MULTI-STOREY BUILDING

This project consists of a multi-storey building having 22 stories of office space, a double height commercial floor with a mezzanine level, as well as three basement levels serving as car parks.

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Several structural systems were considered, however the solution opted for is a diagrid. Diagrid is a structural system consisting of diagonal members and horizontal spanning beams that meet at nodes, effectively creating a series of trusses with pin connections. A diagrid transfers both gravity and lateral loads through the system without the need of vertical columns or heavy shear walls. The diagrid system eliminates the use of internal columns, opening up additional space on all floors of a building.

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Each member of the diagrid was designed to span over three floors. This implies that floor plans had to change depending on where the member hits each floor in order to have primary beams being supported by nodes and not edge beams. This resulted in three different floor plans alternating at each triangulation.

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The diagrid imposed an issue at basement level where it was difficult to have a good car park layout with all the triangulation going on. This is why the diagrid was stopped at street level, and supported by a moment resisting frame underneath.