

Vapiano Fitout Centre Point House 26 June 2017

Structural Strategy Statement

Submitted by Pell Frischmann

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Prepared for:

Prepared by:

Harper Dennis Hobbs Langham House 302-308 Regent Street London W1B 3AT Pell Frischmann 5 Manchester Square London W1U 3PD

1. Extent of structural works

Pell Frischmann has been appointed to provide structural services for tenant fitout of Retail unit R05 located on the first floor of Centre Point House for Vapiano restaurant. The structural scope includes:

- Design of the raised floor for existing first floor level, allowing all services to be integrated within floor depth and being capable of withstanding restaurant loading.
- Design of a new mezzanine floor structure to allow for additional seating above the kitchen area without overloading the existing Centre Point House structure.

2. New mezzanine floor frame

The new mezzanine level is a steel frame with timber floor infills. A 2.5m long double-cantilever is achieved by using substantial continuous UC sections with backspans formed by the main floor frame. The frame in back-of-house areas is generally constructed of lightweight UB sections. Timber floors are built using solid floor joists generally spanning approximately 2.5m between steel beams. The joists are suspended on joist hangers fixed to the timber packers between steel beam flanges. 18mm thick plywood nailed to the joists is proposed to complete the structural build-up of the new mezzanine floor.

Steel post locations are governed by the architectural layouts of the wall partitions in the kitchen area. The posts are supported by the grillage of floor beams that are provided to avoid the existing RC slab directly bearing the load. Therefore the heaviest loads are applied at the vicinity of main RC columns where they are distributed into the existing first floor slab by steel spreaders. Drilling to columns is avoided and only nominal fixing of spreaders to the slab is required to avoid any accidental movement. In the back-of-house corridor area it is not feasible to provide a raised floor beam and therefore the lightly loaded posts are fixed directly to the slab. The loads from back-of-house posts are transferred to the existing steel frame supporting Landlord's Stair 09.

In several instances, the first floor beams supporting the mezzanine frame are fixed to the existing floor beams installed for restraint of Brise Soleil. It has been confirmed that the existing sections are adequate for supporting additional loading from new mezzanine level.

Stability of the mezzanine floor steel frame is provided by cross-bracing integrated within partitions around cold room.

3. Raised floor

The 550mm deep raised floor structure is formed of 2.5 x 4 m bays of timber sleeper walls consisting of top and bottom chords and posts at approximately 1 meter centres. The voids in sleeper walls accommodate all the required service runs within the raised floor. The floor loading is taken by the timber joists spanning between the sleeper walls, suspended on saddle joist hangers. 18mm thick plywood is to be nailed to the timber joists.

The floor beams supporting the new mezzanine structure are proposed the have web openings to allow for service runs in the kitchen area within raised floor.

4. Structural design

The structure was designed to the current and relevant codes of practice and specifications according to the structure material and type.

Codes of Practice used for design (including all parts and references to National Annexes where applicable:

- BS EN 1990 Eurocode Basis of Design
- BS EN 1991 Eurocode 1 Actions on Structures
- BS EN 1992 Eurocode 2 Concrete
- BS EN 1993 Eurocode 3 Steel

Design loads assumed for the mezzanine frame design:

•	Imposed	=	2.5 kN/m ²
•	Superimposed	=	1.0 kN/m ²
•	Horizontal balustrade loading	=	1.5 kN/m
•	Exhaust canopy loading	=	1.0 kN/m

Deflection limits assumed for the mezzanine frame design:

•	Simply supported	=	Span/360 for LL
•	Cantilever	=	Span/180 for LL

5. Frame construction

5.1 Beam splices

Mezzanine floor frame includes considerably long continuous steel sections. Due to restricted access to site through the building envelope, the long beams are proposed to be delivered in 3m long splices and assembled on site using friction grip bolts. To avoid building up the structural depth, countersunk bolts are to be used, with splice plates fixed to internal flange faces only.

5.2 Fixings

The majority of fixings to concrete are nominal and do not require exact setting out. It is important that drilling through first floor slab rebar is avoided. Diamond drilling should be used for installing fixings, with RC structure being scanned for rebar prior to drilling.