



New Smithfield Market

RussellWBHO Investigative Works

to

Establish the Location of the
Cornbrook Tributary

as shown on Arcmap GIS information

12th July 2022

Introduction

RussellWBHO has submitted a new planning application for part of the New Smithfield Market site to construct 2 new warehouse Units to the southwestern end of the existing site.

The works will involve the demolition of existing markets buildings and the erection of 2 steel frame buildings with concrete pad foundations, cladding and associated external carparking and access roadworks.

During assessment of a previous application for the site the Lead Flood Authority have raised a concern over the route of a culverted water course that is shown within the Arcmap GIS information mapping system to cross the southwest corner of the existing New Smithfield Market site below existing markets buildings completed circa 1960.

The pre-commencement condition for Application Reference **127742/FO/2020** was as follows

7) No construction works shall commence until further survey works have taken place to ensure that the Corn Brook Tributary Culvert is not located within the proposed building footprint and not within at least 3m of the proposed building perimeter. These surveys shall be submitted to and approved in writing by the City Council as Local Planning Authority . The development shall be implemented on accordance with the approved scheme.

The Arcmap extract is shown below in Figure 1.

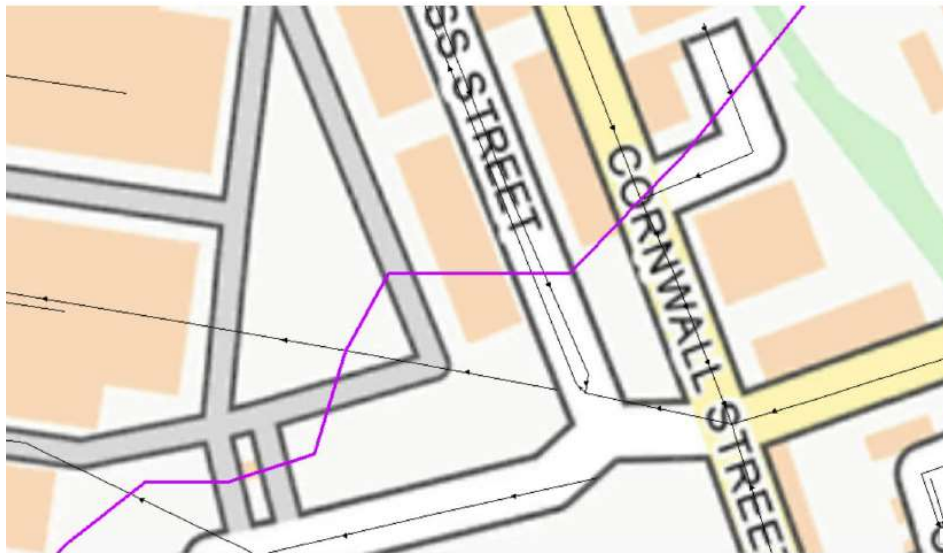


Figure 1. Extract of the Arcmap showing route of the ordinary water course culvert referred to as the Corn Brook Tributary – New Smithfield Market

Historic Search and Desktop Review

As part of the Geotechnical data study an historic map review was conducted of the area from 1848 to the present day

Table 3.1 of the geotechnical report shows the history of the site and notes the existence of Corn brook tributary stream in 1848 culverted under the Stockport Canal (see figures 2 &3) but no further mapping reference is made to the canal or culverted stream in subsequent ordinance maps

TABLE 3.1 SITE HISTORICAL DEVELOPMENT

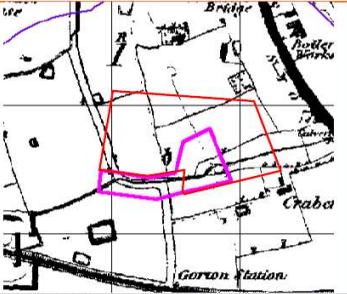
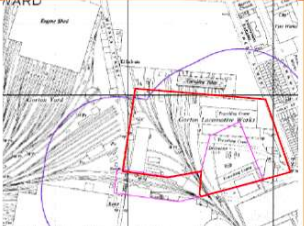
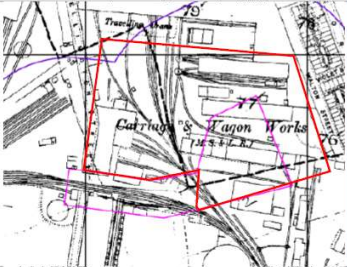
MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT			
1848 1:10,560	The site is predominantly agricultural fields with a road running north south through the centre of the site. A small stream flows east west across the site and a pond is present in the centre of the site.		1951-1952 1:2,500	A locomotive works is present on the site. Buildings have been removed indicating demolition activities. Travelling cranes are shown on site. A destructor is identified in the central sector.	
1893 1:2,500	The site is occupied by a carriage and wagon works with railway tracks across the central sector and industrial buildings across the site. Travelling cranes related to the railway sidings are present in the north of the site.		1977-1980 1:1,250	The former locomotive works have been replaced by New Smithfield Market, indicating demolition and construction work. An electricity substation is shown in the north west of the site.	
			1978-1987 1:1,250	No significant changes	

Table 3.1 Extract of Historic Map Searches for E3P Phase 1 Geotechnical Report showing development of the site area from 1884 to the current Market of note neither the Stockport canal or the culvert are present on the OS map from 1893 onwards

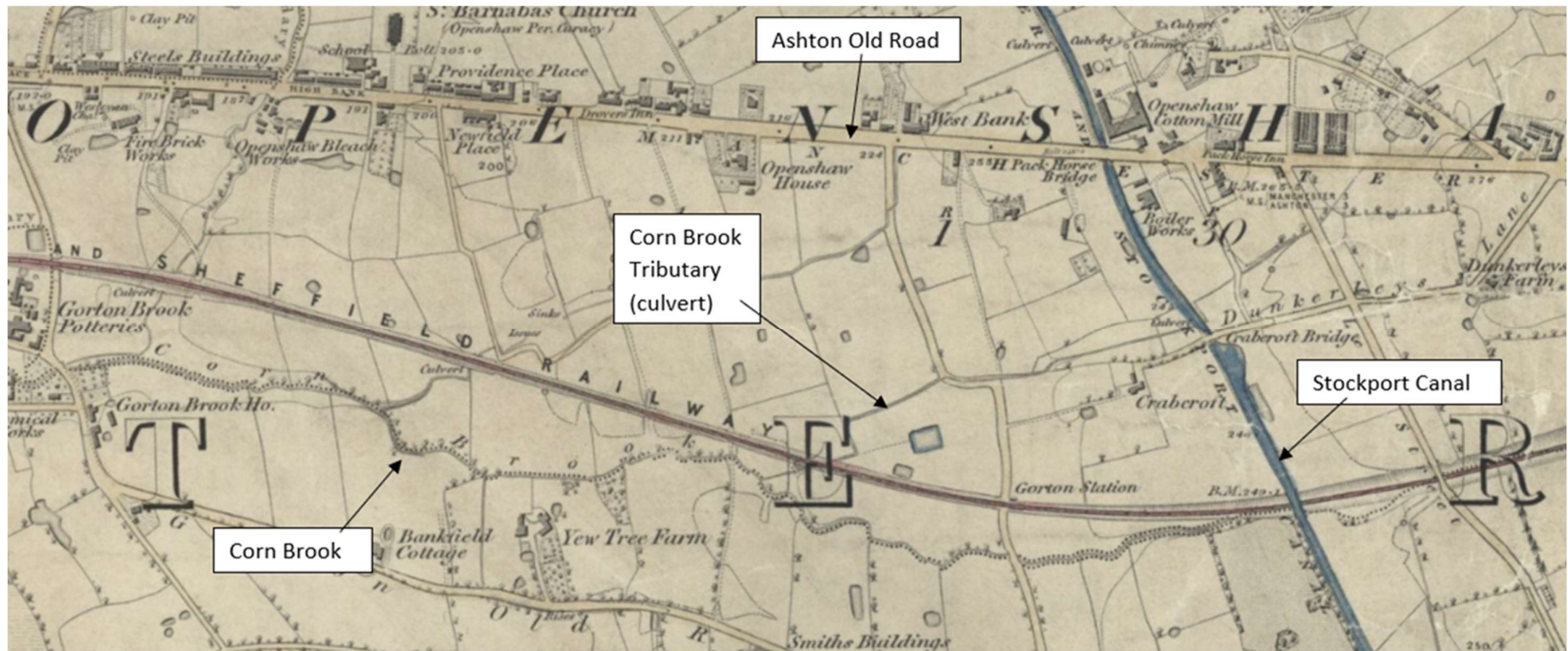


Figure 2 Extract of Historic 1848 Map with key elements noted

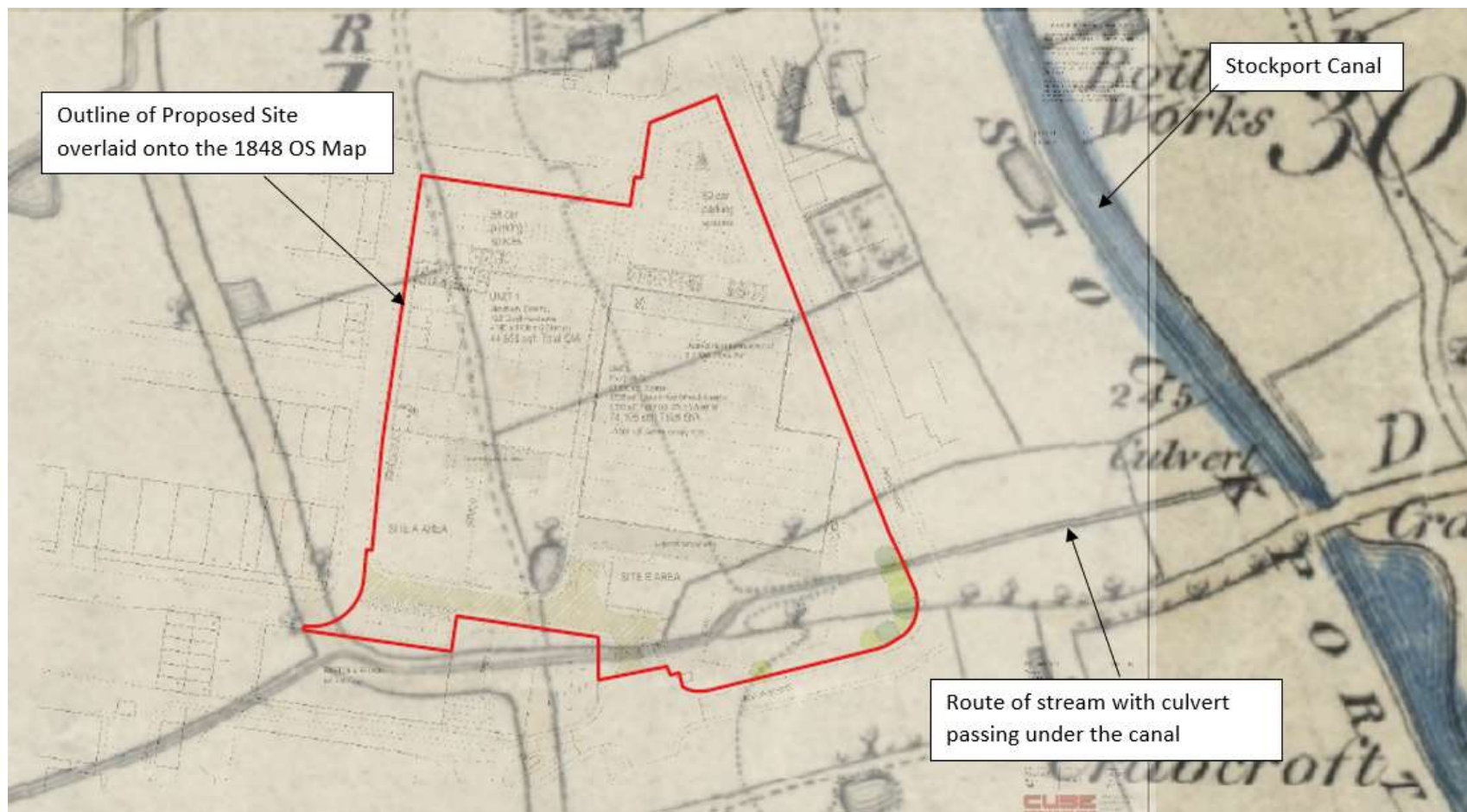


Figure 3 Larger Scale Historic 1848 OS map (source NLS) with proposed development site boundary overlaid

As part of the desktop review RussellWBHO has produced an overlay assessment of the Arcmap culvert route, the proposed development site general arrangement and the historic route of the Cornbrook Tributary shown in figure 4 below.

RussellWBHO was unable to make a direct link at the upstream section of the Arcmap culvert route (purple line) and that of the cornbrook tributary (blue line) on the overlaid plans assessment. If correct, as the Arcmap route, the culvert would pass directly under the southwest corner of the larger Unit 2 building.

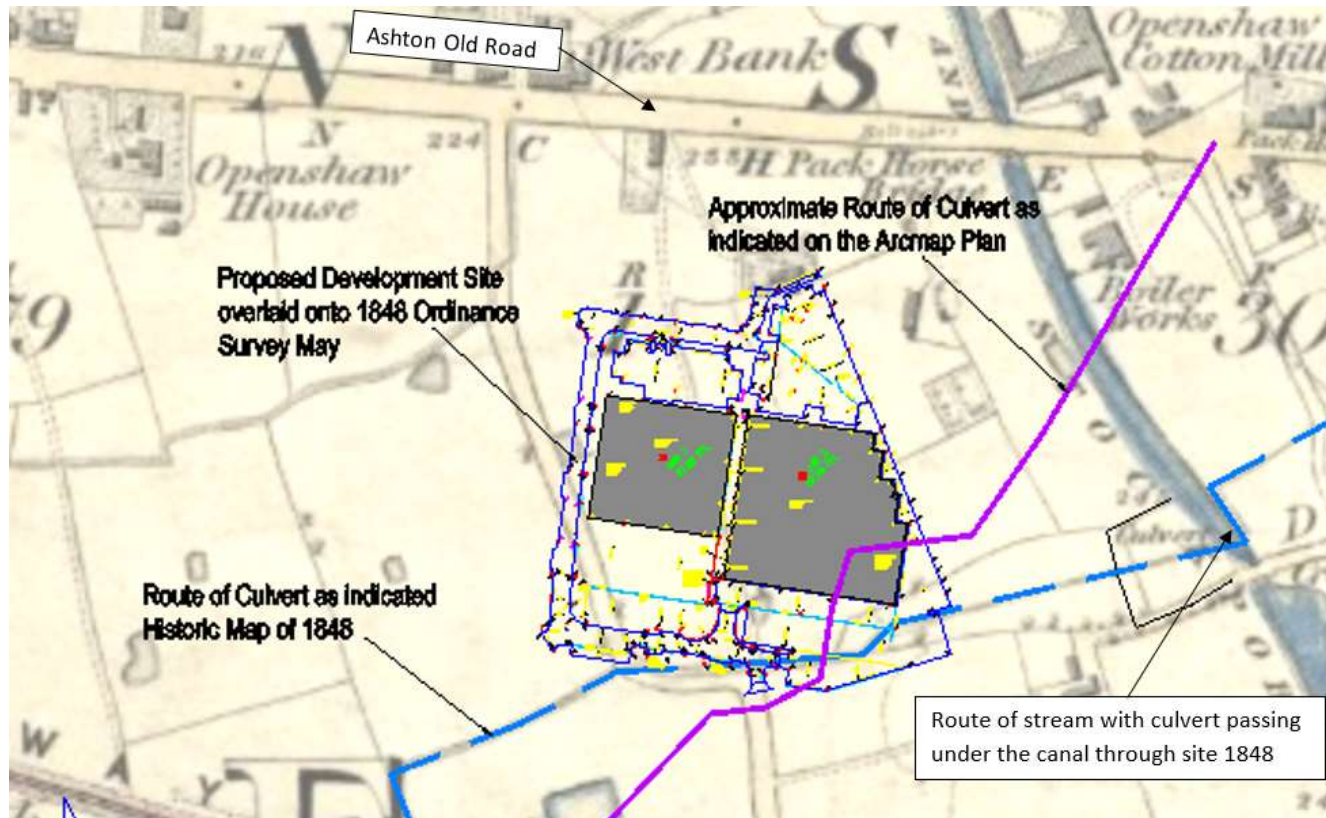


Figure 4 Proposed site general arrangement overlaid on the exiting 1848 map

As part of the ground investigation works a series of bore holes and trial holes was completed within the site area located to avoid damage to existing drainage routes. At the time of these intrusive surveys the engineers were not aware of the potential existing Arcmap culvert.

Exploratory Hole Location Plan

Location Options

- Approximate Utility Service Provider Location
- Approximate Utility Service Provider Location with Detail
- Approximate Trench Location
- Approximate Cable Penetration Location

Revision

Rev	Rev By	Rev Date	Rev Description
1	REV	18.05.2020	LM
2	REV	25.05.2020	CB

Client

Russells Construction

Job File

12-757
005

Date

29.05.2020
NTS @ A3

Job Title

Barton & Redman, Manchester

Drawing Title

Exploratory Hole Location Plan

Notes

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Figure 5 Part Markets site plan with intrusive bore hole and trial pit locations shown

Additional Drainage Survey Work

As part of the compilation of existing information for the revised planning submission for the site RussellWBHO instructed an extensive series of drainage network surveys that included a camera condition survey, a drainage levels survey and a sub-surface radar scan to identify existing buried services both within site and to the local area adjacent to establish if the actual location route of the cornbrook tributary could be found.

To assist the survey works RussellWBHO received a Market wide drainage plan from Manchester City Council Engineers covering the site produced in 1970. Of note within the plans is an older drain referred to as the Collyhurst 'V' Sewer that is adjacent to the proposed development site and highlighted below in figure 6.

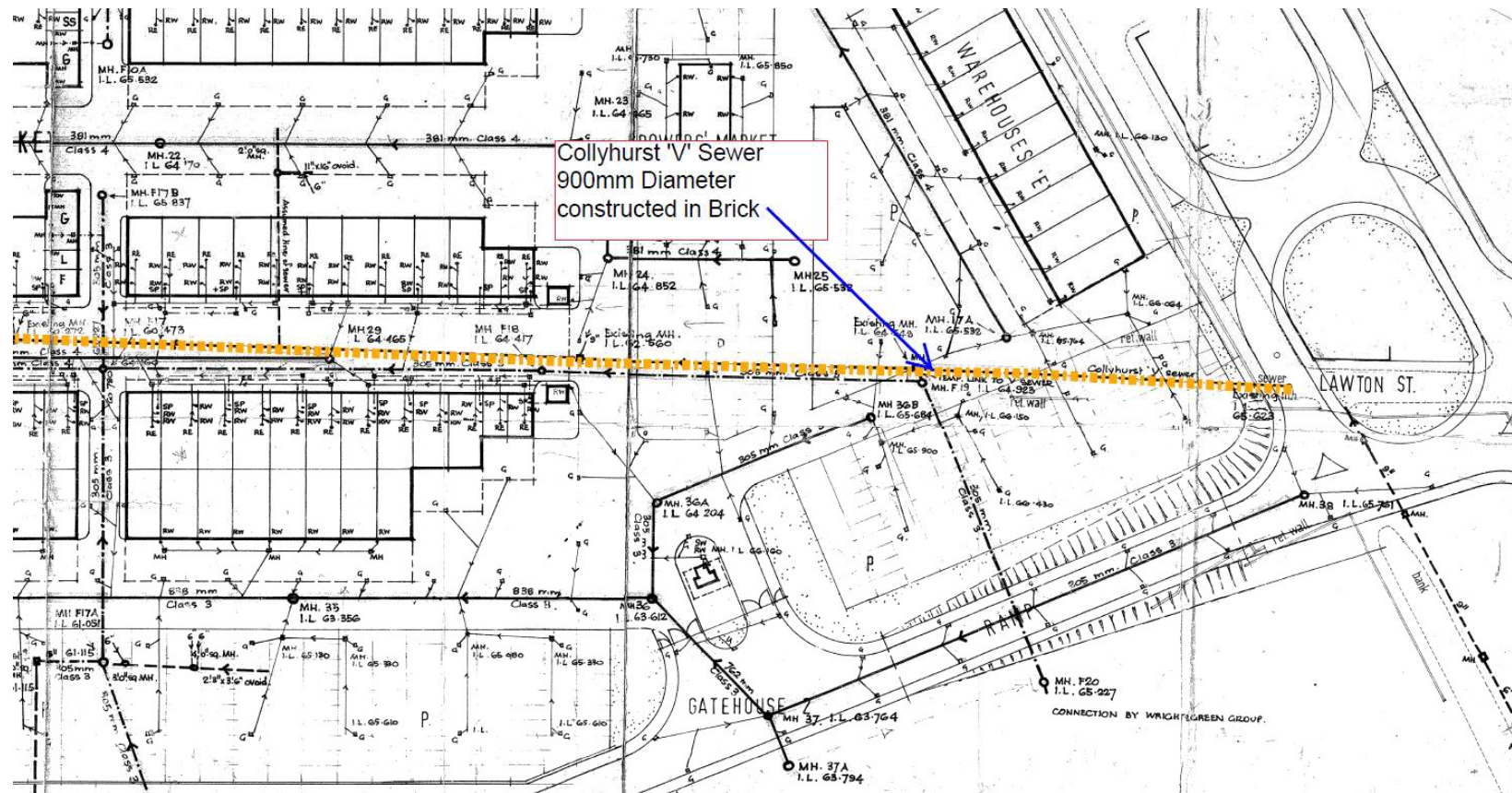


Figure 6 Extract of the existing site drainage plan from 1970 highlighting the route of the Collyhurst 'V' sewer

The Existing Collyhurst V Sewer



Images 1 & 2 showing the construction of the Collyhurst 'V' Sewer at the entry manhole closest to site

The Existing Collyhurst Sewer drain run consists a circular brick construction, 900mm diameter and is estimated to be between 125 and 150 years old based on the type of construction a evidence or wear at the base.

Images 1 & 2 are taken from within the sewer entry manhole closest to the development site

The sewer has a sandstone trough lining to the base and engineering brick to line with the pointing generally appears to be intact and in good condition throughout.

The sewer run enters the site from the south west corner from Lawton Street and continues through the market from west to east exiting across Bessemer Street

CCTV Camera Survey

A camera survey of the existing markets drainage has been completed from each manhole access point including the Collyhurst 'V' sewer run that shows the sewer to be in good condition with only minor defects despite the age of the drain as can be seen in images 3 & 4 below.



Image 3 & 4 showing the condition of the 900mm diameter Collyhurst 'V' sewer

During the camera survey of the existing network no evidence of the culvert being branched into the existing network drainage pipework was found along the Arcmap route and its potential interface with the existing drains.

RussellWBHO completed an overlay assessment of the existing drainage, the historic rout of the Cornbrook Tributary and the Arcmap route of the culvert. A summary of all the survey findings and key interface points with the Arcmap route and existing drainage is noted within the detail of figure 7.

The overlay of the collated information could not establish a direct intersection between the Arcmap culvert route and that of the historic watercourse route shown on the 1848 Ordinance survey Map

Datum Levels Survey

A Levels Survey of the existing drainage network has established drainage depths to OS datum in the area local to where the Arcmap plan denotes the Cornbrook tributary route of between +64.400mm (2870mm deep from existing ground level) and +63.410mm (3900mm deep from existing ground level).

From the survey work carried out we have been unable to establish the existence of the culvert route as noted on the arcmap within the proposed development site between the current ground level and a depth of 3900mm below ground as an absolute minimum based on the depth of the existing drains.

We have concluded that should the culvert route exist as mapped it would be a further 1m below this level at the very least due to the construction excavation required to install the current drainage network within the market site.

In addition to the camera and levels surveys for the drainage a services sub-surface radar scan was completed to the upper 2m of the existing ground to identify all buried services including gas, mains water and electricity cabling.

No evidence of a culvert or void was found within the site during the sub-surface scan.

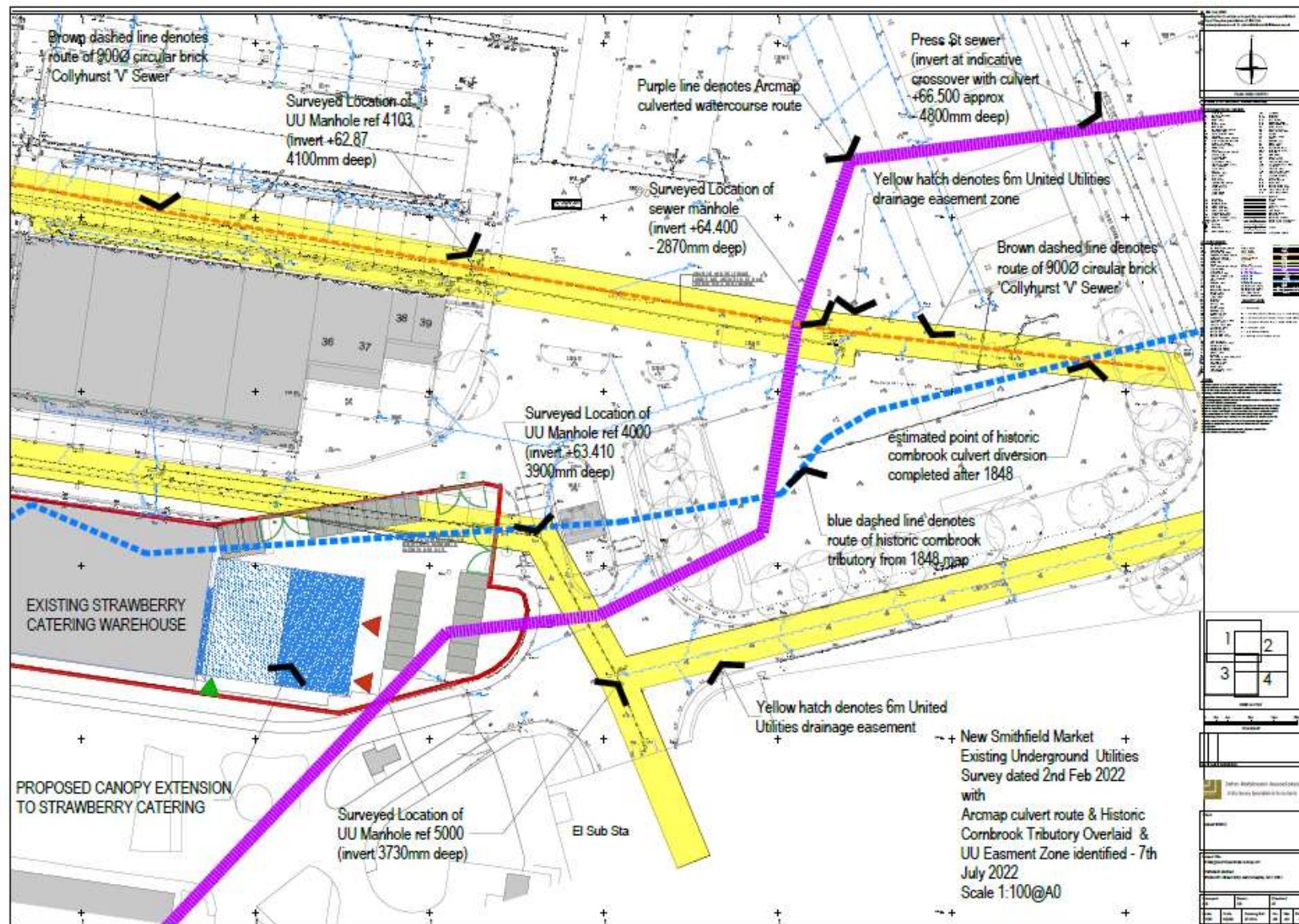


Figure 7 Existing site general drainage plan with Arcmap culvert route overlaid and key interface points noted

Proposed Development

The new proposals for the site include 2 warehouse buildings with the Arcmap route as drawn passing under the southwest corner of the larger of the two warehouses Unit 2. The new units are to be constructed from a clad steel frame and shallow concrete pad foundations bearing onto the stiff underlying clay strata. The new foundation bases will be approximately 1450mm below external finishes.



Figure 8 Proposed Site plan with foundations and Arcmap culvert route overlaid

The proposed floor datum for Unit 2 is +67.700 with the lowest external finishes level against the building being at +67.500.

Therefore, the lowest excavation for the proposed pad foundations is +66.500. Given the shallowest depth of surveyed drainage has an invert of +64.400 the 2100x2100x1000mm deep foundation bases would be +2100mm above this level.

Summary

Following the desktop study and subsequent site survey work RussellWBHO have been unable to establish the location of the existing culvert as noted on the Arcmap. In addition, whilst RussellWBHO do not have access to the wider route of the Arcmap culverted Cornbrook tributary we have also been unable to establish a logical route to link a between the culvert route of the Arcmap and the original route of the watercourse locally around the site from either historic maps or intrusive surveys.

We believe following the overlay of historic information and existing drainage from the completed surveys established a likely interface between the Cornbrook Tributary shown in the 1848 Ordinance Survey map and the existing 900mm diameter 'Collyhurst 'V' brick sewer towards the southwest corner of New Smithfield Market site identified within the details shown on Figure 7 or further upstream along the Collyhurst 'V' sewer on Lawton St.

Whilst we have been unable to provide conclusive evidence that the Collyhurst 'V' sewer is the actual route of the culvert indicated on the Arcmap, the age and size of this sewer are typical of historic engineered culverts constructed to divert an existing watercourse elsewhere in the city.

The Arcmap route of the culvert, if correct, shows that a significant number of existing buildings both within the market site (1970's) and to the adjacent surround area both up-stream and down-stream have historically been constructed directly over the culvert.

The completed surveys have established the depths of exiting drainage are at least 2870mm deep below existing ground level with no evidence of a branch connection for the culvert and therefore should the culvert be located as the Arcmap mapping it can only be at a much deeper invert level with proposed foundations at least 2.4m above the likely shallowest depth of the Arcmap culvert route and would impose ground bearing loads similar to those currently imposed on the ground by the existing markets buildings

