

43-47 Piccadilly, Manchester**New Hotel****Structural Design Philosophy (Planning Stage)****Revision 2**

The site is approximately 500m² with highway boundaries against Piccadilly to the south, Lever St to the west and Back Piccadilly to the north. To the east, the site has a boundary with grade II listed 49 Piccadilly, with the boundary comprising a masonry wall six stories above ground and one basement level below ground.

The site consists of two plots: 43-45 Piccadilly to the west and 47 Piccadilly to the east. 43-45 has been demolished to ground level with no existing buildings. 47 has a grade II listed townhouse on Piccadilly and a grade II listed warehouse on Back Piccadilly. Both the townhouse and warehouse are constructed from brick walls, timber floors and timber roof trusses and have three stories above ground and one basement level, with a link staircase and lightwell between. The warehouse has a jack-arch floor slab over the rear 7m of the ground floor.

The west walls of the townhouse and warehouse are currently supported by scaffold buttressing located at ground level on 43-45. This buttressing is likely to have been installed after the demolition of the 43-45, which could have been providing a degree of support to the west wall of 47. The west wall of the warehouse is in particularly poor condition and has props and waling beams on the internal sides of the wall at all levels.

The east wall of the townhouse and warehouse appears to be structural independent from 49 Piccadilly boundary wall i.e. the buildings do not share a load bearing wall. The depths of the basements of 47 and 49 Piccadilly are both around 2.5m below Piccadilly street level. Ground investigations are to be undertaken to establish the foundation depths and arrangements of 47 and 49 Piccadilly. The proposed basement level is approximately 3.15m below Piccadilly street level, which is 650mm below existing basement level in 47 and 49.

The proposed hotel is to be a 12-storey structure with one storey of basement, comprising:

- Basement: retail and hotel plantrooms and back of house facilities
- Ground floor: retail and access to hotel
- First floor: hotel reception, restaurant and kitchen
- Floors 2 to 12: bedrooms
- Plant enclosure over the east half of the roof

The proposed structure for the new building is:

- Continuous Flight Auger (CFA) bearing piles
- Contiguous piled OR insitu reinforced concrete (RC) retaining walls to the entire perimeter of the site except the south and east sides of the townhouse.
- Foundations: RC pile caps, ground beams and basement slab
- Vertical Elements: RC stair and lift cores between basement and roof and RC columns between basement and second floor level
- Horizontal Elements: RC flat slab at ground and first floor and transfer deck at second floor level

- Lightweight metal stud frame from second floor level to roof (walls and floors)

It is proposed to retain the following parts of the existing listed buildings:

- Townhouse: all wall and floor structure except the staircases between basement and first floor level
- Warehouse: The rear façade between first floor level and roof

The temporary and permanent structural works associated with retaining the existing townhouse building are (refer to figure 1):

1. Erection of temporary support towers in the townhouse to provide lateral stability following removal of the existing scaffold buttressing
2. Removal of the existing scaffold buttressing
3. Masonry repairs to the west wall of the townhouse (if required)
4. Excavation of the basement of 43-45
5. Underpinning of existing west and north wall foundations
6. Erection of new building foundations and structure to provide lateral support to townhouse

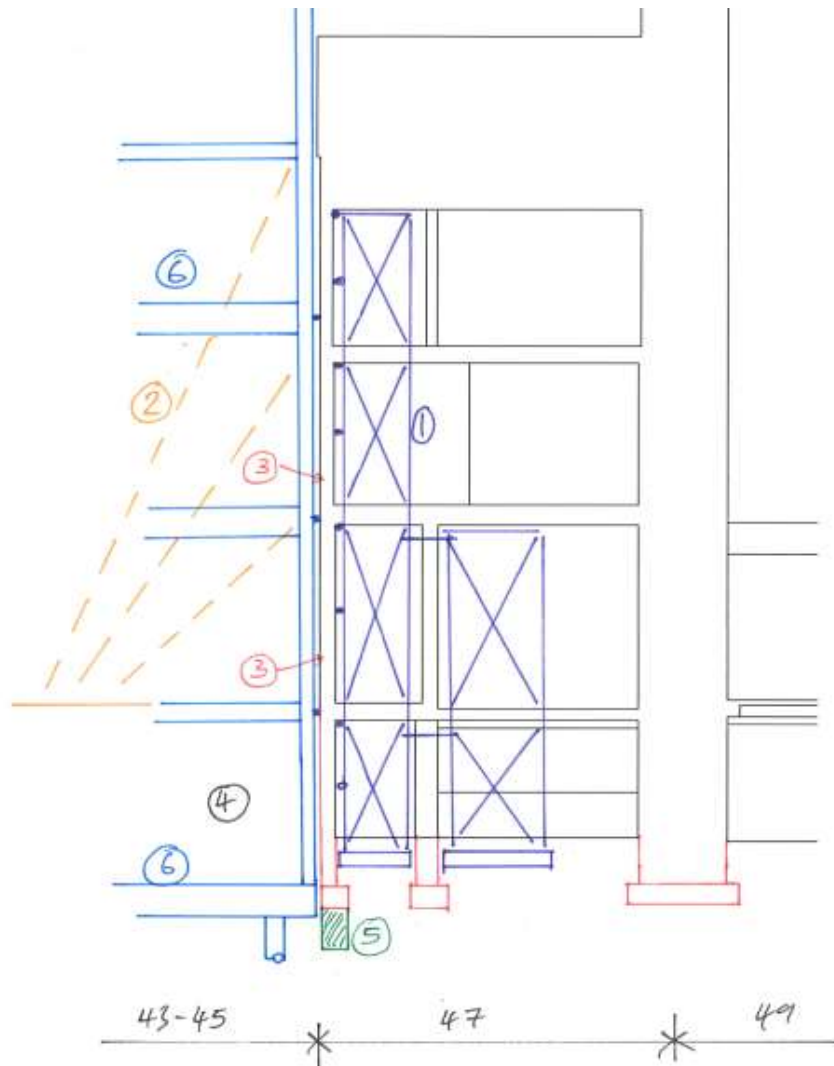


Figure 1 Temporary and permanent works required to retain the townhouse

The temporary and permanent structural works associated with retaining the existing warehouse rear façade are:

1. Temporary support of the warehouse rear façade using temporary steel towers supported in the rear parking space of the site on Back Piccadilly (refer to Figure 2)
2. Permanent support by the new RC frame

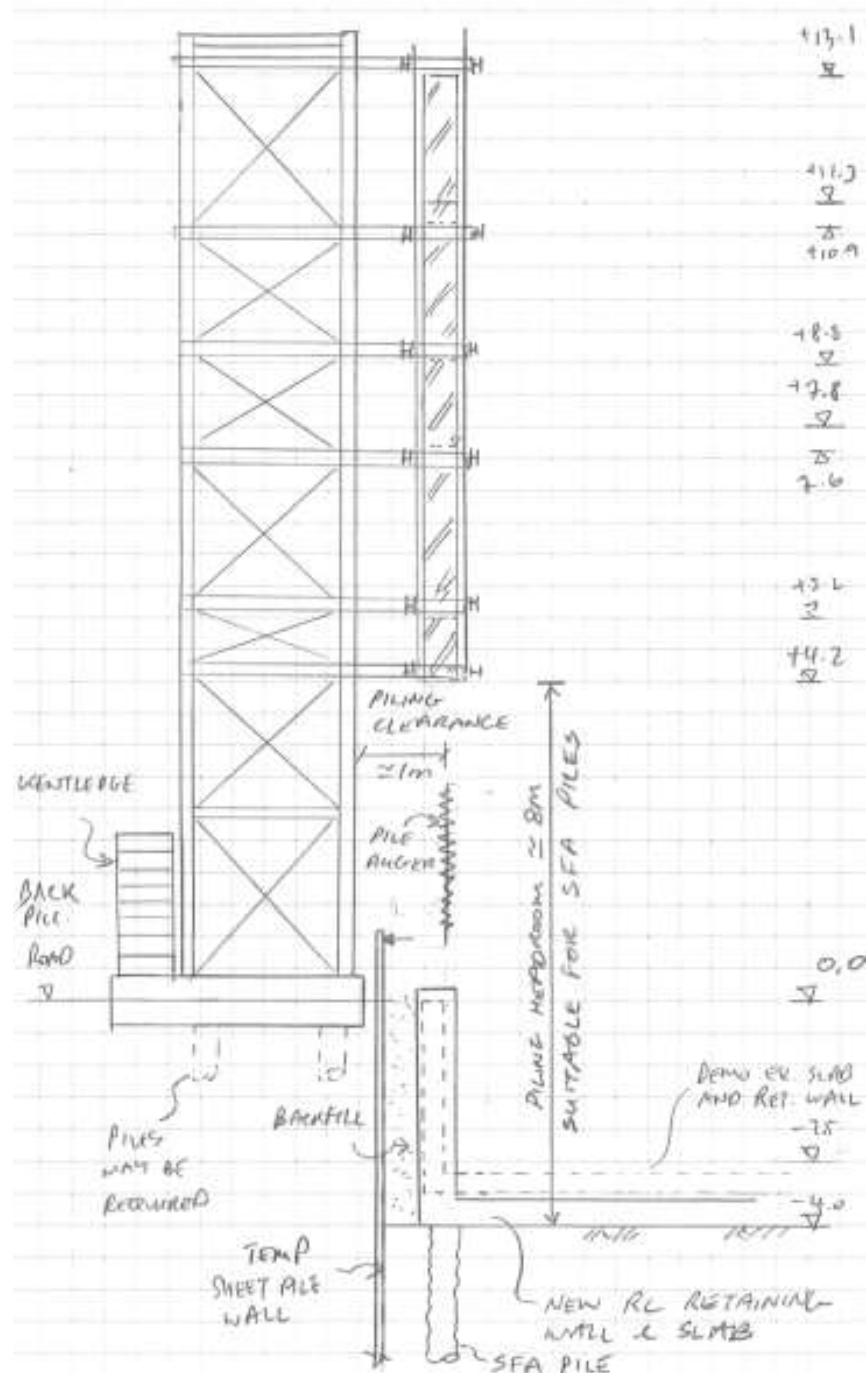


Figure 2 Temporary support of rear facade

The structural works required to achieve alterations of the townhouse are:

- Basement (Figure 3):
 1. Removal of internal load bearing walls and replacing with steel beams supported on existing masonry walls
 2. New steel beam lintels will be used to create openings in west external wall

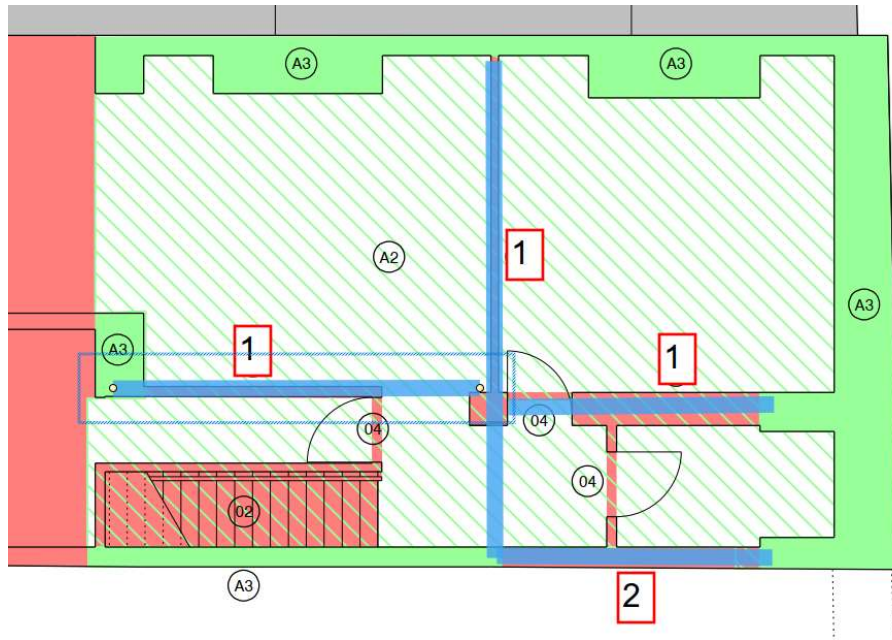


Figure 3 Basement high level Strengthening

- Ground Floor (Figure 4):
 1. Removal of internal load bearing walls and replacing with steel beams supported from new building RC concrete frame
 2. Removal of north external wall and replacing with steel beams supported from existing masonry walls or new building RC concrete frame

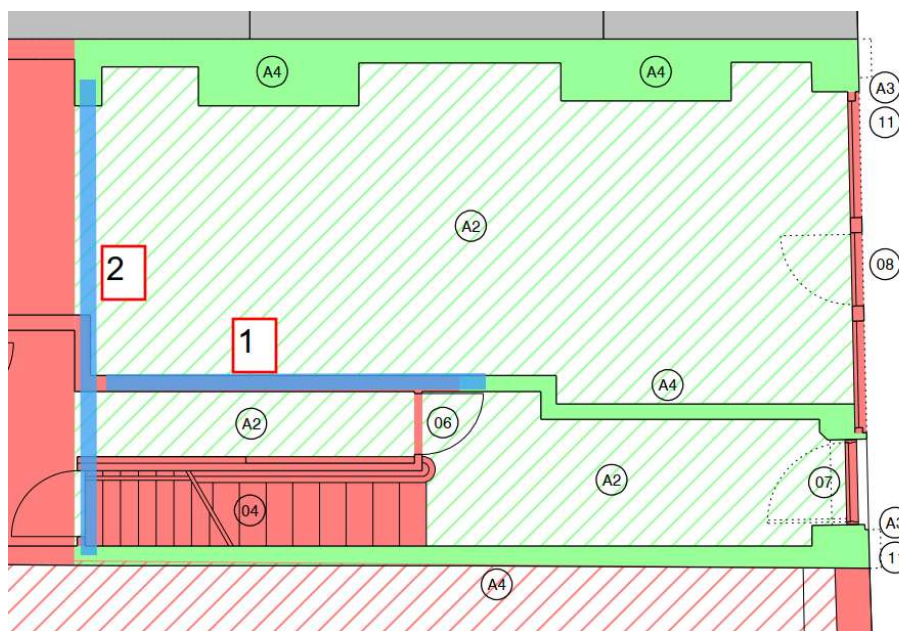


Figure 4 Ground Floor high level strengthening

- First Floor (Figure 5):
 1. Removal of internal load bearing walls and replacing with steel beams supported on existing masonry walls and new building RC frame
 2. New steel beam lintels will be used to create openings in west external wall

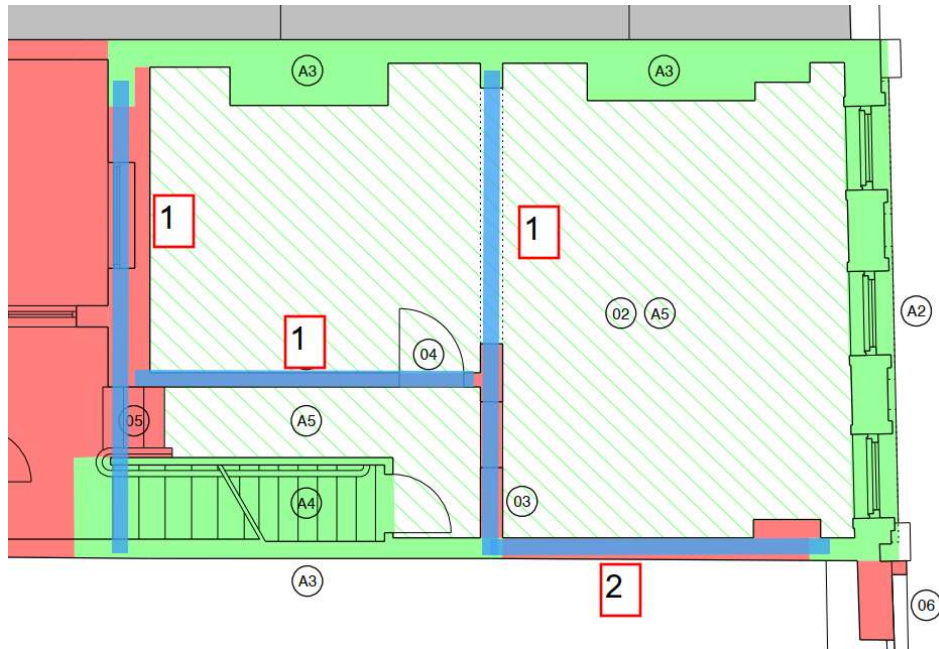


Figure 5 First Floor high level Strengthening

- Second Floor (Figure 6):
 1. Removal of internal load bearing column and replacing with steel beams supported on existing masonry walls
 2. New steel beam lintels will be used to create openings in west external wall

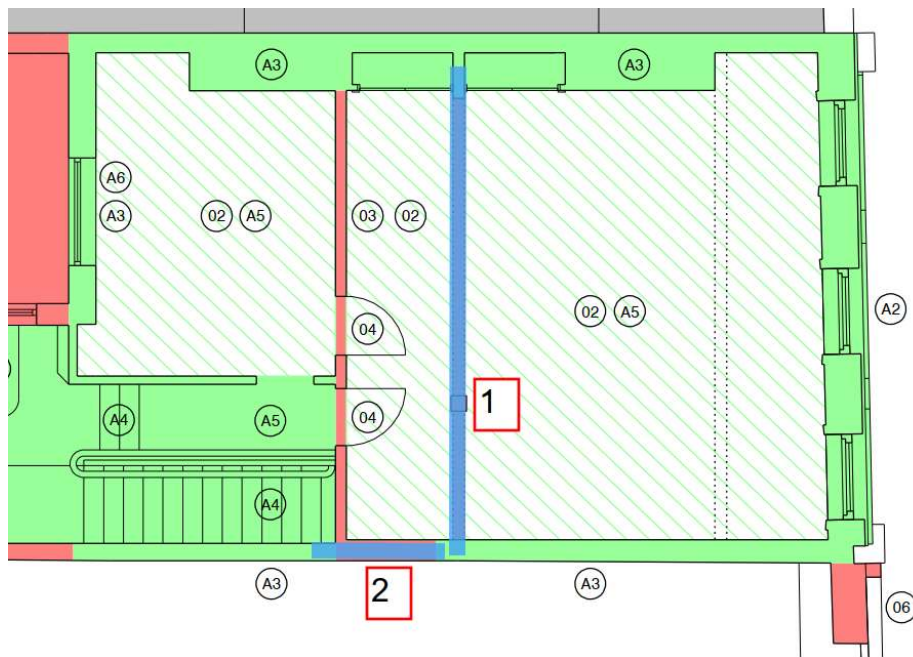


Figure 6 Second Floor high level strengthening

Where existing masonry walls are shown to have insufficient capacity to support new beams, new steel posts may be employed to transfer loads down to the lower levels. Structural alterations to the townhouse will be undertaken to avoid excessive deformation of the retained listed structure.