



### **Ceilings**

Ceilings are exposed pine vigas, 9-10" diameter, with 1 x 8" rough-cut exposed wood decks over them. Insulation above is 12" cellulose (R-44). A vented air space is indicated above the cellulose layer and below the final cover above. The final cover is a galvanized, 26 gauge metal deck over 1x 6" wood purlins.

### **Sunspace**

Along with the vertical, direct gain glass on the south wall, a portion of the Sunspace roof (roughly 21' x 5') is dedicated to solar gain, using a translucent greenhouse material. The owner will utilize the Sunspace for growing vegetables year-around. As with all greenhouses, the temperature swings will be greater than in the adjacent Living, Bedroom and Bath areas. That means that closeable doors must be provided between the Sunspace Room and the interior rooms. These are standard tempered, and double-glazed. 6' wide sliding patio door units.

### **Light into back rooms**

During the coldest period of winter, the low sun will penetrate the clerestory windows above the Living Room, and beam sunlight through two interior windows into the Bedroom, assuring well-lit interior rooms. They have plenty of vertical space: the highest portion of the Living Room Ceiling is approximately 18' 6", and the highest portion of the Bedroom ceiling is 14' high.

### **Energy Calcs, severity of climate and solar operations**

The owner wanted a home with exposed rammed earth walls, not requiring an insulation and stucco cover on the exteriors. As a consequence, all exterior walls are 18" stabilized rammed earth. The upper portion of the east and west walls is insulated 2 x 6" frame with an added foamboard layer and board/batten finish on the exterior. Extrapolating from New Mexico's Ue factors, SWSA established a value for the 18" rammed earth portion of the wall system. This was combined with the composite of R factors for the insulated frame portion of the walls and allowed SWSA to pass **Plan 1342** through the NM Model Energy Code for this climate zone, without the need for exterior wall insulation over the rammed earth wall.

The great input of passive solar energy through the south doors and windows are the main energy driver for **Rammed Earth House Plan 1342**. They are a combination of standard sliding glass patio doors and fixed glass on the first story, with open able and fixed units in the clerestory above. The owner will operate nighttime insulating blinds at sundown (minimum R-5) to cover the glazings. During summer months, the solar overhangs cut the sun, creating shaded south walls. Other windows on north, west and east exposures are low-e or heat mirror type, and will be fitted with "storm glazing" during winter months for a higher R factor. The average R factor for all glazings in Plan 1342 should be at least R-3, with east and north units striving for an R-5 (check manufacturers' ratings).

### **Backup for winter heating**

Backup is via an under floor radiant heating system using an efficient boiler and Ipex piping from Radiant Heating Systems of Albuquerque. The boiler location will be in the Sunspace Room. It is anticipated that backup will be required during periods of extended cloudy weather. The owner may opt for a small, efficient, wood-burning stove in either the Living or Bedroom area.

### **Interior mass walls to aid in heating and cooling**

There are two major interior mass walls, one of rammed earth 18" thick, between the Sunspace (greenhouse) Room and the Living Room. Also, the wall between the Living Room and Bedroom/Bath area is 14" adobe, which may be exposed for an "artistic" finish. Interior rammed earth walls may be left exposed or plastered with a ½" gypsum-based smooth finish. Both of these walls have secondary adobe walls above them (with additional bond beams) to support the clerestory windows and the exposed viga ceilings. The significant mass of interior earth walls has a stabilizing effect on temperature swings and will help the home to "cruise" through cold and hot spells.

### **Frame Walls**

Standard wood frame construction of 4" thickness is shown along the Hallway and a small portion of the Kitchen. Bath and Wash/dry areas utilize a 6" frame wall to house plumbing systems.

### Summary

**Rammed Earth Studio Plan 1342** represents an efficient Living/working studio for one or two people for areas of the Southwest where winter severity does not exceed 5500 degree heating days, and for elevations between 5000-6500'. Good air flow and high ceilings will take care of cooling for much of the summer season, with an evaporative cooler required for hot spells. The Sunspace provides ample room for growing vegetables, as well as generating needed winter heat. The passive solar system will require night time closing of insulating curtains or blinds.

The builder of **Plan 1342** should be familiar with rammed earth construction, including forming systems and quality control for fully-stabilized walls. The New Mexico rammed earth code was utilized as part of the design process for Plan 1342.

**Rammed Earth Studio Plan 1342** comes as a set of four, 24 x 36" sheets in black on white. Drawings in standard drafting scales depict Elevations, Floor Plan, Foundation Plan, Wall Sections, Viga Framing Plan, and Electrical Plan\*\*. Several Isometric Drawings (for clarification) are included.

For New Mexico builders, an additional sheet, with NM Energy Conservation Code figures (necessary for NM permit) is available at \$15(covers NM Climate Zones 3-7).

\*If such "add-ons" are anticipated, the builder should consider pouring the "future" footings at the time the main house footings are poured. Rebar can be extended and "tied off" from the new bond beams so as to tie into the future bond beams. A review of the new NM Rammed Earth Code in [Adobe Builder](#), Issue 9, shows further attachment options.

\*\* . A standard AC plan is shown, but some fixtures on the Electrical Plan are shown in D.C. because of solar electric circuitry.

One set of **Rammed Earth Studio Plan 1342**, sent in a tube via priority mail is \$85, or three sets for \$105.

One set of **Rammed Earth Studio Plan 1342** with NM Energy Calcs is \$100, or three sets for \$125.

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\$85



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