



11 / MONOCOQUE CONSTRUCTION  
NEW FORMS OF HOLLOW, COMPOSITE,  
WOOD AND PLYWOOD COLUMNS AND BEAMS

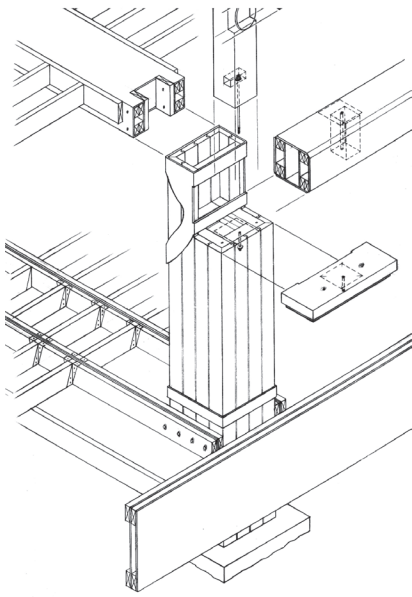


*The new clubhouse with a structure of large members showing the beauty which this formation of members achieves.  
Christopher Alexander, Randy Schmidt, Masaya Okada, Miyoko Tsutsui, completed 2002.*

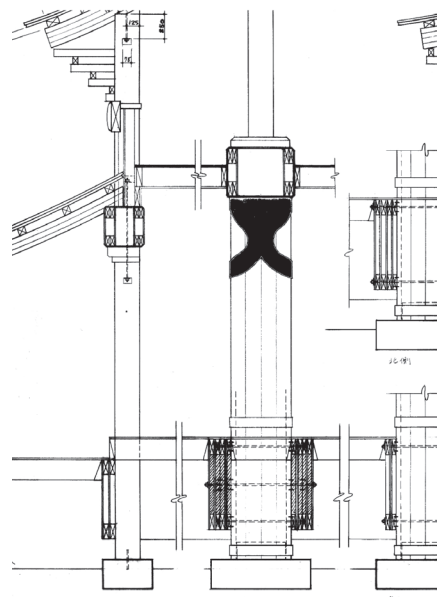
On page 478 I mentioned that the need might arise to make members which are large, yet lightweight, efficient, and structurally real. One example of such a form of construction that we invented is a way of building massive columns and beams out of plywood and small-section lumber, yet producing members with a very large moment of inertia and with high-performance structural behavior because of the innovative distribution of physical material in the members. We may think of these members

as comparable to the way a grass stalk works: it is highly flexible, very light because it has thin material all distributed at the perimeter of the section, yet huge moment of inertia for its weight, and outstanding performance in bending and shear.

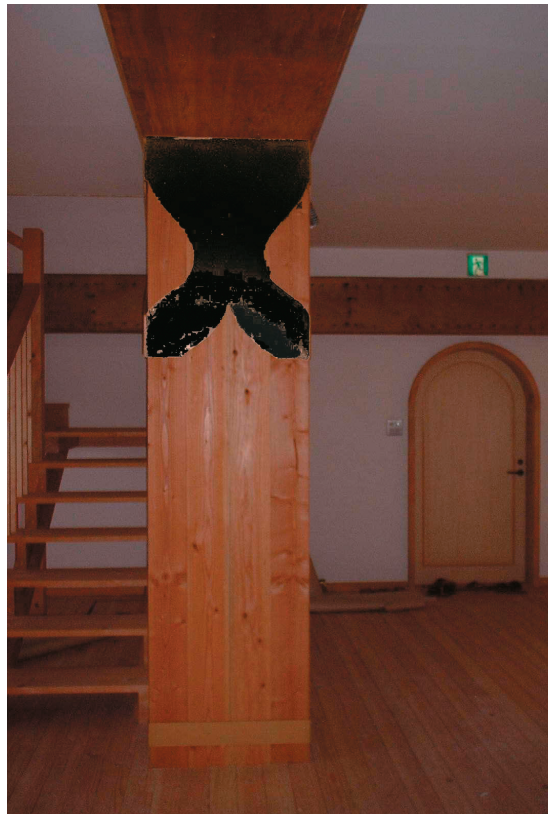
A grass stalk is largely hollow. The columns and beams we developed for the Clubhouse at Eishin, outside Tokyo, are also largely hollow. The Clubhouse, built in this technique, was completed in 2002.



*Cutaway drawing showing the build-up of the hollow column.*



*Section showing the treatment of edges and corners to increase stiffness.*



*A massive hollow column, almost two feet thick, with a steel strap connecting to the hollow beam.*