

# PAPER LOG HOUSE

## SHIGERU BAN

Location: Kobe, Japan

Date of Finished Construction: 1995

Type of Structure: Cardboard Tubes

List of Materials

- KIRIN beer crates

- sand bags

- 13'x13' plywood floor

- plywood pegs

- 2x8 pieces of wood

- 4 1/2" diameter cardboard tubes

- waterproof tape

- tent like material

- 1/4" steel rods

- plywood roofing connections

Time it takes to assemble it on site : less than 6 hours

People it takes to assemble : 1-20

Cost of Building : under \$2,000



Shigeru Ban's method of architecture is simple; to create structures that challenge the modern concept of materiality. Ban chooses to use simple recyclable material to create structures of magnificence. One of his most successful projects came at a time of great need. In January 17, 1995 a magnitude 6.9 earthquake hit the city of Kobe, Japan leaving three hundred thousand people homeless. The aftermath of the quake left the city in ruins, destroying some one hundred and two thousand buildings. This catastrophic event gave Ban the commission he needed to truly test his method of building.

As the project went underway, Ban quickly found the materials he needed. All the materials used were to be prefabricated and assembled at the site. Ban used Kirin Beer crates as the foundation for the one hundred and seventy-two foot site. Each of the crates was filled with bags of sand, which helped to anchor the crates to the site. Next, a thirteen by thirteen foot plywood floor lined at the edges with plywood pegs. Four and a half inch diameter cardboard tubes (each four millimeters thick) were slipped onto the pegs and sealed at the joints with waterproof sponge tape. The tubes are held together horizontally by two quarter inch steel rods. The gabled roof is also supported by the cardboard tubes and is covered by a thick double-layered tent material. The gabled ends of the roof are operable, allowing the resident to open or close them at times of rapid climate change. The houses also contain operable windows and shutters, both framed in plywood.

The project in Kobe was of huge significance in Ban's life. He says, "Refugee shelter has to be beautiful. Psychologically, refugees are damaged. They have to stay in nice places."

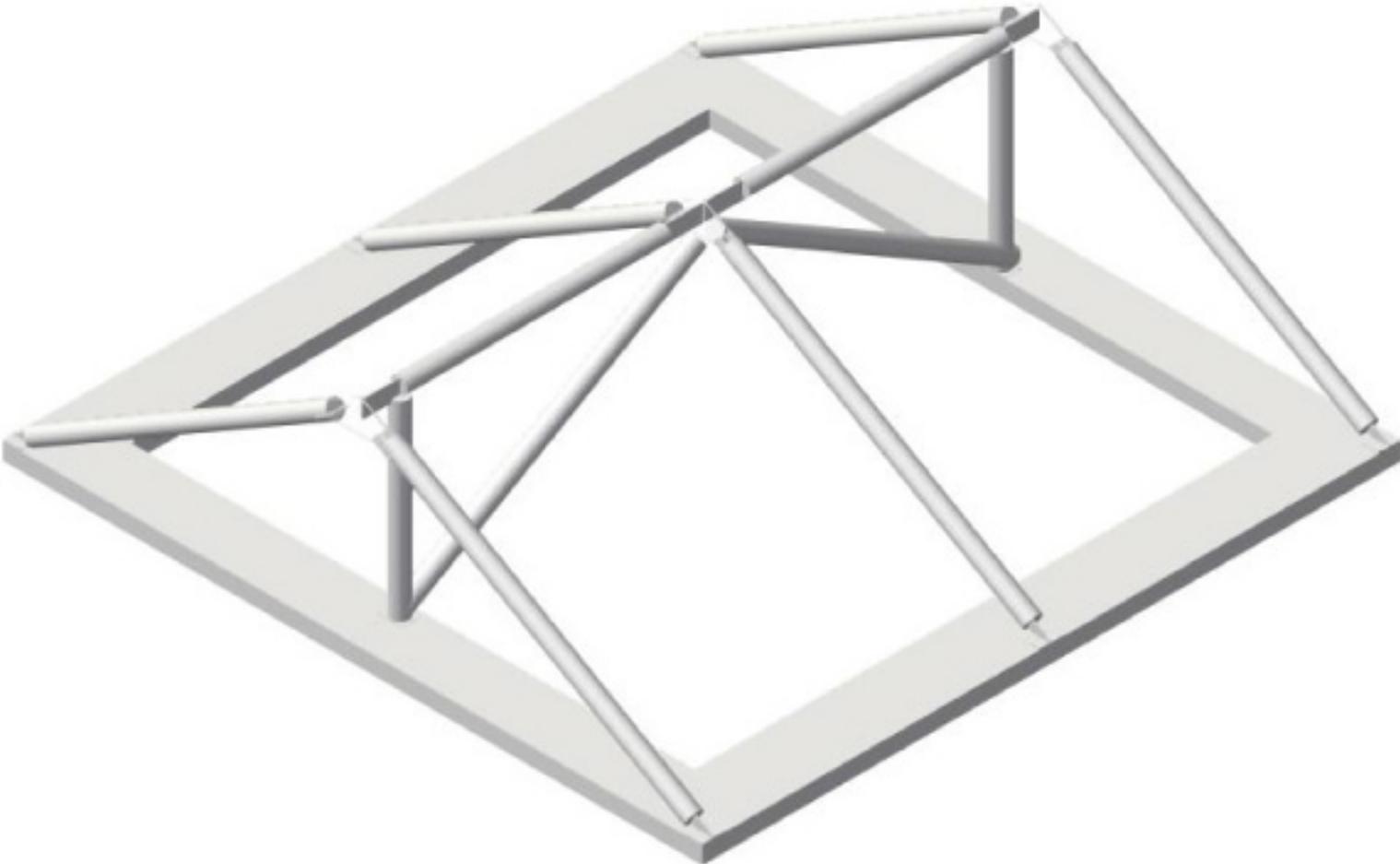
This remains important in the building of these refugee homes. Each fifty-two foot squared unit costs less than two thousand dollars to build. They are also easily erected and dismantled. Each house is said to have taken around six hours to build. After dismantling, the materials go to a recycling plant where the process begins again.

The houses in Kobe, Japan are an important example of nomadic architecture. In 1995, Ban established NGO Voluntary Architects Network, helping to provide cheap housing for those affected by natural disasters. Each of the houses are cost effective and easily erected. Ban's work in Kobe was such a success that similar shelters were used in Rwanda, Turkey, India the recently destroyed coast of South East Asia. He quotes, "Even in disaster areas, I want to create beautiful buildings. This is what it means to build a monument for common people. And this is what I would like to continue doing as an architect."

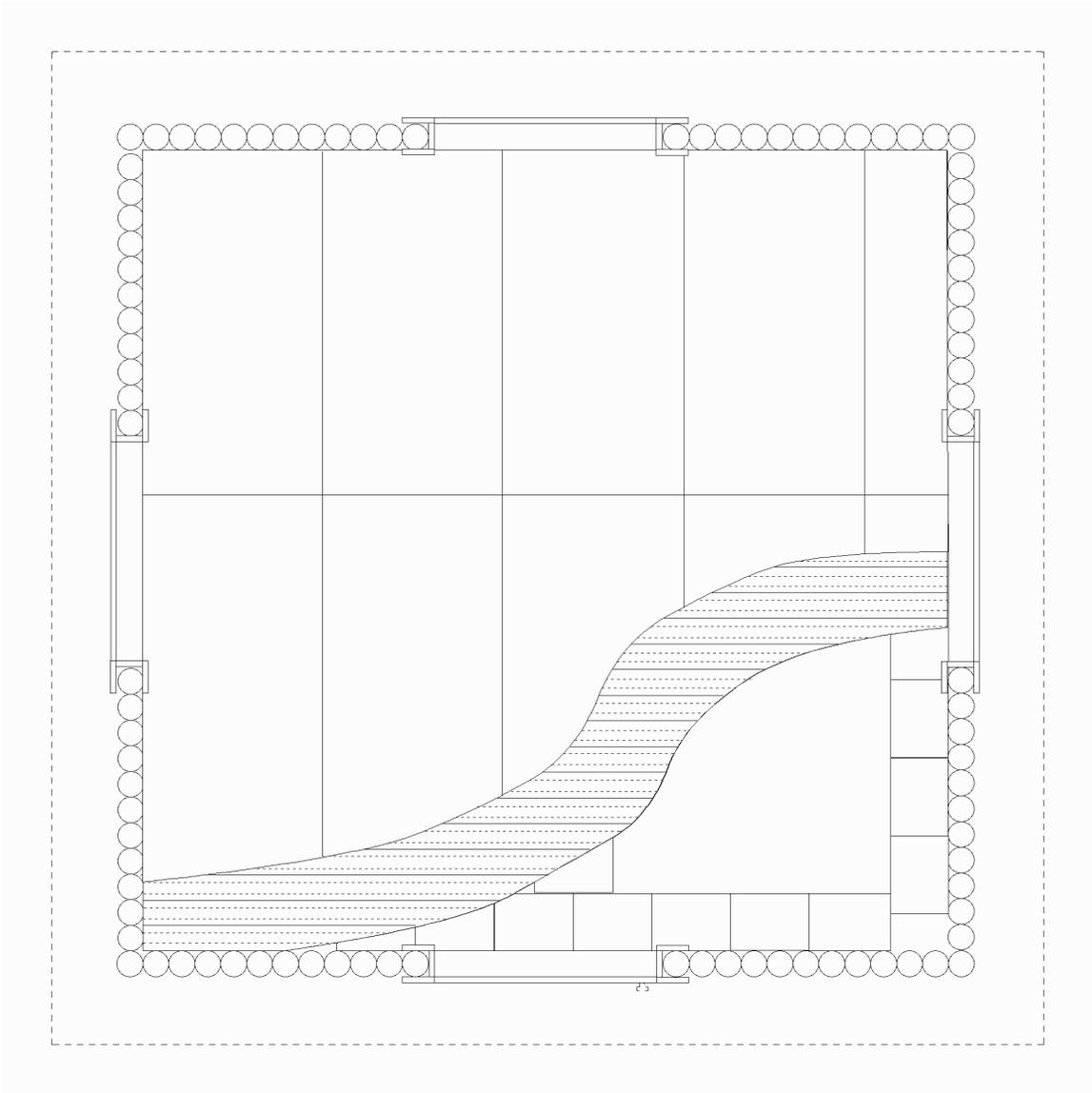


The assembly of the building starts from the ground up. The first step is to place the beer crates in a thirteen foot by thirteen foot square. The next step is the plywood flooring system. Once the plywood flooring is in place, the plywood pegs are placed at the outer perimeter of the floor. The four and a half in diameter cardboard tubes are then placed over the pegs. Once the tubes are in place, weather proofing tape is applied inbetween the joints of the cardboard tubes. Thirteen foot quarter inch diameter steel rods are then slipped through the tubes to add horizontal support. A two inch by eight inch header is placed on top of the tubes and begins the roofing system. Plywood connections are created to connect the four and a half inch cardboard tubes to the header. Once the gabled roof is in place, diagonal supports are added to sides of the roofing system. A tent like material is then tied to the top of the tubes.

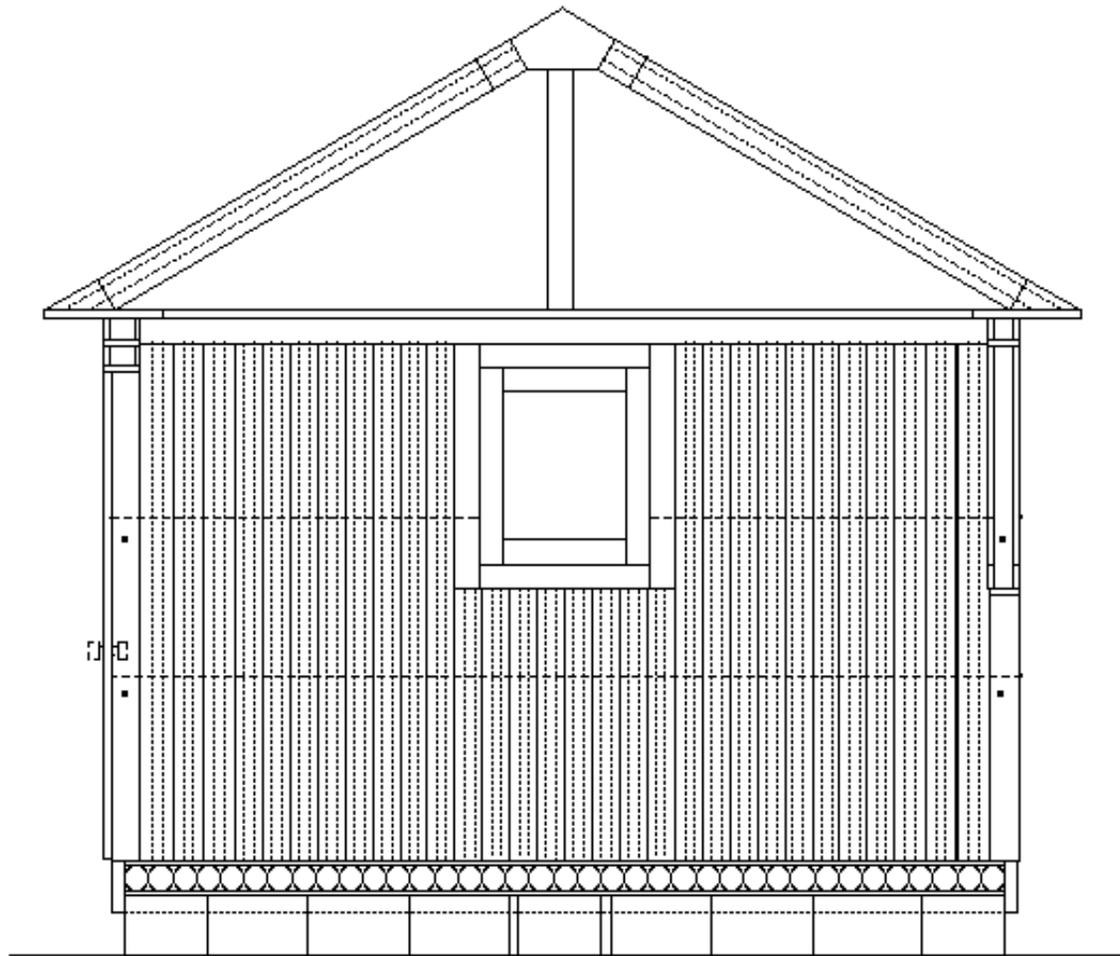




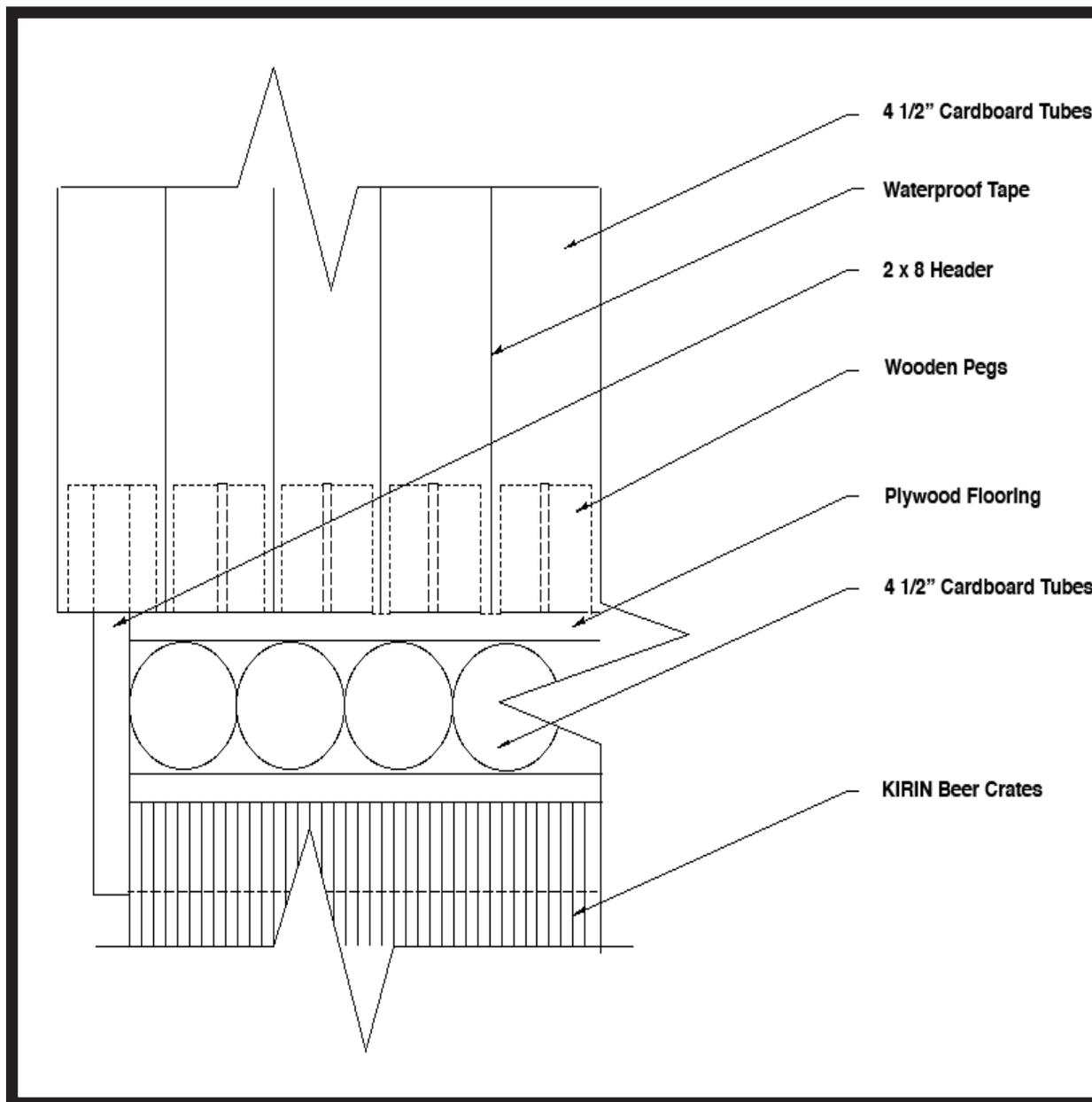
Roof System Construction Assembly



Plan



Section



Detail-Wall to Beer Crate Foundation

## Works Cited

McQuid, Matilda. Shigeru Ban. New York, New York: Paidon Press Limited. 2003

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<http://www.satyamag.com/apr05/ban.html> (April 5, 2005)