

Study on Scheme of Annular Crossed Cable-truss Structure—Membrane Roof Structure

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Abstract

Based on Annular Crossed Cable-truss Structure(ACCTS) model with diameter of 17.15m, the type of membrane roof was firstly studied. Two schemes of membrane roofs, cable-supported membrane roof and skeleton supported membrane roof, were proposed. The form-finding analysis of two types of membrane roof structure was carried out. By comparative study, the strengths and weaknesses of two schemes were given, and the feasibility of skeleton membrane roof was demonstrated. Secondly, skeleton membrane roof was studied by collaborative form-finding and non-collaborative form-finding. The form-finding method being suitable for the structure was given. Finally, load analysis of membrane and non-membrane roof structure were carried out. The results showed skeleton membrane roof had strength to resist to external loads. The studied content has promoted the application of annular crossed cable-truss structure in practical engineering.

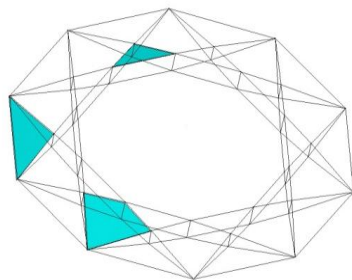


Figure 1 Diagram of cable-supported membrane roof

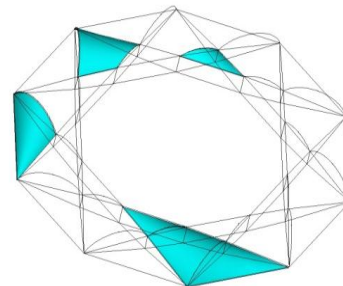


Figure 2 Diagram of skeleton membrane roof

References

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