

VITAL ENERGI UTILITIES LIMITED

Manchester Civic Quarter Heat Network (CQHN)

The Town Hall Extension and Central Library Complex

Design and Access Statement

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Revision History						
Revision	Date	Page(s) Affected	Description	Produced By	Checked By	Approved By
P1	05/12/2017	All	Preliminary Issue	SJR	-	-
P2	15/12/2017	All	Preliminary Issue	-	-	-
P3	21/12/2017	All	Updated based upon Comments from Turleys.	SJR / IA	SJR	PK
P4	14/12/2020	All	Updated for new HV cable route and LBC submission	ME	RG	CH
P5	07/01/2021	All	Turley comments incorporated. Appendix B added to the report.	ME	RG	CH

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1 Introduction

This Design and Access statement serves to provide information in sufficient detail for the intended connections of district heating and power to the Town Hall Extension and Central Library Complex. It is part of the overall planning application for the Manchester City Council (MCC) Civic Quarter Heat Network (CQHN) project. The information provided in this report is specific to the Town Hall Extension and Central Library connection in order to clearly explain the work content and any impact on the Grade II* listed areas of the building.

This document has been prepared in accordance with the requirements of Circular 01/06 and the CABE Guidance "Design and Access Statements – How to Read, Write and Use Them."

The report covers: -

- Scope of work.
- Method statement of works.
- Structural considerations.
- Drawings of the work entailed.
- Outline specifications.



2 Background to the Project

The MCQHN project is part of the Greater Manchester (GM) heat network programme, which has identified a pipeline of heat network opportunities across the ten Greater Manchester authorities.

Manchester – A Certain Future (MACF) is the city's climate change action plan, setting out the vision and commitment for Manchester to become a leading low carbon city by 2020. MACF recognises that low-carbon decentralised energy networks will play a key role in the city meeting its 41% carbon reduction target by 2020 (from a 2005 baseline), and they will help to ensure the city's energy supply is more resilient.

MCC's contribution to MACF includes the commitment for MCC to deliver heat networks. The Civic Quarter contains a number of key MCC-owned buildings, and the Authority is committed to supplying them with low-carbon energy as well as demonstrating leadership to others in the city to do the same.

The CQHN is a network that is located in the Civic Quarter area of the city centre. The heat network in this phase of work is intended to serve the following core buildings in the Civic Quarter: Town Hall Extension and Central Library, Manchester Central (the proposed location for the energy centre), Bridgewater Hall, Manchester Art Gallery and Manchester Town Hall. The initial phase of works also includes the supply of electricity to Manchester Central, Town Hall Extension and Central Library, Bridgewater Hall, Heron House and Manchester Town Hall.

As part of the MCQHN project, a previous listed building modification has been granted. Please refer to planning application number 118871/LO/2018. The following report has been modified for the proposed High Voltage (HV) cable route change only, with pipework and mechanical plant references removed as we are not applying for modification to these element of works.



3 Town Hall Extension and Central Library Complex – Outline Description

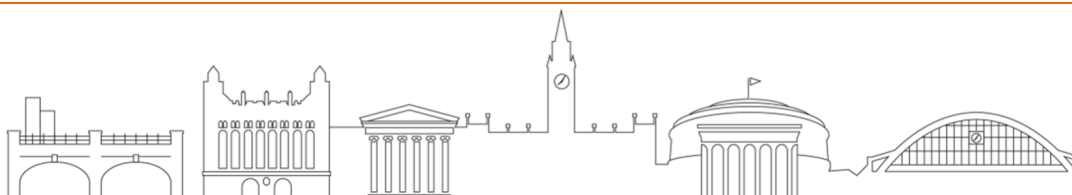
The Town Hall Extension and Central Library Complex connection involves the installation of a new 6.6KV HV ring circuit to serve the existing electrical substation located within the basement level. The HV cabling follows the same route via Mount Street from the main Energy Centre at Lower Mosley Street. It is then proposed as part of the new route for the HV cables to enter existing spare cable ducts down Peter Street, before entering into the basement plant room where it then traverses to the existing substation also located within the basement level.

Due to health and safety reasons the original proposed route proposed through the buildings undercroft via the existing boiler plantroom where the district heating enters the building, was deemed to be unacceptable to install the HV cable and containment within, due to the low height in the enclosed space (~1500mm from finished floor level to soffit). The undercroft was also unlit which also led to the decision for the new proposed route described above.

The Town Hall Extension electrical connection consists of a 6.6kV ring connection onto an existing private ring main unit that is installed within the existing Town Hall Extension ENWL substation. The principal works on the building will be the installation of 6No. single core HV cables from the new 6.6KV private HV network into the Town Hall Extensions substation.

The 6No. 185mm² single core cables (approximately 80mm diameter per 3 no. cables) forming the ring circuit will follow a separate route to the heating pipework penetrating from the Peter Street into the Town Hall Extension basement plant room as originally proposed. The cables will break through into the service corridor at the basement plant room adjacent Peter Street, where it will traverse through the existing plant room to the HV substation also located in the basement. The cables will be installed at high level on cable ladder supported from the soffit/structure above. Please refer to appendix B of this report for further supporting survey photos, for the proposed HV cable route through the basement plantroom and where the cable ducts are proposed to enter the building.

The integration of the existing systems will require the installation of a fibre optic ring circuit which will be installed adjacent the buried heating pipework within new buried 100mm cable ducts. As described above this element of works has already been granted LBC.



4 Scope of Works – Electrical

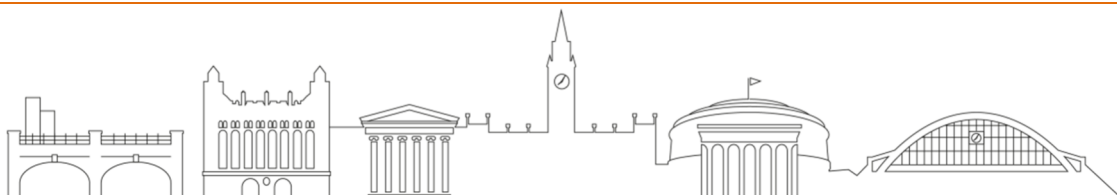
4.1 Method statement

A new 6.6kV ring circuit comprising of 6No. 185mm² single core cables will be installed upon 450mm medium duty ladder rack containment within the existing basement water treatment plant room. The ladder rack will be installed to the underside of the existing structure within the plant room. The cable will terminate within the existing substation, at the existing RMU's.

Proprietary “wedge anchor” fixings will be installed into the existing structure to allow support bracketry to be installed to support the ladder rack containment throughout the plant room. Holes will be drilled into the building fabric to allow proprietary “wedge anchor” fixings to be used.

The penetrations through into the existing ENWL substation will be via 2No. new 100mm core drilled holes located adjacent the existing ENWL cable penetrations.

Please refer to the containment drawing layout for a section of the ladder including its fixing arrangement from the soffit above.



5 Construction Work and Structural Considerations

5.1 Holes through existing structure

To install the new cabling new holes to allow a route through the existing structure will be required. It is envisaged that the 2no. 150mmØ holes will be core drilled below the external ground level into the existing external building facade. The 2no. cable ducts will be sealed with Roxtec cable duct seals to prevent the ingress of ground water into the existing plant room via the cable duct entry points. The cable ducts penetration will also be sealed with suitable weatherproof sealing compound, with the existing below ground building tanking and membrane reinstatement in mind.

Please refer to the drawing layout and photos in Appendix B for the exact location.

The forming of holes to allow distribution routes will be reviewed by a structural engineer to ensure there is no structural impact to the existing building structure.

5.2 Holes for fixing to structure

The means of fixing to the existing structure will also be checked by a specialist to ensure that a sufficient quantity of fixings are installed to allow the weight of the new HV cabling and cable ladder so that it is adequately supported.

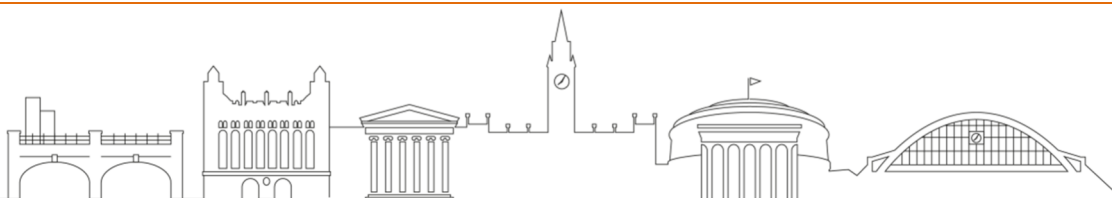
Holes will be required to allow fixings to be used to support the cable ladder.

The forming of holes will be reviewed by a structural engineer to ensure there is no structural impact on the existing building.

It is envisaged that holes required to allow fixings will be ~20mm diameter at largest, and these will be in the water basement water treatment plant room.

5.3 Additional weights imposed by installation

The additional weights of the proposed pipework / cabling and plant will be reviewed by a structural engineer to ensure that the additional weight imposed causes no detriment to the existing structure.



6 Specifications

6.1 Containment

The 2No. HV cables running through the plant rooms and service corridor will be installed upon 450mm medium duty SW6 ladder rack containment as shown in the image below, all elbows and Tee pieces will be pre-manufactured.

Cable Ladder

The Speedway Cable Ladder System represents a major advance in cable ladder design, providing faster and easier installation, a unique coupler locking system and a comprehensive range of accessories.

The Speedway Cable Ladder System is subject to Registered Design, Trade Mark and Patent considerations and conforms to BS EN 61537:2007.

Speedway 4 (SW4) Medium Duty Cable Ladder is manufactured in 3.0m lengths as standard with 6.0m lengths to order. The cable ladder is available in standard widths of 150mm, 300mm, 450mm, 600mm, 750mm and 900mm, although other widths up to 1050mm are available to order. Rung spacing is 300mm as standard.

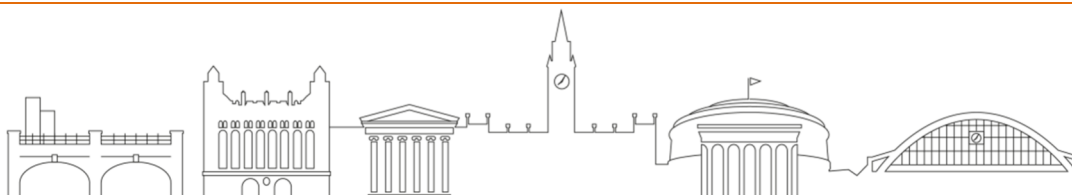
Finishes available



Quality & Accreditations



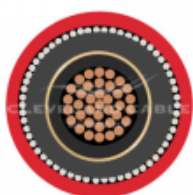
Code	W (mm)	H (mm)	W1 (mm)	Length (mm)	No. Rungs	Weight (kg)		Downloads	
SW4-SL3-150-GY	150	110	200	3000	10	13.93	Speedway Cable Ladder Systems	Catalogue Page	Documents ▼
SW4-SL3-300-GY	300	110	350	3000	10	15.55	Speedway Cable Ladder Systems	Catalogue Page	Documents ▼
SW4-SL3-450-GY	450	110	500	3000	10	17.17	Speedway Cable Ladder Systems	Catalogue Page	Documents ▼



6.2 HV Cable

The cables forming the 6.6kV private ring network will be 185mm² CU CTS XLPE SWA LSZH, manufactured to BS7385 as per the data sheet below.

BS 7835 XLPE LSZH SINGLE CORE COPPER TAPE SCREEN 11KV CABLE



APPLICATION

Medium voltage power and distribution cable is used for supply networks. The low smoke halogen free construction makes this cable ideal for use in public buildings.

Please note: Red outer sheath can be prone to fading when exposed to U.V rays.

CABLE STANDARDS

BS7835

Flame Propagation to BS EN 50265,
BS EN 50266 (IEC 60332)

Acid gas emission to BS EN 50267 (IEC60754)

Smoke emission to BS EN 50268 (IEC61034)

CONSTRUCTION

Conductor: Stranded Plain Annealed
Compacted Circular Copper Conductor

Insulation: Cross Link Polyethylene (XLPE)

Metallic Screen: Individual or overall copper
tape screen

Separator: Binding Tape

Bedding: LSZH

Armouring: Aluminium Wire Armour

Sheath: LSZH

Sheath Colour: ■ Red

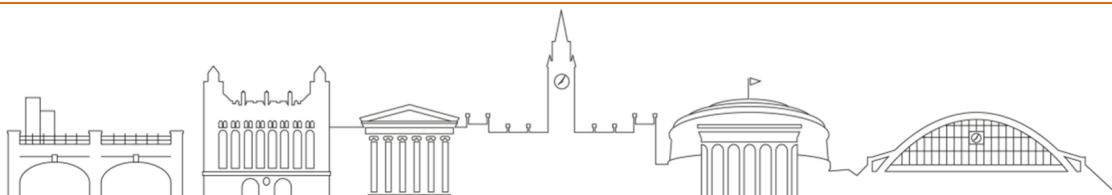
CHARACTERISTICS

Voltage Rating: 6350/11000 Volts

Temperature Limits: Up to 90°C

Minimum Bending Radius: As per cable
manufacturer datasheet

Should not be installed at temperatures
below 0°C or above +40°C



6.3 Cable duct seal

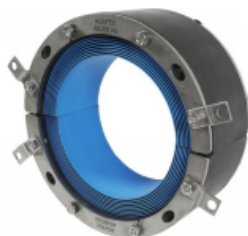
Roxtec RS UG™ seal

The Roxtec RS UG™ is a two-part seal for installation around single cables or pipes entering via foundations. It works as a long-lasting barrier against flooding, gas, humidity and rodents. The transit can be installed also in wet conditions and environments with running water. It withstands extreme cable bending and has a +5mm tolerance towards the aperture as well as an indicator showing when a compressed seal is achieved. The seal can be installed into sleeves, conduits and core drilled holes.

- For single cable or pipe



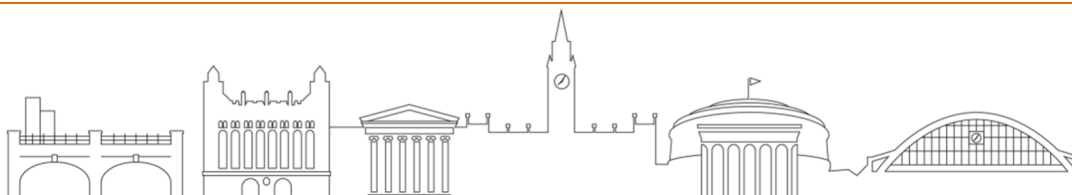
RS 110 UG



IMG_6572 RS 200 UG WOC fix.tif

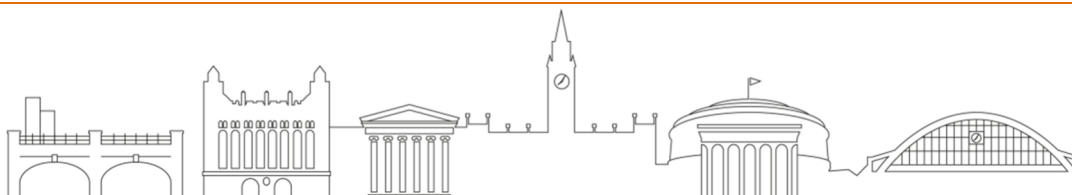


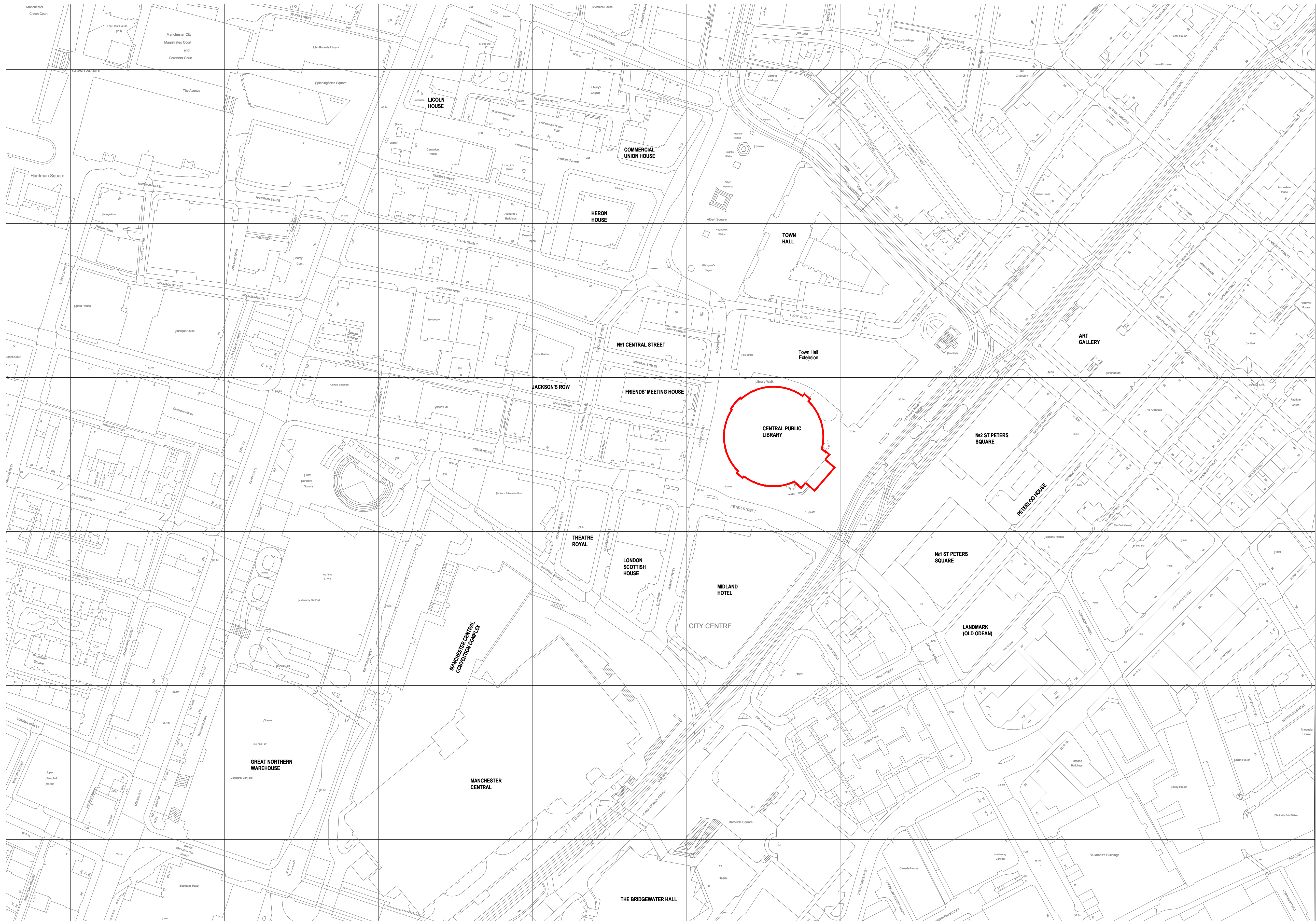
RS 110 UG



7 Appendix A – Drawings

Drawing No.	Title
50467-VE-CL-00-SI-M-XX01	Site Location Plan.
50467-VE-SW-BG-DR-M-5601	Heat Network Layout
50467-VE-TE-ZZ-DR-E-6101	Manchester Town Hall Extension & Central Library HV Private Wire Connection





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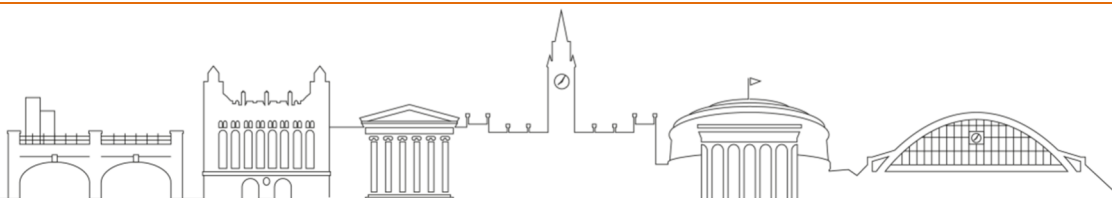
8 Appendix B – Survey Photos



Proposed building entry position externally / adjacent Peter Street

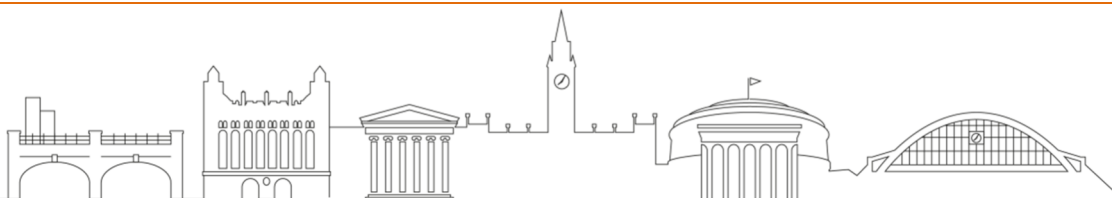


Proposed building entry position internal basement level



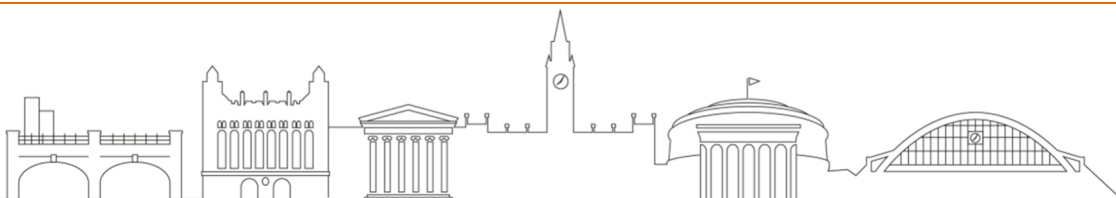


Proposed building entry position internal basement level



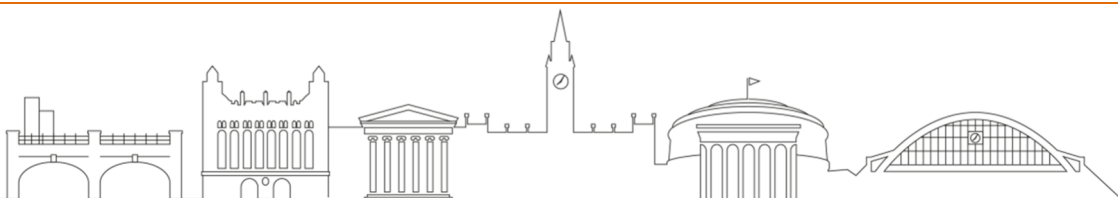


Basement plantroom HV cable ladder route adjacent existing services



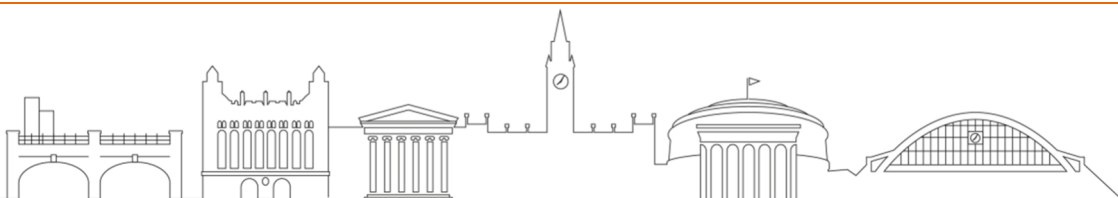


Basement plantroom HV cable ladder route adjacent existing services





Basement plantroom HV cable ladder route adjacent existing services

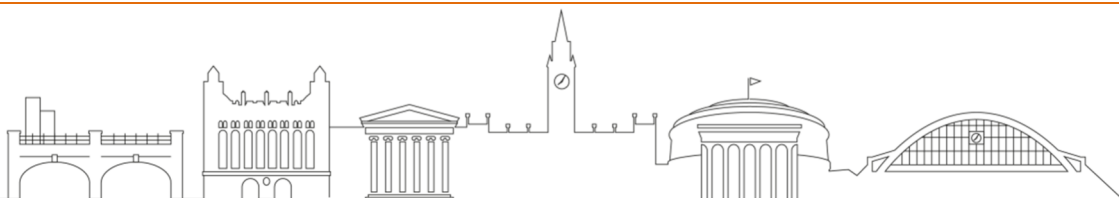




Basement plantroom HV cable ladder route through existing blockwork wall



Basement plantroom HV cable ladder route adjacent existing services





Existing RMU transformer room switchroom cable ladder entry position above double door through existing blockwork wall

