

34 Fly Ranch

The event space 34 Fly Ranch is inspired by the Wickiups, a tee pee like structure which the North American Indian Paiutes of the Numic group built for their large families to reside in and the concepts of the pre-contact lifestyle which was well adapted to the harsh desert environment. The wick ups were built with the entrance facing the east to avoid the wind, a central firepit, and a hardened mud base to keep the insects out. Willow poles were placed in a circle and leaned together in a manner that a smoke hole would materialize above. The poles were either covered with mats woven from tule reeds, bundles of long grasses, or animal skin.

34 Fly Ranch is proposed to be assembled approximately 100 feet from the Fly Geysers and the geothermal pools for two reasons:

- 1) According to the tradition, the tribes occupied a specific territory surrounding a lake or wetland that supplied fish and waterfowl.
- 2) The 34FR should gain the function of a landmark in order to lead visitors towards the main attraction found on the property, the Fly Geysers and the geothermal pools.

The structure is composed of sixteen Glulam (glued laminated timber) members inclined to acquire the renowned teepee outline of the wick up. This arrangement is paramount, for a column free space is created to facilitate the reconfiguring of interior elements thus supporting a variety of events. The GLULAM members are anchored to a 3'-0" tall rammed earth wall or "ring" with a diameter of approximately 52'-0", comprised of a mixture of local aggregates abundant on site, including gravel, sand silt and clays. The low impact "ring" ought to play multiple roles, which are to keep elevated the finished floor of the interior considering the possibility of flooding, store heat, keep out the insects, and provide a smooth and sound surface to anchor the Glulam member to ring connectors and attach the polycarbonate sheets.

Polycarbonate is capable of withstanding a harsh exterior environment and offer multiple advantages. The panels have great impact resistance, protection against yellowing and optical clarity, excellent load ratings, and the highest resistance to wind uplift. Panels are available in soft white for maximum light transmission without glare, as well as clear and a range of colors to filter light or reduce heat loads. Control of heat gain can be achieved using glazing materials which are designed to influence the nature and quantity of transmitted light. Some products are available in bronze and opal white tinting and are both effective for solar control, reducing glare by diffusing incoming light and reducing heat gain. The innovative development in polycarbonate sheeting which limits heat buildup through the sheet while transmitting light is ideal in any situation where natural light is required but excessive heat buildup can be a problem.

Great thermal insulation is ensured by the presence of airgaps inside the panels. In order to improve the thermal properties of the component, the gaps can be filled with insulating materials or substances such as argon gas or granular silica aerogel. The synthetic porous gel is up to five times more effective than traditional insulation materials while being industrially robust across a broad temperature range in a space-saving, easy-to-use form, making it the most efficient industrial insulation on the market. It is also the world's lowest density solid and most effective thermal insulator which at a pressure of one-tenth of an atmosphere, has an R-value of R-20 per inch of thickness, compared to R-3.5/inch for a fiberglass blanket.

Indoor environmental comfort is achieved and controlled with a synchronized ventilation system. With a black coated (to increase air suction) skylight, air can be drawn from a piping system that feeds off cooler underground (about 4'-6' depth) temperatures. For example, on a sunny cold day, the skylight/smoke vent is kept shut to avoid the heat from escaping the interior. On the other hand, on a warmer day, the heat within the space is released meanwhile extracting the cooler temperature from the piping system. On the long run, power could be generated onsite from either organic photovoltaic OPV sheets attached to the to the polycarbonate envelope or via a set of monocrystalline panels.

The 34 Fly Ranch scheme aims to capture the spirit and some of the available on hand resources (passive heat and cooling) of the surrounding mean while proclaiming its own identity. Within the space, guests can tackle small ongoing projects comfortably under one roof driven holistically after the same objectives. These events could include exhibitions, seminars, and meetings for science communication and positive public relations to raise awareness of the potential found at Fly Ranch and its future endeavors. Furthermore, it serves as one of countless examples of the construction methods that can be adopted on site and an approach of connecting the guests with the land, a feature considered sacred by the Paiutes.

Preliminary Cost Estimate

- I) Pre-Construction
 - a. Site work
 - 1. Trenching: Hand excavation, bulk and wheeled 100', 2'-0" deep, sand or gravel, = \$46.00 C.Y.
18.33 CY @ \$40.00 = **\$733.00**
- II) Structural
 - a. Glulam (Glued Laminated Timber) Western Species: \$24.00 LF (includes sales tax) – 47'-0" (16)
=\$18,048.00
 - b. Rammed Earth Wall "Ring": \$75.00-\$100.00 per sq. ft.(verify) 3'-0" Wall - 870 SF = **\$65,250.00**
 - c. Steel Connections (Hardware):
 - 1. Glulam member to Rammed Earth Wall - (16) @ \$300.00 ea. = **\$4,800.00**
 - 2. Glulam member to Polycarbonate Sheets Connectors–
 - 3. Skylight/Smoke Vent: **\$2,000.00**
 - d. Floor Structure:
 - 1. On Grade Concrete Floor Slab: (~\$6.00)(1,989.82 SF) = **\$11,938.92**
- III) Doors
 - a. 3'-0" x 7'-0" Pair of Glass Doors: **\$2,000.00**
 - b. Single 3'-0" x 7'-0" Glass Door: **\$1,000.00**
- VI) Windows

V) Specialty equipment

- a. Corrugated Polycarbonate Roofing Panels - .90 – \$1.65 per sq. ft.

$$(\sim 4,400 \text{ sq. ft.}) (\$1.65) = \$7,260.00$$

IV) Electrical

- a. Lighting

IIV) Mechanical

Cooling pipe system: LF

$$9'' \text{ PVC diameter pipes: } 244 \text{ LF} = \$16.00 \text{ LF} - (244)(16) = \$3,904.00$$

$$6'' \text{ PVC diameter pipes: } 96 \text{ LF} = \$9.50 \text{ LF} - (96)(9.5) = \$912.00$$

IIIV) Hardware

Subtotal Probable Cost Estimate: \$117,839 (blue highlighted numbers)

10% Contingency: \$11,783.00

Total Probable Cost Estimate: \$129,606.00