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BRWRY, MANCHESTER

BASEMENT DESIGN NOTE

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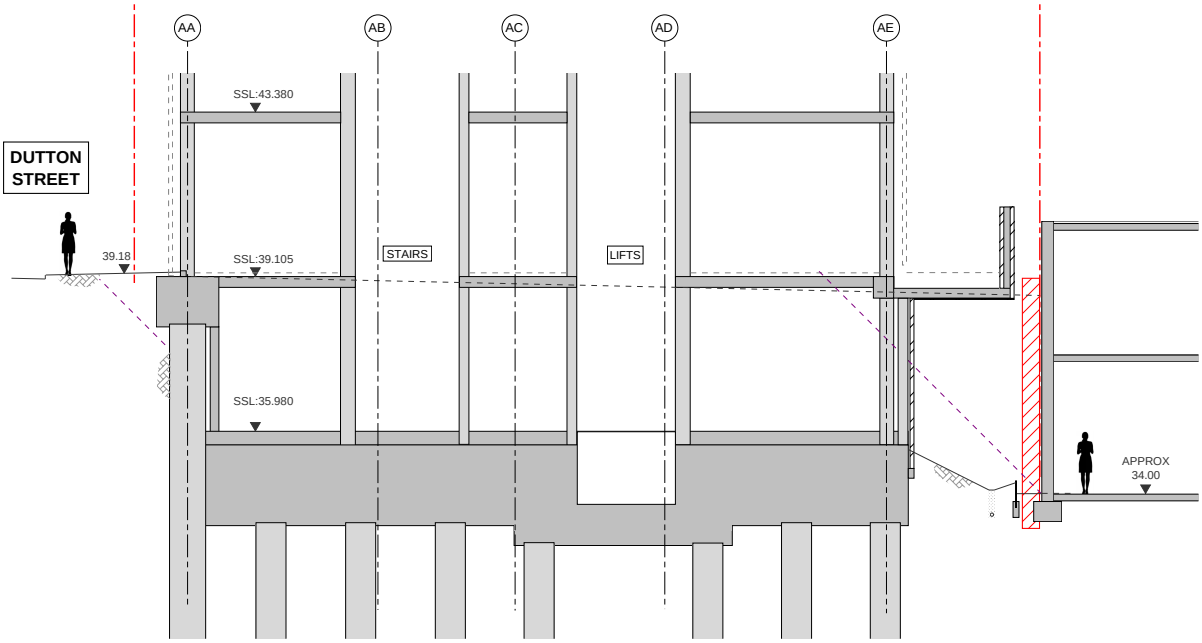
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This design note has been produced to demonstrate how structural considerations govern the presence of a basement shell to BRWRY Block A as part of the redevelopment of the former Boddingtons Brewery site in Manchester.

The profile of the existing ground slopes Southwards from approximately 38.50-40.00m to the Dutton Street Pavement, to 34.00m to the Southern face of Block A facing Charter Street. Given the variable nature of both these levels and the geotechnical profile (significant made ground, glacial deposits, varying rock levels) the site is not suitable for shallow foundations founded at higher levels and deep piled foundations are required to transfer the vertical load to the bedrock up to circa 30m below external ground level.

Due to the height of the proposed structure, large lateral forces are developed in the central core and shear wall and these must be transferred into the ground by the piles. Because the earth is mobilised to provide the lateral resistance of the piles, it is critical that this lateral/passive pressure is generated at sufficient depth as to not cause any slope failure or require intensive additional retaining walls. The existing structure 2-16 Charter Street is founded below 34.00m, meaning the force needs to be transferred below 34.00m. Because the piles alone have inadequate stiffness to distribute the lateral force from ground floor level to below 34.00m, the foundations must be founded at lower level so the stiffer core can perform this role instead.

Consequently, the proposed foundations must be constructed at lower level and this is reflected in the section below which shows the proposed foundations lower than the existing foundations to the neighbouring property.



Typical section through Block A basement

The proposed build sequence then dictates why constructing a basement is required, this is because:

- If the ground floor slab was constructed by backfilling the excavation for the core foundations, providing a layer of 6F2 or similar with blinding over, and then casting the ground floor slab over, this would require significant additional temporary works and retaining structures to avoid surcharging the existing structures – 2-16 Charter Street, Julia Street Warehouse, and the retaining wall between. As such the ground floor slab must be designed as suspended in the permanent condition and propped from a suitably low level during construction to avoid surcharging the existing structures.

- Based on a 2:1 slope from existing structures, a higher level piling mat can only be constructed to part of Block A (i.e. to the North of the site) without surcharging existing structures, meaning the column foundations must also be at lower level.

- A retaining wall is required to allow the core base and column foundations to be constructed at lower level while retaining the existing highway, Dutton Street. Due to the ground conditions a contiguous pile wall has been selected, the design of which is governed by the temporary condition but effectively becomes a permanent structure to support the columns to the North elevation. This forms one side of the basement.

- A wall line is built to the West of the structure to support the ground floor slab for back of house/plant areas and first floor terrace columns, and a wall is present to the East because a shear wall is present as part of the stability structure. These form the other earth-retaining faces of the basement.

Once the above is complete, a shell for the basement remains and this is as a result of the most viable structural solution. Whether or not this space is used has minimal impact on the build sequence or the extent of the proposed structure.