FROM THE EDITOR…

Tall towers and buildings have fascinated mankind from the beginnings of civilization, their construction being initially for defence and subsequently for ecclesiastical purposes. The growth of modern tall building construction began in the 19th century, and it has been largely for residential and commercial purposes. The development of new engineering materials, design procedures and construction techniques accelerated high-rise building construction, first in North America and later in Europe and other parts of the world. The new materials allowed the development of light weight skeletal structures, permitting buildings of greater height with larger interior open spaces and windows. The first high-rise building was the 11-story Home Insurance Building in Chicago in 1883, followed in 1889 by first all steel frame of 9-story Rand-Mcnally building. The development of high-rise building was so immense as such 102-story braced steel frame Empire State building (381 m in height) was opened in 1931 and it continued to expand further.

By 1980's, Sri Lanka saw the beginning of high-rise building construction and it was accelerated after 2010. Presently, the country ranks 32nd in the world and 12th in Asia considering the number of completed buildings over 150 m height according to the Council of Tall Buildings and Urban Habitat. From all high-rise buildings, the Altair tower makes so special among general public because of its unique shape. On 12th March 2021, the first phase of Altair tower was declared open. The building has a 68 floor vertical tower (240 m in height) and 63 floor leaning or sloping tower (209 m in height). At 240 m, the building is the second tallest building and only the Lotus tower is taller than the Altair tower. The building is situated on the banks of the Beira Lake on a 2-acre plot of land leased by the Urban Development Authority of Sri Lanka to the Developer Indocean Developers at a cost of LKR 2,560 million in 2011 for 99 years with the objective of developing underdeveloped lands under the Beira Lake Development Project, started in 2012.

The leaning tower is inclined from level 5 to level 39 and goes vertical up to roof level at a height of 209 m. The leaning or stepping tower has an angle of 13.8 degrees from the vertical and leans towards the vertical tower. The two towers are connected by steel outriggers at four points at levels 39 and 41. Each tower is supported by external walls and internal core walls forming a three-dimensional structured frame.

It was designed by Moshe Safdie of Safdie Architects, Boston, in association with Design Team 3 Singapore and Thailand as detailing and submitting architects, Derby Design Dubai as structural engineers and CKR Dubai as M & E engineers. The leaning tower has been designed using a distinctive diagrid structure-a basket with a permeable surface for large windows and openings providing an access to balconies on the one hand and an intriguing geometry that will make this building unique across the city's skyline with flat slabs which not only add structural stability to the building without the need for internal columns but also allows for a permeable surface with large windows. This allows maximum airflow and light which contributes to energy savings in heating.

The towers were constructed on reinforced concrete piles and a raft footing with a reinforced concrete or steel superstructure. Even though Colombo rarely experiences significant earthquakes (it is classified in seismic Zone 0 under the international building code), Altair has been designed to withstand earthquakes up to 7 on the Richter Scale. The developers have also commissioned wind tunnel tests in Canada where intense studies were undertaken with 103 individual wind speed sensors placed on a 2 m model of the Altair with all relevant surrounding buildings and topography within a 480 m radius. With development of high-rise buildings such the Altair tower, the country can pursue ambitions to become the leading commercial hub in South Asia.

Eng. (Dr.) P.A.K. Karunananda
BSc. (Eng.) (Hons.) (Peradeniya), MPhil. (Peradeniya), MEng. (Ehime),
DEng. (Ehime), C.Eng, MIE(SL)
Editor, 'ENGINEER', Journal of The Institution of Engineers.