Our Ref: RA/863

rodriguesassociates
1 Amwell Street, London EC1R 1UL
tel 020 7837 1133
info@rodriguesassociates.com
www.rodriguesassociates.com

155 Drummond Street
London
NW1 2FB

SUSTAINABILITY STATEMENT

The existing building consists of a three-storey masonry building with the third floor constructed with timber joists and floor boards; the first and second floor constructed in 200mm reinforced concrete slab bearing on a reinforced concrete podium structure providing vehicular and pedestrian access to Tolmer's Square Estate.

An initial inspection of the substructure revealed an unusual substructure and foundations.

A historic search for documentation revealed that Tolmer's Square Estate was designed by consulting structural engineers Ove Arup & Partners.

An archive request was made to Ove Arup and drawings from the original development issued between May and November 1980 were made available for viewing and from which copies of relevant drawings were made.

The buildings that constitute 155 Drummond Street replaced terraced houses, with retail at ground floor, and can be seen adjacent to and further along the street.

The terraced houses have basements and historical investigation revealed that the original terraced houses were damaged by bombs dropped during World War II and replaced as part of the Tolmer's Square Estate development.

The substructure and foundations designed by Ove Arup & Partners were designed to replace the existing terraced house without disturbance of the existing basements each side of 155 Drummond Street.

The reinforced concrete podium structure, which supports the three-storey residential structure is supported by a double-storey brickwork wall along each boundary and three double storey brickwork clad reinforced concrete columns positioned between the vehicular access and the freeholder's demise.

The brickwork wall and brickwork clad reinforced concrete columns is supported by a 400mm thick reinforced concrete raft slab which is supported by two parallel reinforced concrete spine walls bearing onto reinforced concrete slabs cast onto mass concrete foundations.

The reinforced concrete spine walls supporting the reinforced concrete raft is positioned a couple of metres from the boundary creating a basement between the spine walls and the side walls of the adjacent property's basements.

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The existing substructure, consisting of reinforced concrete raft slab, spine walls and slabs, bearing onto mass concrete foundations were cast in 1980 have been designed to support three storeys of residential accommodation.

Consequently, to support seven storeys of residential accommodation above the podium requires significant strengthening of the existing foundations.

To demolish and replace the existing substructure and foundations would create a significant disturbance to the existing access to the Tolmer's Square Estate, destroy a structure with significant embodied energy and any new foundations would have a significant carbon footprint.

To mitigate any detrimental effect to the adjacent properties, to significantly reduce the carbon footprint of the proposed development, it was decided to use the existing foundations, and to significantly strengthen the existing foundations.

A detailed assessment was made of the capacity of the existing foundations and strengthening of the existing foundations designed to significantly increase the capacity of the existing foundations. This has been done by propping the edges of the existing raft slab and increasing the existing bearing area of the existing foundations, without undermining the adjacent basement foundations and party walls.

The design principles for the strengthening of the substructure and foundations is the most cost-effective method and energy efficient method of developing the site.

The maintenance of the podium structure allows the vehicular and pedestrian access to be maintained at all times during the demolition and construction period. This facilitates uninterrupted access to the Tolmer's Square Estate.

It is proposed to demolish the existing building down to podium level, i.e. demolish the existing timber roof and third floor, and reinforced concrete first and second floor, and, all internal and external masonry walls.

The reduction in weight from the removal of the existing building above podium level and strengthening of the existing foundations allows a lightweight steel and timber framed to be constructed.

It would not be possible to retain the existing masonry structure and extend the building by a further four floors. The capacity of the existing masonry cavity wall would not have been enough to support the additional weight of the new structure.

The load from the additional weight of the four floors would have overloaded the existing reinforced concrete podium structure, which would have required substantial strengthening. This would have resulted in temporary closure of the access through the site to the Tolmer's Square Estate, which is anticipated would not be acceptable to the freeholders of the estate.

The superstructure of the proposed development has been designed with a transfer structure at second floor level, allowing all the load from the six storeys to bear onto the three strengthened reinforced columns and the masonry walls each side of the side, against the party walls. One floor is supported by the existing podium structure at first floor level. The capacity of the podium structure will be adequate as it has been originally designed to support the three storey masonry structure.

Rodrigues Associates Limited. 1 Amwell Street, London EC1R 1UL
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The preservation of the podium structure and strengthening of the existing foundations is the most efficient and lowest embodied energy solution for creating a multi-storey building above the existing podium structure, whilst preserving the vehicular and pedestrian access to Tolmer's Square Estate.

The efficient use of steelwork for the primary structure and timber for the floors, internal wall and external walls allows a multi-storey building to be constructed with the lowest carbon footprint. The proposed superstructure uses the lightest and most efficient materials to minimize the overall weight of the seven storeys of residential development, and

By insulating the structure using high specification materials the lifespan carbon footprint of the building is also minimized.

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