“ Rossia” With Love.

Europe's tallest skyscraper is being built in Moscow. If you are thinking of designing a tall building, make it at least 600 metres or nobody will bat an eyelid. Moscow's est addition to the 600 m plus club is 612 m high, Rossia Tower, a cool 2m higher than the Chicago Spire. Rossia's site is currently being cleared to make way for what will be Europe's tallest building. The skyscraper will incorporate retail and office space, a hotel and apartments on its 120 floors, three of them below ground level.

Rossia is elongated pyramid, or a rocket shape structure, but on the inside, the structure tells the different story. At its base there are three colossal, high strength concrete abutments clamping the whole structure down. Each abutment forms the base of three wings of the building from which columns radiate. The wings converge at a central spine, or concrete core, which runs the full height of the towers. The constructors have designed the steel frame and the composite floor structure. The plan and the profile of the building take on an efficient geometry of a triangle to achieve maximum stability using the minimum amount of material.

Initially the tower was designed as discrete blocks, arranged in Y shape in plan But it means that each block was too slender, having a height of wide ratio of 10:1 The whole design was starting to look like a familiar form of a cable stayed mast However instead of tension cables, Rossia uses the sloping columns to act in compression - propping the central core and essentially acting like three dimensions arches.

The fan columns carry gravity load and wind overturning forces as direct axial loads. And as the weight of the building and its inhabitants exceeds the design wind load in the majority of the columns and core, there is a little tension in the system.

The Tower's three wings comprise steel and concrete columns which fan out from the three massive abutments at the base. Visually this gives the form of a tripod supporting the rest of the building- a structural form known for its efficiency.

The facade of the wings is stiffened by the series of"reserve fan columns" which triangulate the facade. The wings are designed as boxes with crossed bracing These resist twisting. The rigid faced is further stiffened by steel chevron bracing up the fourth floor on the outer edge of each wing. This provides sufficient torsion stiffness. But the structure with sloping columns causes other problems in the form of horizontal loads amassing at the base.

The construction sequence requires the fanning columns to be designed for erection loads. Later they will be encased in reinforced concrete to achieve the final strength for permanent loads.