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Construction Methodology Statement

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1. Introduction

1.1 Scope and Objectives

Civic Engineers has been appointed by Maryland Securities Ltd to provide structural engineering input for the listed building application to Manchester City Council for the redevelopment of Brunswick Mill.

The site, Brunswick Mill, is situated on Bradford Road, Manchester, M40 7EZ. The proposed development works involve the following.

1. The conversion of Brunswick Mill to form a residential scheme of apartments and ground floor commercial units.
2. Construction of a residential scheme to Bradford Road comprising of apartments set over a ground floor with commercial units along with a refuse and cycle store.
3. Landscaped route from Bradford Road to the Ashton Canal allowing both pedestrian access to the tow path and vehicular access to the car parking.

This report appraises the feasibility of the proposed works, including available construction methodologies for the development. This report does not alleviate the Contractor in any way of their obligations under CDM 2015 in their role as Principal Contractor to develop a Construction Phase Plan in conjunction with the Principal Designer, Contractors, and other Duty Holders.

2. Site Context

The development site is located on Bradford Road, Manchester, M40 7EZ and is shown approximately by the extents of red line in Figure 1. Note that the orange bound area is not under the ownership of this Client and is not considered as part of the development proposals.

The development site is approximately 9,200m²/0.92 ha in area.

The approximate OS coordinates of the site are 393530E 398720N.

The development can be split into three distinct zones as shown in Figure 2.

1. The Mill (Red)
2. The Mid Building (Blue)
3. The Corner Building (Green)



Figure 1: Site Location Plan



Figure 2: Development Designation

3. Development Proposals

The proposal is a redevelopment of Brunswick Mill and adjacent land comprising the partial deconstruction of buildings, re-purposing of existing buildings, and erection of new buildings for a mixture of uses comprising 277 no. residential homes and circa 2030m² flexible commercial space, ancillary hard and soft landscaping, formation of new vehicular accesses onto Bradford Road, vehicular and cycle parking, and associated works and infrastructure.

An indicative view of the development proposals is shown in Indicative Development Proposals



Figure 3: Indicative Development Proposals

4. Existing Structures and Boundary Interfaces

4.1 Brunswick Mill

The existing mill is formed as a quadrangle of varying height. The mill has undergone various additions and alterations since its original construction and is now of the general layout as shown in the below Figure 4.

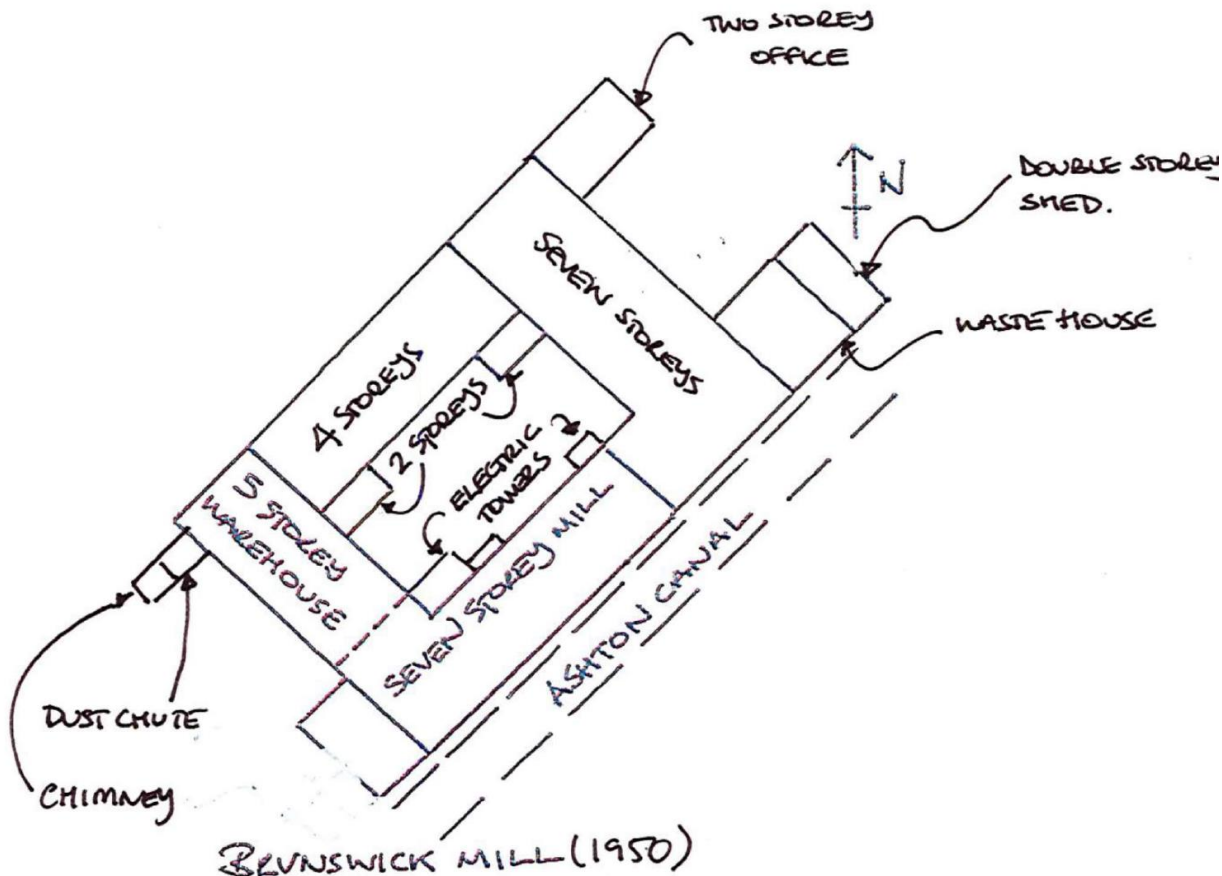


Figure 4: Existing Mill Layout

The structural form of the main buildings of Brunswick Mill is typical and as expected for the construction era of the building. Floor slabs are formed as masonry jack arches spanning between cast iron beams. Cast iron beams span between external masonry piers and internal cast iron columns. Tie bars are evident between cast iron beams to counteract thrust forces induced by arch action of the floors.

Stability of the building is achieved by the two primary stair cores and the large external masonry walls.

It is proposed that the main mill building is retained with small internal alterations including slab cut outs for vertical distribution of services.

However, it is proposed that the existing 4No. two storey later additions within the internal courtyard, noted as "2 storeys" and "electric towers", in Figure 4 are demolished as part of the

internal courtyard proposals. This is shown in Figure 5 and Figure 6. Further deconstruction works are proposed of the two-storey office and double storey shed to the north east of the site shown in Figure 7.



Area of building to be demolished shown by red hatch.

Figure 5: Buildings to be Demolished Looking South West from Internal Courtyard



Area of building to be demolished shown by red hatch.

Figure 6: Buildings to be Demolished Looking North East from Roof

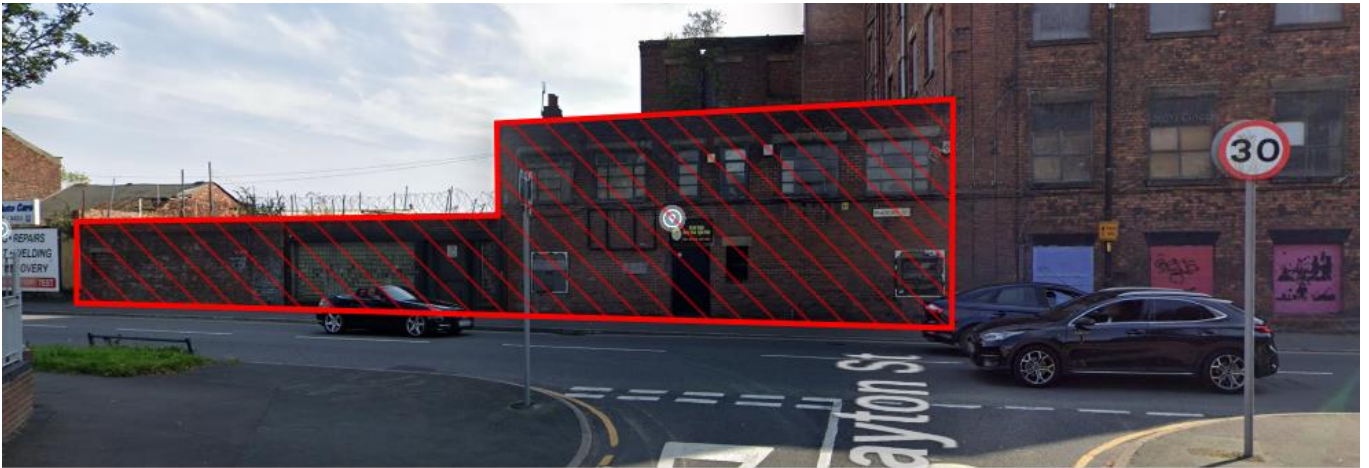


Figure 7: Building to North West of Site to be Demolished.

deconstruction of the structure is expected to be carried out by a specialist deconstruction contractor.

It is apparent from other consultant input, including The University of Salford, Manchester, Archaeological Desk Based Assessment (2021) and Stephen Levrant Heritage Architecture Ltd, Heritage Statement (2018), that Brunswick Mill was constructed in stages over the course of many years. This included later additions and alterations to the mill. A brief overview of the change in layout with time is shown, and taken from SLHA Heritage Statement (2018), in Figure 8.

The proposed areas to be demolished are known to be later additions. It would be reasonable to therefore assume these areas are structurally independent of the main mill building. As a result, it is not anticipated that the deconstruction of these would have adverse impact on the stability or load bearing capacity of the main mill building.

However, a detailed methodology is to be developed for the proposed deconstruction works with input from specialist during future design stages. This is to consider safe methods of deconstruction and ensure these do not have any detrimental effects on existing adjacent buildings.

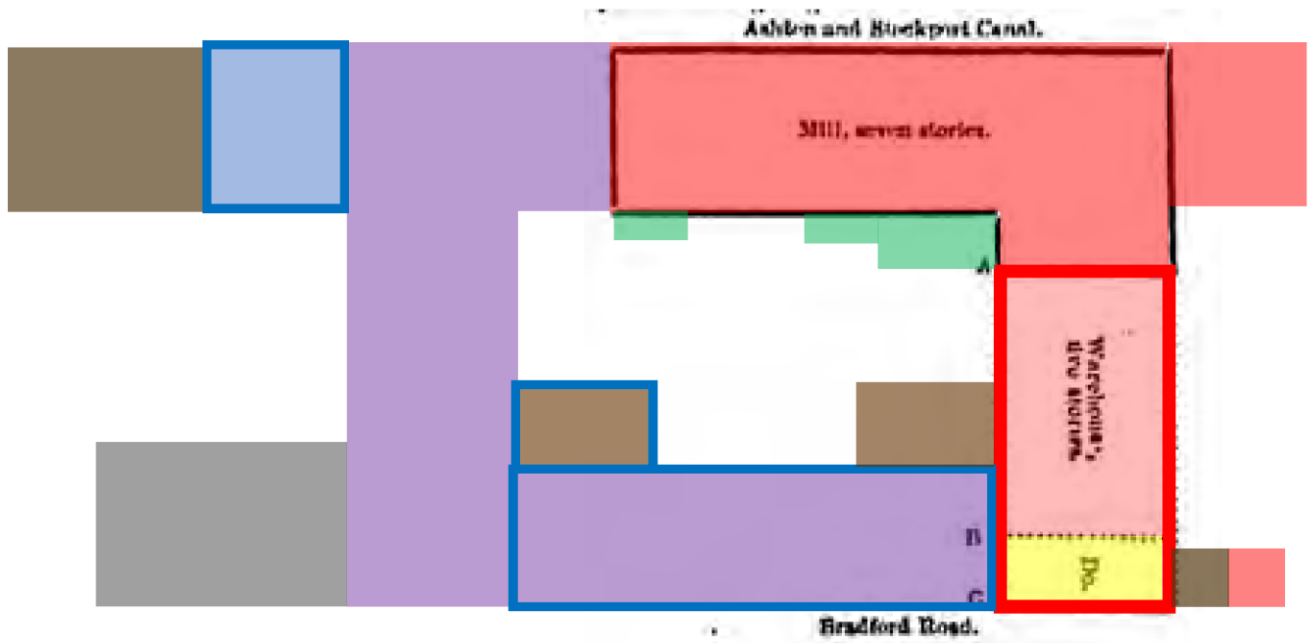


Figure 6 –Morphological plan of Brunswick Mill, showing the original mill constructed in 1839 shaded red and pink. The area shaded yellow was constructed in 1840-1. The area shaded pink collapsed in 1841, and along with the yellow section (together circled red) was totally reconstructed that same year.

The area shaded purple was presumably constructed by 1842. The area shaded blue was constructed as a waste house in 1844.

The two brown shaded areas within the courtyard denote the pair of two-storey buildings constructed in the c1880s. The building shaded brown adjoining the mill chimney to the right is the dust chute, constructed during the c1890s. The brown shaded building to the top left forms a single-storey shed, constructed in the 1880s/90s.

The two, now demolished electric towers and sub-station (highlighted green) were constructed in 1908, and demolished in the late-20th century.

The blue outline denotes the construction of an extra floor level during the c1920s. Note the chimney to the bottom right corner was demolished in the late-20th century.

The grey shaded building forms the new office, constructed in the 1950s. (Heritage Architecture)

Figure 8: Morphological Plan of Brunswick Mill (SLHA 2018)

4.2 The Mid Building

The proposed site for The Mid Building is that of the former India Mills. This site was developed from the original Pooleys Mill which is known to have been constructed circa 1826. India Mills was demolished circa 2007-2008 according to SLHA Heritage Statement (2018) and retains only limited areas of the perimeter, boundary walls along Bradford Road.

The development of the Mid Building involves the deconstruction of the remaining walls of India Mills fronting Bradford Road.



Figure 9: Historic India Mill Walls

To the north east of the site, there remains a small infill building fronting the Ashton Canal, refer to Figure 10. The form of this existing building appears to be of traditional construction. The date of construction of this is unknown. However, these buildings do not appear to be structurally linked based on a visual review from tow path level.

It is proposed to demolish this area of structure to facilitate a new pedestrian access route to the Ashton Canal.

Deconstruction of the structures in this area is expected to be carried out by a specialist contractor. A detailed deconstruction methodology is to be developed for the proposed works with input from specialist during future design stages. This is to consider safe methods of deconstruction and ensure these do not have any detrimental effects on existing adjacent buildings.



Small infill
between former
India Mills and
Brunswick Mill

Figure 10: Infill Structure

4.3 The Corner Building

The proposed site for The Corner Building is currently occupied by a part demolished three storey structure. This has been demolished to first floor level as shown in Figure 11 sometime between 2017 and 2019, The demolition appears to include internal structure with only a single storey face fronting Bradford Road and Beswick Street retained.

The development of the Corner Building involves the deconstruction of the remaining walls of this structure fronting Bradford Road and Beswick Street.



Figure 11: Existing Corner Structure

5. Construction Methodology – The Mill Building

The construction methodology below sets out an assumed sequence at this early stage until further detailed contractor input can be developed. The construction type of the buildings on site is based on Civic Engineers Structural Appraisal Report.

5.1 Sequence of Deconstruction

Deconstruction of the masonry building currently occupying the Brunswick Mill site is to be achieved by via the use of handheld tools and complimented using a mechanical excavator where appropriate. Use of an excavator will require special attention to the existing main Mill building to ensure that this is not affected during deconstruction works.

It would be prudent for the Main Contractor to carry out a dilapidations survey ahead of carrying out any works.

deconstruction is to include superstructure elements, ground floor and drainage. Capping off services may also be required. Associated foundations may also require removal however could be left insitu if it is deemed a risk to form deep excavations adjacent to the existing mill.

Basements are not anticipated to be present however the former electrification tower is known to accommodate a lower ground floor which is set below the external courtyard level.

5.2 Proposed Construction Methodology

There are no new construction proposals within the site of the existing mill building. Works will be limited to internal spaces with landscape works to the central courtyard. It is therefore assumed that works could be delivered within the confines of the site.

5.3 Anticipated Site Access & Constraints

5.3.1 Anticipated Site Access

It is anticipated that site access would generally be provided off Bradford Road.

Deliveries would be to site compound within the confines of the site. Materials could be craned into position by a mobile visiting crane within the confines of the site. For the height of development, it is not anticipated that a static, tower crane would be required.

For the purposes of delivery to site the contractor may wish to apply for temporary road closure. They should submit application at the earliest possible stage to prevent any delay to the project. The contractor will need to demonstrate in their construction phase plan the proposed site working area and highlight risks present on site.

5.3.2 Existing Structures

As previously noted, there are numerous existing structures in the vicinity of the proposed buildings as well as the presence of existing on-site buildings.

Surcharging of the foundations to the existing adjacent structures is not anticipated at this stage. The proposed buildings are seen to be sufficiently set away from the existing buildings to mitigate against this risk. However, a review will be required depending on the Contractors preferred method of working and site storage. This could include a non-working zone for large vehicles, machinery and or site cabins.

A party wall surveyor should also be consulted at an early stage in the next design phases to understand the party wall requirements and an agreed method of working within proximity to the existing buildings.

5.3.3 Site Storage / Facilities

The footprint of the proposed building does not encompass the full site area bounded by the red line boundary. This offers opportunity for site welfare/office facilities and site storage to be situated within the confines of the site. Possible areas available are within the central courtyard and north western area of proposed deconstruction.

An indicative site access and delivery sketch, including possible site storage area is presented in subsequent sections considering the entire development.

6. Construction Methodology – The Mid Building

The construction methodology below has been provided without prior access to the former India Mills site and is based upon road level observations during Civic Engineers recent site visit. The construction sequence is assumed at this stage until safe access can be provided and until further detailed contractor input can be developed.

The construction type of the buildings on site is assumed based on the approximate age of the buildings.

A party wall surveyor should be consulted at an early stage in the next design phases to understand the party wall requirements and an agreed method of working.

6.1 Sequence of Deconstruction

deconstruction of the existing boundary wall occupying the India Mills site is to be achieved by use of mechanical excavator. Temporary footpath and road closure to Bradford Road may be required to execute the works. Special attention is to be made to the interface with Brunswick Mill to ensure that the adjacent wall is not affected during works.

It would be prudent for the Main Contractor to carry out a dilapidations survey ahead of carrying out any works.

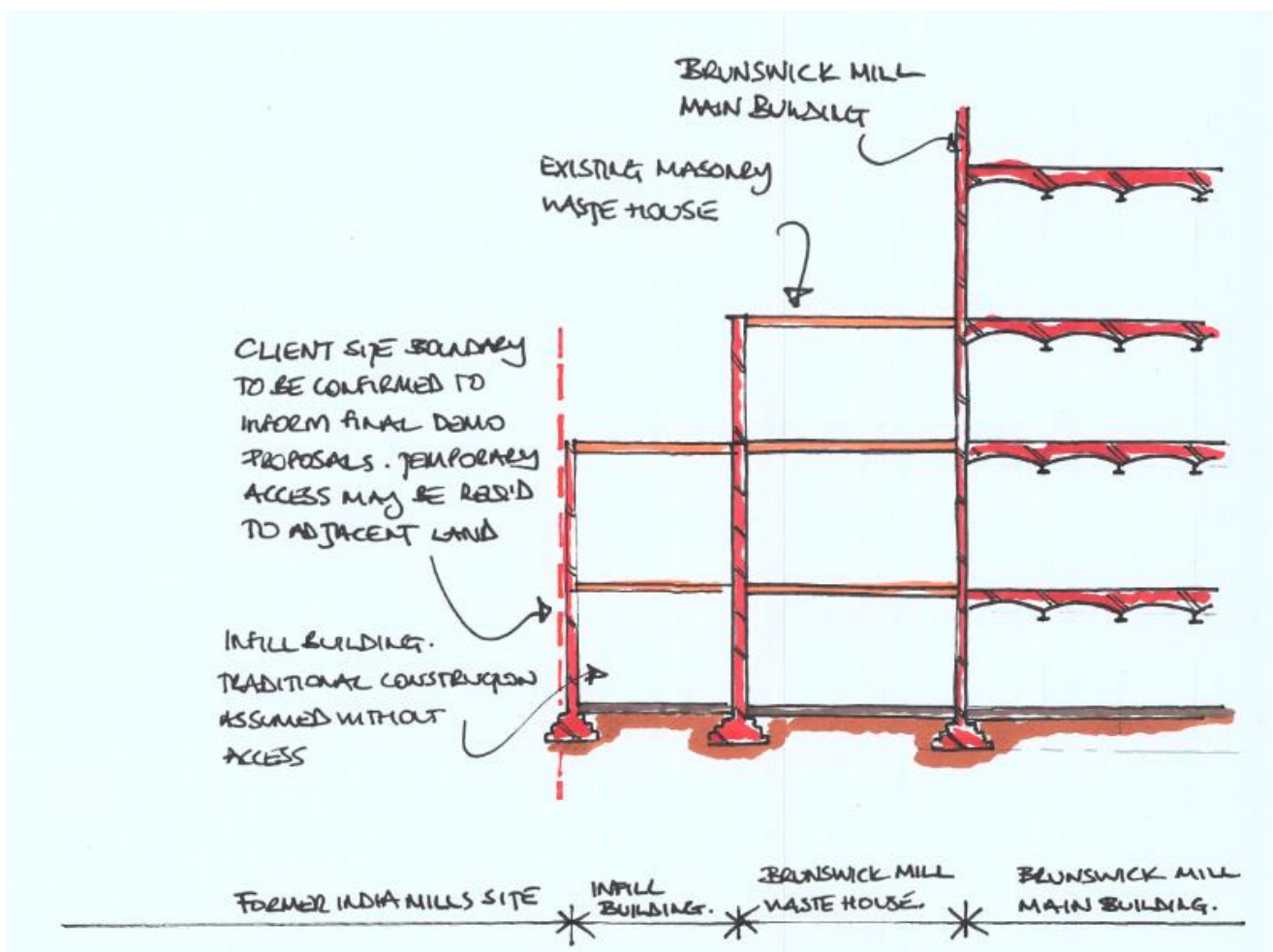


Figure 12: Indicative Existing Layout

Deconstruction of the existing small infill building, adjacent to Brunswick Mill on the canal side of the development is to be achieved by use of mechanical excavator. Where the building interfaces with Brunswick Mill it would be prudent to carry out final deconstruction works using handheld tools to avoid damage to the existing mill building.

Temporary towpath closures to the Ashton Canal may be required to execute the works. Delivery of the mid-block without access to adjoining land is likely to be feasible however, temporary access may be preferable pending final construction proposals.

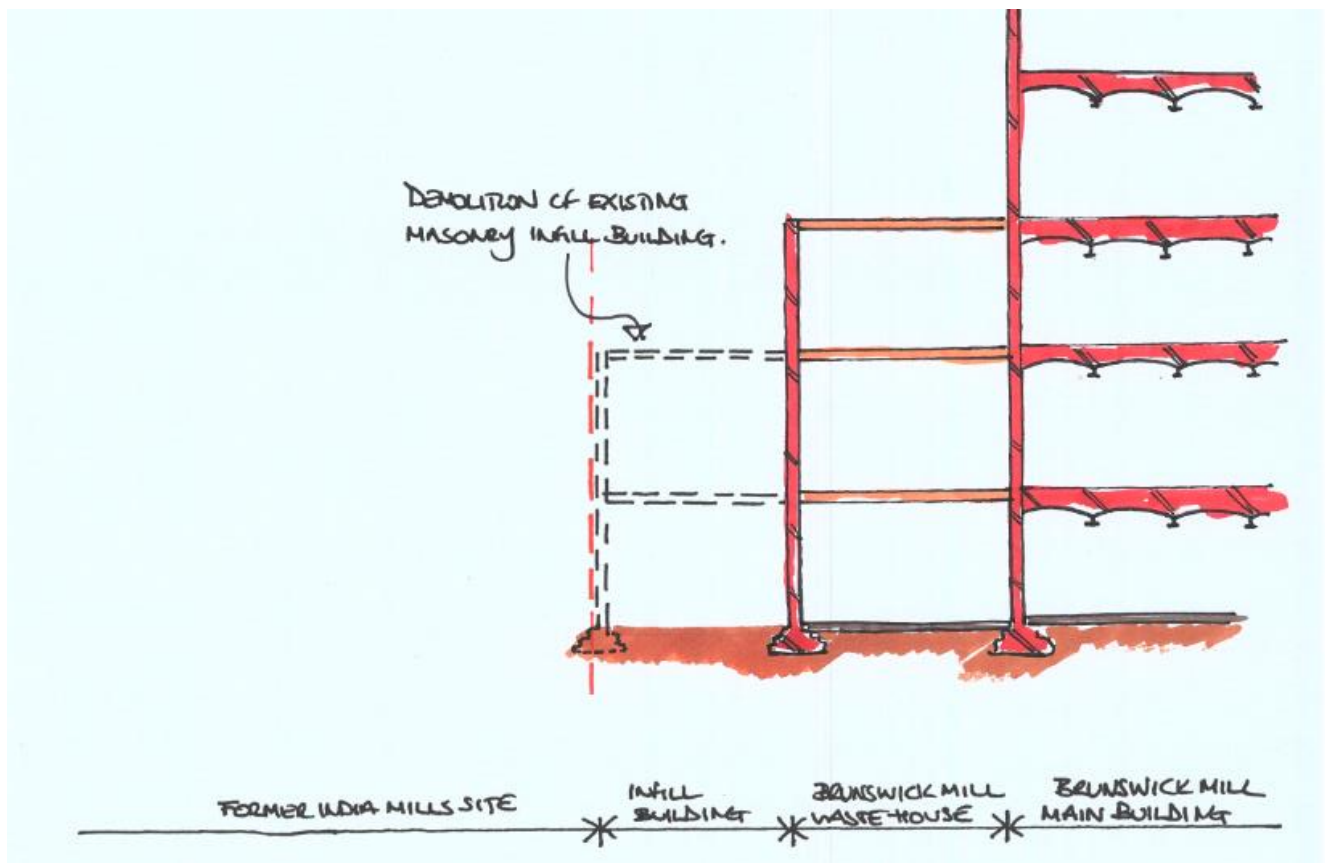


Figure 13: Indicative Deconstruction Methodology

6.2 Proposed Construction Methodology

The proposals for the Mid Building are set back from the existing main Brunswick Mill building by circa 12m. Therefore, it is not anticipated that the construction of the Mid Building will influence the mill building structure.

The proposals for the Mid Building are to build up to the back of Bradford Road footpath. Therefore, further investigations will be required to understand the allowable proximity of piling works to back of footpath. This will also require surveys to understand the location of any existing services within the footpath.

The following construction methodology is an assumed sequence and is subject to detailed consideration by the appointed Main Contractor. Detailed discussions will be required with statutory bodies such as Manchester City Council, Environment Agency, Building Control to discharge portions of the construction methodology.

- Prepare the ground for piling rig, which will include reduced level dig and installation of a piling mat to the required depth. The site will need to be upfilled if basements are present.
- The piling mat is to be designed by a specialist.

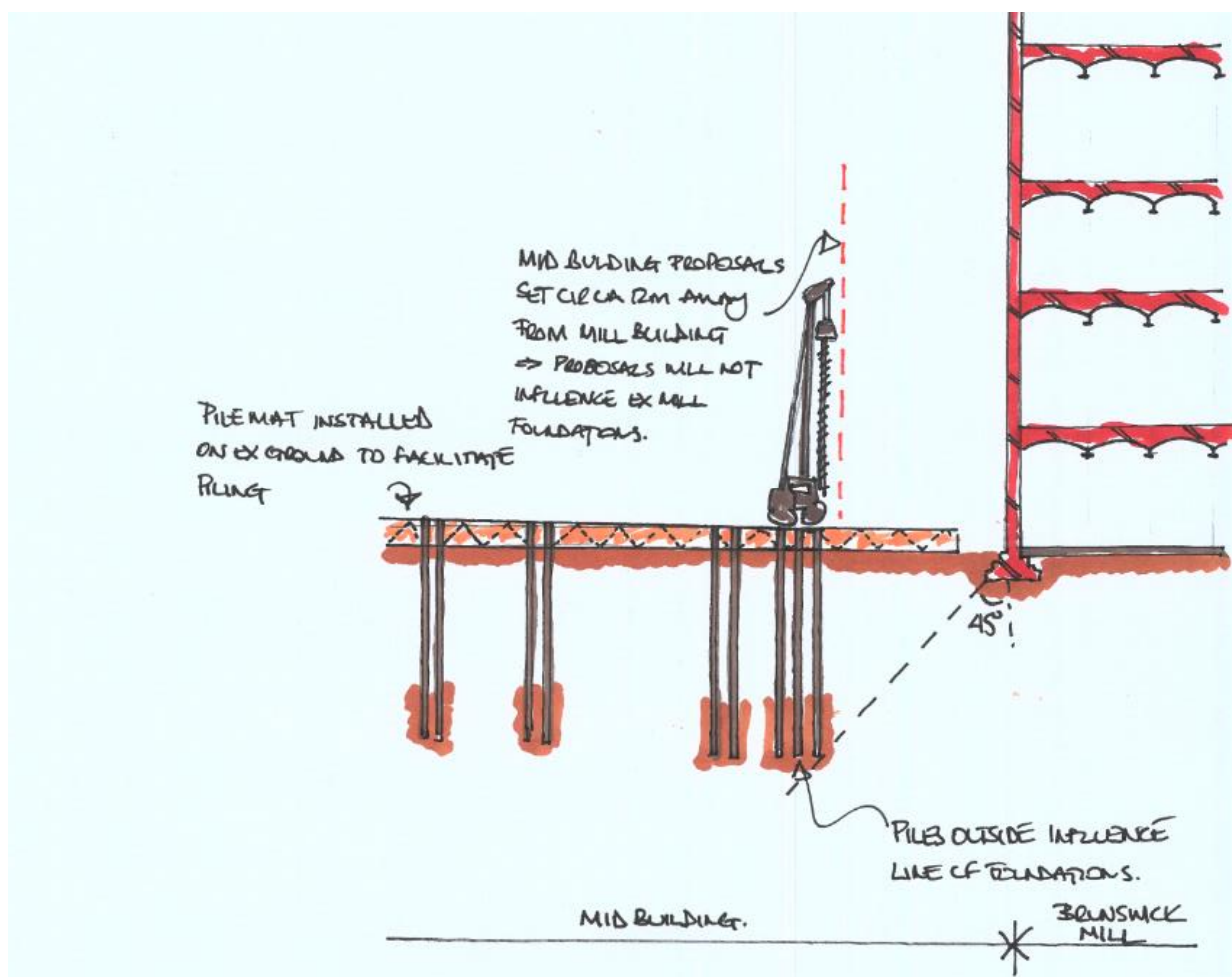


Figure 14: Site section following commencement of piling.

- The piling operation can commence. At present this is expected to be continuous flight auger piles installed to depth to resist the horizontal and vertical forces from the new

development however this will be confirmed upon results of a Phase II Site Investigation in future design stages.

- Piles and pile caps around the perimeter of the site will not be permitted to extend outside of the redline boundary. A pile-free zone adjacent to existing buildings at the perimeter would need to be set up so that the piling rig does not affect existing footings from surcharge and the zone would be set up to provide sufficient clearance to allow installation of piles. The pile free zone would be determined by the size of the rig required to install the piles, which could be up to 1.5m from the face of existing buildings.
- Upon completion of the piling operation, pile cropping can commence to install new reinforced concrete pile caps at structural wall and column positions.
- Pile caps at the perimeter adjacent to the red line boundary may need to be cantilevered to take account of the pile rig proximity and clearance.
- Install appropriate gas membrane (if required pending results of Phase II site investigation) and waterproofing below slab level, lapping below pile caps and any ground beams in accordance with manufacturer's requirements.
- Commence construction of superstructure elements.

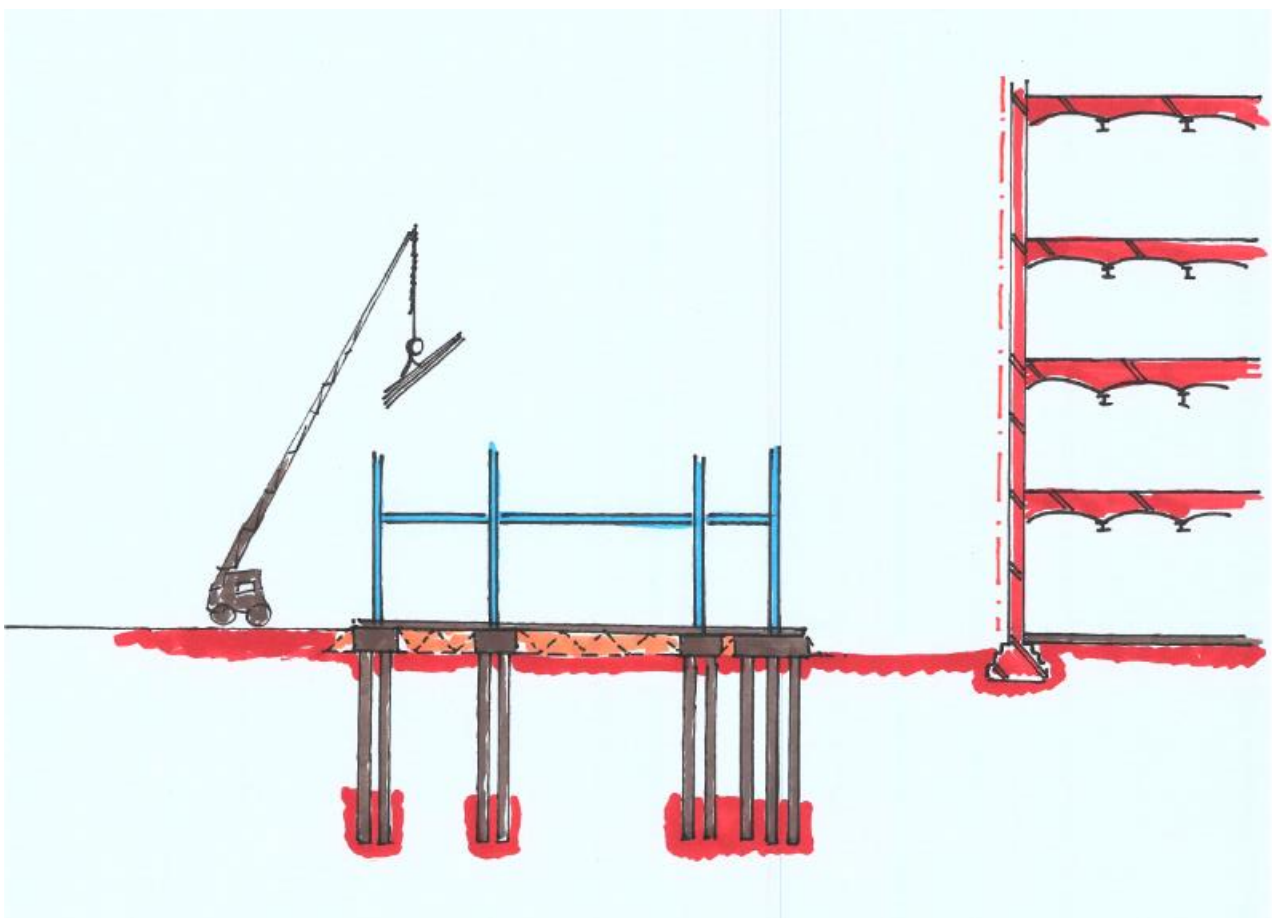


Figure 15: Site section following commencement of superstructure.

- Access to the upper floors as the superstructure progress can be provided via personnel hoists which may be founded within the closed portion of Bradford Road or within the compounds of the site pending contractor construction methodology.

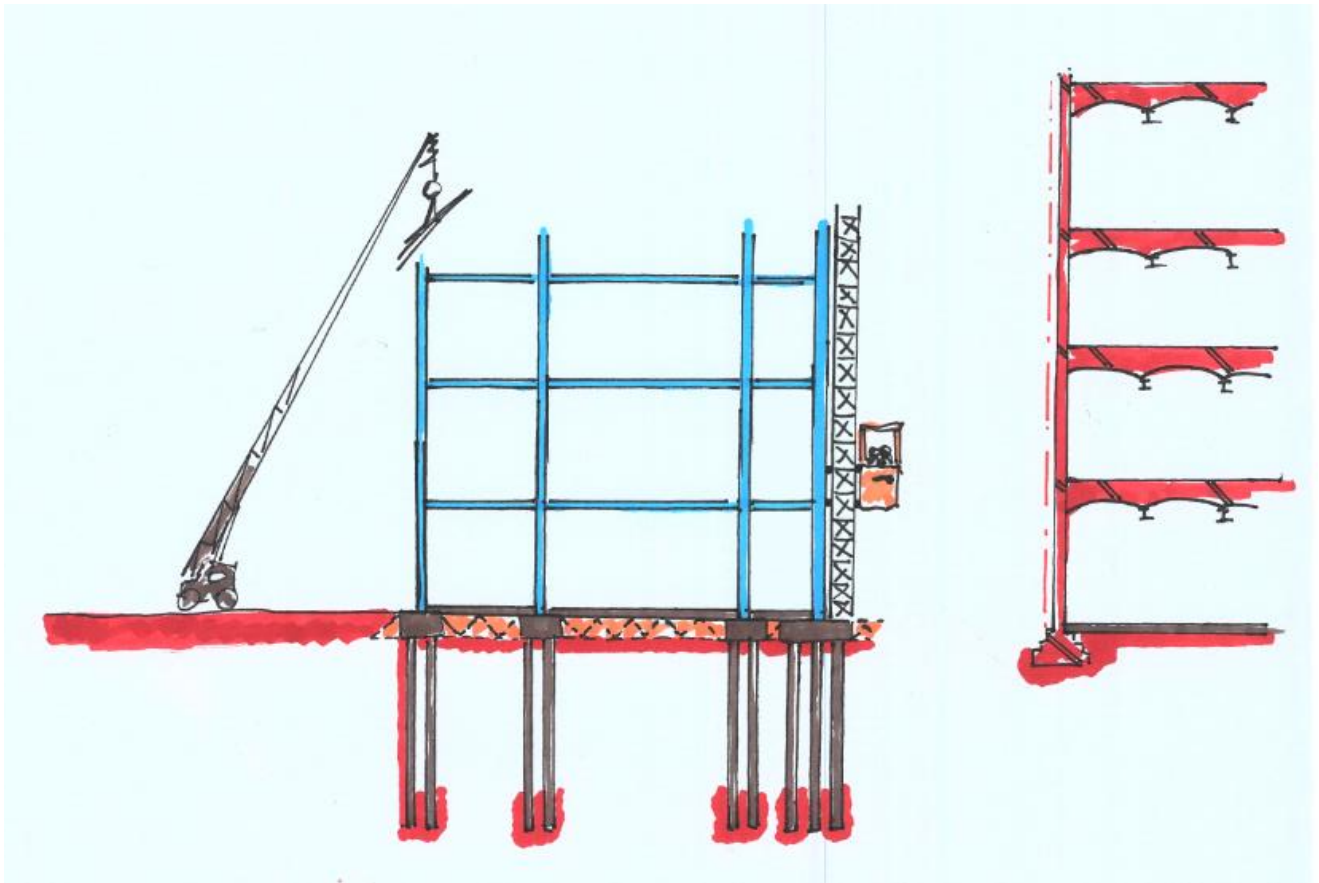


Figure 16: Site section of progressing superstructure

6.3 Anticipated Site Access & Constraints

6.3.4 Anticipated Site Access

It is anticipated that site access would generally be provided off Bradford Road or off Beswick Street if a negotiation be reached with the adjacent landowner.

Deliveries would be to site compound or directly onto Bradford Road and then materials craned into position by a mobile visiting crane within the confines of the mid building site. For the height of development, it is not anticipated that a static, tower crane would be required.

For the purposes of delivery to site the contractor may wish to apply for temporary road closure. They should submit application at the earliest possible stage to prevent any delay to the project. The contractor will need to demonstrate in their construction phase plan the proposed site working area and highlight risks present on site.

6.3.5 Existing Buildings

As previously noted, there are numerous existing structures in the vicinity of the proposed buildings as well as the presence of existing on-site buildings.

Surcharging of the foundations to the existing adjacent structures is not anticipated at this stage. The proposed buildings are seen to be sufficiently set away from the existing buildings to mitigate against this risk. However, a review will be required depending on the Contractors preferred method of working and site storage. This could include a non-working zone for large vehicles, machinery and or site cabins.

A party wall surveyor should also be consulted at an early stage in the next design phases to understand the party wall requirements and an agreed method of working within proximity to the existing buildings.

The presence of in-ground relic structures and basements associated with the former India Mills is to be investigated as part of an Archaeological WSI and Phase 2 site investigation and removed/upfilled accordingly to facilitate the installation of specialist piling mat.

6.3.6 Site Storage / Facilities

The footprint of the proposed building does not encompass the full site area bounded by the red line boundary. This offers opportunity for site welfare/office facilities and site storage to be situated within the confines of the site. This could be within the proposed car park and soft landscaped area.

An indicative site access and delivery sketch, including possible site storage area is presented in subsequent sections considering the entire development.

7. Construction Methodology – The Corner Building

The construction methodology below has been provided without prior access to the former existing partially demolished building on the Corner site and is based upon road level observations during Civic Engineers recent site visit. The construction sequence is assumed at this stage until safe access can be provided and until further detailed contractor input can be developed.

The construction type of the buildings on site is assumed based on the approximate age of the buildings.

A party wall surveyor should be consulted at an early stage in the next design phases to understand the party wall requirements and an agreed method of working.

7.1 Sequence of Deconstruction

Deconstruction of the existing structure is to be achieved by use of mechanical excavator. Temporary footpath and road closure to Bradford Road and Beswick Street will be likely be required to execute the works and maintain safety of the public during the works. It is anticipated that as the internal structure of the building has historically been demolished that the remaining works can be achieved without access to the neighbouring land.

This should be confirmed upon appointment of a demolition contractor.

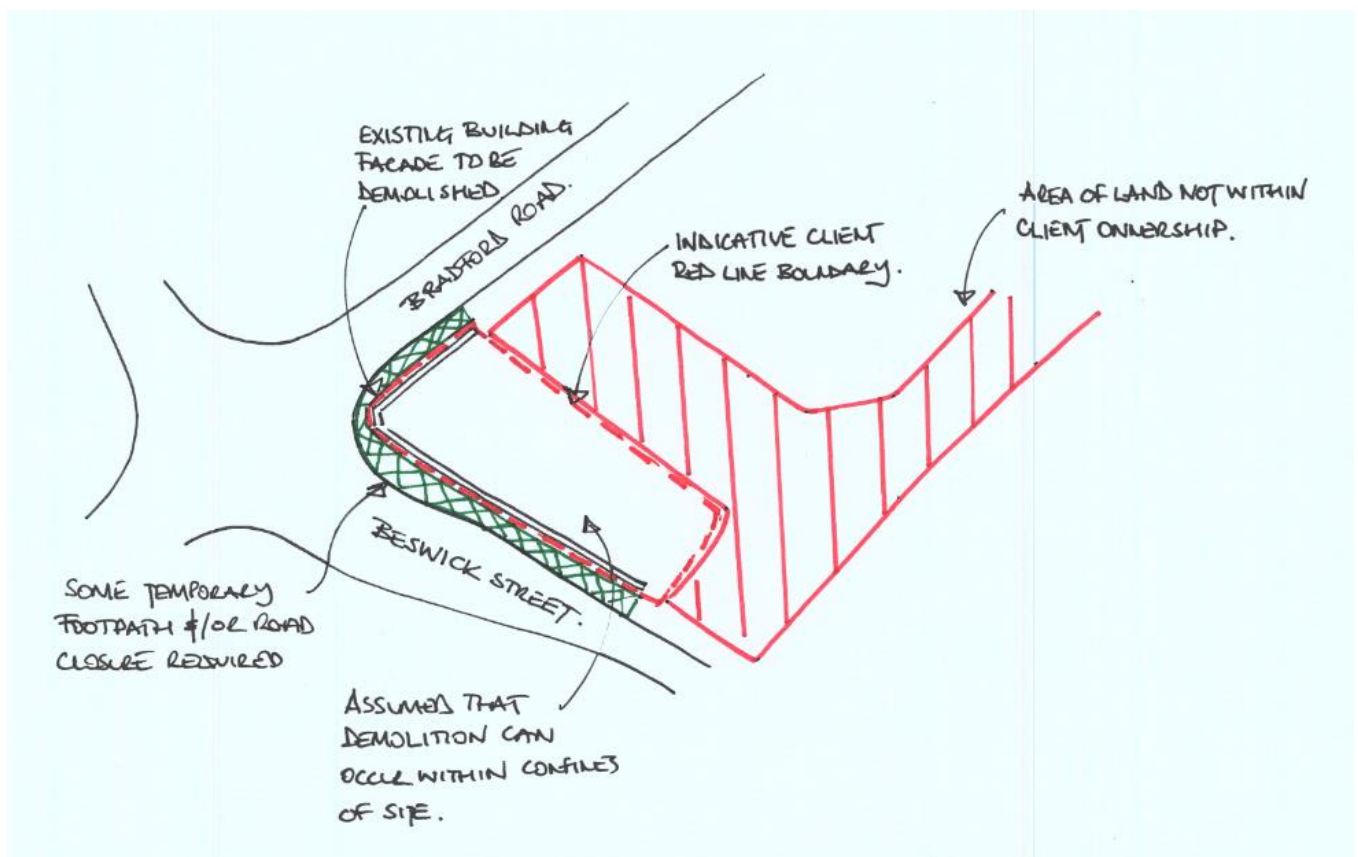


Figure 17: Indicative Deconstruction Access Plan

7.2 Proposed Construction Methodology

The proposals for the Corner Building are to construct up to the red line boundary with the adjacent land and back of footpath. Both of which lie outside the ownership of Maryland Securities. With regards to footpath further investigations will be required to understand the allowable proximity of piling works in this location. This will also require surveys to understand the location of any existing services within the footpath.

The following construction methodology is an assumed sequence and is subject to detailed consideration by the appointed Main Contractor. Detailed discussions will be required with statutory bodies such as Manchester City Council, Environment Agency, Building Control.

- Prepare the ground for piling rig, which will include reduced level dig and installation of a piling mat to the required depth. The site will need to be upfilled if basements are present.
- The piling mat is to be designed by a specialist.

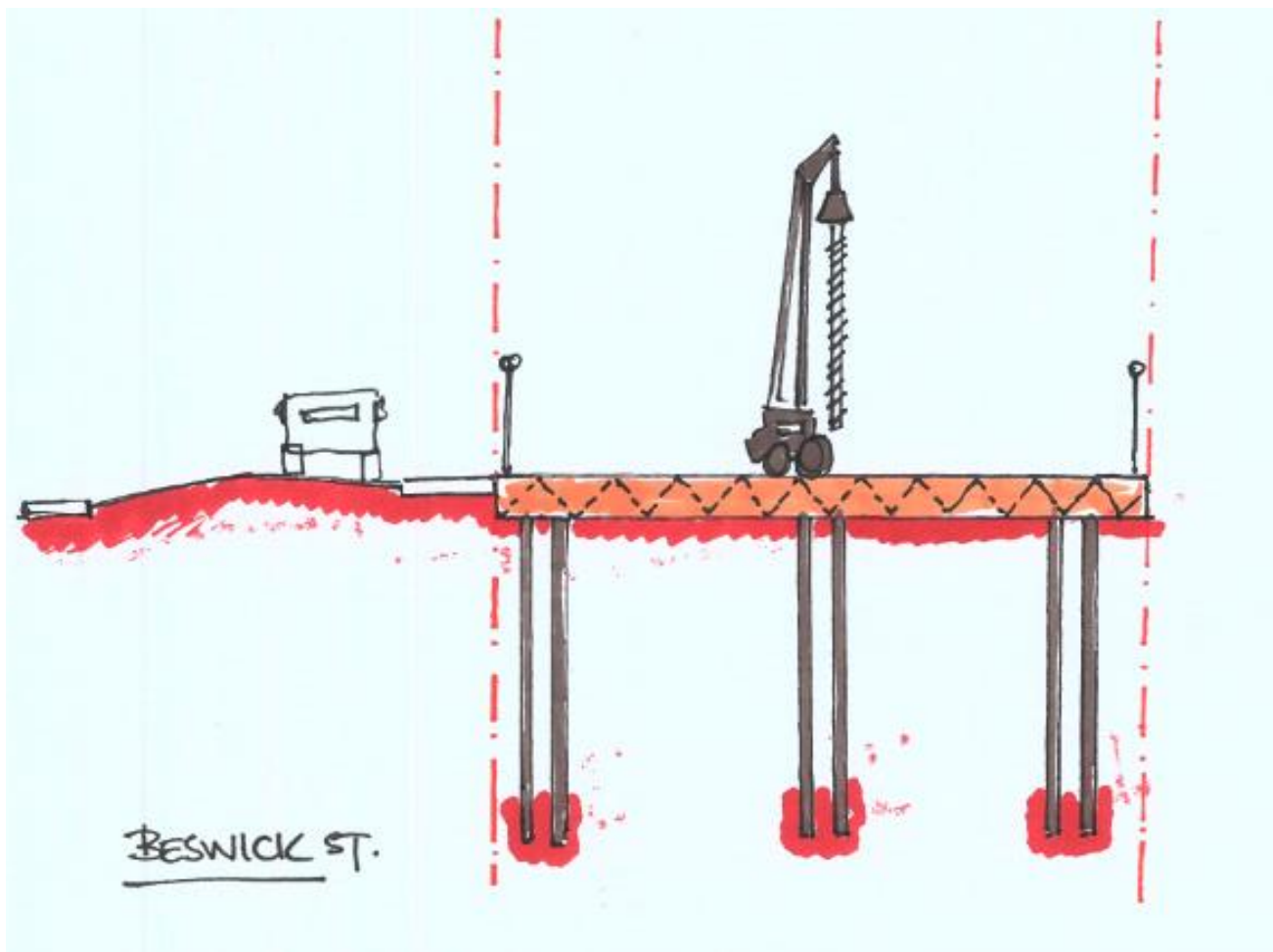


Figure 18: Site section following commencement of piling.

- The piling operation can commence. At present this is expected to be continuous flight auger piles installed to depth to resist the horizontal and vertical forces from the new development however this will be confirmed upon results of a Phase II Site Investigation in future design stages.

- Piles and pile caps around the perimeter of the site will not be permitted to extend outside of the redline boundary. A pile-free zone adjacent to existing buildings at the perimeter would need to be set up so that the piling rig does not affect existing footings from surcharge and the zone would be set up to provide sufficient clearance to allow installation of piles. The pile free zone would be determined by the size of the rig required to install the piles, which could be up to 1.5m from the face of existing buildings.
- Upon completion of the piling operation, pile cropping can commence to install new reinforced concrete pile caps at structural wall and column positions.
- Pile caps at the perimeter adjacent to the red line boundary may need to be cantilevered to take account of the pile rig proximity and clearance.
- Install appropriate gas membrane (if required pending results of Phase II site investigation) and waterproofing below slab level, lapping below pile caps and any ground beams in accordance with manufacturer's requirements.
- Commence construction of superstructure elements. Temporary footpath and road closures would be required to wrap around the corner of Bradford Road and Beswick Street for the purposes of site deliveries, storage and lifting operations for construction.

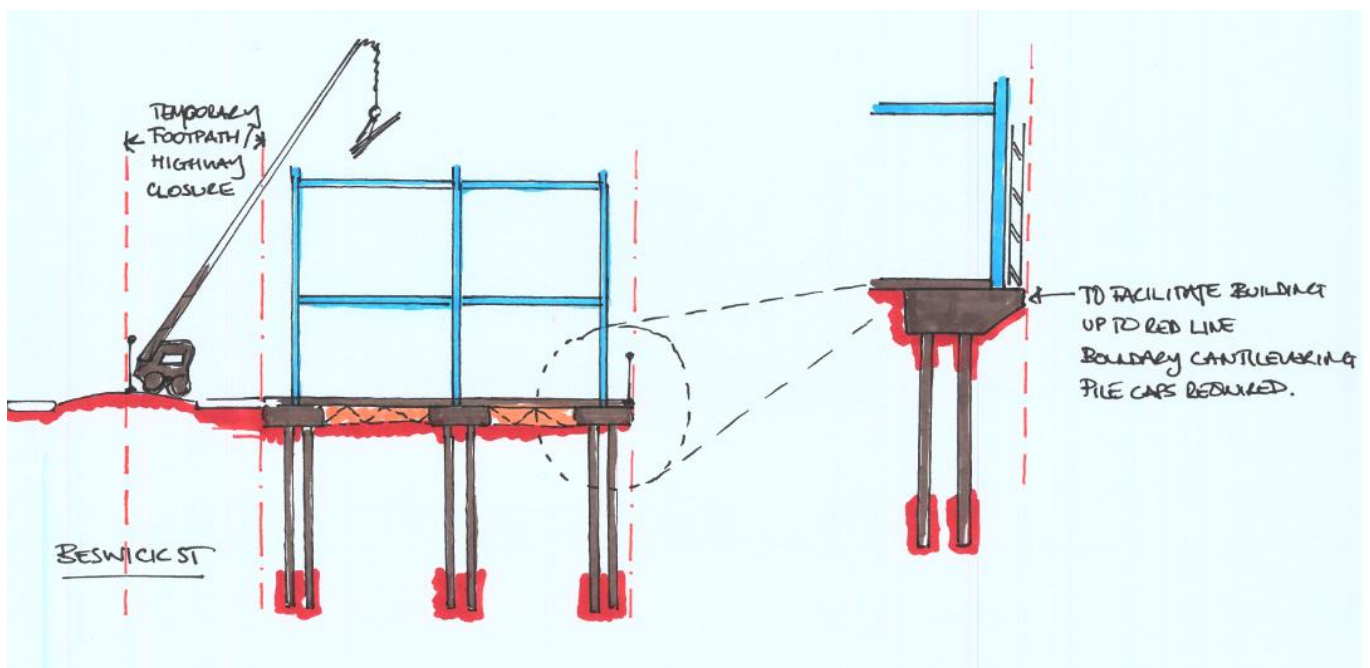


Figure 19: Site section following commencement of superstructure.

- Access to the upper floors as the superstructure progress can be provided via personnel hoists which may be founded within the closed portion of Bradford Road or within the compounds of the site pending contractor construction methodology.
- Masonry facades along adjoining land would be difficult to install without access. A cantilevering scaffold solution could be adopted from Levels 01 – roof to facilitate these works.

7.3 Anticipated Site Access & Constraints

7.3.7 Anticipated Site Access

It is assumed the Corner Building will be delivered alongside the mid building. Therefore, this could utilise some elements of the mid building site access off Bradford Road or off Beswick Street if a negotiation be reached with the adjacent landowner.

Deliveries would be onto Bradford Road and Beswick Street via temporary footpath and road closures. Materials would be craned into position by a mobile visiting crane from delivery point. For the height of development, it is not anticipated that a static, tower crane would be required.

For the purposes of delivery to site the contractor may wish to apply for temporary road closure. They should submit application at the earliest possible stage to prevent any delay to the project. The contractor will need to demonstrate in their construction phase plan the proposed site working area and highlight risks present on site.

7.3.8 Existing Buildings

There are no existing structures within the direct vicinity of the proposed corner building. However, a party wall surveyor should also be consulted at an early stage in the next design phases to understand the party wall requirements and an agreed method of working within proximity to the existing adjacent land.

The presence of in-ground relic structures and basements associated with the former India Mills is to be investigated as part of an Archaeological WSI and Phase 2 site investigation and removed/upfilled accordingly to facilitate the installation of specialist piling mat.

7.3.9 Site Storage / Facilities

The footprint of the proposed building encompasses the full site area bounded by the red line boundary offering little provision of space for site welfare/office facilities and site storage.

The Main Contractor will likely want to consider the temporary closure of Bradford Road and Beswick Street as well as utilising the adjacent car park of the mid building for additional space.

An indicative site access and delivery sketch, including possible site storage area is presented in overleaf considering the entire development.

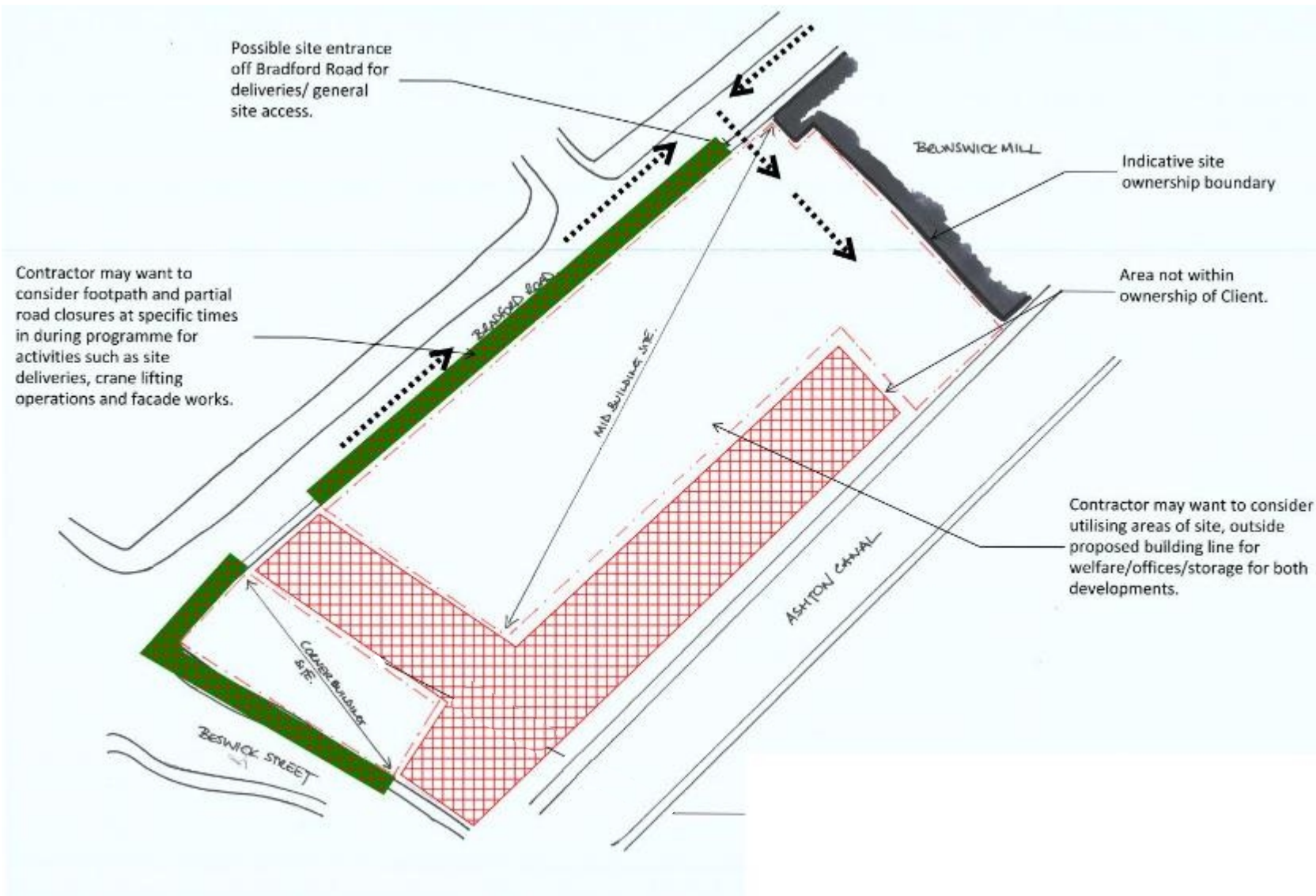
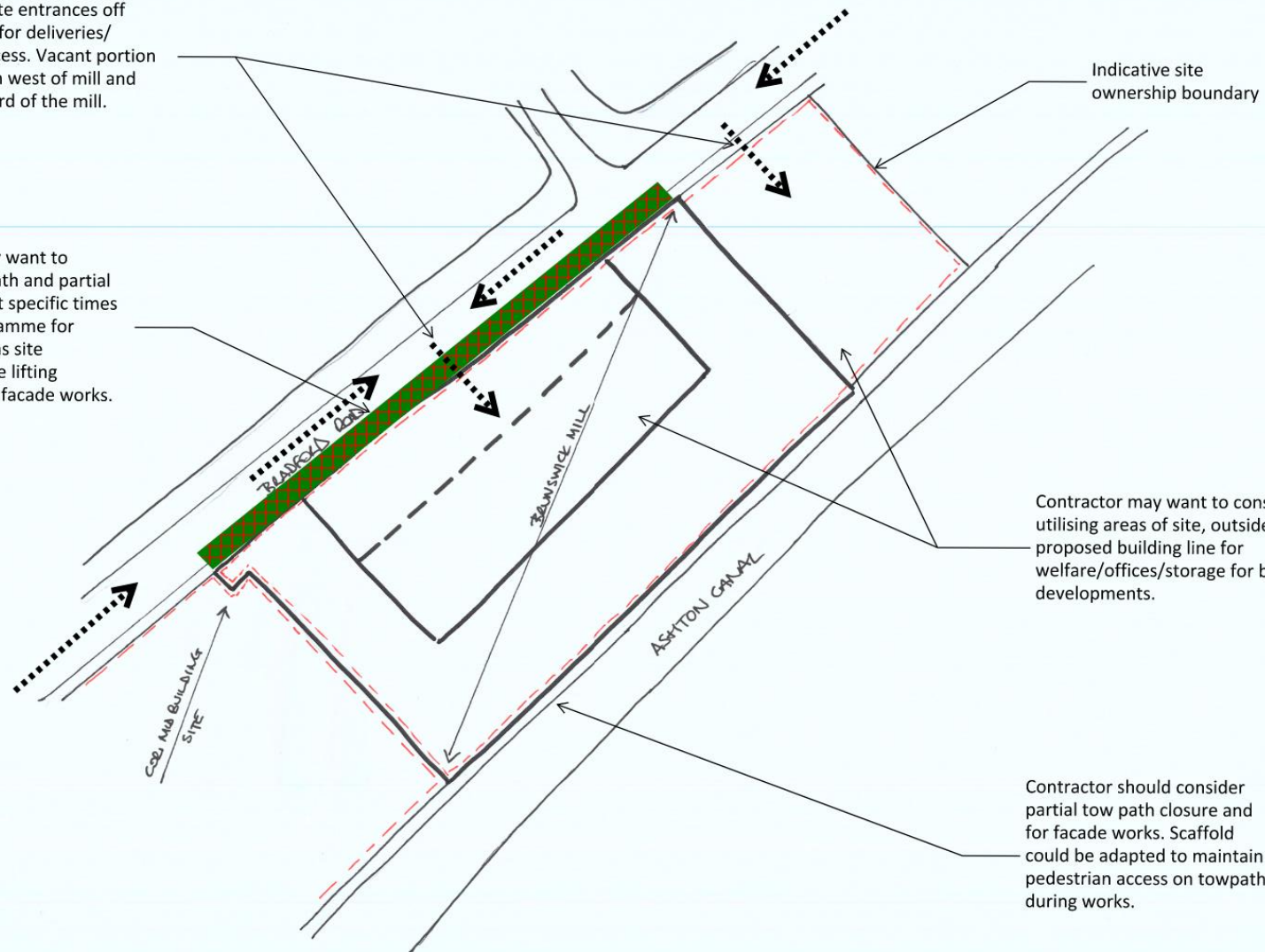


Figure 20: Indicative site access and delivery sketch

2 No possible site entrances off Bradford Road for deliveries/ general site access. Vacant portion of land to north west of mill and central courtyard of the mill.

Contractor may want to consider footpath and partial road closures at specific times in during programme for activities such as site deliveries, crane lifting operations and facade works.



Contractor may want to consider utilising areas of site, outside proposed building line for welfare/offices/storage for both developments.

Contractor should consider partial tow path closure and for facade works. Scaffold could be adapted to maintain pedestrian access on towpath during works.

Figure 21: Indicative site access and delivery sketch



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