

PLANNING SUPPORT DOCUMENT

DATE:	14 October 2021	CONFIDENTIALITY:	Confidential
SUBJECT:	C&S Philosophy		
PROJECT:	HOME Arches	AUTHOR:	Selina Redmore
CHECKED:	Stephen Straughton	APPROVED:	Stephen Straughton

THE SITE

The site is located on Whitworth Street West and sits behind the HOME building, separated by the service yard. The arches are currently unoccupied external spaces and used as an area of storage for HOME.

The red brick arches form part of the busy Castlefield corridor, a multi-span viaduct which carries a mixture of local and long-distance passenger trains as well as intermodal freight trains. The site sits between Manchester Oxford Road Station and Deansgate Station.

EXISTING STRUCTURES

It is understood that the arches were constructed in the late 1840s. The structures comprise brickwork masonry piers, soffit and spandrels. The arches have been historically strengthened using pattress plates and tie bars through the arch barrel. There is evidence of water seepage and calcite throughout the soffits and elevations and some areas of spalling to the piers.

The pavement level on Whitworth Street West is approximately 1m above the ground level within the arches. The steps down into two of the arches (Arch 1 and 2) form retaining structures along this line. Arch 3 adjacent to the loading bay sits at a slightly lower level.

SITE INVESTIGATION

Works are currently being scoped for approval with Network Rail. The investigations will be focused on assessing the constraints posed by:

- The existing viaduct foundations;
- The retaining walls along Whitworth Street West;
- Ground conditions in general.

Following the investigations, a geotechnical assessment of the ground will be undertaken to advise on the foundation type with allowable ground capacities to use for the foundation design. As the arches will be transformed into habitable spaces, there will likely be a requirement for ground gas monitoring.

BELOW GROUND DRAINAGE

A drainage survey is to be commissioned to determine the connectivity and condition of the sites existing drainage system, including position of down pipes from the rail arches above, and any drainage installed to serve the arches as part of the redevelopment work in the immediate vicinity.

The proposed below ground drainage foul and surface water drainage systems will be designed in accordance with BS EN 752:2017, the Building Regulations 2015 Approved Document H "Drainage and Waste Disposal" and Sewers for Adoption. Pipes will be laid at gradients to achieve self-cleansing velocities of 0.75 metres per second for foul sewers and 1.0 metres per second for surface water sewers.

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Below ground drainage pipework will be either concrete to BS EN 1916 & BS 5991-1, clayware to BS EN 295 or structured wall plastic pipes to BS EN 13476.

Double rocker pipes or flexible joints are to be provided for any elements that connect between piled and non-piled elements.

Manhole covers and channel drains covers shall be able to withstand minimum D400 loading class for vehicular loading and B125 for pedestrian only. Manhole covers may be recessed in areas of public realm.

Should new drainage be required, foul drainage will connect into manhole F1.0, with pumping likely to be required depending on levels. Rainwater pipes from the arches will drain to a new surface water drain which will outfall into the existing surface water drainage network which passes through the oil separator.

It is assumed that the design of the surface water drainage and attenuation, previously installed as part of the wider redevelopment works, included the catchment area generated by the rail arches, and that further surface water attenuation is not required.

STRUCTURAL FRAMING

A structural frame will be constructed in either steel or timber to support the lighting rig, possible aerial work and MEP equipment. The frame will be independent such that no significant loading will be applied to the existing Network Rail railway arches. The beam to column connections will be designed to resist horizontal forces, omitting the need for vertical bracing and allowing an open plan space.

The units housing the facilities will be constructed using load-bearing masonry. This will be tied back to the structural frame for lateral stability. The roof over the units will be constructed in concrete or timber and designed to support MEP equipment.

FOUNDATIONS

At this stage, it is anticipated that the new structure will be supported on a raft slab foundation, transferring loads from the columns into the ground below. This will be subject to the ground conditions and final column loads. An upstand off the raft slab will form the retaining wall along the Whitworth Street elevation. Thickenings in the slab will be provided to support the load-bearing masonry.