

**OPTIMAL ASPECT RATIO FOR DIFFERENT TYPES OF BRACED DOMES
SUBJECTED TO GRAVITY LOADS**

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ABSTRACT

Latticed structures are one of best structural systems used for roofing. Lightness, rigidity, strength, shape flexibility, speed of construction, and economy were the main reasons behind the use of such systems in the last five decades. Braced-domes were one of oldest types of latticed structures and were used to cover many structures all around the world.

In this paper, two main geometrical parameters of domes were studied; topology of the dome and aspect-ratio. Four different types of domes were studied using five different aspect-ratios for each type. SAP2000 was used to analysis a total of 20 models. Models were mutually rigidly-connected while pin-supported at bottom ring and subjected to total gravity loads of 120 kg/m².

It was concluded from that Ribbed-dome had the minimum weight, but it had the lowest structural performance. On the other hand, Schwedler-dome had the maximum weight with the best structural performance. The optimal value of dome aspect-ratio (H/D) for all types was 0.25 as it resulted in maximum

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linear-buckling load with minimum displacements and internal forces but with slight increase in total dome-weight.

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