

Prefabricated Integral Design of Building Services

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Abstract : The common approach in the construction industry for restraint requirements in existing structures or new constructions is to have Non-Structural Components (NSCs) assembled and installed on-site by different MEP subcontractors. This leads to a lack of coordination and higher costs, construction time, and complications due to inaccurate building information modelling (BIM) systems. Introducing NSCs to a consistent BIM system from the beginning of the design process and considering their seismic loads in the analysis and design process can improve coordination and reduce costs and time. One solution is to use prefabricated mounts with attached MEPs delivered as an integral module. This eliminates the majority of coordination complications and reduces design and installation costs and time. An advanced approach is to have as many NSCs as possible installed in the same prefabricated module, which gives the structural engineer the opportunity to consider the involved component weights and locations in the analysis and design of the prefabricated support. This efficient approach eliminates coordination and access issues, leading to enhanced quality control. This research will focus on the existing literature on modular sub-assemblies that are integrated with architectural and structural components. Modular MEP systems take advantage of the precision provided by BIM tools to meet exact requirements and achieve a buildable design every time. Modular installations that include MEP systems provide efficient solutions for the installation of MEP services or components.

Keywords : building services, modularisation, prefabrication, integral building design

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