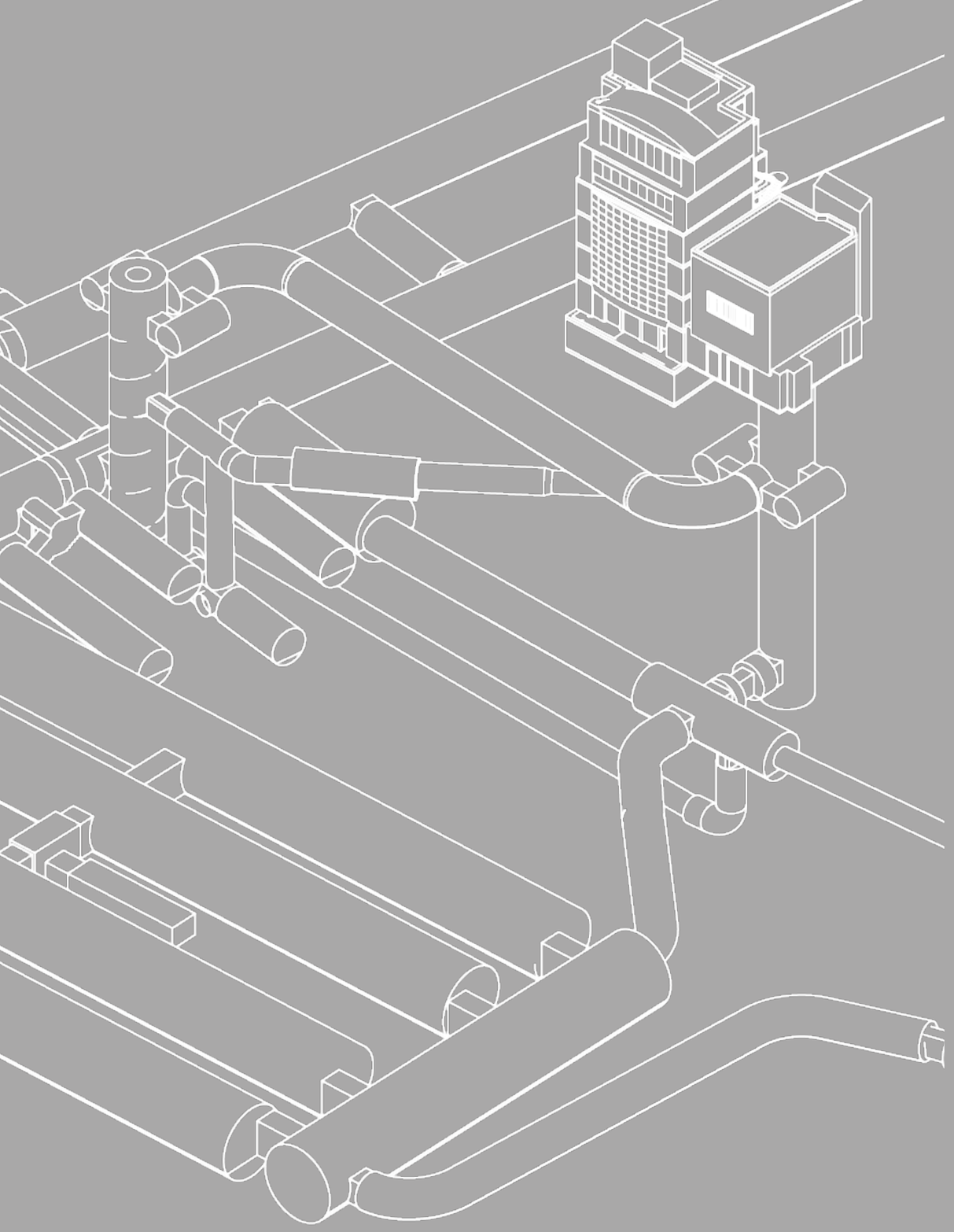


4.2 Furnival Street

4.2.1 Site Location

38-39 Furnival Street

The building at 38-39 Furnival Street is situated directly above the goods shaft connecting to the Kingsway Tunnels. Originally constructed as a ventilation plant for the tunnels, it underwent extensive reconstruction by the Post Office in the early 1950s during the second stage of the tunnels' construction, following significant damage from a bomb explosion during WWII. Currently the building houses the goods lift and ventilation ducts serving the eastern section of the tunnels.

Lacking internal slabs, the structure is primarily defined by its envelope and ventilation grill. The existing building shares party walls at the ground floor with Dyer's Buildings to the East, 36-37 Furnival Street to the South, and 40 Furnival Street to the North. Additionally, the title indicates ownership extends beyond the building line under the pavement.

40-41 Furnival Street

The building at 40 Furnival Street, constructed in the 1990s, features a concrete frame construction with a blend of brick and glazed elevations. It has undergone several modifications, including a facade update in 2015. The current structure comprises a basement level and five floors above street level, serving as commercial office space that is currently occupied.

Sharing party walls with 38-39 Furnival Street to the South, Dyer's Buildings to the East, and 14-18 High Holborn to the North, the property's ownership extends beyond the building line under the pavement.

Given its proximity to the existing goods shaft, this building is deemed the most appropriate building to amalgamate with 38-39 Furnival Street to provide the required access areas to enable the Scheme to be acceptable in planning terms. It will provide space for visitor welcome and processing, staff facilities and plant equipment for the Proposed Scheme.

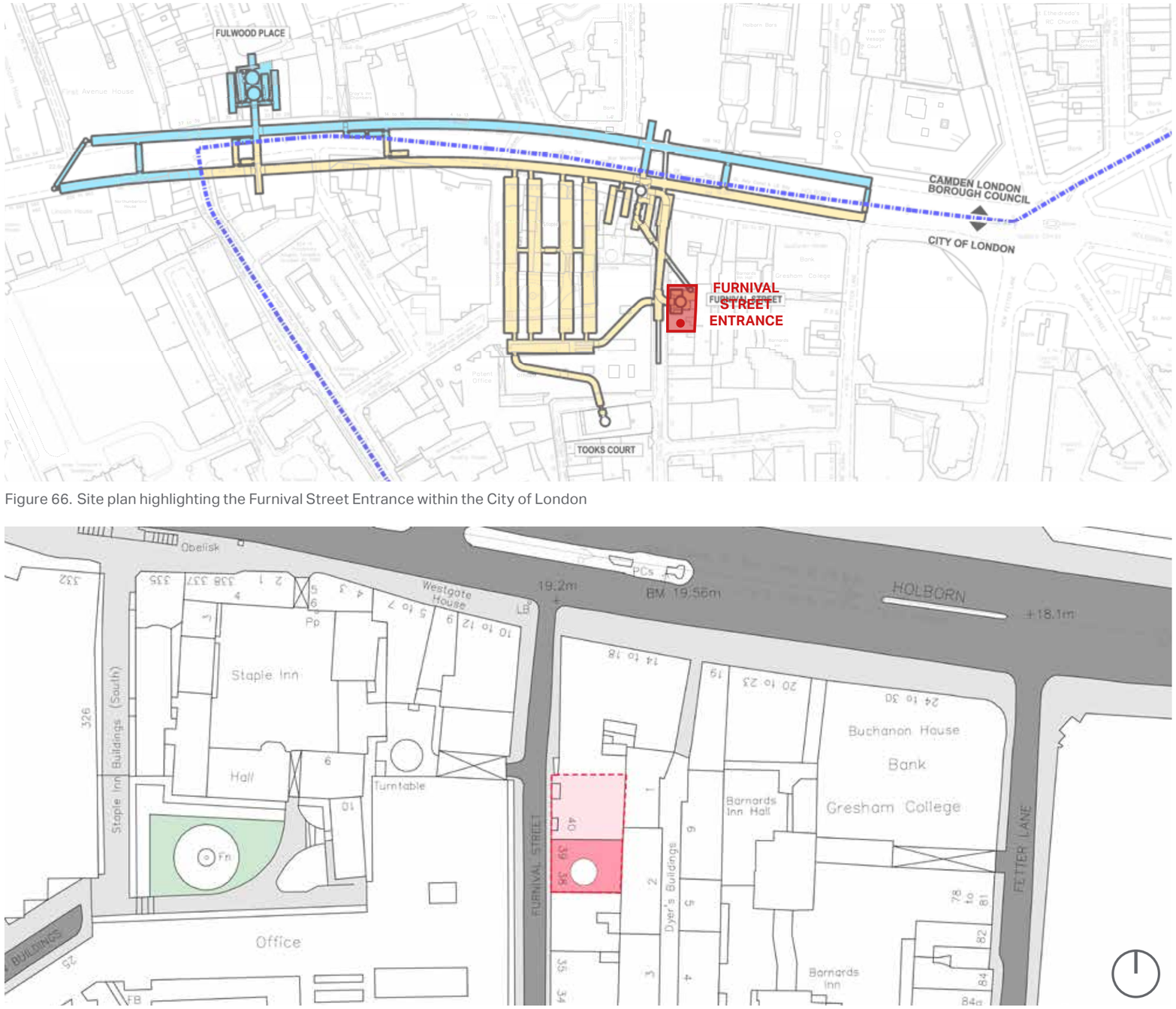


Figure 66. Site plan highlighting the Furnival Street Entrance within the City of London

Figure 65. Furnival Street entrance highlighted on site plan

4.2.2 Existing Buildings

Figure 67. View of 38-39 and 40-41 Furnival Street towards High Holborn

38-39 Furnival Street

This entrance, one of the two leading to the tunnels, underwent reconstruction in the late 1940s following severe damage caused by a V1 rocket explosion on the opposite side of the street. Its distinctive character is defined by its brick structure and concrete louvres on the facade, clearly marking it as a utilitarian structure. Internally the building facilitates access to a goods lift and ventilation shaft connecting to the 'Dog Leg' tunnel at lower level.

40-41 Furnival Street

As a more recent construction lacking historical significance, the building necessitates demolition to facilitate construction works. A proposal suggests the creation of a new building that is sensitive to the surrounding area.

Figure 68.38-39 and 40-41 Furnival Street site boundaries

4.2.3 Existing Context

There are a number of contemporary developments along the length of Furnival Street, mixed in with the more traditional buildings. Nearly all of the contemporary buildings use brick as the primary cladding material alongside metal detailing and glazing. In terms of colour there is a wide range used on both sides of the street.

14-18 High Holborn
Traditional Portland stone facade with full height modern glazing to retail units on the ground floor. The High Holborn facade is more detailed than the Furnival Street facade.

10 Furnival Street
A mixture of Portland stone and light yellow brick with a high level of traditional detailing and pilasters. Windows with consistent and frequent placement across facade.

32-33 Furnival Street
Cream rendered front facade with large sash windows spaced consistently across wall. Dark brick present at top sides of elevation.

10-12 High Holborn
Opposite the site the facade is simple discoloured concrete with aggregate finish and smooth pre cast concrete. A large black roller door sits adjacent to expressed deep architectural reveals on the ground plane.

27-31 Furnival Street
30 to 31 facade is primarily dark brick of a similar colour as 39 Furnival St with modern style glazing of an irregular module spaced out with metal panel details. 27 contains lighter more orange brick upper facade with smooth cream render to the ground plane with moderate glazing regularity

34-35 Furnival Street
Orange brick with red brick detailing up facade and painted concrete which mimics stone. 36 to 37 appears slightly more modern with less detail to the brick facade with recess modern glazing.

138-142 High Holborn
Grand historic landmark building with red brick upper facade and beige stone lower. Facade is highly ornamented with traditional detailing, large bronze arched windows to lower and white tall cream simple style to the upper facade.


14-18 High Holborn


36-37 Furnival Street


10 Furnival Street


10-12 High Holborn

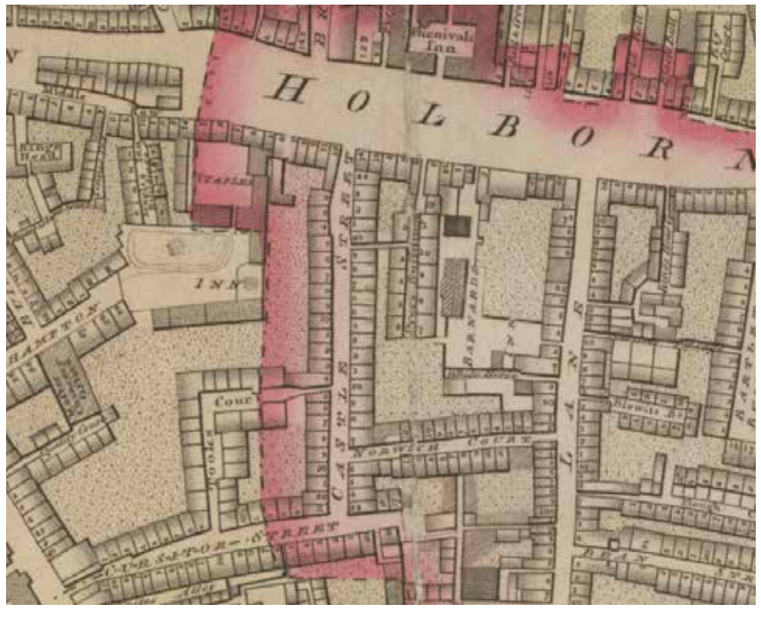
34-35 Furnival Street

32 & 33 Furnival St

Current Ordnance Survey Map

30-31 Furnival Street

138-142 Holborn



Historic London City Map - 1792

4.2.4 Interface With the Tunnels

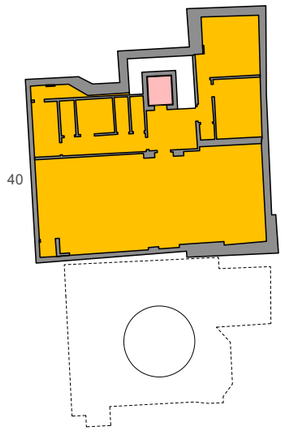


Figure 70. 40-41 & 38-39 Furnival Street - Basement

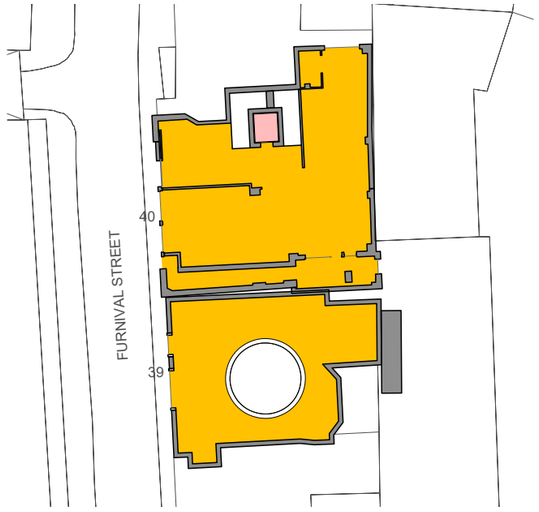


Figure 72. 40-41 & 38-39 Furnival Street- Ground Floor

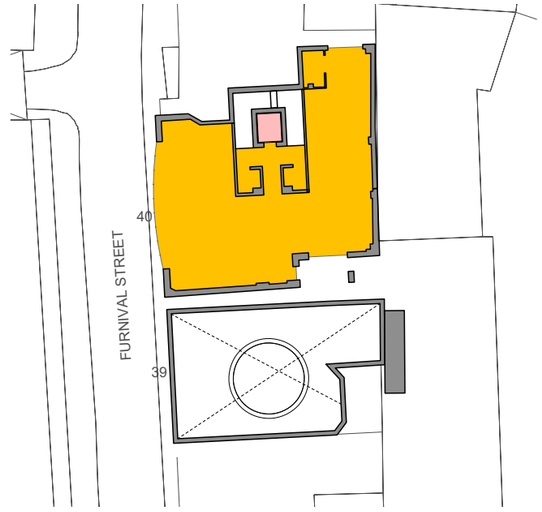


Figure 71. 40-41 & 38-39 Furnival Street -Levels 1-5

Figure 69. Existing facade of 38-39 Furnival Street

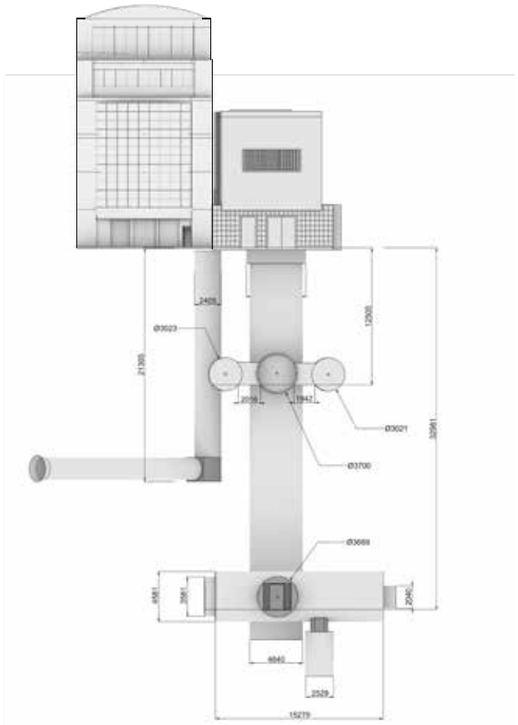


Figure 73. Front cross section of existing buildings and tunnel level

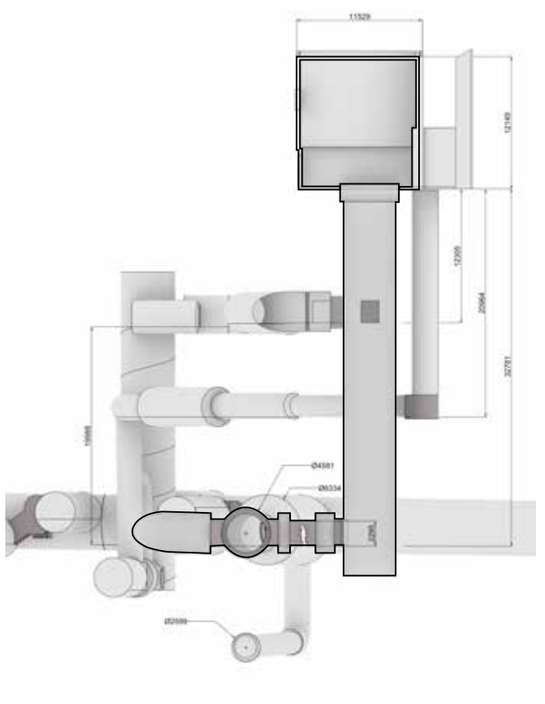


Figure 74. Lateral cross section through 38-39 Furnival Street and tunnels

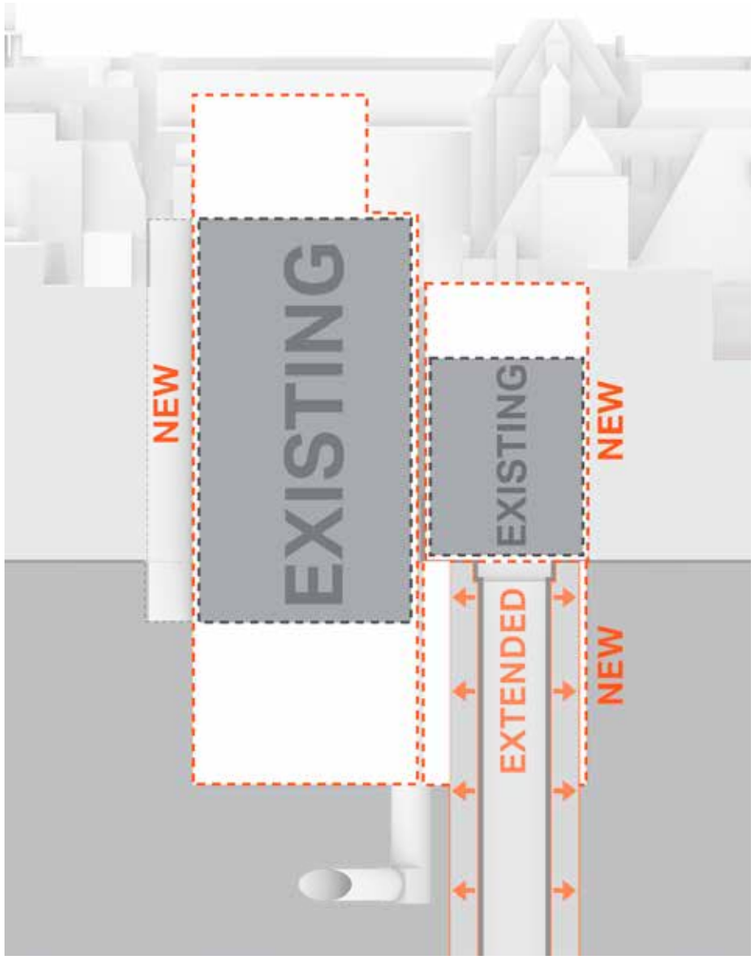


Figure 75. Indicative diagram of the proposed new structure and basement extension

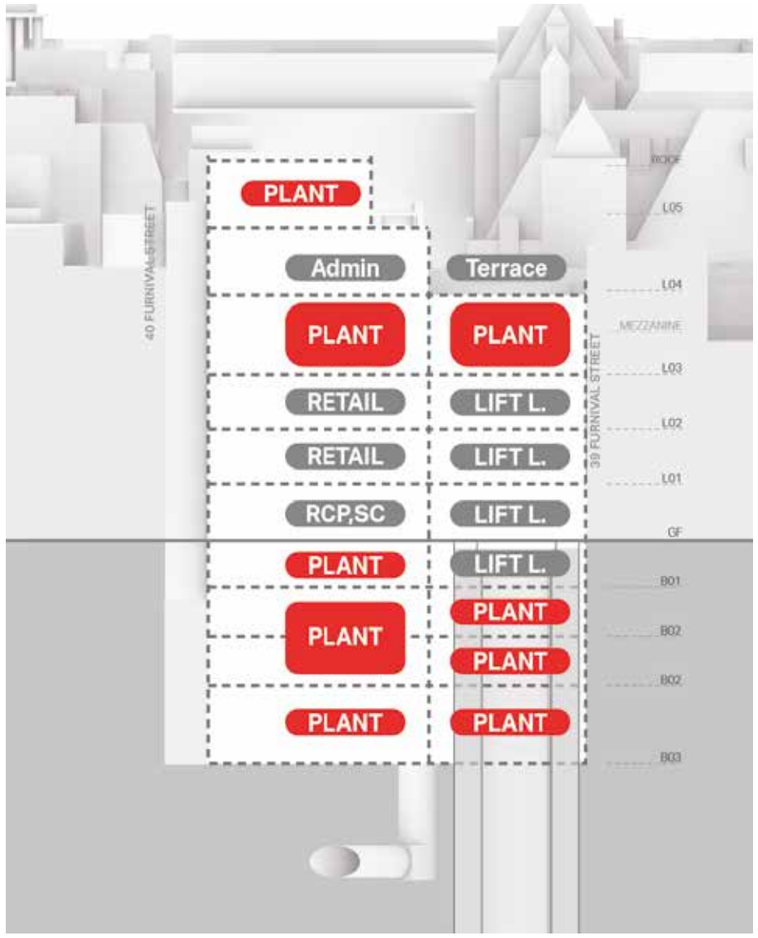


Figure 76. Schematic cross section showing the spatial distribution for the required plant equipment and public uses at 38-41 Furnival Street

4.2.5 Uses, Constraints, and Retention of 38-39 Furnival Street

Various retention strategies were explored, including scenarios involving partial demolition and retrofitting. However, these options were deemed not feasible due to structural, programmatic, and construction-site health and safety requirements. Early studies revealed that, by regulation and for ease of inspection and replacement, the majority of plant equipment must be above ground.

Adapting the existing structure at 40-41 Furnival Street was deemed not feasible due to the limited floor to floor height and load-bearing capacity of the slabs and columns. The current area is insufficient for the combined plant equipment and front-of-house architectural program required to process visitors. As a result, expansion of both the buildings and basement is necessary.

To implement the fire strategy and accommodate shaft expansion works, the demolition of the building above is essential. Construction works demand a secure site area, as illustrated in the sketch below. The demolition of both buildings is indispensable for unifying the site and basements.

In acknowledgment of the historical value of 39 Furnival Street, the Scheme aims to preserve the building's character by respecting its dimensions and materiality. Efforts will be made to reuse the existing brick and louvres following further assessment.

4.2.6 Shaft Enlargement

The dimensions of the shaft beneath 38-39 Furnival Street are inadequate to meet the access and evacuation needs for the intended use.

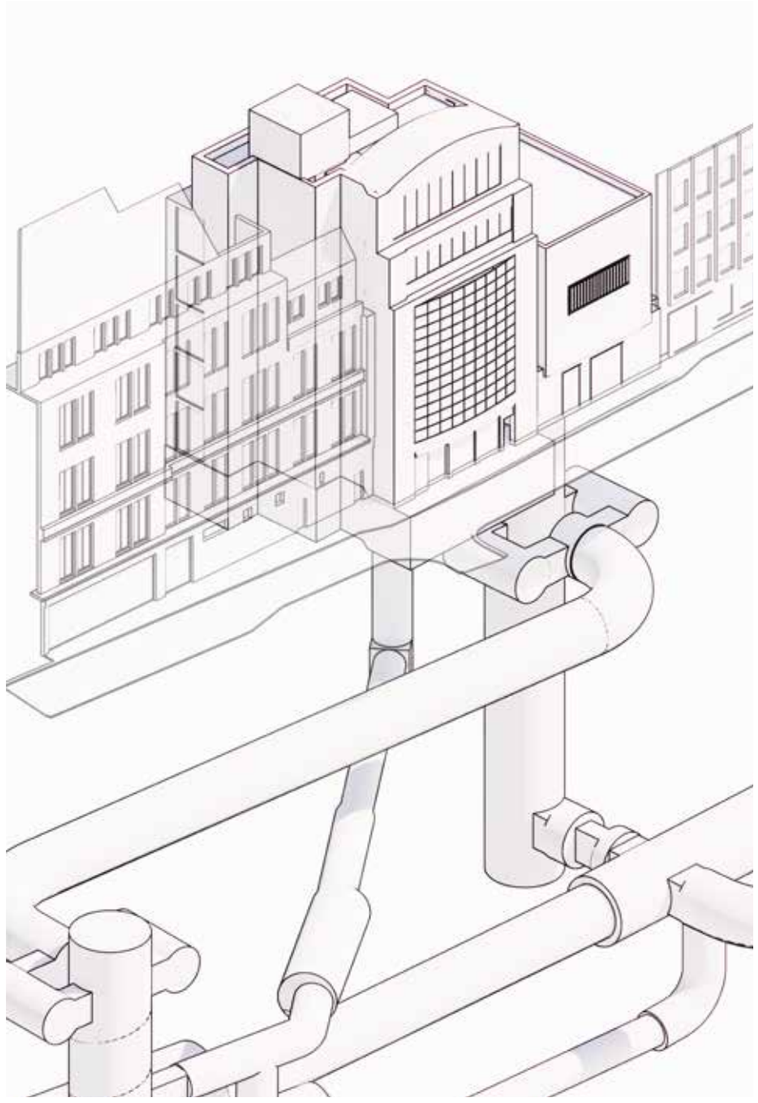
The upgraded shaft must accommodate:

- Visitor access
- Firefighting access
- Evacuation lifts and stairs
- Staircase and Lift Pressurization system

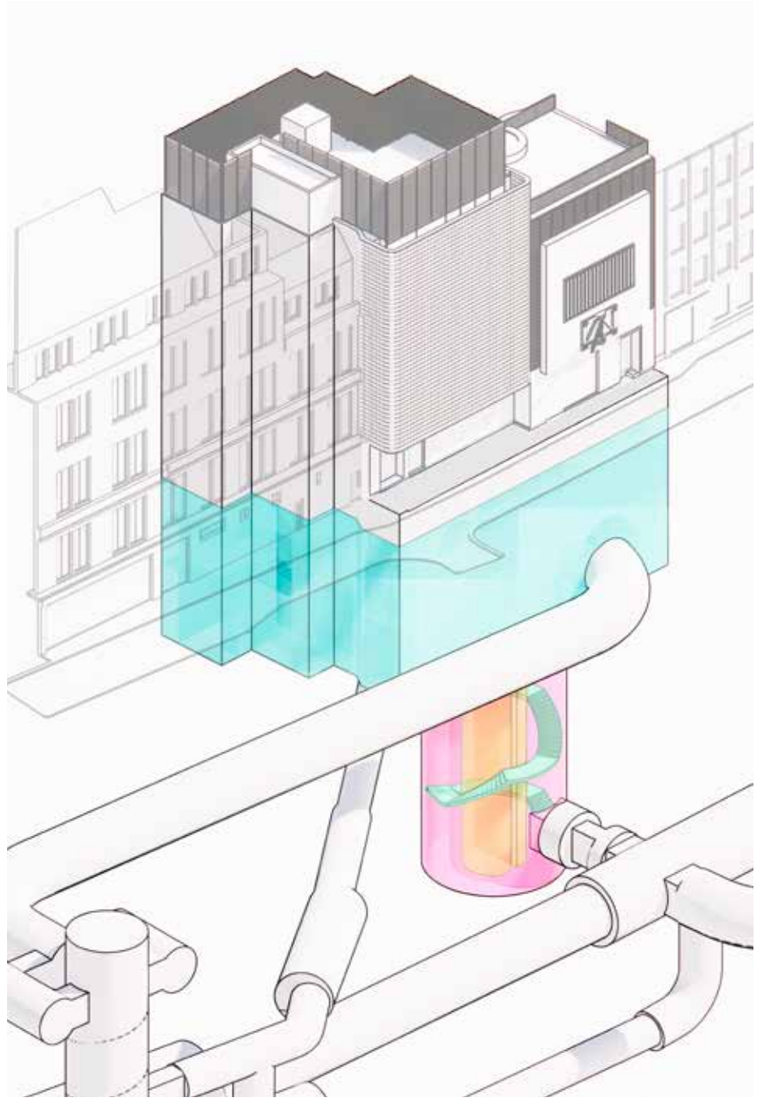
Achieving these requirements necessitates enlarging the existing shaft diameter from the current 5 meters to a minimum of 8.2 meters. The excavation works will involve specialized equipment and appropriate health and safety measures.

Various retention strategies were explored, including scenarios involving partial demolition and retrofitting. However, these options were eventually rejected due to structural, programmatic and construction-site health & safety requirements.

The conclusion is that the operations will require open-air excavation and this dictates careful demolition of the existing buildings.



Furnival Street: Existing Shaft



Furnival Street: Proposed Shaft Enlargement

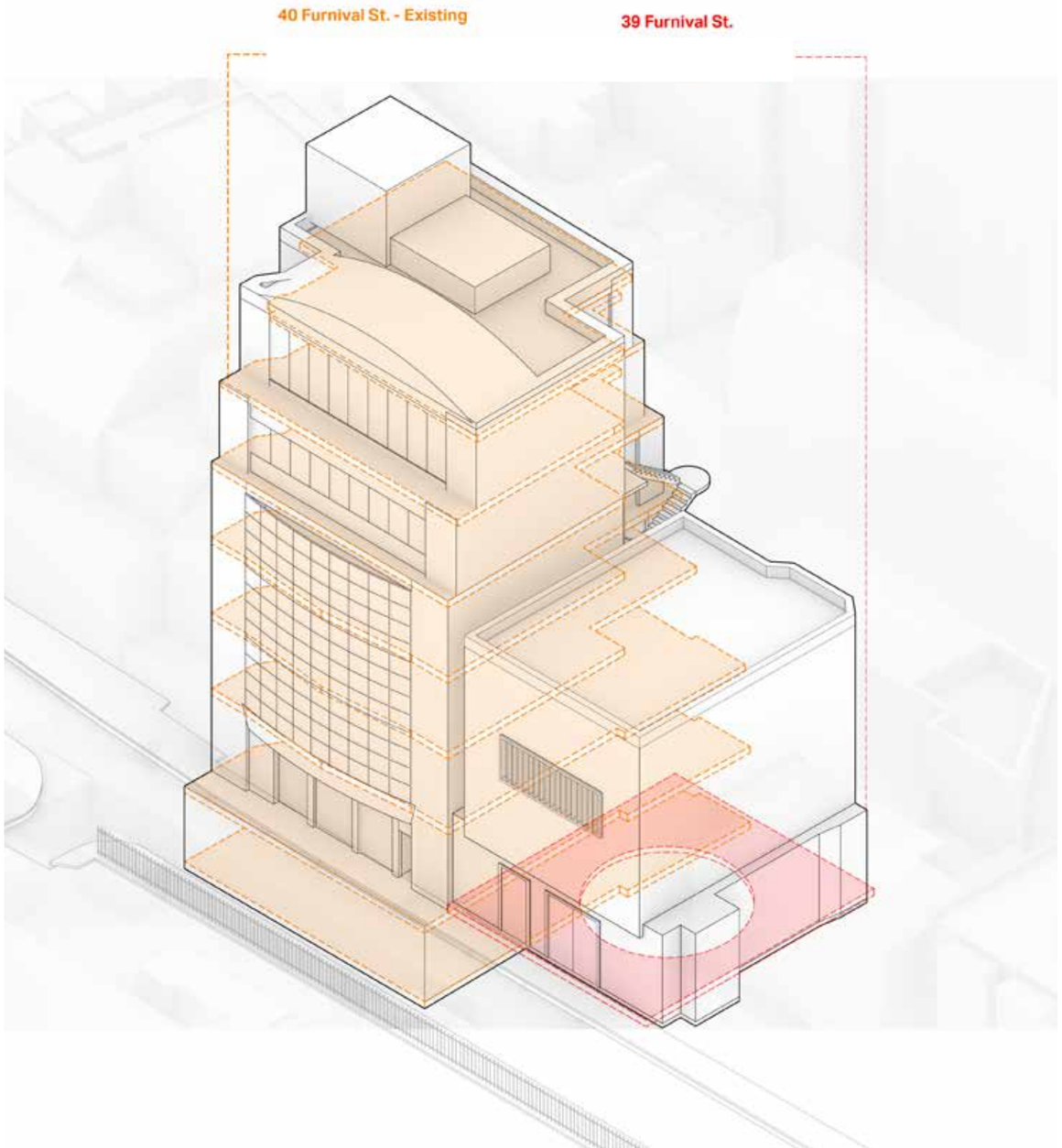


Figure 77. Furnival Street - Existing buildings

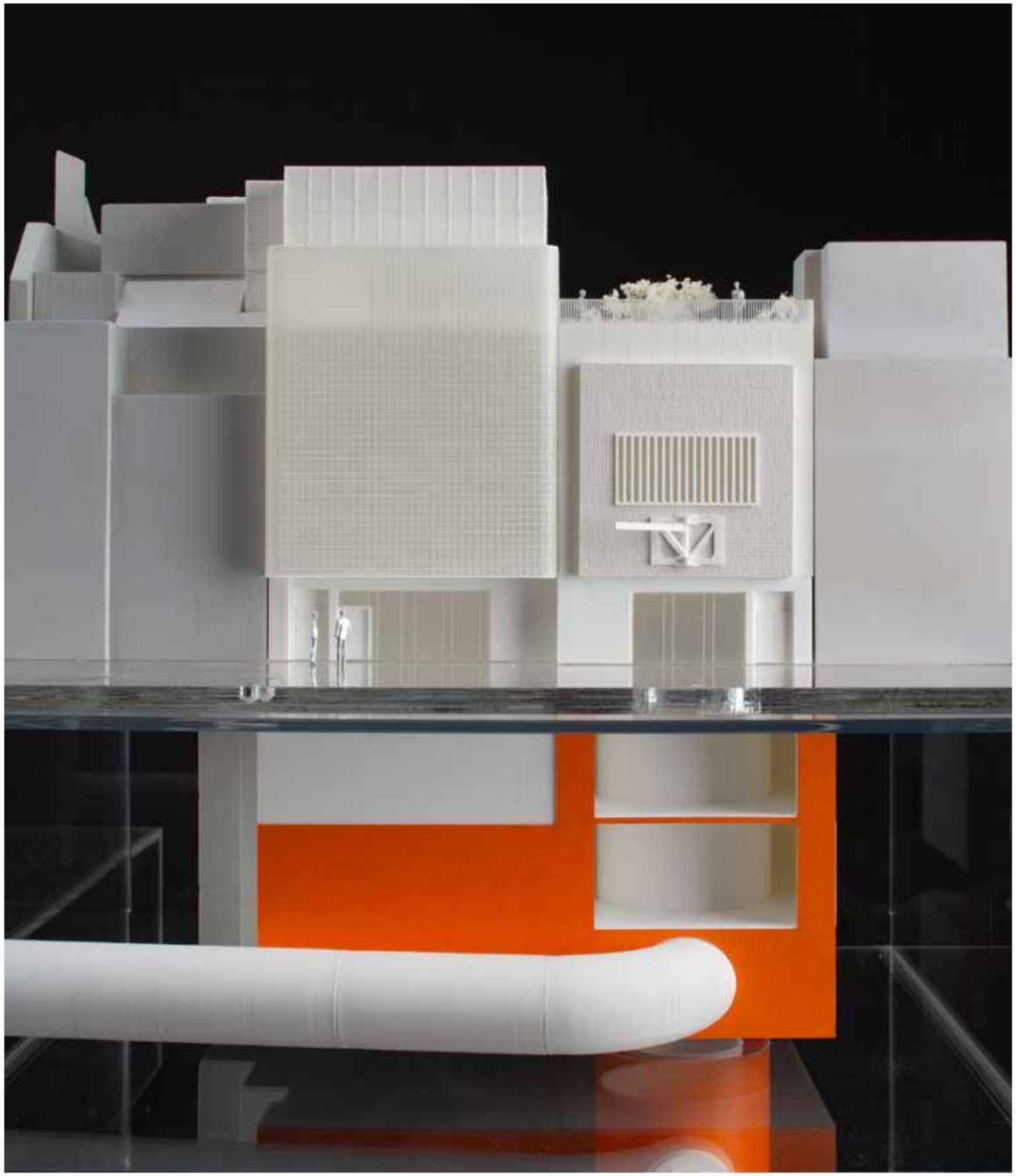


Figure 78. Furnival Street - Model showing proposed massing

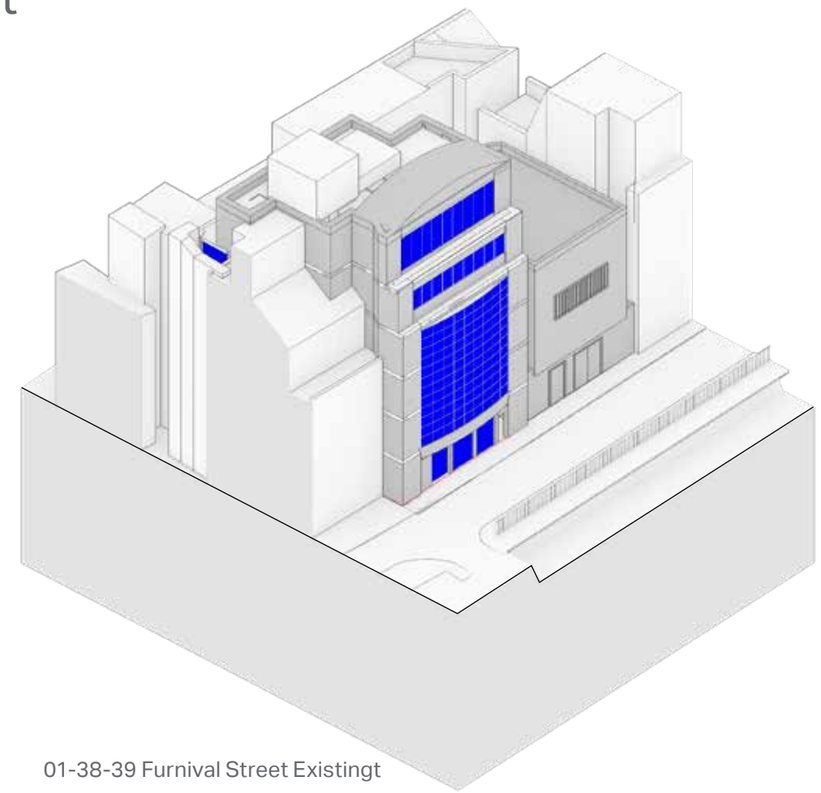
4.2.7 Demolition and Reinstatement

The requirement for the shaft enlargement dictates the need for an open excavation at 38-39 Furnival Street.

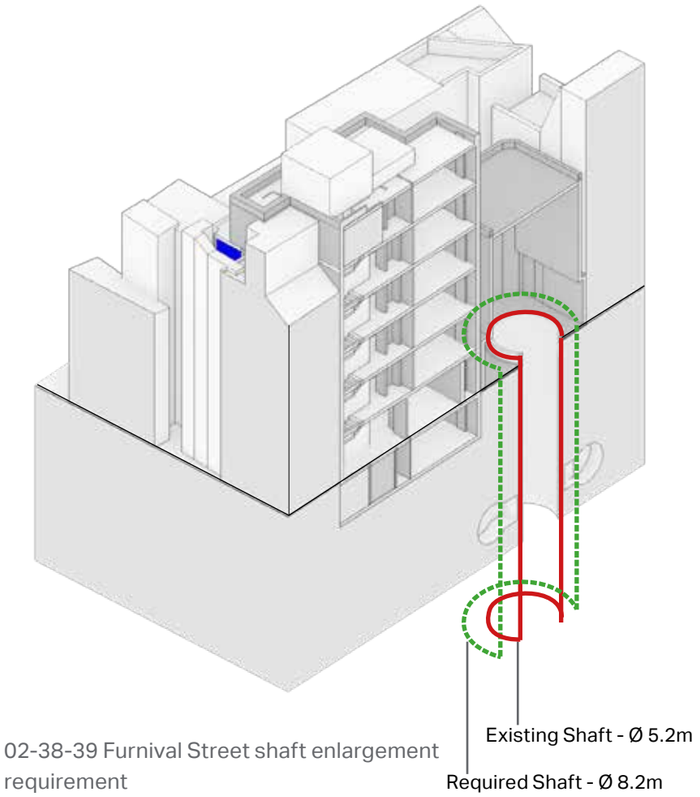
In addition to this, the new building at 38-41 Furnival street is required to host the majority of equipment to serve the tunnels.

The plant space requirement can not be accommodated above ground as it will exceed the permitted massing.

The retention of the buildings at 38-39 Furnival Street and 40-41 Furnival street has been carefully considered and deemed unfeasable, both practically and financially,



01-38-39 Furnival Street Existingt



02-38-39 Furnival Street shaft enlargement requirement

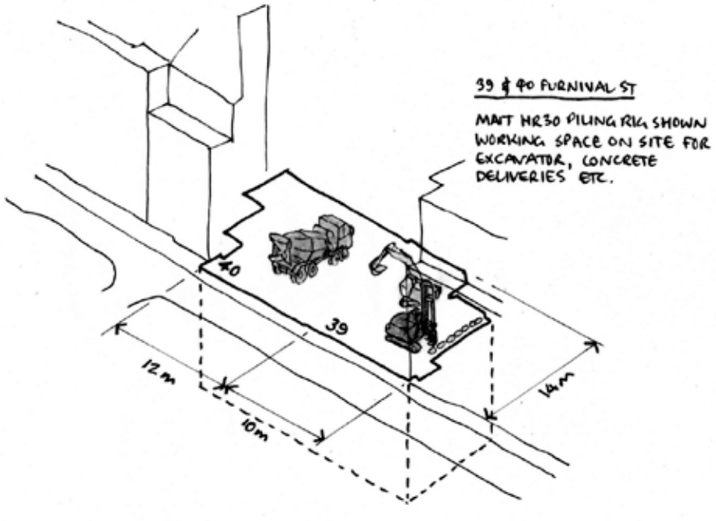
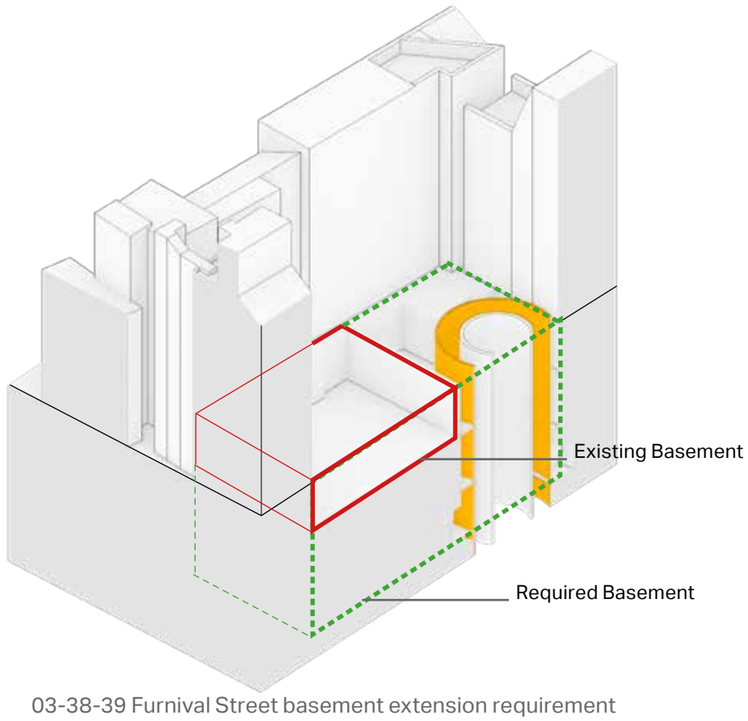
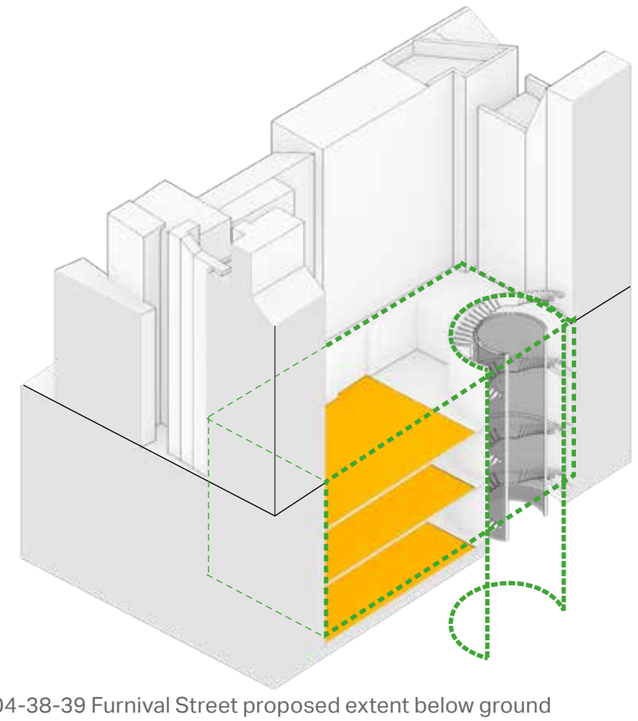


Figure 79. Indicative sketch comparing the size of the required piling rigs and trucks relative to the combined site footprint.



03-38-39 Furnival Street basement extension requirement



04-38-39 Furnival Street proposed extent below ground

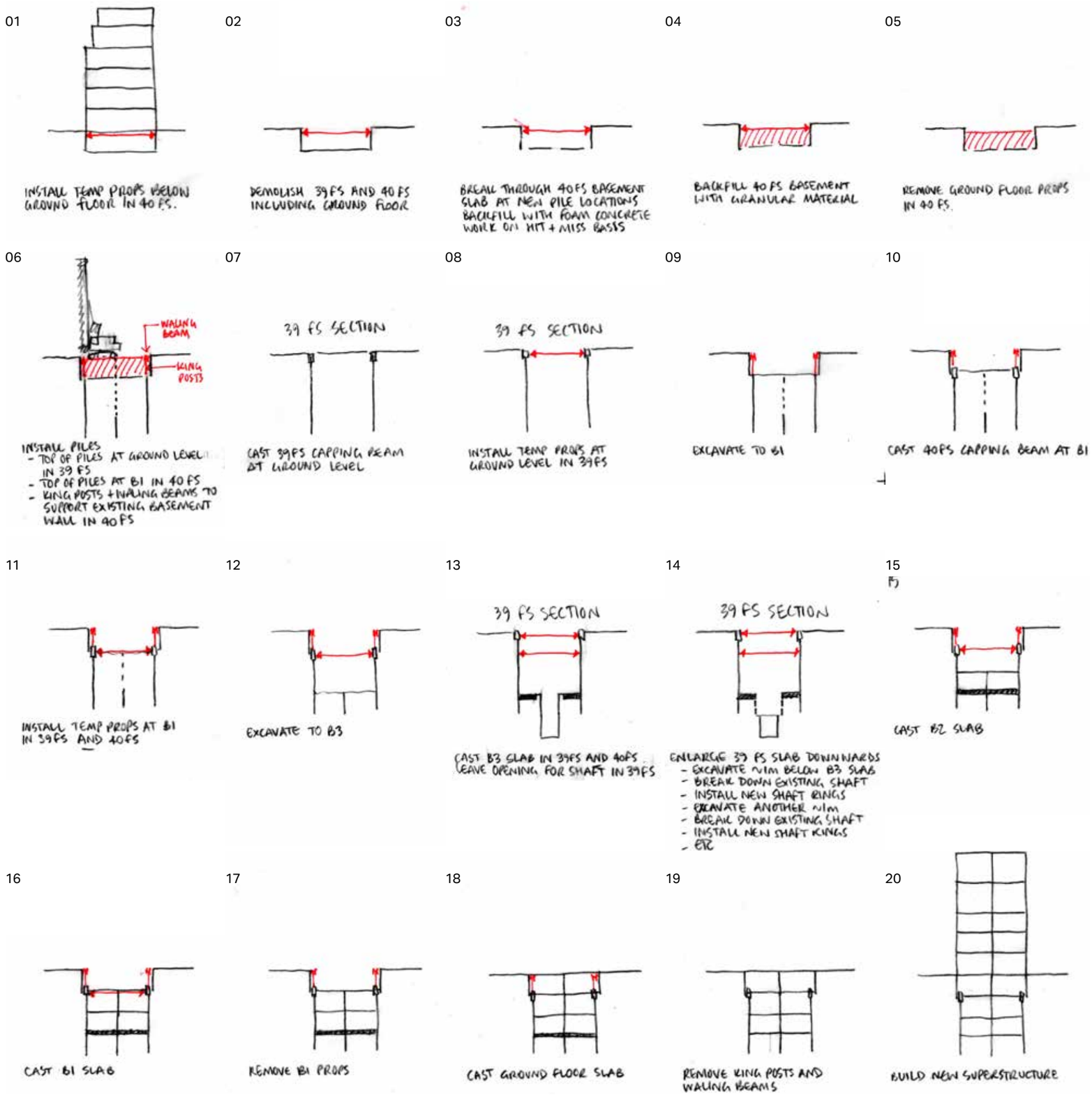


Figure 80. Demolition and construction sequence at 38-39 and 40-41 Furnival Street

The substructure design has been coordinated to accommodate the various MEP requirements that enable the tunnels below. Including a 5m high sprinkler tank, access hatches for large plant and access to the UKPN rooms. The ground floor and basement comprise a reinforced concrete frame with reinforced concrete floor slabs. Additional columns reduce the spans and support the access hatch structure.

The new basement will be formed within a piled retaining wall installed from existing ground level with a dig and prop construction sequence. The sequence shown on this page illustrates a method for demolition and construction of the new Furnival Street structure and enlargement of the lift shaft.

4.2.8 Facade Articulation & Townscape

The existing facade along Furnival Street is characterized by slender 4 to 8-storey individual buildings with a variety of materiality and alignments, creating a dynamic streetscape. The current structures at 38-39 and 40-41 Furnival Street, where the main visitor access to the tunnels is proposed, exhibit notable differences, enhancing the variety of street elevations. These buildings not only differ in appearance but also reflect their distinct functionalities. The proposed Scheme envisions a merging of the two structures, preserving their individual characters by articulating the two façades, and emphasizing their respective functionalities to contribute to the overall townscape.

Facade Rhythm and Townscape

Furnival Street has a diverse range of elevations and alignments, lacking strong or consolidated datums, thereby contributing to the street's varied character. Among these structures, 40-41 Furnival Street stands as one of the tallest, situated adjacent to 38-39 Furnival Street, one of the shortest. The proposed massing seeks to harmonize the height disparity by minimizing the gap between the two buildings.

Despite being proposed to be taller, the distinctive elements of the brick facade and concrete louvre in terms of dimension and material, which characterize 38-39 Furnival Street, will be preserved, thereby ensuring the safeguarding of the structure's historical character. In contrast, 40-41 Furnival Street is envisioned with a visually distinct geometry, featuring translucent glass bricks. While both façades exhibit differences, there are material and architectural commonalities that unmistakably identify them as integral parts of a unified project. Placed at different datums, both façades contribute to the rhythmic stepping pattern of the street-scape.

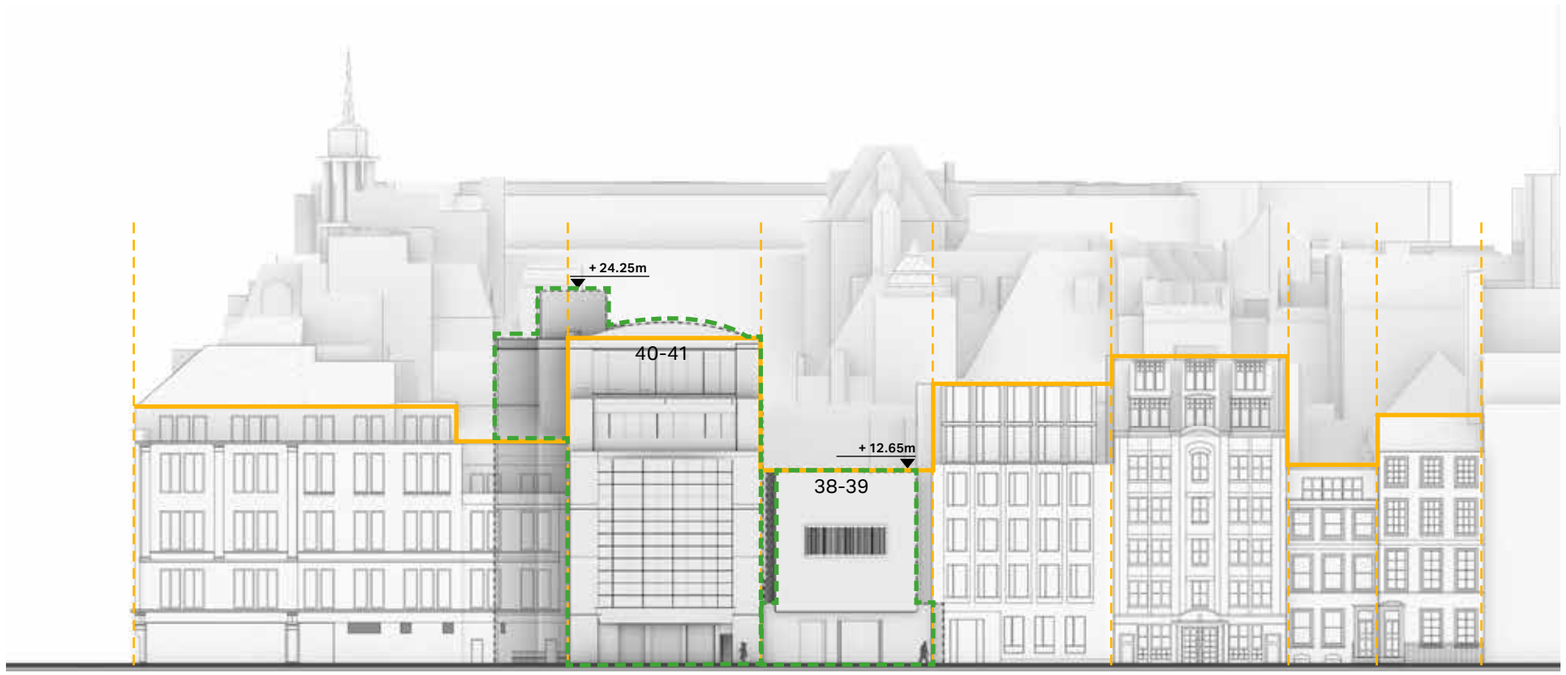


Figure 82. Existing 38-39 and 40-41 Furnival Street buildings within townscape context

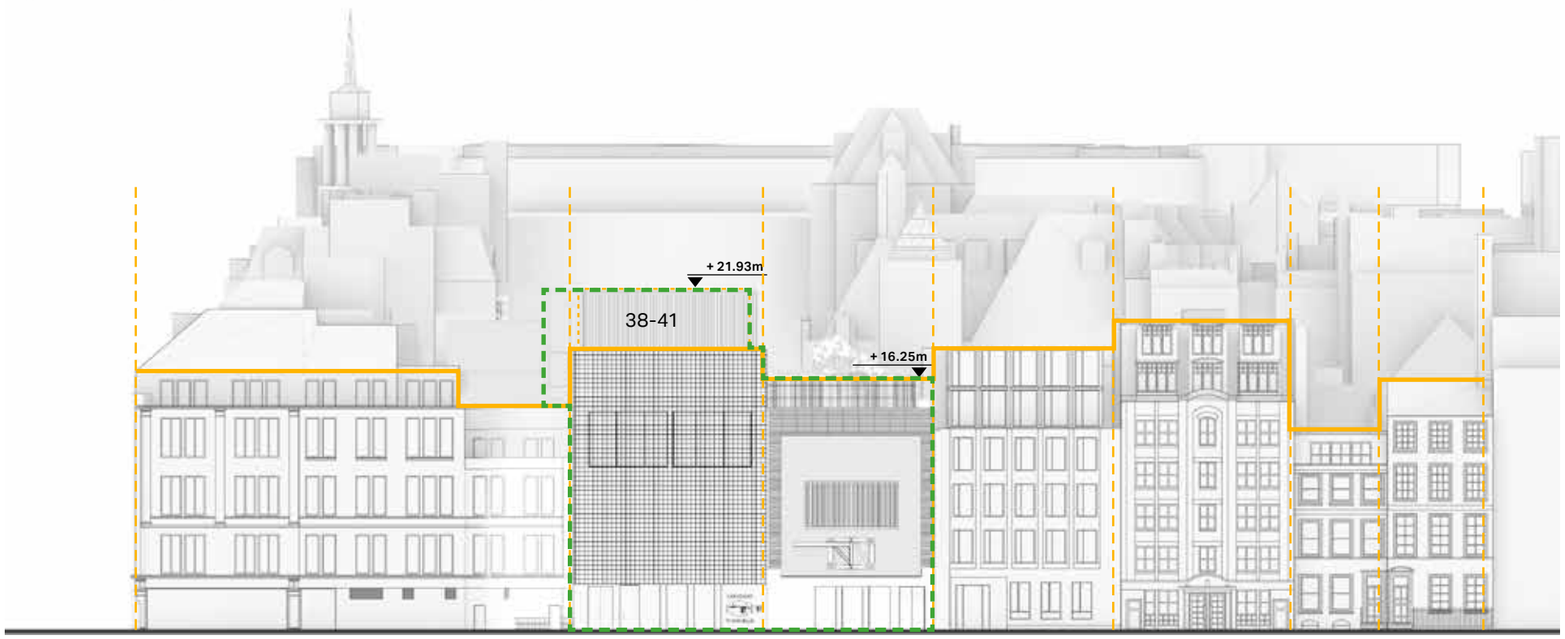
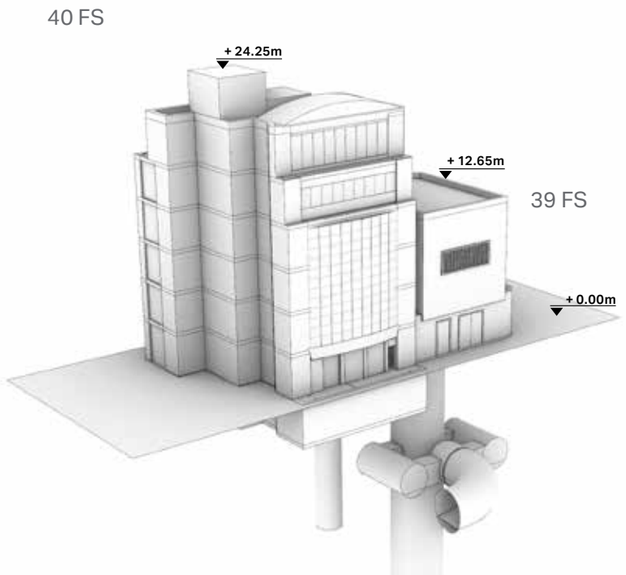
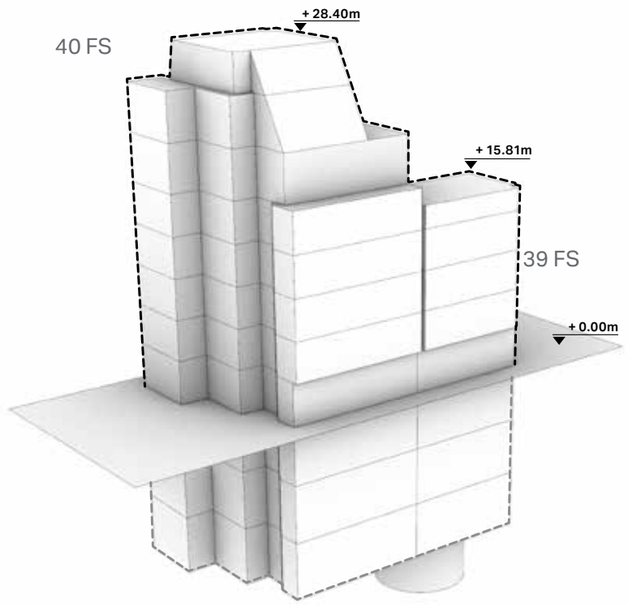


Figure 81. Proposed 38-39 and 40-41 Furnival Street buildings within townscape context

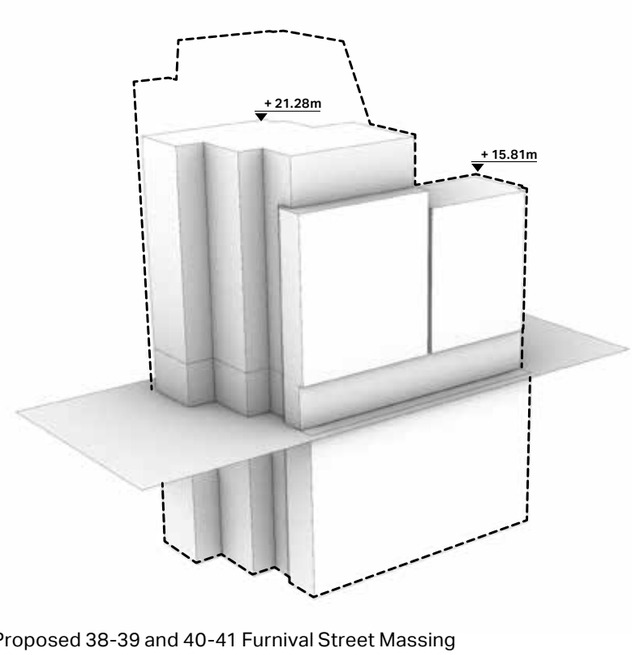
4.2.9 Massing



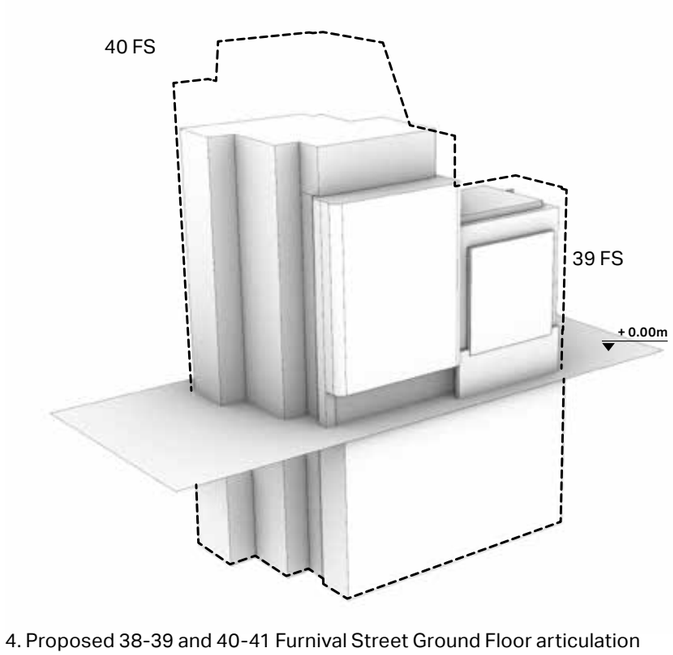
1. Existing massing of 38-39 and 40-41 Furnival Street buildings



2. Rights to Light building envelope for 38-39 and 40-41 Furnival Street



3. Proposed 38-39 and 40-41 Furnival Street Massing



4. Proposed 38-39 and 40-41 Furnival Street Ground Floor articulation

The existing combined area of 38-39 Furnival Street and 40-41 Furnival Street falls short of accommodating the necessary plant equipment, as well as the essential back and front-of-house spaces for processing visitors to the tunnels.

A Sunlight and Daylight analysis defined the height limitations and massing extents, influenced by various factors, including proximity to neighbouring buildings. This analysis defined a maximum building envelope (2).

Distinct constraints determine the maximum massing for each building, resulting in two recognizable volumes. Despite the maximum above-ground volume provided by the building envelope, it remains insufficient for all the required plant and architectural uses. To address this, a combined basement is proposed to offer additional plant area. The basement extension must interface with the enlarged shaft and the existing ‘dog leg’ tunnel, determining the excavation depth.

The deep and combined basement facilitates the placement of larger plant elements underground. Consequently, the buildings don’t need to occupy the maximum envelope, resulting in an intervention that is more considerate of neighbouring views (3). Lastly, the ground-level facade at 40-41 Furnival Street is recessed to allow for more comfortable access parallel to the street and provides shelter in front of the building (4).

Figure 83. Building envelope and massing analysis for 39 and 40 Furnival Street buildings.

40-41 Furnival Street Facade Treatment

A significant feature introduced by the proposed 38-41 Furnival Street is the recessed ground floor facade, offering shelter and activating a side entrance, parallel to the street, through where 38-39 Furnival Street currently sits. This design enhances pedestrian access, and provides an external covered area in the property boundary where visitors can gather.

Considering that a majority of visitors will approach from High Holborn, the side-facing access door becomes prominently visible, contributing to the overall clarity of the project and wayfinding. Moreover, the projecting glass brick facade, aligned with the furthest point of the existing facade, serves as a distinctive element that can be seen from a distance, inviting visitors from the main road.

Figure 84. Artistic render of view from High Holborn looking south towards Proposed Development at 40-41 Furnival Street

Figure 85. Artistic indicative image of Proposed Development from south

38- 39 Furnival Street Facade Treatment

The proposed Scheme replicates the existing brick facade and concrete louvres in its proportions and location. The existing bricks will be dismounted and reused wherever possible. Where the original material can't be reused, it will be replicated in line with the heritage requirements.

The ground floor is aligned to 36 Furnival Street to maintain continuity in the street facade.

Note: Some available imagery suggests the crane below the concrete louvres existed in the facade until recently, however it is no longer there. Efforts have been made to locate and reinstate the original piece but it has been scrapped. The scheme aims to replicate the original artefact.

4.2.10 Vertical Transportation Strategy

The new building at 38-41 Furnival street includes a number of lift cores to facilitate vertical transportation.

The building hosts the access lift to the tunnels, while providing independent lift cores serving the basement and the upper floors.

The main core connecting to the tunnels will sit within the proposed enlarged shaft and will provide visitor access to the exhibition areas below ground. A set of two double deck lifts, with a combined capacity for 60 passengers, will transport visitors to the tunnels and out. The split twin-lift arrangement provide the required resilience and allows for both banks of lifts to be used independently,

In an emergency scenario, round shaft lifts will be used for evacuation and for fire fighters access.

The second set of lifts are designed to serve the building and provide mechanical transportation for visitors leaving the building.

They are also integral in connecting the basement levels to ground and provide access to the upper floors for staff.

These lifts will be used for evacuating the staff area at levels 04, but not the public retail levels.

These will be evacuated mainly through protected stair. When a visitor requires to be evacuated via mechanical means, the pressurised lift in the circular shaft will be used.

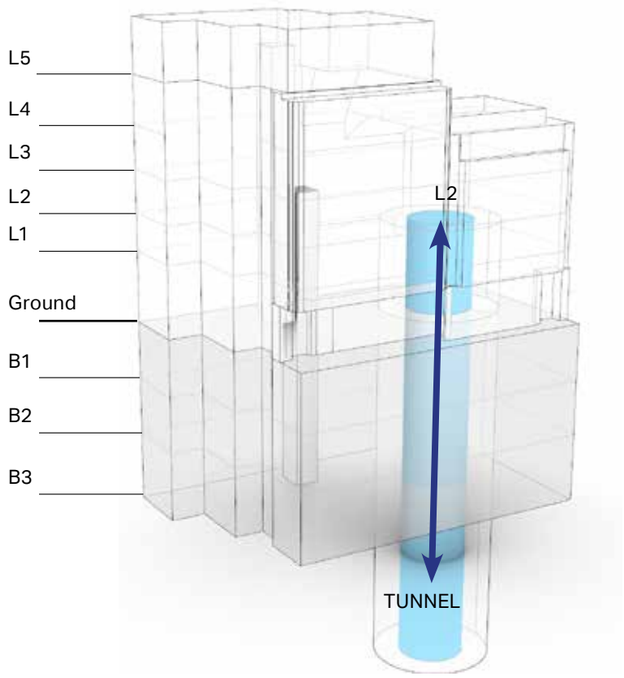


Figure 87. Main Lift Core connecting L2 to Tunnel Level

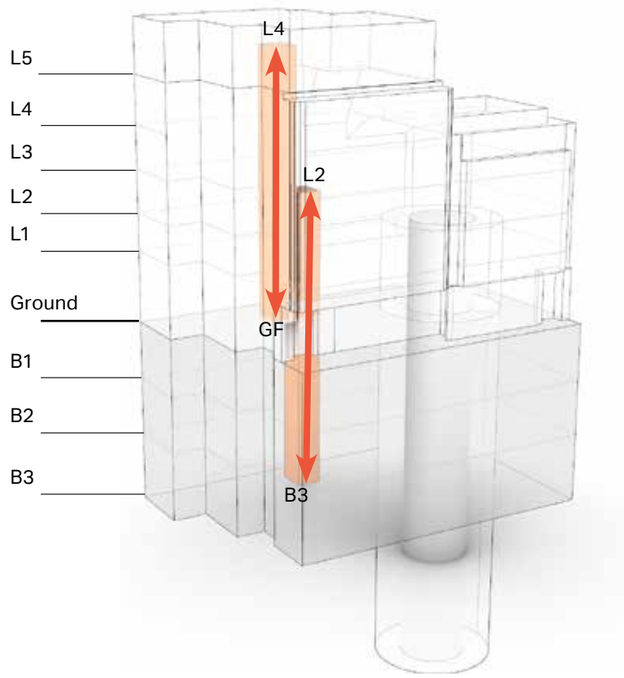


Figure 88. Service Lift Core connecting from B1 to L4

Figure 86. Artistic render of view from High Holborn looking south towards Proposed Development at 40-41 Furnival Street

Figure 89. Evacuation route from Tunnel Level

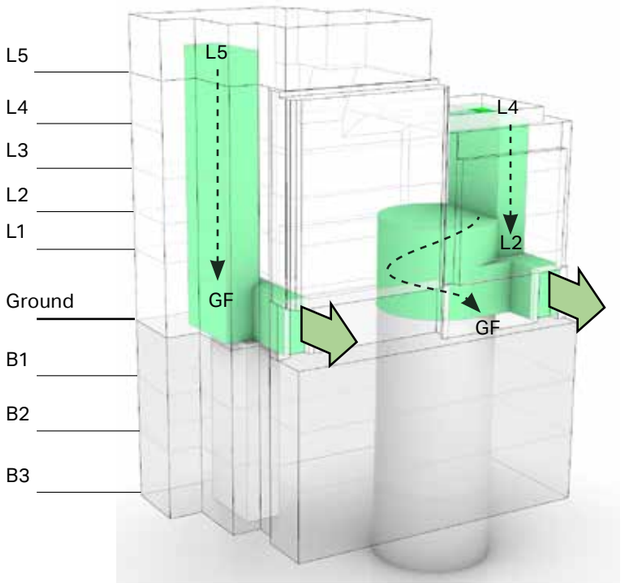


Figure 90. Two means of Escape from Level 5 to Ground Floor

Figure 91. Two means of escape from the basement levels

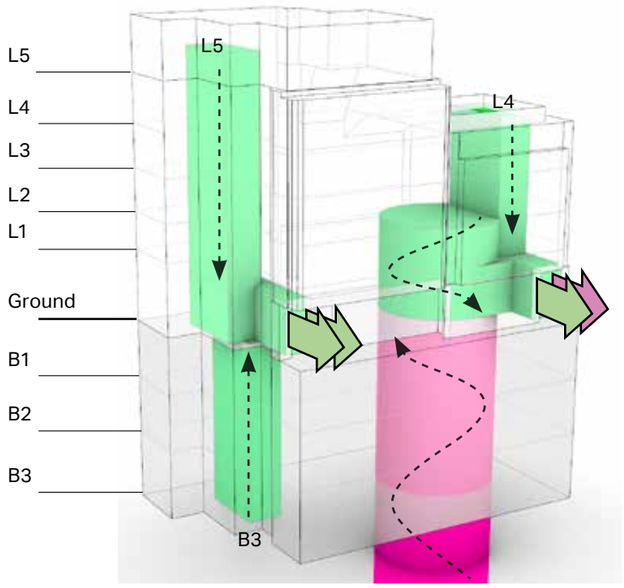


Figure 92. Combined evacuation strategy

Evacuation Strategy & Cores

- Evacuation route from the Tunnel levels is via the main shaft and terminate at ground level through protected corridors out to Furnival Street
- Evacuation from the basement levels of the Furnival Street is via 2 no. routes - the main shaft and an additional protected core to the north. At ground level egress is out through protected corridors out to Furnival Street.
- Evacuation from the upper levels of the Furnival Building via 2 no. routes- the main shaft and an additional protected core to the north. At ground level egress is out through protected corridors out to Furnival Street.
- Evacuation from roof terrace to L2 is through an additional stair connecting to the extended shaft.

Visitor Access and Egress

To efficiently process visitors, the new shaft will rely on a set double decker 30-people twin lifts, with a total capacity of 60 people. The strategy is centred around guaranteeing at-grade access for disabled users.

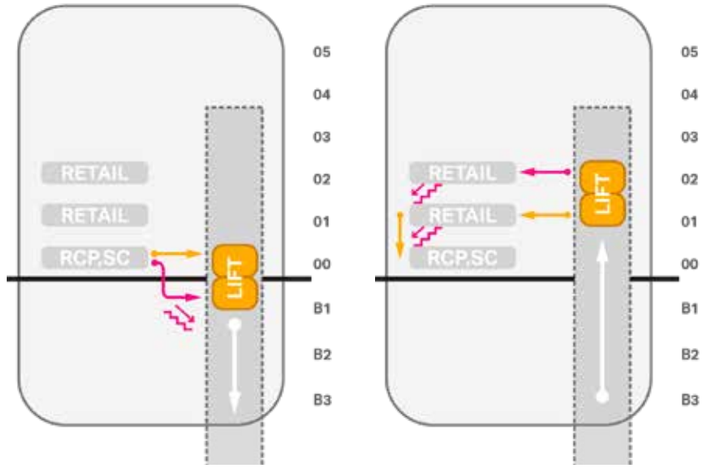
Access will be through the ground floor at 38-41 Furnival Street where disabled and non disabled users will enter the top deck at ground floor level. At peak times, once the top deck is full, visitors that can manage stairs will walk down a level and access the bottom deck at B1. A similar strategy will be used to exit the tunnels, with disabled and non disabled users entering the lift at floor level, and visitors that can use stairs will use board the upper deck if necessary.

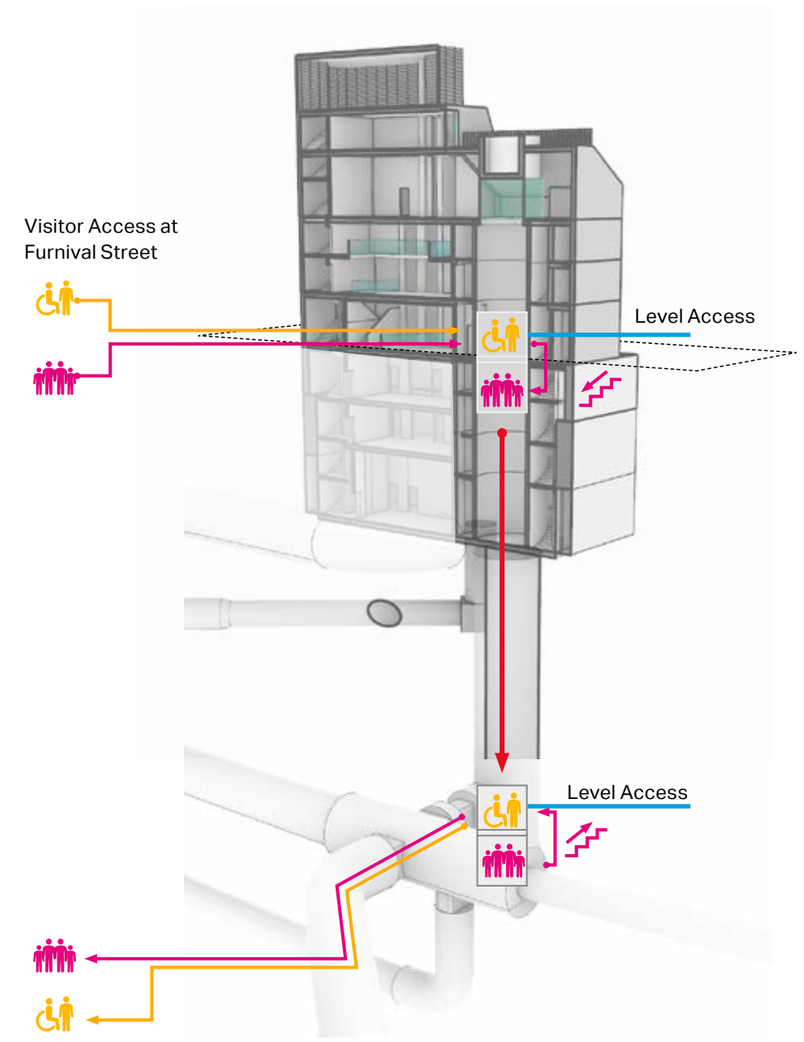
The lift will then stop at level 1 and 2, where disabled visitors will exit directly to the main retail space at level 1, while upper deck users will disembark at Level 2 retail.

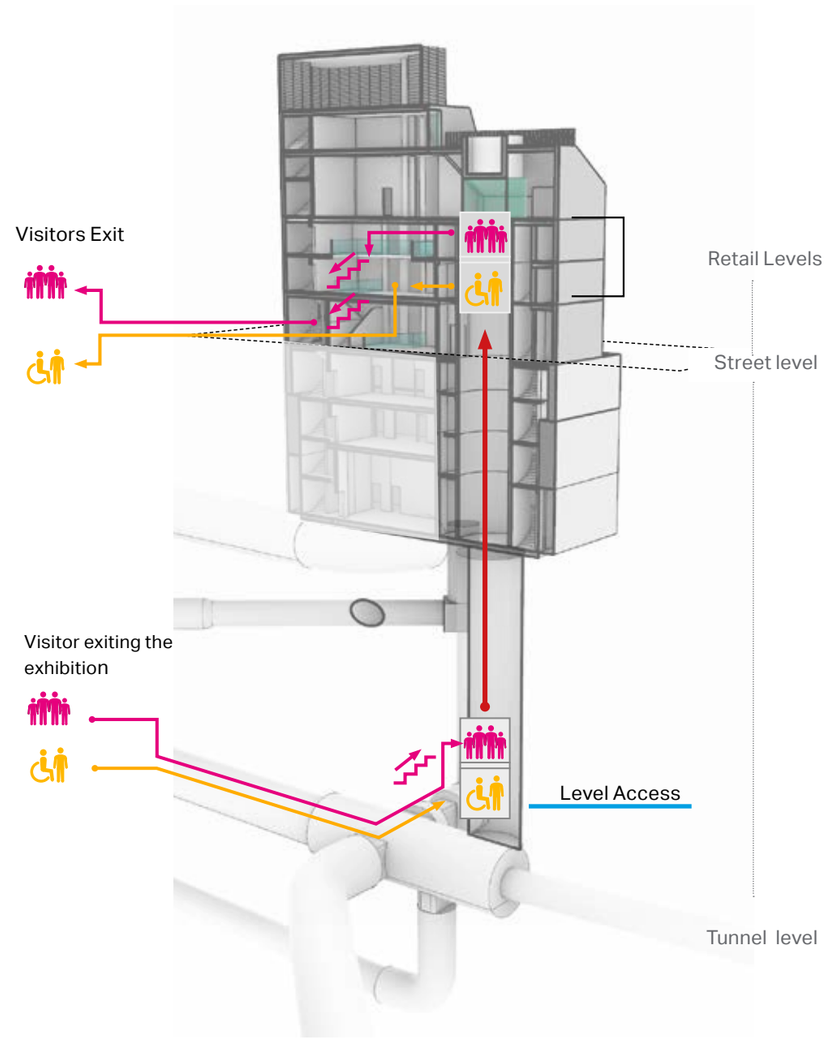
When in the retail levels, all users will be able to exit via the separate retail lifts or stairs. The lifts provided at retail level are

Visitors requiring additional lift space will be allowed to exit using the lifts in the circular shaft.

The lifts could be programmed to allow users with disabilities to exit directly at ground level if required. These scenarios will be studied furhter during the next design stages.

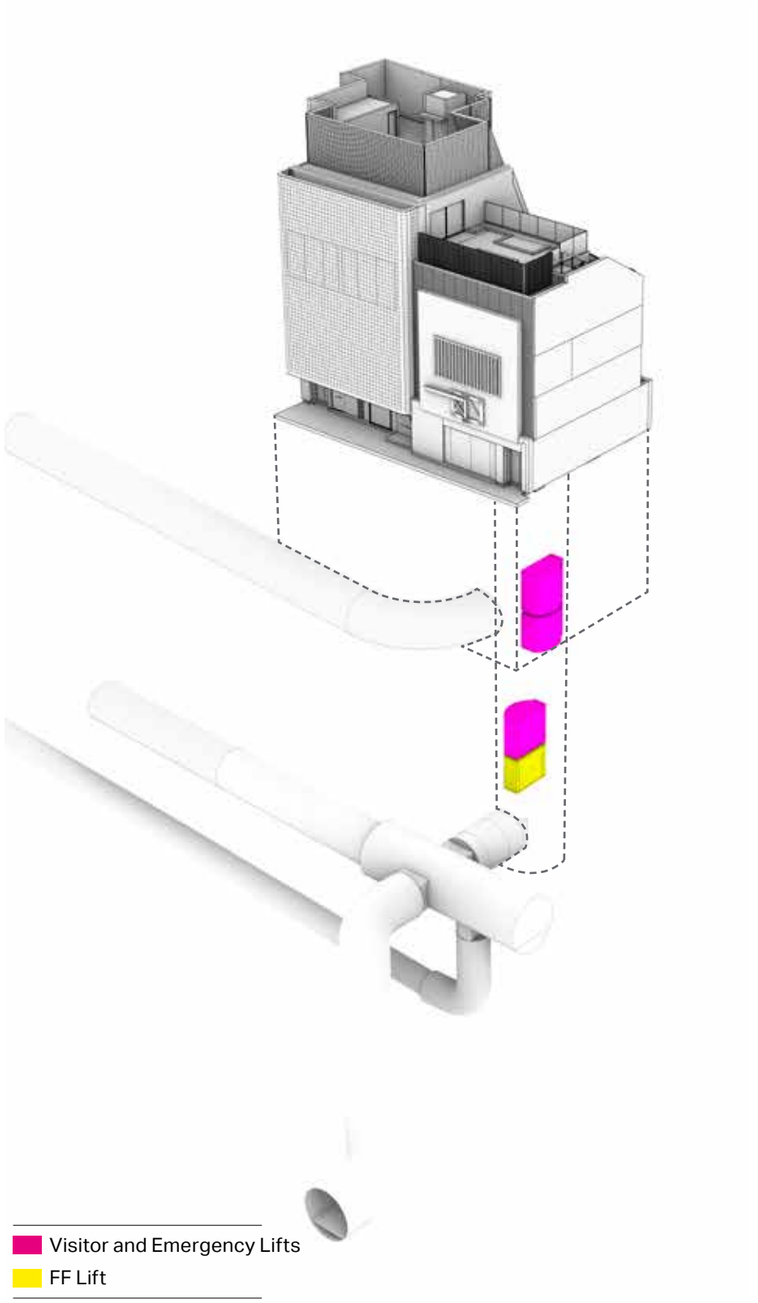


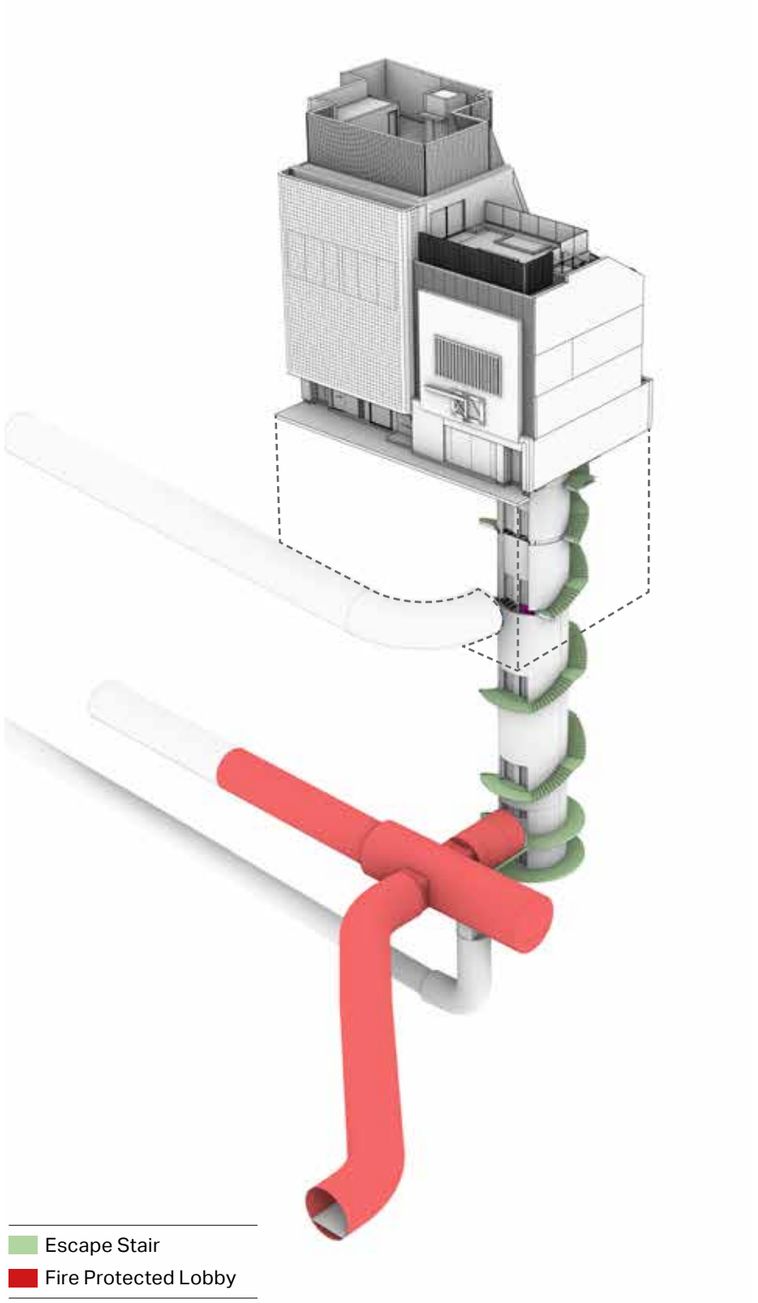




Non-disabled

Disabled + non-disabled





Furnival Street Shaft

38-41 Furnival Street and its associated shaft will function as the main entrance to the tunnels.

The shaft is also required to provide firefighters access to the tunnels and evacuation. For this, the shaft will be pressurised and connected to a fire protected lobby at tunnels level.

Requirements

The tunnel access requirements at this location are summarised below:

- 1 Fire Fighter lift - Pressurized.
- 1 Emergency lift - Pressurized.
- 1 spiral Escape stair - Pressurized.
- Escape stair and lift must share protected lobby.
- Set of lifts must be provided for resilience - rescue if needed.

In order to accommodate these requirements spatially, the strategy for Furnival Street proposes the construction of a new wider shaft, from grade, down to the level of the tunnels.

4.2.11 MEP Internal Distribution

38-41 Furnival Street provides the primary access and exit to the tunnels for visitors and staff, and also contains the retail spaces and plant serving the majority of the tunnels.

3 basement plant levels contain water tanks and pumps for domestic and sprinkler systems, electrical plant serving the tunnels, and chillers providing chilled water to the tunnel network.

Ventilation plant is located at Furnival Street level 3 including the main AHU for tunnel ventilation, tunnel smoke extract fans, pressurisation fans serving the Furnival Street lift shaft and lobbies, and the AHU serving the building itself. Air is both drawn in and exhausted from roof level via vertical air wells.

Cooling towers at roof level will reject heat which cannot be recovered, louvres around the plant will provide cooling air to the units.

A life-safety generator will also be located at roof level, providing back-up power to life safety systems such as lifts, smoke extract and stair pressurisation.

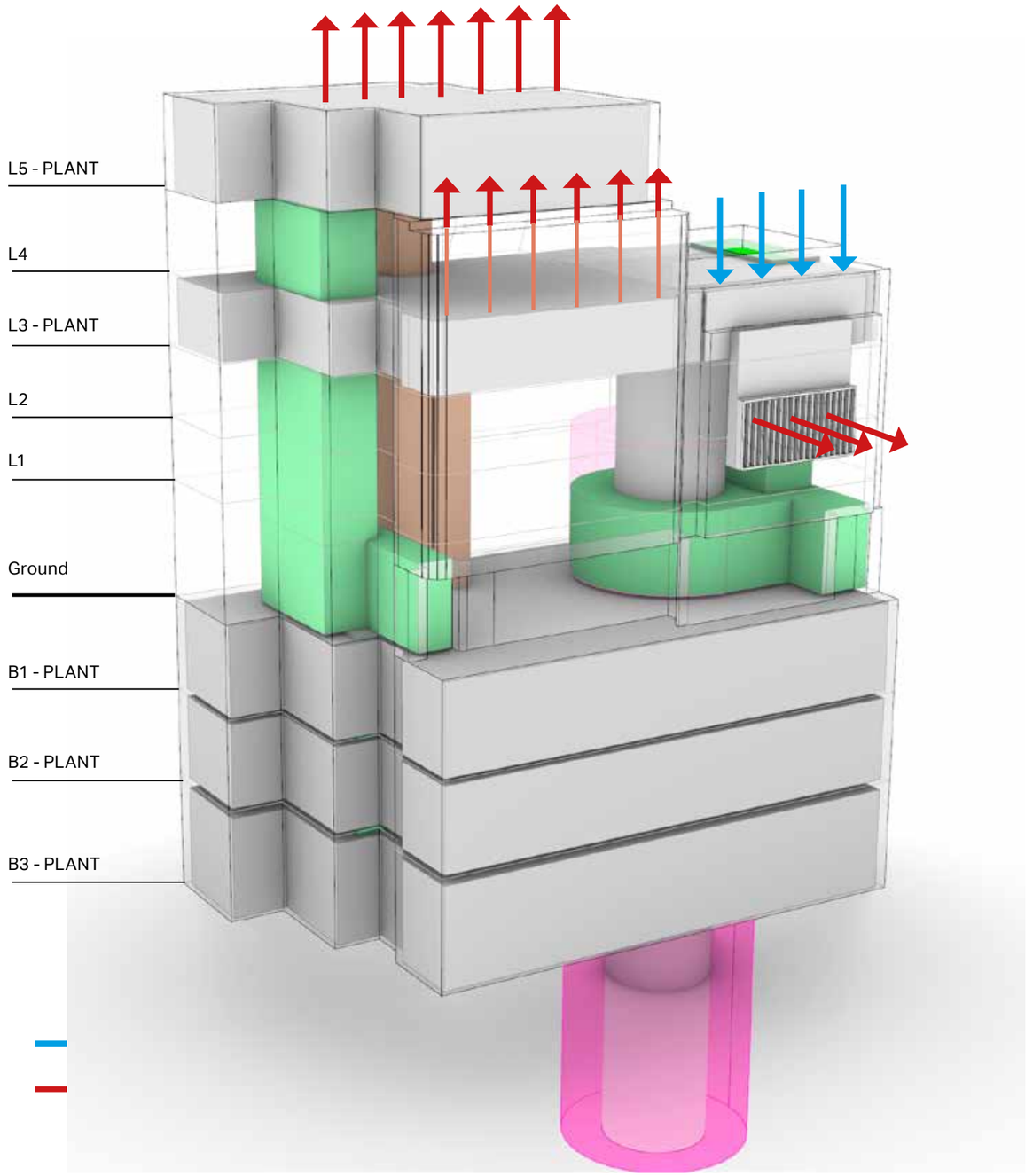
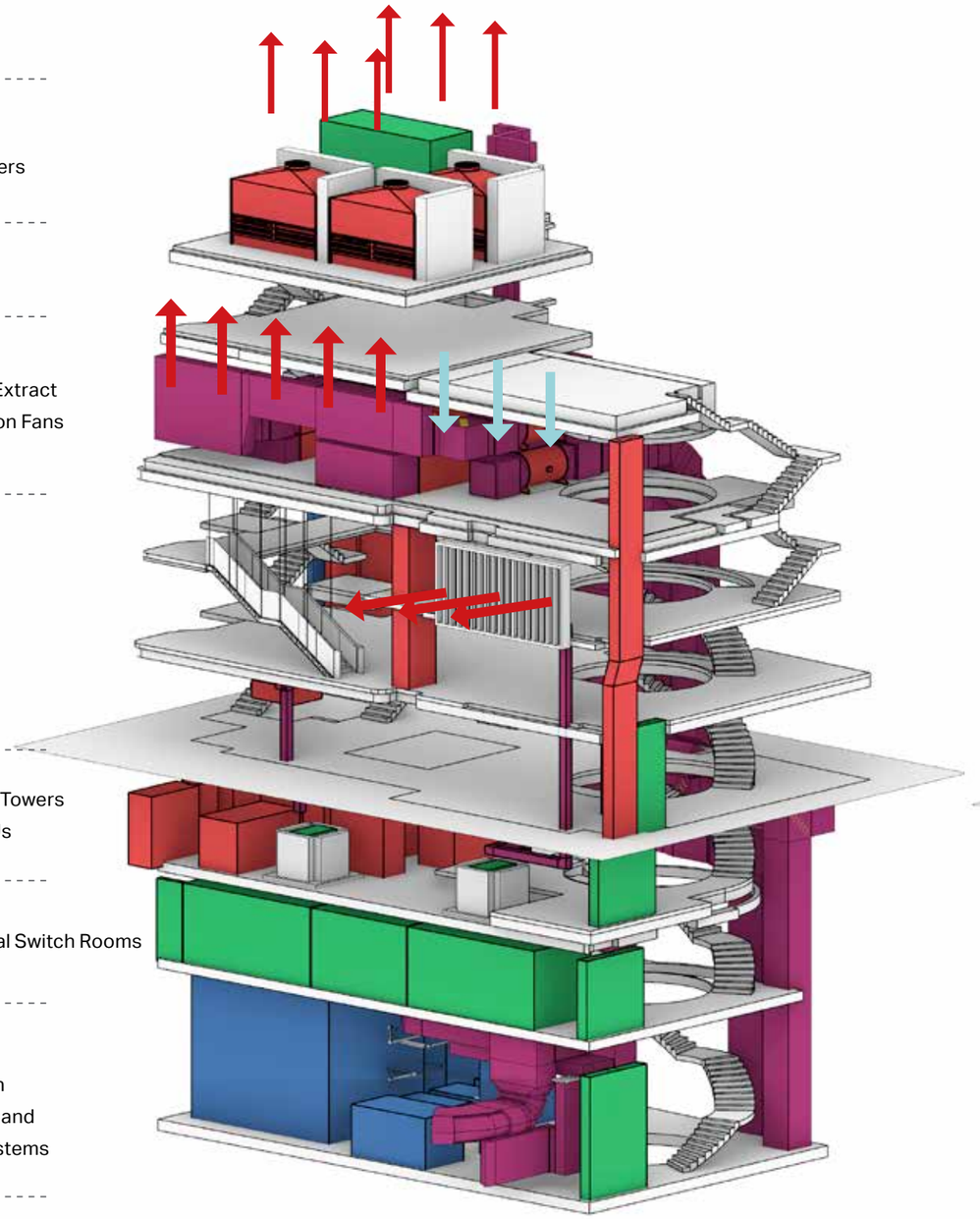


Figure 93.2. Furnival St. - Plant rooms and ducts system

Mechanical
Electrical
UKPN RMU
Public Health

Roof
Cooling Towers

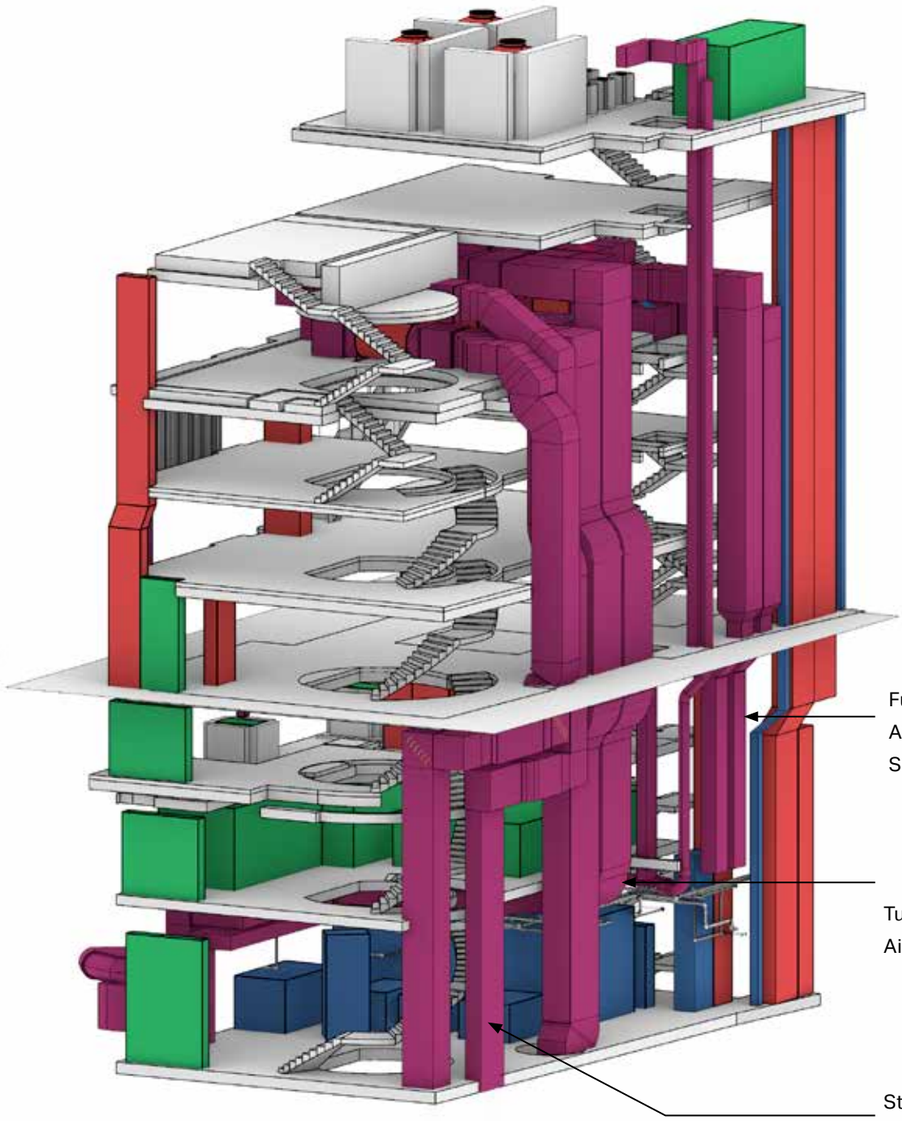
L3 - Smoke Extract
Pressurisation Fans



B1 - Cooling Towers
UKPN - RMUs

B2 - Electrical Switch Rooms

B3
Public Health
Water Tanks and
Filtration Systems



Furnival St. Plantrooms
Air Supply/Return Ducts
Smoke Extract

Tunnels
Air Supply/Return Ducts

Stairs & Lifts
Pressurisation Ducts