

John Lewis Building Condition Assessment

ARUP

Sheffield City Council

Summary Report



November 2021 Rev A

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On behalf of Sheffield City Council, Arup has undertaken a high-level condition assessment of the John Lewis Building. This is based on limited record information and limited site access and so should be treated as indicative.

Following the announcement that John Lewis Partnership would be vacating their store in Barkers Pool, Sheffield City Council required a high level appraisal of the current condition of the building. This also needed to consider what systems could be retained in principle for alternative uses for the building.

This report is structured to set out the current assessment and observations for the structural elements in Section 2, the MEP systems in Section 3 and the Fire Safety Assessment in Section 4. At the end of each discipline section there is a summary of the observations relating to each discipline.

This report forms a summary report. A more detailed technical report has also been produced.

Overall the following observations are applicable:-

- The structure of the main store is difficult to assess due to restricted access to the site and existing finishes/coverings. However exposed areas witnessed are in a reasonable condition, and we would expect the structure to be reusable as part of an extensive refurbishment of the building. Further intrusive investigations would be recommended if this option is to be pursued.
- The car park is not in good condition and would require significant repair and ongoing maintenance over a 25year period. In conjunction with reducing demand and John Lewis vacating we would recommend that serious consideration is given to demolition of the car park in any redevelopment option.
- The Building Services and Sprinkler Systems are at the end of their serviceable lives and should be fully replaced with modern systems as part of any significant refurbishment.
- The Fire review highlights that the egress stair provisions do not meet modern capacities, which would limit building reuse without the addition of further fire stair provision.
- A separate asbestos report has been undertaken by a specialist. There is extensive asbestos present throughout the building which will need removal as part of any significant refurbishment.



On behalf of Sheffield City Council, Arup has undertaken a high-level condition assessment. This is based on limited record information and limited site access and so should be treated as indicative.

A series of visits have been undertaken to review building and various reports prepared for John Lewis have been reviewed.

The inspections were a non-intrusive walk around visual survey to determine the overall condition of the building rather than a detailed inspection of every element of the building. Access was limited in a number of areas by the risk of asbestos, and existing finishes.

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A separate asbestos report has been undertaken by a specialist. There is extensive asbestos present and the report noted the presence of unsealed asbestos in various locations. We understand that air sampling is not regularly undertaken but it is after specific elements of work have been undertaken where the asbestos has been touched to allow the space to be brought back into operation. Based on the current position some areas of the building had limited inspection.

There are archive and microfiche copies of the majority of the drawings held by John Lewis' structural engineer and it is recommended that these are obtained by the council as part of any agreement with John Lewis Partnership.



Summary of Observations

Main Store

The main store comprises a four storey building above ground with two below ground levels that are cut into the sloping site off the south side of Barkers Pool. It has a reinforced concrete flat slab frame that is stabilised by the walls around the lift and stair cores. There appears to be a solid RC wall that separates the store from the car park.

The concrete frame of the main store could not be immediately inspected due to the presence of the interior fit out and the extensive asbestos issues in the finishes. Therefore the condition of the structure of the main store is difficult to assess due to restricted access to the site and existing finishes/coverings.

However, the limited exposed areas of structure witnessed during our inspections are in a reasonable condition, and we would expect the structure to be reusable as part of an extensive refurbishment of the building –noting the limited nature of the visual survey. Further intrusive investigations would be needed if this option is to be pursued.

There will inevitably be some issues with this frame, particularly on the roof level due to failures in the roof finishes and having RWP's embedded in some of the columns.

Once the building is stripped out and available for inspection then the concrete frame can be closely inspected for any signs of deterioration and damage.

The main store has a substantial grid of 8.84m square and floor to floor heights of 4.7m. As a department store it will have a floor loading of c.4kN/m².

Full details and images are outlined in the full detailed report.



Car Park

The car park is in a much poorer condition than the main store and there are numerous elements of cracking and spalling of the concrete. The steel beams have areas of corrosion that has removed the corrosion protection and also the intumescent paint that provides the fire protection to the structure.

The de-icing salts used over the years have corroded the concrete structure. The chloride ingress has resulted in significant areas of deterioration. Significant repair works and maintenance would be required over the next 25 years

The car park structure as originally constructed was a combination of RC perimeter walls, a central deep beam spanning between ventilation shaft walls, and some insitu beams on an east west axis to tie the structure together.

There were then precast prestressed asymmetric I beams at close centres spanning between the perimeter walls and the deep beam. Thin biscuit precast planks with an insitu topping slab created the continuously sloping floors of the car park. These precast and prestressed elements of structure were constructed with High Alumina Cement, HAC, concrete, which was a common cement type for these products from the 1950s.

Due to a change in the chemical composition of HAC concrete, through a process called conversion, these prestressed beams can lose up to 50% of their intended structural capacity.

Following the identification issues of the reduction in structural capacity of these precast prestressed members that were constructed with HAC concrete, in the 1970s the majority of the HAC elements were removed and replaced.

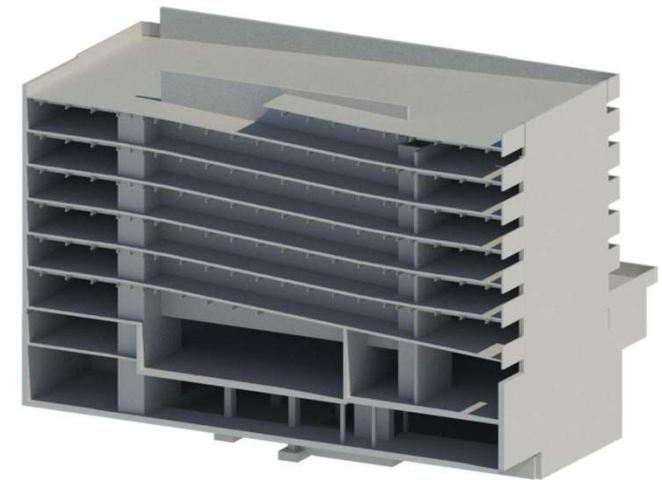
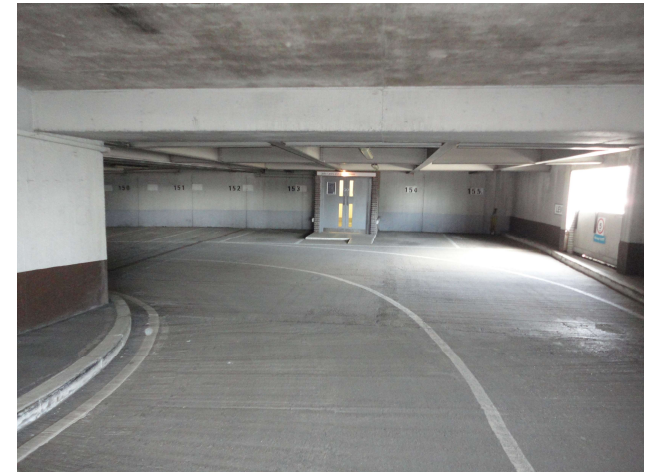
The lower levels of the car park have been retained in their original form of precast prestressed HAC concrete beams but these have been strengthened by the addition of steel beams and columns to mitigate the issues.

Once the lower levels of the car park part of the building is stripped out and available for inspection then the original prestressed beam structure can be closely inspected for any signs of deterioration and damage.

There are other elements of damage that would require remediation and repair in the structure and in the façade.

From a serviceability perspective it should be noted that the car park was designed in time when vehicles were smaller and the size of the stalls and aisles are now too small for two-way traffic. The lack of alternative up and down ramps makes the search patterns for a parking location difficult.

The car park is not in good condition and would require significant repair and ongoing maintenance over a 25year period. In conjunction with reducing car parking demand with John Lewis vacating, we would recommend that serious consideration is given to demolition of the car park in any redevelopment option.



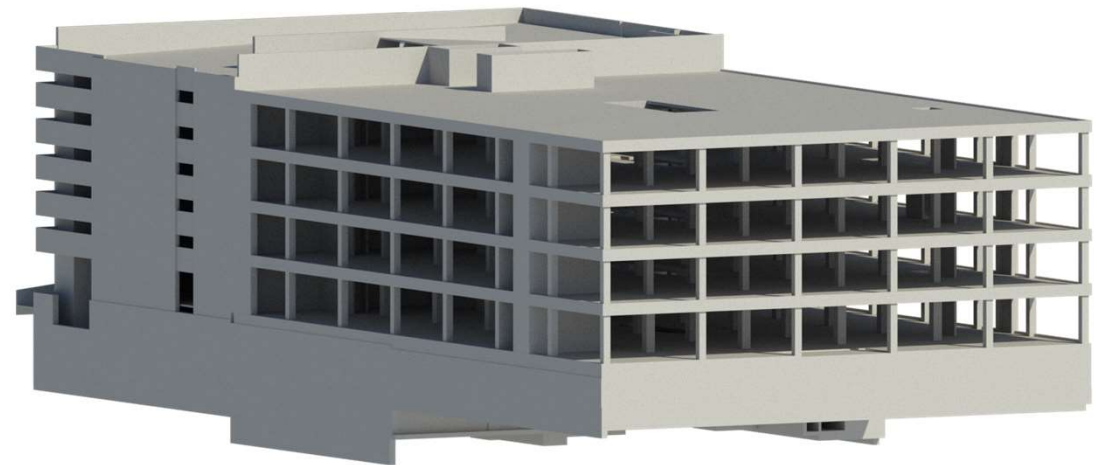
The key structural considerations identified are:

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- The main store has a substantial grid of 8.84m square and floor to floor heights of 4.7m. As a department store it will have a floor loading of c.4kN/m².
- There will inevitably be some issues with this frame, particularly on the roof level due to failures in the roof finishes and having RWP's embedded in some of the columns.

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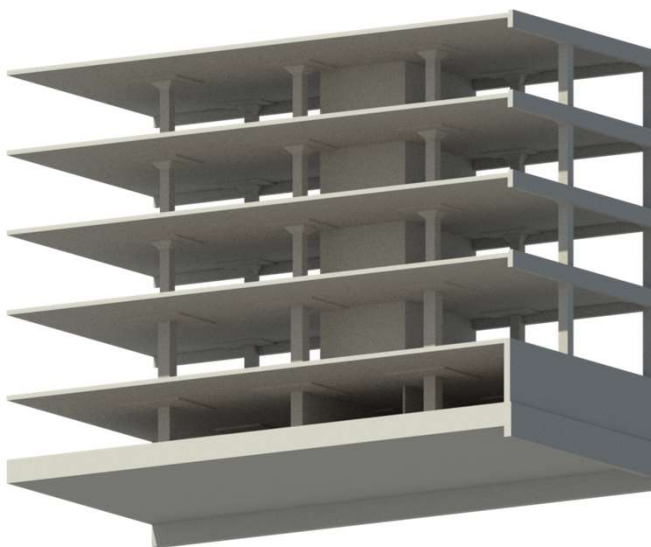


Summary of MEP Observations

Many of the MEP systems are original from when the building was constructed in the early 1960s as such these systems are at the end of their useful life – robust, well maintained systems can be expected to last up to 30 years, and many JL systems have lasted almost double that. Although many are still working, having been well maintained, there will have to be a program of renewals as systems will start to fail and efficiencies of the system will be poor in comparison to modern standards.

The renewal of systems in this building is problematic due to asbestos in and around the MEP services; in many cases it will not be possible to maintain or replace services without removing asbestos completely. Primarily asbestos exists in the MEP services (for example in the thermal lagging of pipework and in gaskets/insulation in the equipment) and also in building components close to the services such as ceilings and fire stopping. This creates a major constraint on the possibilities for the economic servicing, maintenance and piecemeal replacement of the building services.

There are a number of newly fitted out areas in the basement and on the second floor where it appears the asbestos has been removed along with the existing services. New cooling, lighting, fire alarm systems etc. have been installed in these areas along with new ceilings and partitions. These areas function well and are in good condition; however their total area is small in comparison with the rest of the building.



The building is not fully protected by an automatic fire detection and alarm system, which would be normal current practice for any similarly sized building. A sprinkler system exists, which is fed directly from the mains water system (with a dedicated booster pump); this would not be compliant with current practice.

The lighting system is inefficient and no longer suitable for continued use, even in a retail situation.

It is therefore recommended that any refurbishment or repurposing of the building includes a full strip out of all ceilings, non-structural partitions, services distribution (wiring containment, ductwork, pipework), MEP plant and equipment, taking care to remove and dispose of all asbestos containing materials (ACMs). This will create a clear canvas for new, efficient systems to suit the new purpose.

It is recommended that the façade is replaced or significantly renovated to bring it up to current standards in terms of thermal performance and air tightness.

The new heating and cooling systems could be connected to the Veolia district heating system, or could be “all electric” (i.e. no on-site fossil fuels). These options would enable the building to contribute towards Sheffield’s aspiration to be Zero Carbon by 2030.

The key considerations from the MEP review are:

- The current building services have historically been well maintained and have had a very long service life - however they are now at end of life and are outdated in the current context.
- To replace the systems will be challenging given the amount of asbestos in and around the MEP services.
- Many of systems can only be removed with a full refurbishment of the interiors as they are entwined with ceilings and fire stopping.
- In the basement, where recent refurbishment works have been undertaken, updated services have been installed. The services in this area are well maintained and adequate but only account for a small proportion on the scheme.
- The building is missing critical automatic fire detection and alarm systems that are expected for a building of this type and scale.
- The lighting system is inefficient and no longer suitable for continued use, even in a retail situation.
- The existing building is energy inefficient due to the poor thermal performance of the historic façade
- Future developments should explore the use of either Veolia district heating system, or could be “all electric.

In summary, considering the condition of the existing building services we would propose that any major refurbishment of the John Lewis store includes a full replacement of the Building Services systems with a new efficient set of systems that meet modern standards and incorporate appropriate carbon reduction measures.



Summary of Fire Observations

Assessing the building against current fire safety guidance highlights that the existing building contains significant shortfalls against the minimum provisions expected in a newer building.

The retail space is currently served by 3 escape stairs and these each have an approximate width of 1100mm. These provide the egress from the lower ground and the storeys above. The ground floor is provided with independent final exits onto Barkers Pool. The final exits from the 3 escape stairs also serve as exits from the Ground Floor.

The combined exit widths currently provided from the building are insufficient to accommodate the populations derived from using contemporary floorspace factors.

Current fire safety guidance limits the maximum compartment area of any one single floor in the building to 2,000m² in a building without sprinklers. This would increase to 4,000m² where a suitable sprinkler system was installed. The current approximate floor areas of the retail store are in excess of 2,000m², being approximately 2,400 m².

The car park and retail store are separated by a solid wall which extends from Lower Ground floor (in part) through to roof level. It is reasonable to assume that this wall is a compartment wall separating the car park from the store.

The fire resistance period for both structural and compartmentation provisions for an unsprinklered retail store of this height would be 90 minutes. For a retail store with suitable sprinklers installed this would reduce to 60 minutes fire resistance.



Structural beams were observed to have cementitious/vermiculite type fire protection boards of varying thickness in the back of house and plant areas. It would be reasonable to assume that this would be likely to provide at least 60 minutes fire resistance. However, areas were observed where this protection was either damaged or missing.

The retail areas are provided with automatic sprinklers. Due to the age of the building, the sprinkler system appears to be designed following the recommendations of the Fire Officers Committee Rules, which predates British Standards.

Current fire safety guidance allows a number of 'trade offs' where sprinklers are used (e.g. reduced fire resistance and increased compartment areas). However, these would only be permitted where the sprinkler installation meets the requirements of the British Standards for life safety. The system is a property protection system and does not possess the additional measure required for a life safety system.

There is an open escalator void that passes through Lower Ground floor to roof level. Skylights are provided at roof level. Some skylights contain fans. It is unknown if these provide any smoke control function. However, current fire safety guidance would only require smoke control where such voids penetrated fire compartment floors



The key shortfalls identified in the Fire Assessment are:

- The current exit provisions are insufficient to accommodate the populations derived from using contemporary floorspace factors or those defined by the current tenant.
- Future refurbishment or adaptation would require the incorporation of additional stairs and exits.
- The current compartment sizes (floor areas) are greater than those required in current guidance (without reliance on sprinklers).
- The current automatic sprinkler system is insufficient to be relied upon to provide any life safety benefits, such as compartmentation.
- If the building were to be adapted or refurbished, without additional compartmentation, then a new sprinkler system would be required.
- The level of fire protection to the building structure is unknown. In some areas damage has occurred to the fire protection of the structure and needs remediation.
- The extent of required compartmentation and fire resisting enclosures should be defined, and all penetrations should be made good.
- The car park appears to have no fire alarm installed.
- If the building is to be refurbished or adapted, the existing fire alarm panel should be checked to see if it can accommodate the extent of additional detection and alarm provisions. Considering the condition of the overall building services it is anticipated that this would be replaced as part of any refurbishment.



A red-tinted photograph of a John Lewis department store building. The building is a multi-story structure with a brick upper section and large glass windows on the lower floors. The 'John Lewis' logo is visible on the upper left and right sides of the building. In the foreground, there are trees, a street with pedestrians, and a traffic light. The word 'ARUP' is overlaid in a large, white, serif font in the center of the image.

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