192-200 Camden High Street

Erection of a canopy to cover ground and
Mezzanine floors and ancillary facilities to an open market.

Ref No: 23920

Date: July Rev A

Quality management

Job No	23920
Client	Camden Market
Location	192-200 Camden High Street, London, NW1
Title	192-200 Camden High Street
Document Status	ISSUE
Date	12th July 2014
Prepared By	DC
Checked By	JG

Revision Status/ History

Rev	Date	Issue/ Purpose/ Comment	Prepared	Checked	Authorised
A	30/07/14	Comments from team	KM	JG	DC

1.0 REPORT

Fluid Structures were appointed in summer 2009 to act as Structural Engineers for the above scheme, comprising the construction of a two storey canopy at 192-200 Camden High Street. The project required the structure to be clad in lightweight materials, such as EFTE for transparency. The double storey arch enclosed a mezzanine level which provided additional raised market space.
The site investigation carried out by Geotechnical and Environmental Services in June 2012 showed that the existing site was underlain by fill materials above the London Clay. This fill material was associated with the historic usage of the site and the demolition of the previous structures. The site is also underlain by deep tube shelters associated with the period of World War II.

Taking cognisance of the fill it was agreed to provide piled foundations beneath all new elements of the scheme.

The piling solution broke down into the following two categories.

i) Piles beneath the main steel arches
ii) Piles beneath the Mezzanine level

In all cases the piles were designed to take account of the deep level shelter tunnels beneath the site and the design depth of the piles were calculated to ensure that they would have no significant effect on the London Underground Assets.

In the first case (i.e. the piles beneath the arches) it was estimated that the vertical load was in the region of {150KN (dead) + 150KN (live)} = 300KN and that this load would be supported on two 450mm diameter piles with a maximum depth of 10 metres.

The loads were greater for the piles beneath the Mezzanine as a result of the requirement to support high live loads. Typically an internal Mezzanine column was found to support {400KN (dead) + 300KN (live)} = 700KN. The piling provision beneath this load was for three 450 diameter piles to a depth of 10 metres.
For the piles along the perimeter of the mezzanine, the loads were less approximately 400 to 500KN. To take account of the sensitivity of perimeter locations the columns are linked by ground beams and smaller piles at 800 to 1000mm centres are inserted.

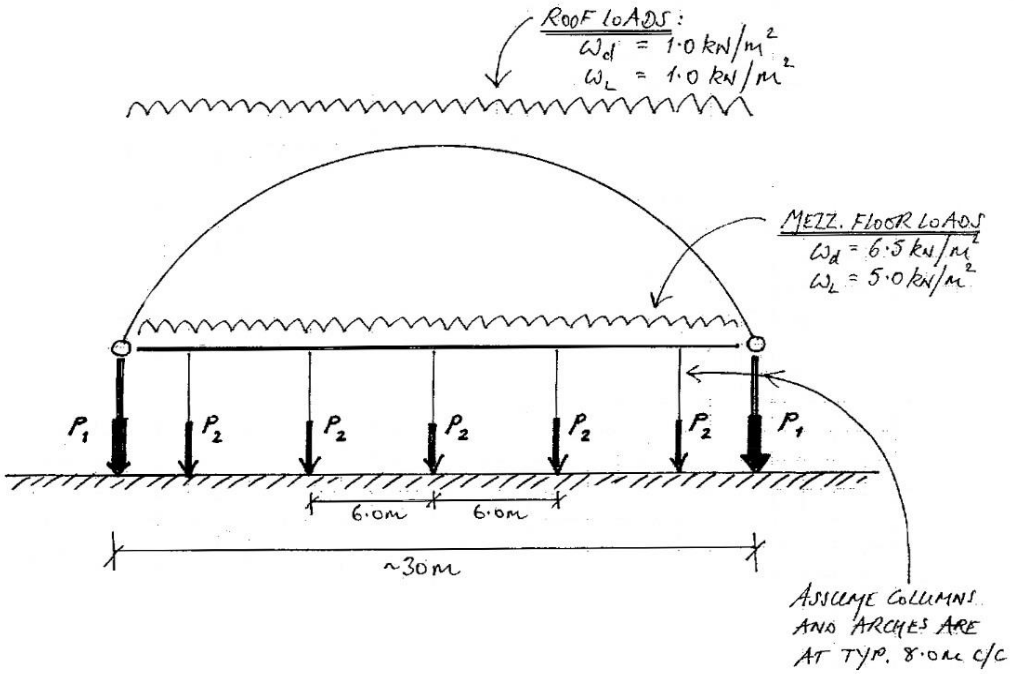

Figure 1 shows the configuration of the Arch and Mezzanine column loads

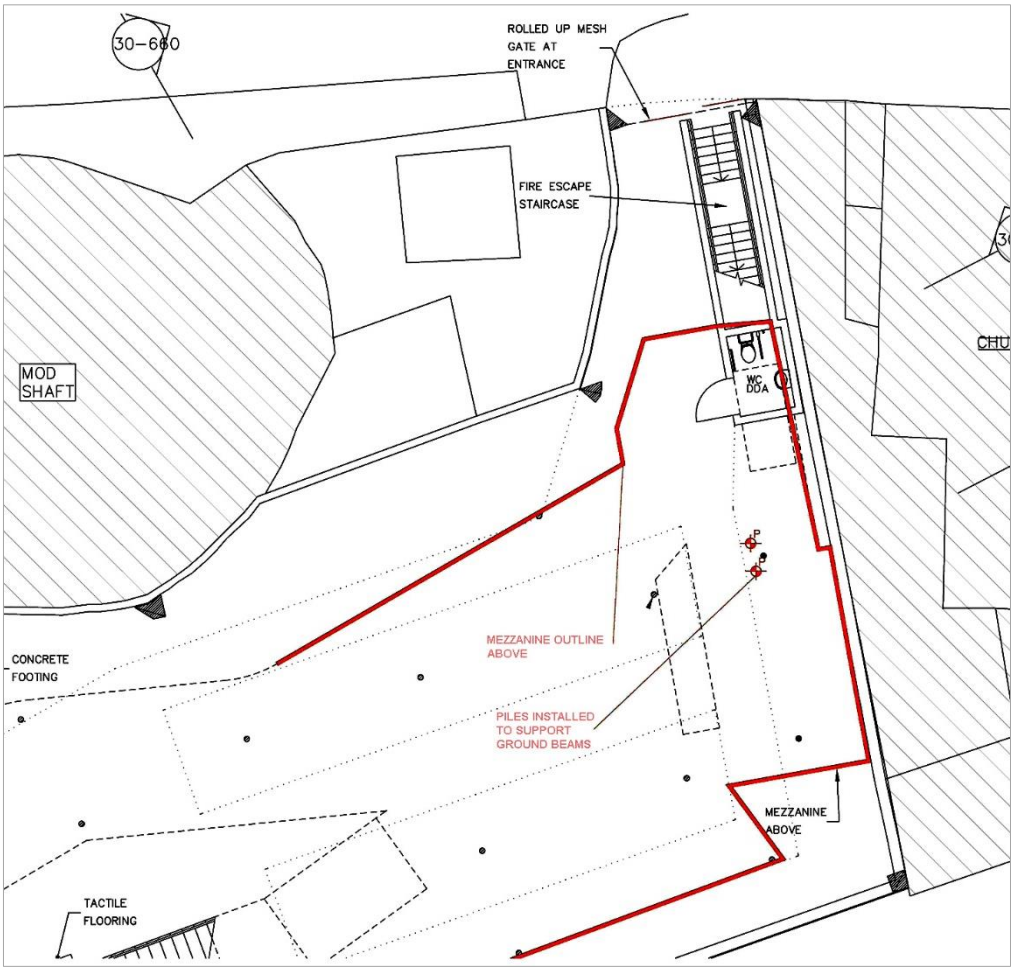

Figure 2 shows pile locations adjacent to perimeter supporting mezzanine above

For the superstructure the scheme consists of curved steel arches spanning up to 30metres formed in circular hollow sections which are generally at 8 metres centres. The arches are held apart by steel sections acting as props / purlins to support the cladding.

The skin of the building consists of either EFTE transparent pillows which are supported by the steel frame or GRP white panels which are insulated and are not transparent. The main arches are raised at their ends on support plinths which are sized such that the arches can be tied against lateral movement by fixing to the mezzanine floor level. In this way the need for resolving large horizontal / thrust forces at foundation level / piling was removed.

The Mezzanine structure is a steel frame with a concrete floor slab cast on to trapezoidal metal deck as permanent formwork. This make up provides a robust platform for the retail environment and also facilitates cleaning down operations.

The mezzanine has been designed for a superimposed floor loading of 5.00KN/m² which is compatible with current retail standards.

At ground level the floor is built off the compacted fill and as a consequence the floor finish needs to be to be flexible and capable of accommodating the possibility of small levels of differential movement. Suitable finishes include paviours or bituminous asphalt, all of which will accommodate sufficiently any movement that might occur.

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