----------------------|
| Invert Depth              | 00.48                 |
| End Depth                 | .                     |
| Method of Inspection      | Direct Inspection (A) |
| Pre-Cleaned               | Yes (Y)               |
| Pipeline Length Reference |                       |
| Pipe Shape                | Circular (C)          |

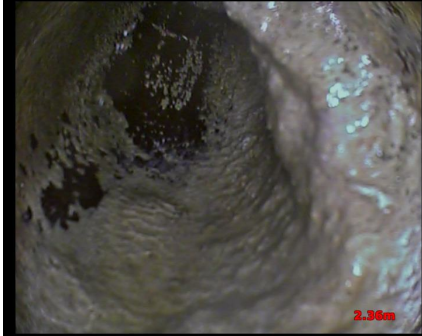
## Section Images

St James Church of England Primary  
School ,  
Greenarce Street ,  
Clitheroe ,  
BB7 1ED

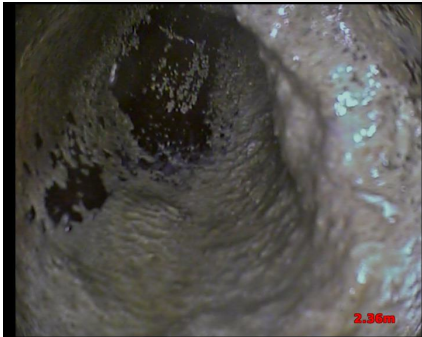
Engineer:  
DM

Date:  
26/03/24

Reference:

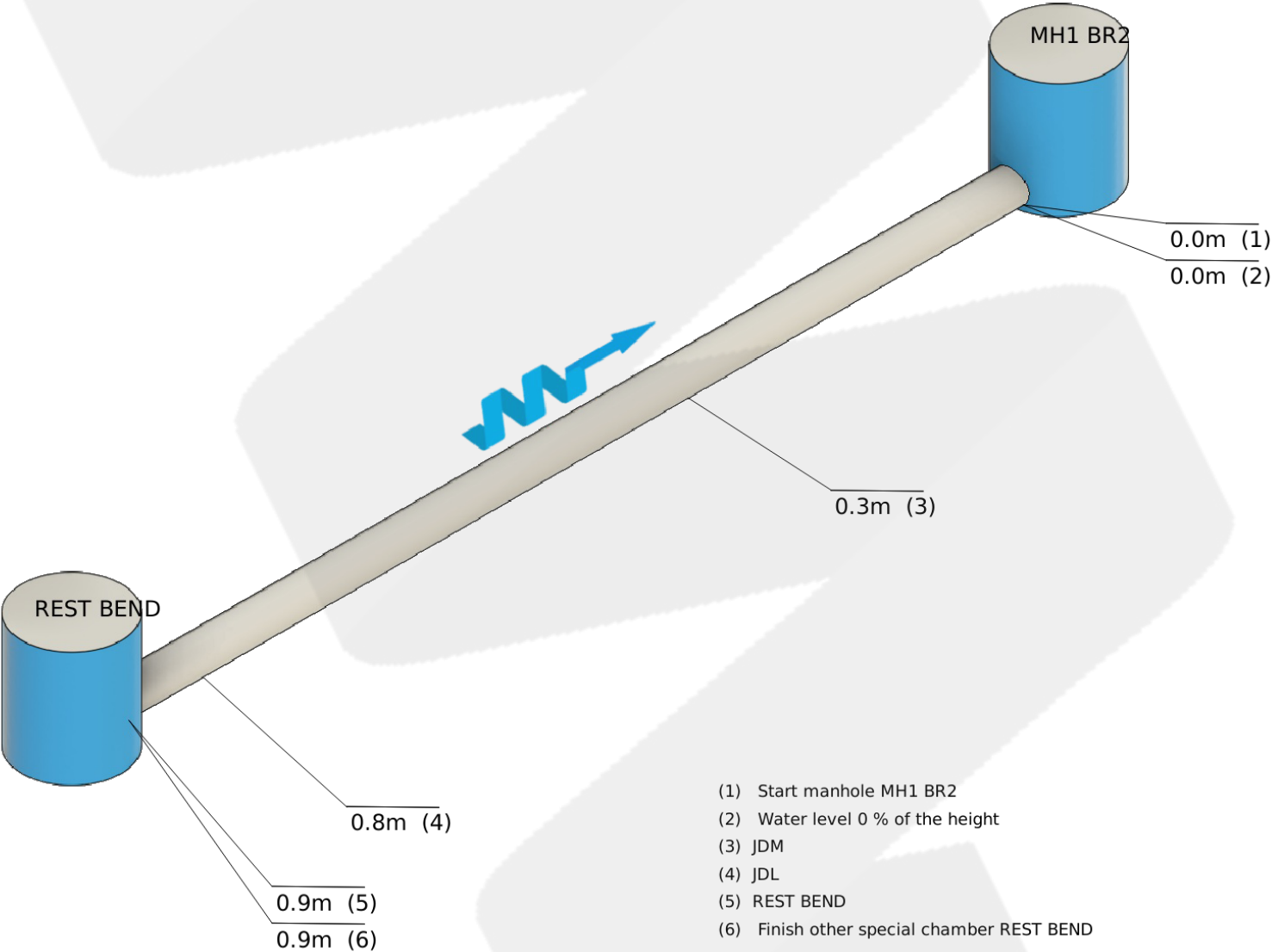


Observation [3]:  
SACLE



Observation [4]:  
REST BEND

|                                                                                  |  |                            |  |                                                                                             |  |
|----------------------------------------------------------------------------------|--|----------------------------|--|---------------------------------------------------------------------------------------------|--|
|  |  | <b>Section Information</b> |  | St James Church of England Primary School ,<br>Greenarce Street ,<br>Clitheroe ,<br>BB7 1ED |  |
| Engineer:<br>DM                                                                  |  | Date:<br>26/03/24          |  | Reference:                                                                                  |  |
| Section Video:<br>mh1_br2_rest_bend                                              |  | Start:<br>MH1 BR2          |  | Direction:<br>Upstream                                                                      |  |
| Material:<br>Vitrified Clay (VC)                                                 |  | Pipeline Size:<br>100      |  | End:<br>REST BEND                                                                           |  |
| Date:<br>2024-03-26                                                              |  | Duty:<br>Combined (C)      |  | Invert Depth:<br>00.48                                                                      |  |
| Time:<br>10:05                                                                   |  | Comments:                  |  |                                                                                             |  |



|                                                                                  |                            |                                                                                             |
|----------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------|
|  | <b>Section Information</b> | St James Church of England Primary School ,<br>Greenarce Street ,<br>Clitheroe ,<br>BB7 1ED |
| Engineer:<br>DM                                                                  | Date:<br>26/03/24          | Reference:                                                                                  |

| Additional Information    |                       |
|---------------------------|-----------------------|
| Invert Depth              | 00.48                 |
| End Depth                 | .                     |
| Method of Inspection      | Direct Inspection (A) |
| Pre-Cleaned               | Yes (Y)               |
| Pipeline Length Reference |                       |
| Pipe Shape                | Circular (C)          |

## Section Images

St James Church of England Primary  
School ,  
Greenarce Street ,  
Clitheroe ,  
BB7 1ED

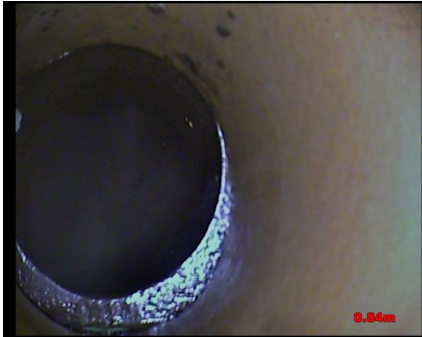
Engineer:  
DM

Date:  
26/03/24

Reference:



Observation [3]:  
JDM

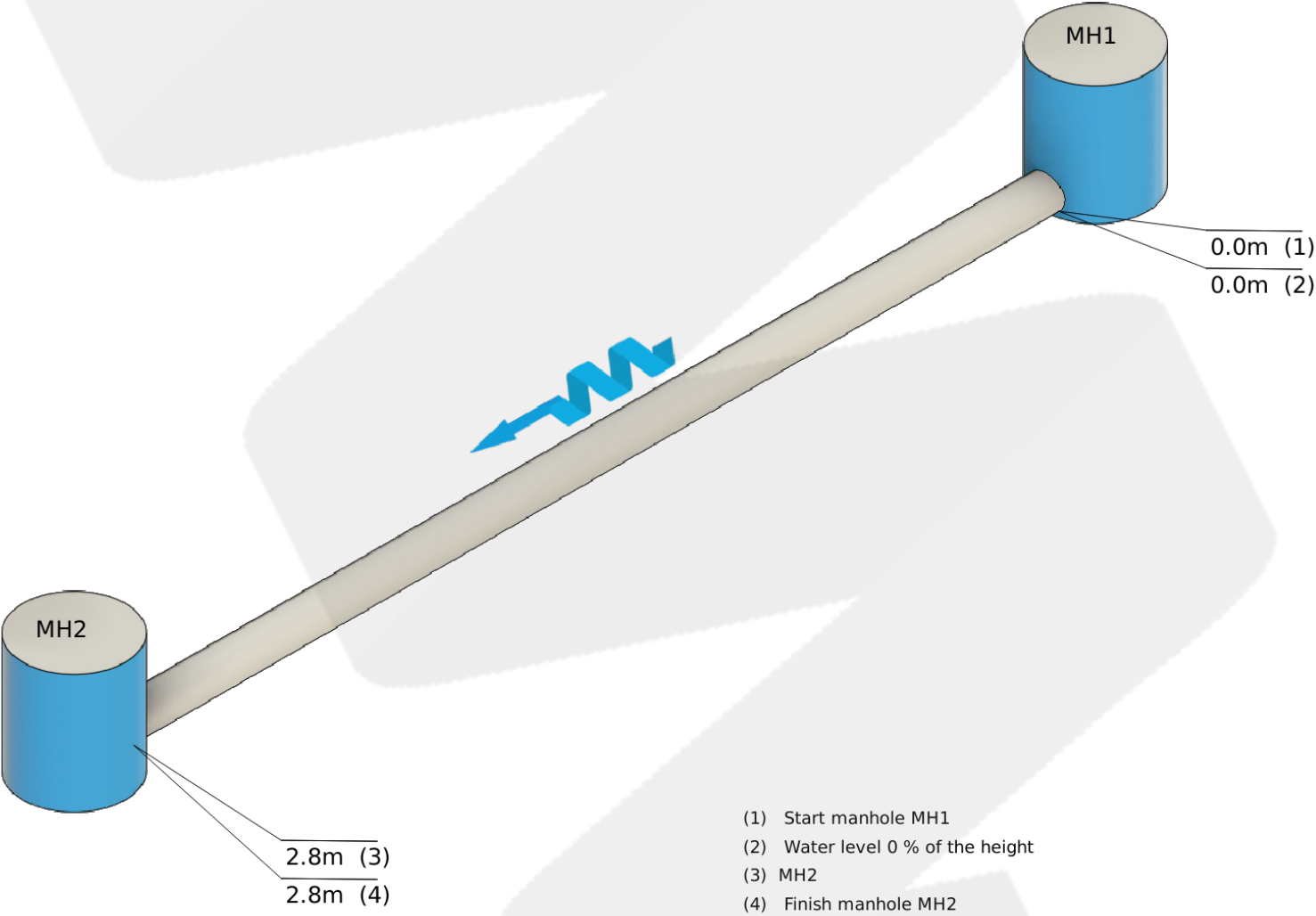


Observation [4]:  
JDL



Observation [5]:  
REST BEND

|                                                                                  |                       |                            |                        |                                                                                             |
|----------------------------------------------------------------------------------|-----------------------|----------------------------|------------------------|---------------------------------------------------------------------------------------------|
|  |                       | <b>Section Information</b> |                        | St James Church of England Primary School ,<br>Greenarce Street ,<br>Clitheroe ,<br>BB7 1ED |
| Engineer:<br>DM                                                                  |                       | Date:<br>26/03/24          |                        | Reference:                                                                                  |
| Section Video:<br>mh1_mh2                                                        | Start:<br>MH1         | Direction:<br>Downstream   | End:<br>MH2            |                                                                                             |
| Material:<br>Vitrified Clay (VC)                                                 | Pipeline Size:<br>150 | Duty:<br>Combined (C)      | Invert Depth:<br>00.48 |                                                                                             |
| Date:<br>2024-03-26                                                              | Time:<br>10:07        | Comments:                  |                        |                                                                                             |





|                                                                                  |                            |                                                                                             |
|----------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------|
|  | <b>Section Information</b> | St James Church of England Primary School ,<br>Greenarce Street ,<br>Clitheroe ,<br>BB7 1ED |
| Engineer:<br>DM                                                                  | Date:<br>26/03/24          | Reference:                                                                                  |

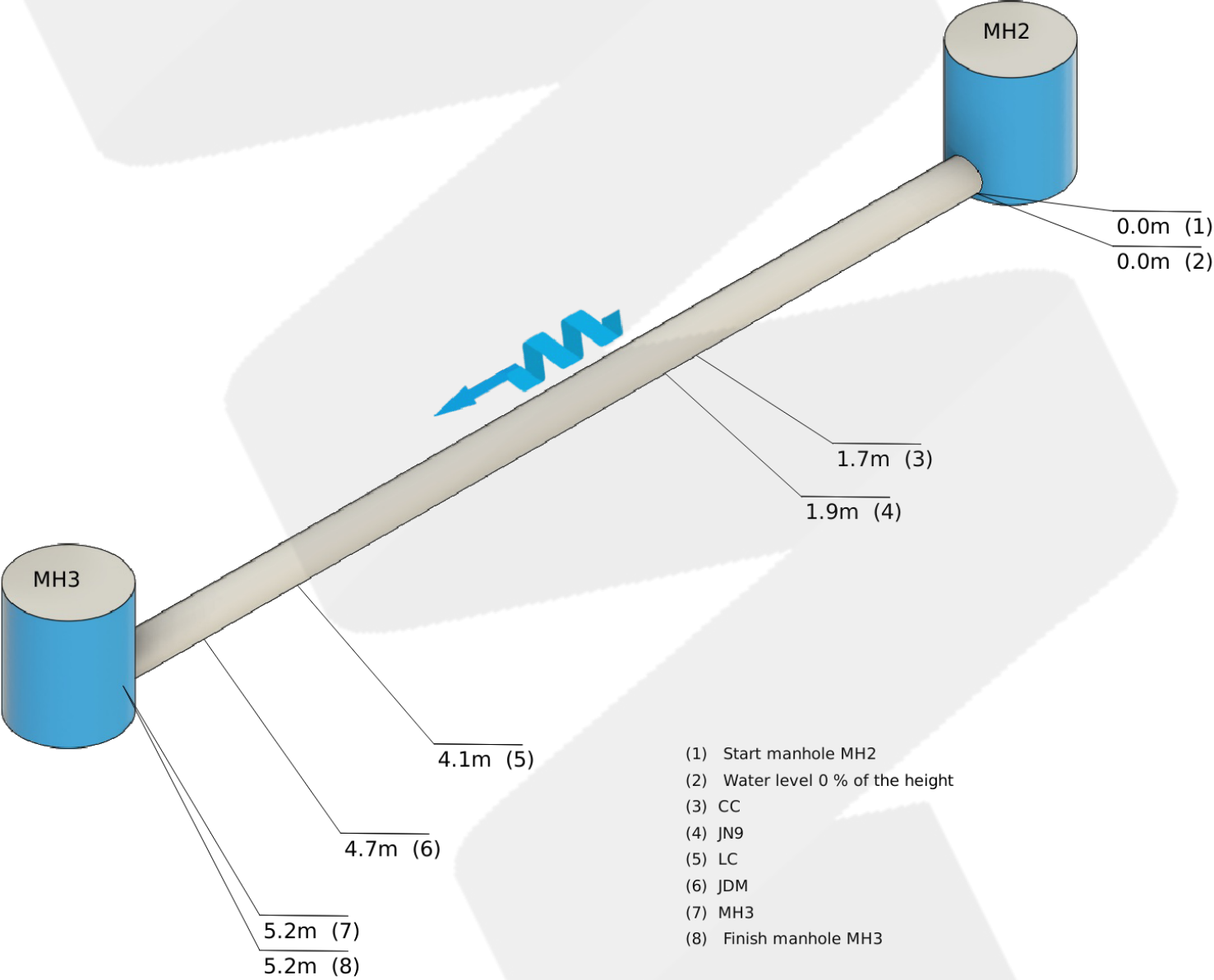
| Additional Information    |                       |
|---------------------------|-----------------------|
| Invert Depth              | 00.48                 |
| End Depth                 | .                     |
| Method of Inspection      | Direct Inspection (A) |
| Pre-Cleaned               | Yes (Y)               |
| Pipeline Length Reference |                       |
| Pipe Shape                | Circular (C)          |

|                                                                                  |                       |                                                                                             |
|----------------------------------------------------------------------------------|-----------------------|---------------------------------------------------------------------------------------------|
|  | <b>Section Images</b> | St James Church of England Primary School ,<br>Greenarce Street ,<br>Clitheroe ,<br>BB7 1ED |
| Engineer:<br>DM                                                                  | Date:<br>26/03/24     | Reference:                                                                                  |



Observation [3]:  
MH2

|                                                                                  |                       |                            |                        |                                                                                             |
|----------------------------------------------------------------------------------|-----------------------|----------------------------|------------------------|---------------------------------------------------------------------------------------------|
|  |                       | <b>Section Information</b> |                        | St James Church of England Primary School ,<br>Greenarce Street ,<br>Clitheroe ,<br>BB7 1ED |
| Engineer:<br>DM                                                                  |                       | Date:<br>26/03/24          |                        | Reference:                                                                                  |
| Section Video:<br>mh2_mh3                                                        | Start:<br>MH2         | Direction:<br>Downstream   | End:<br>MH3            |                                                                                             |
| Material:<br>Vitrified Clay (VC)                                                 | Pipeline Size:<br>150 | Duty:<br>Combined (C)      | Invert Depth:<br>00.55 |                                                                                             |
| Date:<br>2024-03-26                                                              | Time:<br>10:10        | Comments:                  |                        |                                                                                             |



|                                                                                  |                            |                                                                                             |
|----------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------|
|  | <b>Section Information</b> | St James Church of England Primary School ,<br>Greenarce Street ,<br>Clitheroe ,<br>BB7 1ED |
| Engineer:<br>DM                                                                  | Date:<br>26/03/24          | Reference:                                                                                  |

| Additional Information    |                       |
|---------------------------|-----------------------|
| Invert Depth              | 00.55                 |
| End Depth                 | .                     |
| Method of Inspection      | Direct Inspection (A) |
| Pre-Cleaned               | Yes (Y)               |
| Pipeline Length Reference |                       |
| Pipe Shape                | Circular (C)          |