

Document Number: CLM07-JAC-TN-0000-0005

Discipline: *MEP/Wet Utilities*

Revision: P02

Date: 22.11.2022

Overview: This Technical Note has been produced to support the development of the Planning Application being drafted by Lancashire County Council and the associated quantities for the cost estimation which is being produced by Jacobs.

MEP/Utilities Services Requirements

1.1 General

This technical note document sets out the requirements and provides the performance criteria for the construction of the MEP / Wet Utilities works associated with the new Cottam Parkway Rail Station.

The services forming part of this document are:

- Foul Drainage
- Potable Water
- Fire Suppression Water system

The following MEP / Utilities works excluded at this stage:

- Electrical building services – including HV/LV design, CCTV and comms etc – please refer to a separate Technical Note documents
- Surface Water drainage - please refer to a specific works area Technical Note document for relevant surface water drainage
- Mechanical building services – to be developed at the next stage but the following assumptions have been made:
 - Building naturally ventilated with exception of some local room requirements
- Public Health services to be developed at the next stage but the following assumptions have been made:
 - Domestic Hot water production via electric point of use water heaters

1.2 Foul Drainage

1.2.1 Performance Objectives

Within the station numerous facilities are provided which will produce wastewater. Included in the planning process, the design team will investigate the most appropriate means of safely discharging the wastewater produced by the station's facilities.

1.2.2 Design Parameters

- BS EN 752 – Drain and sewer systems outside buildings
- BS EN 12255 – Wastewater Treatment Plants
- BS EN 12566 – Small Wastewater Treatment Systems for Up to 50 PT
- BS EN 13725 – Air quality – Determination of odour concentration by dynamic olfactometry
- Sewers for adoption 7th edition
- The Building Regulations 2010 – Drainage and waste disposal: Approved Document H

1.2.3 System Description

Cottam train station is situated on a greenfield site North West of Preston. No existing foul utilities are located within the proposed construction area. The closest foul sewer connection point is owned by United Utilities approximately 170m West of the station's future location, refer to Appendix A for existing utilities.

An initial desktop study has determined a gravity solution would not be possible, as the expected depth of the existing drainage connection is approximately 1.4m, according to United Utility records. This however will require further clarification during the design process.

Upon the completion of the train station a housing estate is proposed adjacent to the roadway north of the station. Within the building works of the housing plots a sewer main is to be designed and installed including a new 125mm Dia. rising main in Lea Road. This will coincide with the final expected waste water flows of the train station. (See Storey Homes Flood Risk and Drainage Strategy included in the planning application number 06/2022/1101)

The final proposal of the foul drainage for the train station is to discharge into the newly installed system upon completion, see Appendix B for an indicative route. It is proposed that the inspection chambers and pipework for the connection to the housing development rising main will be installed during the construction of the train station but may not be initially commissioned as the rising main being installed by the developer may not be completed. Therefore, as an interim proposal a wastewater treatment tank has been proposed until the connection with the new main sewer can be commissioned. The waste produced by the station will be treated locally and discharge into the nearby brook.

The wastewater treatment system proposed at planning is the 'Klargester BioDisc BH-BL Large Sewage Treatment Plant' to provide a safe, quiet, and odourless solution with minimal maintenance. Tank approximate size to be 8x3x2.6m. The exact location of the tank has yet to be determined.

In addition to the above the use of a settlement tank significantly reduces required excavation and construction time, whilst providing flexibility for any future works within the area.

1.2.4 Design Assumptions

The assumed facilities within the facility are:

- 2 WCS with washbasins (one staff one communal)
- 1 cleaner's sink
- 1 baby change sink
- 2 kitchen sinks (1 staff & 1 community use)
- 2 vending machines – assume 1 uses water

The station is expected to receive 640 thousand passenger per year, with 2 staff permanently based at the station. As this is a commuter's station it has been assumed that a maximum of 25% of the daily commuters would use the facilities over a 24-hour period. Therefore, the maximum users of the facilities for a 24-hour period is 450.

1.2.5 Risks / Opportunities

There have been two opportunities identified at this stage of the project:

1. The current assumption of 450 users of the facilities during a 24-hour period can be reviewed and defined as the design progresses.
2. The use of a gravity system can be reviewed once more accurate information is available. If a gravity system is proven to be unfeasible the option of a pumped route has the potential to be more cost efficient than a settlement treatment tank.

1.3 Potable Water

1.3.1 Performance Objectives

To provide a supply of fresh, safe, potable mains cold water to station main building

1.3.2 Design Parameters

- The Building Regulations 2010 – Sanitation, hot water and water efficiency Approved Document G (Part G3).
- HSE's L8 (Fourth edition) and Legionnaires' Disease Part 2 the Control of legionella bacteria in hot and cold water systems HSG 274 Part 2.
- CIBSE TM13

- BS 8558 Specification for design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages, BS EN 806-2 'Specification for installations inside buildings conveying water for human consumption - Part 2: Design
- CIBSE Public Health Engineering Guide G
- Water Supply (Water Fittings) Regulations 1999

1.3.3 System Description

Cottam train station is situated on a greenfield site North West of Preston. No existing potable water utilities are located within the proposed construction area. There are two 90dia water main lines located near the site. One to the east and one to the west of the proposed site location, both within approximately 120m away, refer to Appendix for existing utilities. Exact size and connection point will be confirmed by United Utilities during the application process.

Due to the current unknown network capacities, regarding flow and pressure, a small storage tank with booster pump set is recommended at this stage of design. This will allow to provide an uninterrupted supply of potable water at required flow rate and pressure rating.

1.3.4 Design Assumptions

The assumed facilities within the facility are:

- 2 WCS with washbasins (one staff one communal)
- 1 cleaner's sink
- 1 baby change sink
- 2 kitchen sinks (1 staff & 1 community use)
- 2 vending machines – assume 1 uses water

Recommended daily water demand has been assessed at 10.5m³ a day based on :

- 640 thousand passenger per year,
- Water demand of 6L per passenger - Based on CIBSE Guide G Table 2.9

The provided 1000L potable water storage tank is assumed to provide enough capacity to deal with peak times. It is assumed there is enough capacity within the United Utilities network to provide a minimum of 32MDPE dia supply pipe, capable to provide 0.8l/s and filling the tank from empty to full within 20min.

1.3.5 Risks / Opportunities

Due to unknown capacities within the mains water network it is recommended to engage with the United Utilities at early stages to establish any design restrictions or requirements. This could include for possible:

- requirement of side wide network upgrade.

- Connection point to water mains network is indicative only and should be agreed/confirmed by UU
- In unlikely event that UU is unable to provide a minimum of 32dia supply @ 0.8l/s a review of potable water storage tank might be necessary including the review of mechanical plant size.

The feasibility of connecting the water system to the existing network is to be investigated through the design process, with the Eastern connection presenting the shorter route, therefore limiting the required excavation work.

1.4 Fire Suppression Water system

1.4.1 Performance Objectives

To provide adequate supplies of water for the sitewide station area for firefighting purposes

1.4.2 Design Parameters

- Fire Strategy Report
- Lancashire Fire and Rescue Service requirements
- Building Regulations Approved Document B
- BSI BS 9999 - Fire safety in the design, management and use of buildings – Code of practice - CORR: February 2017
- BSI BS 5839-1 - Fire detection and fire alarm systems for buildings

1.4.3 System Description

A wet fire hydrant network is to be provided, with 90m spacing, external to the station,

The system is required to provide 2100 L/m for a 45minute period. The system will be connected to an external water storage tank at a size of 95m³. The tank will be located underground with a dedicated pump house above ground.

Dry risers will be will be provided for both sides of the platforms. The dry risers will be provided with breach inlet for use by the fire brigade, with no direct connection to the external hydrants.

Based on Fire Report there is no sprinkler system is required for the station building.

1.4.4 Design Assumptions

The below design assumption used to determine the system:

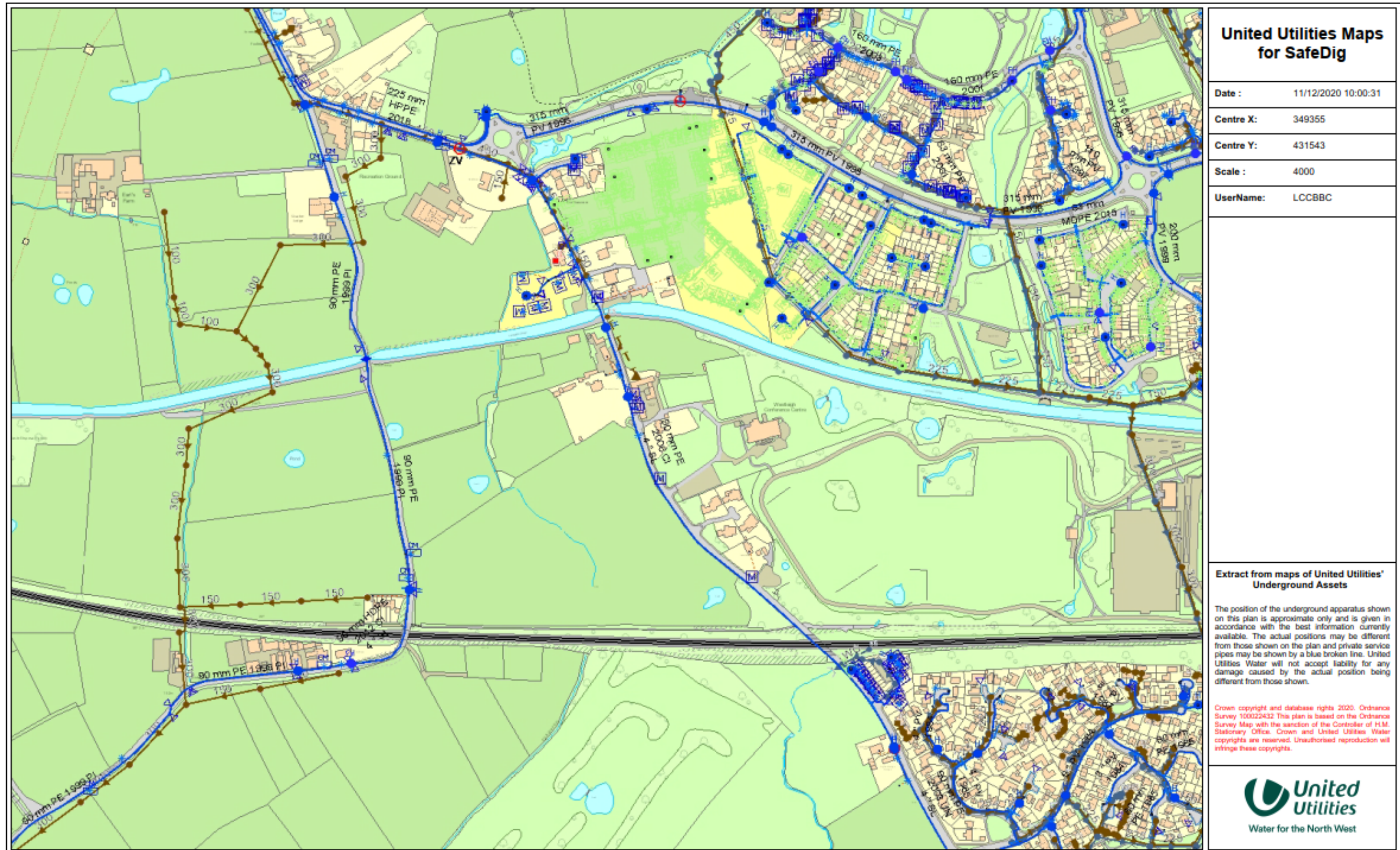
- The refuse area will be protected by a standalone mist suppression, supplied by bottle water storage.
- A flow rate of 2,100 litres per minute over a 45-minute period is required for the hydrants.
- It is assumed there is not enough capacity within local water main to connect into, therefore a 95m³ external water storage is required to provide the necessary water for

fire protection requirements. This should be checked and liaised with the water authorities

1.4.5 Risks / Opportunities

As the design of the station develops, it will be confirmed whether the proposed fire suppression for the refuse area and electrical room is the correct engineering solution. Through the development of the local area there is the opportunity to provide a direct water main connection to the station's hydrant network.

1.5 Appendix A



Section C-C
CLM07-JAC-
DR-0130-2000

Section D-D
CLM07-JAC-
DR-0130-2000

125mm HPPE risingmain
along Lea Road to approx
802m Length

Risingmain will require surge
analysis due to length.

Pond bed level 17.00
Pond min top of embankment level 18.50

Pump station
26.08m³ Emergency
storage required for 163
dwellings. Cover level to
be above 200yr WL.
3.7m Extra depth of well
well based on 3m dia
ring. Design by others.

New culvert installed under railway zone
min. 975Ø laid at 1in400 to allow for site
discharge. With Althon Precast Headwall
with Trash Grill or similar equal approved.

Lea Road

Preston >
< Salwick

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