

1. Introduction

This section outlines the main items for consideration should a pre-cast concrete frame construction solution be considered for an office type development.

It is assumed for the purposes of this section that the core areas of the office development would house all toilet accommodation, lifts, stairs and main MEP riser positions.

2. MEP Issues

a. Ventilation

Within the DFC Site and the newer office accommodation within Dubai, the ventilation and cooling is normally provided by:-

- a. VAV (Variable air volume)
Popular for high grade offices
- b. FCU (Fan coil unit)
Popular for lower grade offices
- c. Wall or Window Units
Popular for temporary or very low grade offices
- d. Underfloor ventilation
Popular for high heat gain areas such as bank trading or computer areas.

Typically, the mechanical ventilation and cooling so far on DFC is by VAV (e.g Bldg 04F) and FCU Systems (e.g Zone 14).

b. Lighting

Generally, lighting is supplied and installed by the Tenant and is typically mounted in/on a suspended ceiling module.

c. Power & Data Outlets

The provision of general purpose power and data outlets is generally by the Tenant and is typically wall or column mounted outlets.

In high usage areas, raised access flooring of approximately 100-150mm height is often a desired solution with power and data cabling routed therein to floor mounted outlet boxes.

d. Fire Detection/Protection

Fire detection and protection systems comprising smoke detectors, heat detectors, sounders, sprinkler pipework and sprinkler heads are all mounted at high level.

e. Ceiling void requirements

Both VAV and FCU Systems require space in all directions to route the ductwork and pipework systems.

Typically, a clear void depth of minimum 600mm is required with the ceilings installed 2700mm above finished floor level (to underside).

f. Current construction methods

The majority of new office developments are now constructed with a flat slab arrangement thus giving full flexibility for routing of ductwork, pipework and electrical services and enabling detailed coordination of MEP Services to be completed generally independent of structural issues.

3. Impact of Ladderblock

- a. The major impact of this system is the installation of relatively deep (600-800mm) downstand beams in all four directions (N, S, E & W). Spaces for routing MEP Services is provided in the basic design but the routes are at different vertical heights in N/S and E/W directions.
- b. If ladderblock is considered in association with VAV, a clear route would be required under the beams (of circa 300mm) which would require some form of Architectural treatment. Alternatively, the building height would need to increase by circa 300mm per floor.
- c. If ladderblock is considered in association with FCU's, it might be possible to configure the pipework and ductwork within the basic design provisions but this would require extensive coordination to ensure pipework is fully vented. Similarly, any flexible ductwork connections from FCU's to ceiling mounted grilles could only be routed in N/S **OR** E/W directions. Otherwise, lower level bulkheads (or similar) would be required as Item 3 (b) above. Each 65-80m² of floor area would require minimum of 3-4 FCU's.
- d. Alternatively, an underfloor ventilation system could be adopted which would also allow main electrical and data services to be routed at low level to point of use. This design philosophy would negate the need for a suspended ceiling (for MEP matters) since feature linear lighting and fire alarm/suppression systems could be employed. Whilst this design solution is not common practice in Dubai (are there any installations like this?) it is very common in Europe in both high spec new and refurbishment developments. The underside of the slab and beams would remain exposed but treated to an Architectural finish.
- e. The downstand beams and severe limitation to 'coring' of future holes through the slabs would limit the future flexibility of the space to adapt for alternate uses.
- f. The use of a 50mm slab coving would also prohibit the installation of floor trunking or floor outlets. A minimum of 75mm depth of screed would be required which, may require an overall depth of circa 100-125mm.

Ladderblock Due Diligence

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- g. Possibly the biggest impact to consider is the need for the full MEP detailed/coordinated design to be completed prior to the detailed design of the pre-cast units being completed. This would require careful planning between all designers and contractors since all builderswork holes would need to be identified and coordinated in order to negate any abortive works.
This work may delay construction activities.

4. Summary

The use of ladderblock generally excludes VAV as an airconditioning system but FCU's can be installed.

Preference would be to use a ventilated raised floor distribution system which would allow Architectural treatment to the exposed beams and slabs. This would also permit power and data cabling to be routed below the flooring.