

Science and Industry Museum Learning Classrooms & Electrical Upgrade



Design, Access & Heritage Statement
November 2020



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-The Science Academy-Heritage Significance and Impact Statement

-Station Building - Method Statements

Introduction

Purpose

This document has been prepared by Buttress for the Science Museum Group to support an application for Planning and Listed Building Consent for works to the 1830's Station Building.

The works include:

- Refurbishment of the Grade 1 listed building to provide accommodation for STEM Initiative
- Creation of flexible high quality office space to host lectures and workshops
- New internal fit out with refurbished kitchen, toilet and storage facilities.
- Repair works throughout to heating systems, repair of existing windows and installation of additional flooring and painting.
- Electrical upgrade and installation of new lighting throughout the building.

This document should be read in conjunction with the following drawings:

8778 01 000 Location Plan

8778 01 001 Existing FF Plan

8778 04 001 Proposed Demo Plan

8778 02 001 Existing North Elevation

8778 04 002 Detailed FF Plan

8778 04 003 Proposed FF Plan

8778 05 001 Proposed Elevations B C D and Ambulant Disabled WC

8778 05 002 Proposed Elevations F E and Accessible WC

8778 05 004 Proposed North Elevation

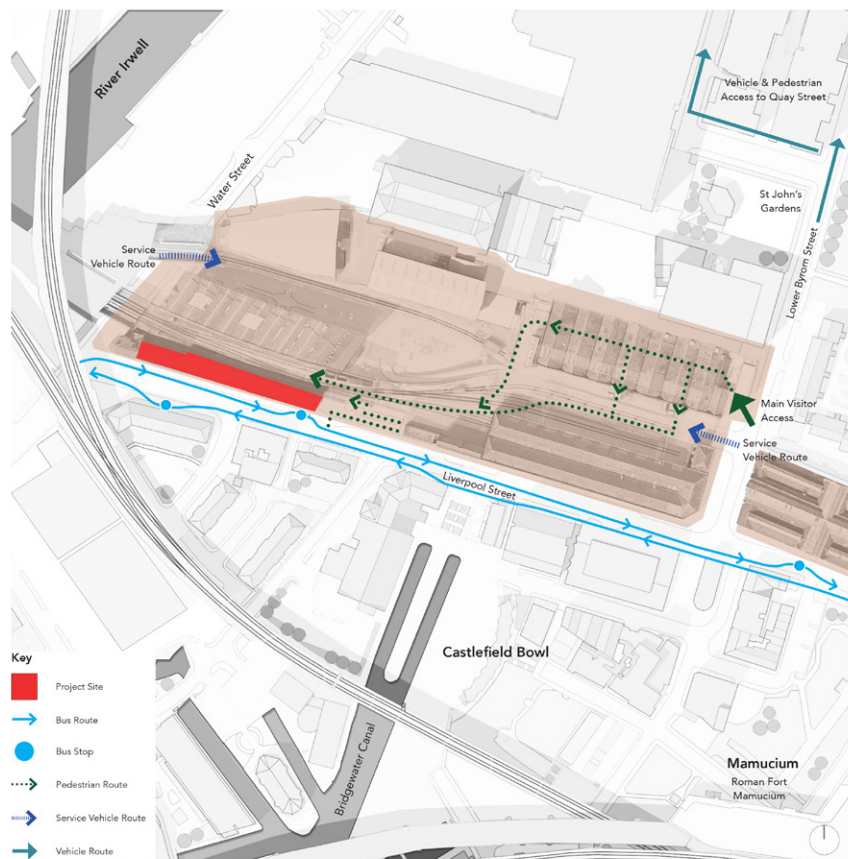
M&E Drawings by Silcock Leedham

Background & Context

Site Location

The site is situated within the larger Science & Industry Museum complex, located within the old Liverpool Road station. The Science and Industry Museum (SIM) is located to the North- West of Central Manchester, to the east of the River Irwell and within the Castlefield Conservation Area. The Liverpool Road 1830's Station is one of two Grade I Listed buildings in the SIM complex.

The various museum buildings are highlighted in orange with the proposed site area depicted in red. The site is within close proximity to Deansgate, Spinningfields and the Castlefield Basin. The site is well connected with Deansgate train station and Metrolink approximately 550m away.



History

Liverpool Road Station is the oldest passenger rail terminal in the world. It was first opened on 15th September 1830. Trains that ran from the station linked Liverpool with Manchester. The station functioned both as a passenger and freight terminal until it closed to public use on 4th May 1844. The elegant, Grade I listed building was built in the style of the late Georgian period and is now under ownership of the Science Museum Group.

The Passenger Station (or Coach Offices) was built in 1830 and comprised the first and second class booking offices on street level and separate waiting rooms, accessed by separate staircases, on first floor or platform level. It was intended for departures only, with arrivals descending from the other side of the track to Water Street, until a separate arrivals station was built on the other side of Water Street in 1837. The building was extended eastward in two stages; these are covered in the following section. When passenger services terminated in 1844, the building was used for goods offices. In 1982 the Station was restored and turned into museum usage and the first class booking hall fittings reconstructed. The staircase to the second class had been removed prior to 1975.

At platform level, to the rear of the building, door open on to the platform from each waiting room. Initially the space was left uncovered; a roof was added in 1834. As of January 2019, the building was being used as offices.

Planning Context

Change of function to Liverpool Road Station from goods railway to railway and Science Museum. Extension and alterations made to Goods Shed.

Decision issued 4th March 1981 by City Council with no objection. REF: F15153/LA/LB

Planning application granted by Manchester City Council 7th January 1984. Proposed works to eastern end of old station building to dismantle, reinstate and stabilise the front elevation and to upgrade floors to ensure they can withstand museum loading requirements. REF: 022690



In 1824, much of the site between Liverpool Street and Charles Street lay empty up until the development of Liverpool Road Station in 1830. The 1808 Station Master's House is the only building that can be seen to the left of the highlighted image.

In 1860 the site of the Science & Industry Museum was now occupied by Liverpool Road Station & the 1830 goods warehouse. In the right image, the Great Western Warehouse has a different position to its current day and the Shipping Shed was a new addition.



Objectives

The development proposals seek to achieve the following objectives :

- **Community:** To engage successfully with the end user (National Science Academy) and develop a range of new opportunities and activities within the building.
- **Visitor Experience:** Improve visitor experience.
- **Visitor Facilities:** Improve and increase the provision of sanitary facilities within the building whilst ensuring any new facilities are accessible to all.
- **Heritage:** Give opportunities to deepen the history and significance of the building.
- **Image:** Raise the profile of the Station Building and to preserve and enhance.
- **Environment:** Ensure environmental good practice at every stage of the project.
- **Social:** To approach and undertake the project in a socially responsible way.
- **Legacy:** To secure a sustainable future for the building and wider Museum Complex.

Brief

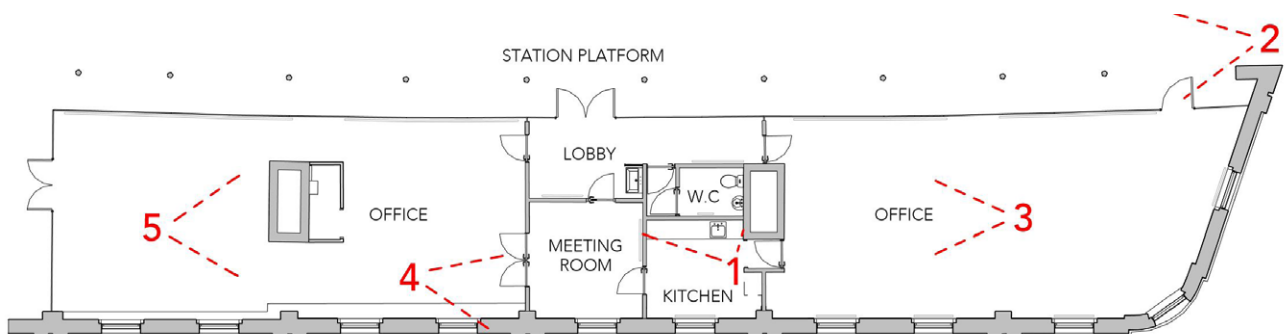
The Science Museum Group (SMG) have chosen to develop a hybrid education centre on the premises of the Grade I listed 1830 Station Building, residing on Liverpool Road within the city of Manchester's Castlefield Conservation Area. It is the world's oldest surviving passenger railway station, and therefore considered internationally important. The building's function as a railway station and carriage shed has been void since 1944, since then becoming a worker's canteen throughout the mid-20th century, and more recently functioning as a STEM based training centre for local schools.

Until recently, the area was in temporary use as temporary offices in connection with The Factory project. Science Museum Group have been developing ideas for the future use of the space and intend to refurbish and bring them into use as a flexible learning centre for experienced practitioners and professionals, providing accommodation for lectures, training workshops and breakout sessions that form an informal and dynamic learning space.

The 1830 Station Building's amenities feature two meeting rooms either side of a central services module, which consists of an entrance lobby, toilet, storage room and kitchen area. Adaptations are proposed that reflect their vision, preserve the building's heritage and comply with modern British Building Regulations. The brief includes: the addition of a small reception/ registration area; accessible facilities; secure storage and furniture storage; two training workshops (both with significant audio- visual facilities).

As part of the brief new service installations and improved electrical works across the Science Academy and the wider Station Building are proposed, which will improve and update the current services, whilst being sympathetic to the historic architecture. To ventilate the building is proposed to remove some of the high level glazing (part of the 1980 refurbishment), to the platform elevation and replace with louvres. These will not be visible elevationally and can be used in conjunction with the sash windows to create cross ventilation. This approach is deemed less intrusive than implementing a new mechanical system. Further information is set out in the MEP Engineering-SIM Learning Platform Concept Report by BDP.

The learning centre will act as a crucial element of SMG's desire to 'inspire wonder', as well as aspire towards the Science and Industry Museum's wider masterplan of becoming an educational hub for STEM- based learning. Simultaneously it will provide a high quality design, that is both sympathetic to the Grade I Listed structure and also brings the aesthetic style and layout of the building into a contemporary setting.



(Above) Existing first floor plan, with photograph locations annotated.

Existing Photographs



1. Existing Kitchen



2. Platform Elevation



3. Room One



4. Exposed roof structure



5. Room Two

Opportunities and Concept Design

SMG's unique vision of a hybrid education centre that combines experienced practitioners with the informalities associated with STEM based learning was carefully considered during the early design process.

Initial concepts aimed to deliver an open, permeable space, that not only responds to the National Science Academy's agenda, but also seeks to rectify some of the unsympathetic design modifications within the 1830 station Warehouse, which arguably fail to reflect the rich heritage of the Grade I listed structure.

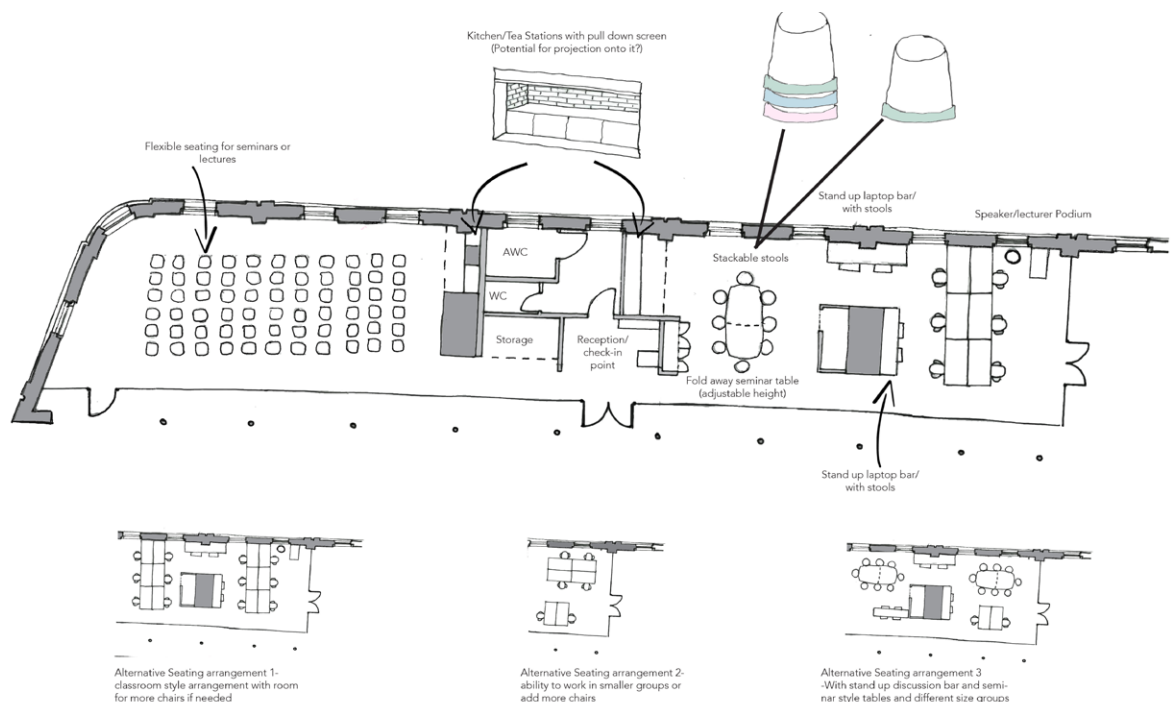
The amendment of the central services module was integral towards the overall streamlining of the 1830 station building. SMG had expressed the importance of a dynamic and flexible workspace, and so it was crucial that the design choices implemented responded to this.

Space Planning and Usage

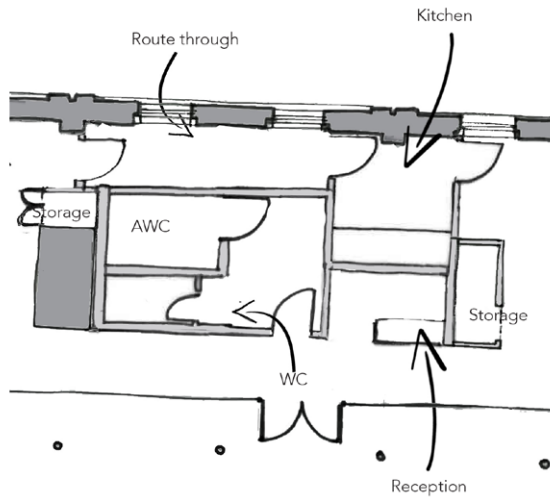
The original services module suffers from numerous issues with current building regulations and space standards, particularly with regard to disabled access.

Given the module is to essentially act as the central hub between the two learning centres, it is important that these issues are not only rectified to become fully accessible, but that design choices made are also sensitive to the buildings heritage.

We developed a number of sketch concept options for the client to review. Initially focusing on how the learning classrooms can be used in a flexible way, before developing a number of options for the layout of the core.

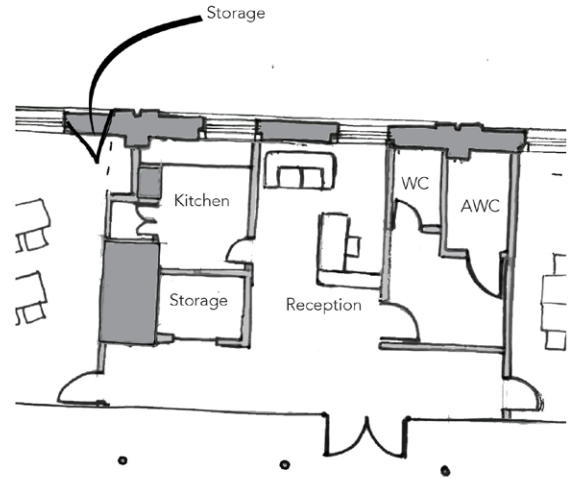


Concept Design- Focused on the layout options in both learning classrooms before focusing on the core of the building.



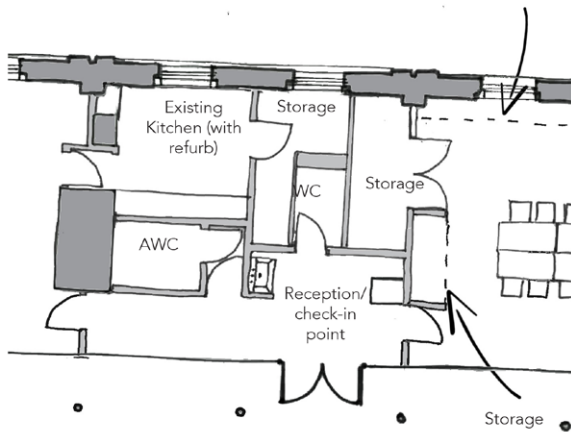
Previous Option 1

- Split storage units
- Joint Part M Compliant space
- 2 Circulation routes between classroom spaces
- Small kitchen facilities
- Entrance lobby replaced with recessed reception area



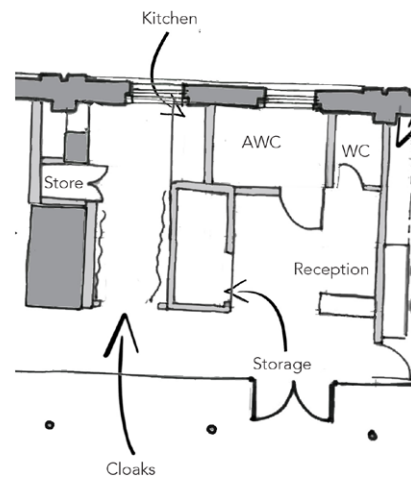
Previous Option 2

- Split storage units
- Joint Part M Compliant WC space
- 1 Circulation route between classroom spaces
- Small kitchen facilities
- Larger central lobby and reception area



Previous Option 3

- 2 Larger, adjacent storage rooms
- Split Part M Compliant WC's
- 1 Circulation route between classroom spaces
- Larger kitchen facilities
- Recessed central lobby and reception area



Previous Option 4

- Split storage spaces
- Adjacent Part M Compliant WC's
- 1 Circulation route between classroom spaces
- Smaller, open-plan kitchen facilities
- Larger central lobby and reception area

Design Development - Science Academy

The chosen option (illustrated on page 13) reflects the best balance between conservation and sympathetic adaptation to the Grade I Listed building, whilst producing a fully accessible learning space for the Museum. It is an amalgamation of the previous options on the previous page and takes the best aspects of each.

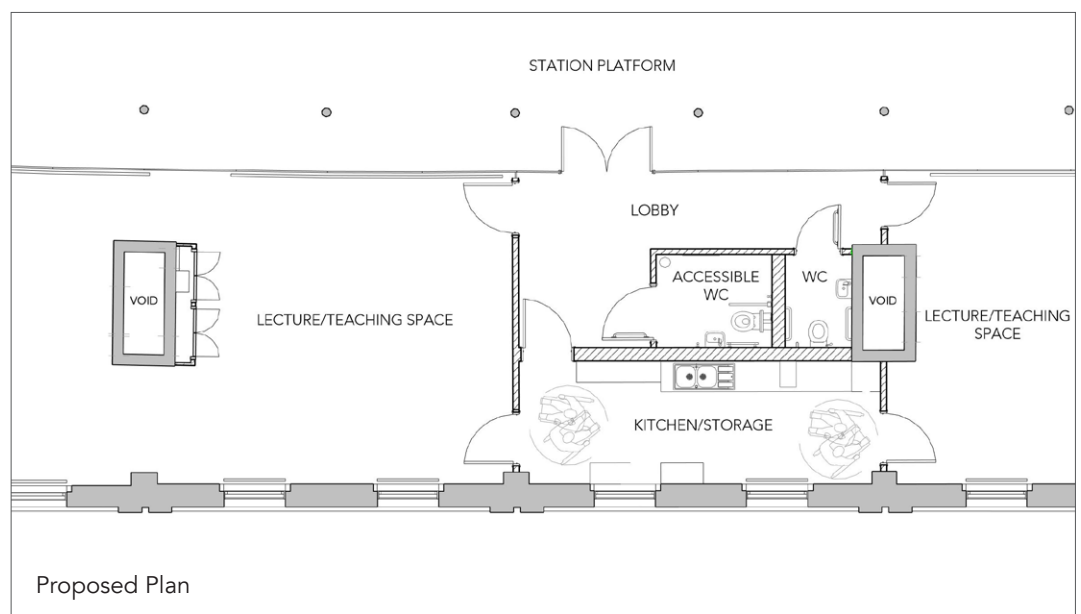
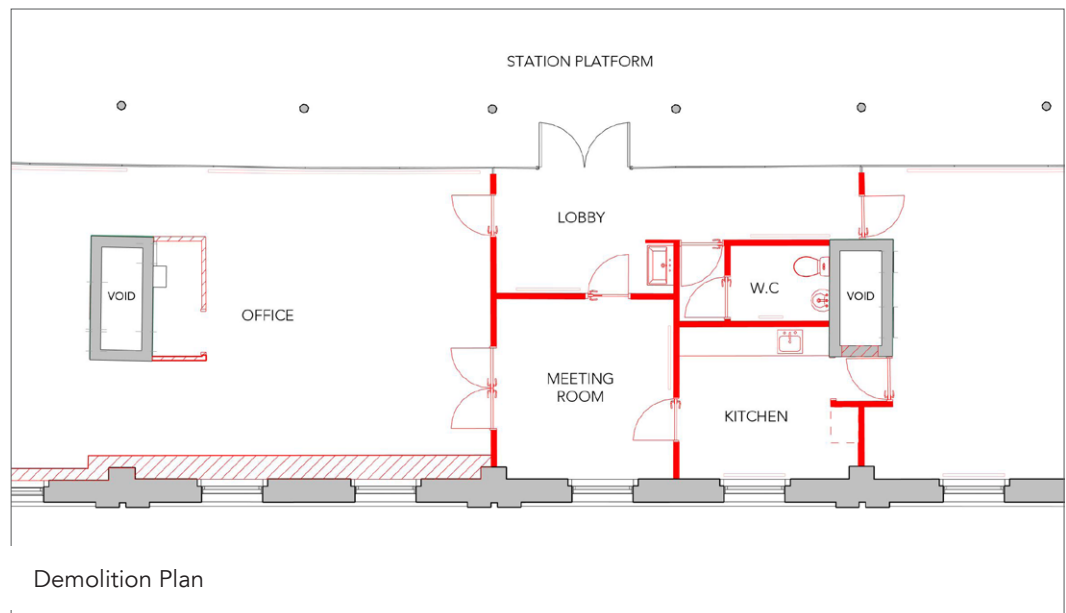
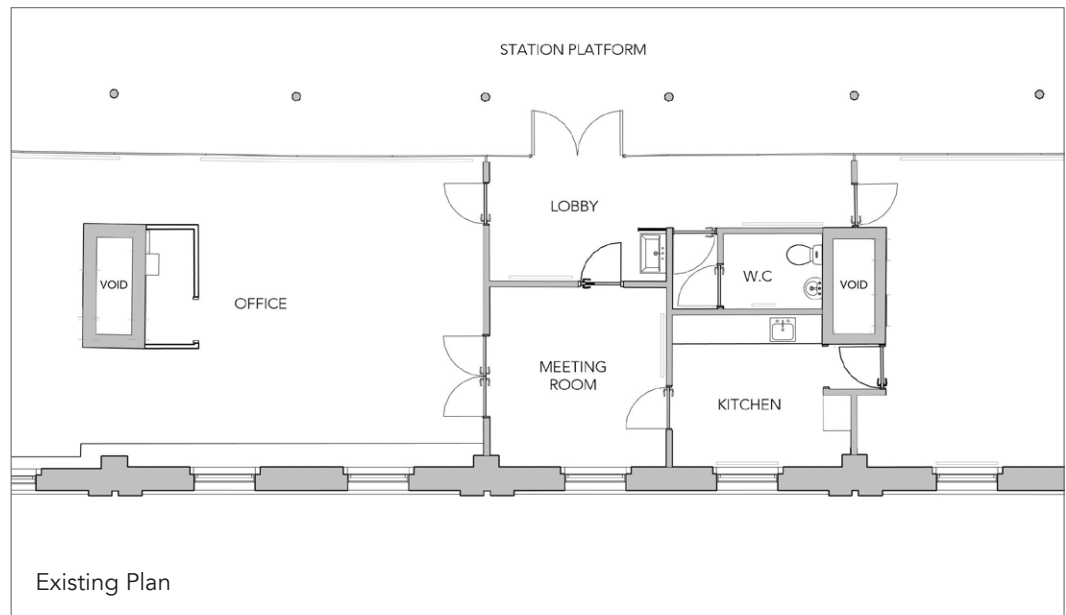
The final outcome, presented on the next page was chosen for a number of reasons. Firstly it encompasses everything required from the client's brief and it is a fully accessible space. The existing services can be reconnected and distributed across the existing network, within a concealed raised access floor, reducing the need for direct fixings into the building fabric. The new WC's and kitchen areas are in close proximity to the previous, which aids this.

These principles were implemented throughout the design development process:

Demolition elements are limited to the 1980's blockwork walls; WCs were amended to become Part M compliant; the proposed kitchen facilities and lobby have appropriate wheelchair turning circles added. The general layout of the structure is intended to evoke a sense of permeable, accessibility within the building.

Accessibility

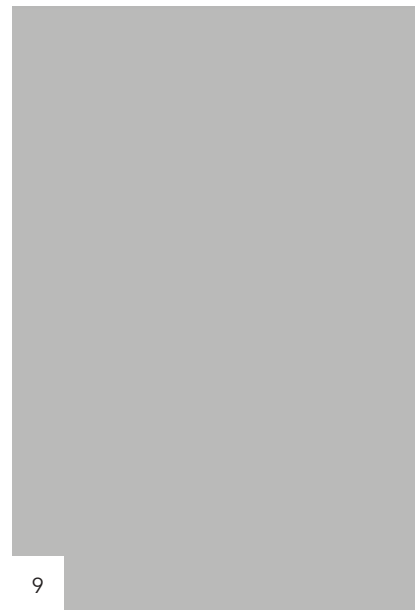
The design sought to rectify the access issues from the previous modern interventions to the building from the mid 20th century, particularly with regard to the central services module. The final design intends to create a space that is compliant with building regulations for accessibility but will also have streamlined access and circulation throughout the classrooms.



Appearance

These neutral materials were chosen by the client to ensure the building's historic fabric takes precedence over the newer additions. A subtle palette of slip resistant flooring in the lobby, kitchen and WC areas and carpet in the teaching spaces were selected, with neutrally painted stud walls and exposed brickwork.

1. Dark Grey Carpet - Milliken 'Tracing Landscapes' collection
2. New kitchen fittings
3. Milliken 'Tracing Landscapes': Colour: FSY119 Secret Caves
4. Anti-slip vinyl flooring for kitchen, foyer and WC's
5. New blinds to be installed
6. New suspended lighting
7. Existing exposed brick to remain as existing
8. Example of Sink/Wall Tiles to be used in accessible WC
9. Satin grey paint for skirting and door frames



Heritage Assessment Summary

This summary is prepared in reference to the document 'The Science Academy-Heritage Significance and Impact Statement' prepared by the Science Museum Group.

Brief

The proposal aims to provide a fully accessible space for a STEM learning facility, as part of the Science Museum Group's Science Academy and includes:

1. Self-contained and can operate out of the Museum's usual working hours.
2. It needs to be inclusive and wheelchair accessible.
3. It needs to have welfare facilities that are not only accessible but can support the occupancy levels intended.
4. Flexible lecture/training rooms that can be rearranged depending on use.
5. Increased provision of WC's (Including an accessible WC).

At present, the proposed site is unsuitable for a STEM learning facility for several reasons:

1. The space is not wheelchair accessible, many of the doors are too narrow.
2. The existing toilet intended to be wheelchair accessible does not comply with current building regulations.
3. Lack of storage space.
4. Generally, run down and well worn finishes in need of rejuvenation.
5. Lintels missing above doors within the 1980's blockwork addition.

Overall Significance

The building is Grade I Listed and sits within the Castlefield Conservation Area. The significance of the structures making up the station buildings has been affected in the past by wholesale rebuilding (particularly to the 1831 shops and carriage shed), however, the Station Master's House and First Class Booking Hall are the original construction with a remodelled interior. Even as a rebuild the Coach Offices, Carriers Offices and Shops were still reconstructed generally in a like for like nature putting the buildings at the highest level of significance - 'exceptional'.

Although the overall significance of the building is exceptional, the project area is in a reconstructed area and a space that had been extensively refurbished in the 1980s in unsympathetic ways. The sense of space, roof trusses, the external walls and sash windows are all of high significance. The 1980s core of blockwork walls are considered an intrusive and harmful addition whereas the glass elevational is considered neutral. (Refer to 'The Science Academy-Heritage Significance & Impact Statement' - page 8).

List Description

List Title - FORMER LIVERPOOL ROAD RAILWAY STATION STATION MASTERS HOUSE

List Entry Number – 1291477

MANCHESTER

SJ8297 LIVERPOOL ROAD 698-1/18/213 (North side) 18/12/63 Former Liverpool Road Railway Station, and Station Master's House

GV I

Also known as: Museum of Science and Industry, Liverpool Road Station LOWER BYROM STREET. Passenger railway station at terminus of Liverpool and Manchester Railway, now part of museum complex. 1830, by George Stephenson for the Liverpool and Manchester Railway Company, with attached house of 1808, formerly occupied by station agent; altered. Red brick, the booking offices faced with sandstone ashlar and stucco; hipped slate roofs. Rectangular plan parallel to street, with house to left and added range of former shops to right. Classical style. The BOOKING OFFICES, which back onto an embankment carrying the railway line at 1st floor level to the rear, have a 2-storey 4-bay facade (2:1:2:1 windows), symmetrical except for the 4th bay, with channelled rustication to the ground floor, panelled pilasters to the upper floor, a moulded cornice and high parapet with cornice and blocking course. The 2nd bay (the centre of the symmetrical portion, containing the entrance to the 1st Class booking hall) breaks forward slightly, has a large square-headed doorway with an architrave of coupled pilasters, moulded cornice and blocking course surmounted by a vase-pedestal sundial, and a recessed panelled door with rectangular overlight; and at 1st floor a tripartite sashed window with a cornice. The flanking bays have 15-pane sashed windows at ground floor flanked by wide segmental-headed tripartite sashed windows with glazing bars, and 12-pane sashes at 1st floor with moulded architraves. The 4th bay, containing the entrance to the 2nd Class booking hall, has a doorway at ground floor similar to the other but with single pilasters, and a 12-pane sash above like the others. Interior: separate booking halls and staircases leading to platform. Rear: 2 doorways to the platform with moulded stone surrounds, a tripartite sashed window to the left of the 1st Class doorway and a one-light sash to the left of the other. To the east, an added hipped-roof platform canopy on slender iron columns (C20 offices with glazed screen wall inserted under this roof). The former HOUSE to the left of the booking offices, 3 storeys and 3 bays to the same height, symmetrical, has a doorway with pedimented stone architrave, sashed windows of 16 panes at ground and 1st floors and 12 panes at 2nd floor, all with raised sills and flat-arched heads, and modillioned eaves; and a double-splayed left corner to the return wall, with sashed and blind windows. To the right of the booking offices is a long 9-bay range, recently rebuilt or restored, formerly with shops at ground floor and a train shed above, which is stuccoed at ground floor, has coupled pilasters, 1st-floor sill-band, moulded cornice and high brick parapet (carried across from the booking offices), and most bays with symmetrical openings including a round-headed doorway at ground floor flanked by windows in segmental-headed blank arches, and 2 windows above. HISTORY: oldest surviving passenger railway station in the world; ceased to handle passenger traffic in 1844 (when Hunt's Bank station was opened, now Victoria Station, q.v.), but continued in use as goods station until 1975. Forms group with Old Warehouse on opposite side of railway track (q.v.).

Listing NGR: SJ8295297867

Electrical Services Statement of Works

The proposed electrical works include those associated with the proposed Science Academy, located on the first floor and further renewal works of the M&E services and equipment across the entire station building. The proposals are less intrusive visually than the current services and electrics and will allow such an important historic asset to be continued to be used in the future.

General - Across the Station Building

A full electrical installation condition report (EICR) with thermographic imaging is proposed to fully understand the true condition of the existing electrical installations which will identify deficiencies and short falls with the current wiring regulations allowing a comprehensive schedule of upgrade works to be completed along with all other works as detailed within this section.

Generally, the electrical services holistically, except for the more recent fire alarm system installation, are now dated and are at/approaching the end of their economic and serviceable life. Most of the electrical installation components are likely to be discontinued with no replacement/spare parts available from the supply chain to repair and maintain.

To update and upgrade the visitor experience through new exhibition, interpretation and learning facilities much of the existing electrical installations will need to be replaced for modern installations which offer more functionality, flexibility, controllability, energy efficiency and sustainability.

New service installations will need to be sympathetic to the building architecture and intended use whilst employing latest technologies in efficiency and control with options such as new LED lighting solutions combined with Bluetooth lighting control matrices to provide flexibility and functionality combined with improved efficiency.

Small power and comms services shall be coordinated with the architecture but at the same time provide a more flexible approach to power and comms provision planned for the intended use whilst providing for the future. New mains switchgear will provide energy meters linked to the site building energy management system (BEMS) to provide up-to-date energy management solutions to help control unregulated energy use.

All new data provided will be in CAT6A U/FTP cabling routed contained either on existing and/or new containment and/or within all available voids spaces back to a new vertical riser type data cabinet (located on the first floor at high level within the kitchen area).

Existing and retained electrical services are to be protected, cleaned, and re-used (subject to the EICR) where possible.

Main & Final Electrical Distribution

The Station Building takes its mains electrical supply (PDU 'B') from the adjacent warehouse building, and it is proposed the current supply arrangement can remain, subject to the EICR confirming the supply can be reused. The current electrical switchboard arrangement, located within room SB LG05B on the lower ground level of the station building, is proposed to be replaced with a new suitably rated form 3b wall

mounted (onto a new metallic frame structure set off from the existing lower ground walls) MCCB panelboard with sufficient and suitably rated MCCB outgoing ways to serve existing to be retained electrical distribution and all new electrical distribution. It is proposed, subject to the EICR, that the existing submain(s) and final circuit cabling distribution from the former busbar chamber type LV switchboard can be reused and reconnected to the new MCCB panelboard. The MCCB panelboard will come with digital energy metering on the incomer and all suitable outgoing ways to allow effective energy monitoring. It is proposed, at this stage, the Station Masters house continues to be served by PDU 'B' until the works there requires the electrical supply to be disconnected.

There are several final distribution boards located within the building that require upgrade and these will be replaced with new with all final circuits (new and existing) upgraded with suitable circuit protection devices. Where possible, final distribution boards that can be retained will be but will be upgraded with suitable final circuit circuit protection devices (as required by the wiring regulations).

Public Health Gallery/Sewer – Lower Ground

Lighting

The existing track type lighting is proposed to be reused, where the EICR confirms it can be reused, with all lamps (where not already LED) to be replaced with energy efficient Philips LED replacement lamps. Existing and new standalone (LED with integral 3hr battery back up) LED emergency illuminated exit signage and lighting to be provided (to meet BS5266 and a building fire risk assessment) with the existing central battery system to be made redundant and removed.

The light switching that covers the ground floor area lighting installation is to be relocated (switch wires to be extended via suitable crimped joints) into the store area located adjacent to room SB LG09 within the lower ground floor area. A new grid rocker switch metalclad type arrangement is to be provided allowing manual control of the ground floor lighting.

Small Power & Data

The small power is generally via floor boxes and a buried trunking supplemented by wall mounted metalclad type power outlets. The system is to be retained but as the power outlets are generally dilapidated, they are to be decommissioned and removed. Manufactured blanking plates will be necessary to provide the necessary isolation and cover for all existing cables that route through the buried metallic ducting system back to the final distribution boards located within room LG05B.

Additional wall mounted metalclad type power outlets are to be provided within the spaces to accommodate any plugin power requirements and maintenance/cleaning equipment.

Data to be provided to allow Wireless LAN's to be installed.

Fire Detection

The existing fire detection system is to be retained (and supplemented with additional repeater, detection, and notification devices where deficiencies occur).

Security

It is assumed any installed security system in this area will be retained and reused.

Science Academy - First Floor

Electrical Distribution

The existing final distribution board serving this area is to be retained (but extended if need be). This distribution board is to accommodate the connectivity requirements of the roof gutter trace heating system so may need extending to accommodate.

All existing distributed containment to high level and beyond is to be retained (if possible).

Lighting

New general and emergency lighting is to be provided to the spaces on this floor.

Withing teaching spaces, it is proposed dimmable suspended decorative linear LED type luminaires are provided with daylight dimming and absence detection coupled with dimmer switch override providing a scene-setting function to assist with teaching.

Within all other spaces, it is proposed suspended/surface mounted decorative LED are provided with daylight dimming and presence detection.

Existing and new standalone (LED with integral 3hr battery back up) LED emergency illuminated exit signage and lighting to be provided (to meet BS5266 and a building fire risk assessment) with the existing central battery system to be made redundant and removed.

Small Power & Data

The small power is generally via recessed floor boxes and a concealed trunking supplemented by wall mounted metalclad type power outlets (either surface mounted and/or recessed into a wall mounted dado trunking). The floorbox system is to be retained, rather than removed, with the floor boxes suitably infilled to allow the final floor covering to be installed seamlessly.

Within teaching spaces, A new surface mounted small power and data installation is to be provided fixed to the exposed brick work and served via surface mounted black enameled conduits (as per the existing installation) all to accommodate the new teaching/lecture space.

Small power outlets shall be provided at high level (surface mounted) to serve either wall mounted and/or suspended LCD teaching screens. It is assumed the LCD teaching screen connectivity (IP and peripherals) will be wireless via Bluetooth and Wifi limiting the need for multiple and trailing cables.

A new data installation shall be provided to the teaching spaces. All outlets shall be mounted at high level to serve Wireless LAN's. Wireless LAN's will be installed as appropriate to effectively serve the anticipated connectivity requirements.

Within the kitchen area, new recessed power outlets shall be provided along the tiled splash back. The outlets are to be coordinated with the tile arrangement with sufficient numbers to accommodate all fixed and portable white goods.

Fire Detection

The existing fire detection system is to be retained (and supplemented with additional repeater, detection, and notification devices where deficiencies occur).

Security

It is assumed any installed security system in this area will be retained and reused.

Summary of Impact

Interventions have been targeted in areas harmed by intrusive interventions and the proposal will bring significance benefits by removing the existing blockwork walls. Additionally the proposal will remove concrete lintels in chimney stacks and refill any redundant M&E openings, these localised repairs will be done in brick and mortar to match the existing and restore the 'original' chimney breasts. Localised brick repairs will also be undertaken across the building, removing and infilling the many screws and fixings in the walls that are no longer used.

Due to the nature of the proposed use as classrooms and teaching spaces, it is proposed the floor is fitted with a new carpet, in a neutral dark grey to complement the existing building fabric. It was felt the scratches to the floor and noise generated from a hard floor meant these rooms would be best carpeted.

Overall the proposal will bring benefits to the significance of the asset by removing inappropriate previous work and using materials and colours that work in the historic space.

The proposed new service installations and electrical works across the Science Academy and the wider Station Building will improve and update the current services, whilst being sympathetic to the historic architecture. The new proposals will improve the efficiency of the services used throughout the building with the latest technologies and where possible, existing services are to be retained, projected and reused. They will also be less visually intrusive than the building's current services and electrics.

Finally, the proposals cause no harm to such an important heritage asset and all works are sympathetic to the existing building fabric. The works will allow the re-use of a currently empty space and help to maintain the historic building through its continued use into the future.



Heritage Significance Plan - First Floor

Significance of Works - Science Academy

Proposal	Significance of element	Heritage Impact	Comment
Removal of 1980s breeze block walls	Intrusive	Highly Beneficial	
Installation of stud walls	-	Neutral	The walls although subdividing the space offer an enhancement on the breeze block walls. The space has been sub-divided historically by 1900 when the wagon store was converted into a canteen so this continues this pattern of use.
Removal of concrete lintels in chimney stacks and localised brick repair	High	Beneficial	The removal of the existing walls allows an appropriate brick repair to the 'original' chimney breast
Brick infill repairs to the chimney stack to cover redundant M&E openings (following a survey of the chimneys)	High	Beneficial	Brickwork to match existing
Replacement of kitchen and sanitary fittings	Neutral	Neutral	
Signage	Neutral	Neutral	Signage to be kept clear of the façade to not harm the key sightlines
Lighting	Neutral	Neutral	Lighting is slim and unobtrusive. The lighting will also incorporate emergency lighting which will mean the separate fixed twin spots currently fitted on the roof trusses can be removed.
M&E	Neutral	Neutral	By removing a number of high level glass panels, that cannot be seen elevationally and installing louvres, this will allow cross ventilation is beneficial to the buildings sustainability.
Cabling rationalisation	High	Beneficial	The rooms suffer from an incoherent and poorly planned cable run which are often fixed to the beams. During the works any redundant cables will be removed. Any new cables will be concealed within voids or hidden from view where possible and within a steel conduit when on show.

Appendices

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