OCTET TRUSS

Designed by Buckminster Fuller, Synergetics Inc.
Consulting Engineers: William McGuire and Arthur Nilson
Contributed to the exhibition by Aluminium Ltd.

Made entirely of aluminum tubes, connectors, and rivets, the octet truss is one hundred feet long and thirty-five feet wide. The roof is held twenty feet above the ground. Measuring from the center of the supporting tower, the roof cantilevers sixty feet toward the street and forty feet toward the wall. The base, running along the ground behind the tower, serves to balance the entire structure. Although it requires only shallow concrete pads on which to rest, it has been anchored to deep concrete foundations in accordance with New York City building codes. The entire structure has been anodized gold in order to make it more easily seen against the background of city buildings.

Like the dome, the octet truss derives from geometric configurations Fuller believed were characteristic of those found in atomic structure. (Electron microscope photographs have since verified his conclusions.) The truss is composed of tetrahedrons with octahedrons between them, from which combination it derives its name "octet truss". These geometric figures disperse load pressures equally along three sets of parallel planes. Pressure applied at any one point is instantly distributed throughout the entire structure. It is this dispersal of forces which gives the structure its great strength.

The most immediately impressive aspect of the octet truss is its delicacy in relation to its size. When it is realized that the entire structure is made of aluminum and weighs only eight thousand pounds, the remarkable strength made possible by Fuller's engineering is more readily appreciated.

The aluminum struts used throughout are all of the same length. Three-pronged aluminum castings have been pressed into the tubes, and the castings are riveted to each other by means of a tool developed for the aircraft industry. Ease of assembly depends on the utmost precision of manufacture for all of the parts.

As demonstrated here, the octet truss is not an actual "building". Its structural principle can be used wherever it is necessary to make large uninterrupted roof-spans: concert halls, factories, museums, train sheds, airplane hangars. A greenhouse of similar design is now being built in St. Louis. The same configuration of tubes may also be used, as they are here, for the supporting "columns", and the nature of the structural system suggests that we may ultimately learn how to "weave" enormous buildings that will differ in every way from what we now call architecture.