

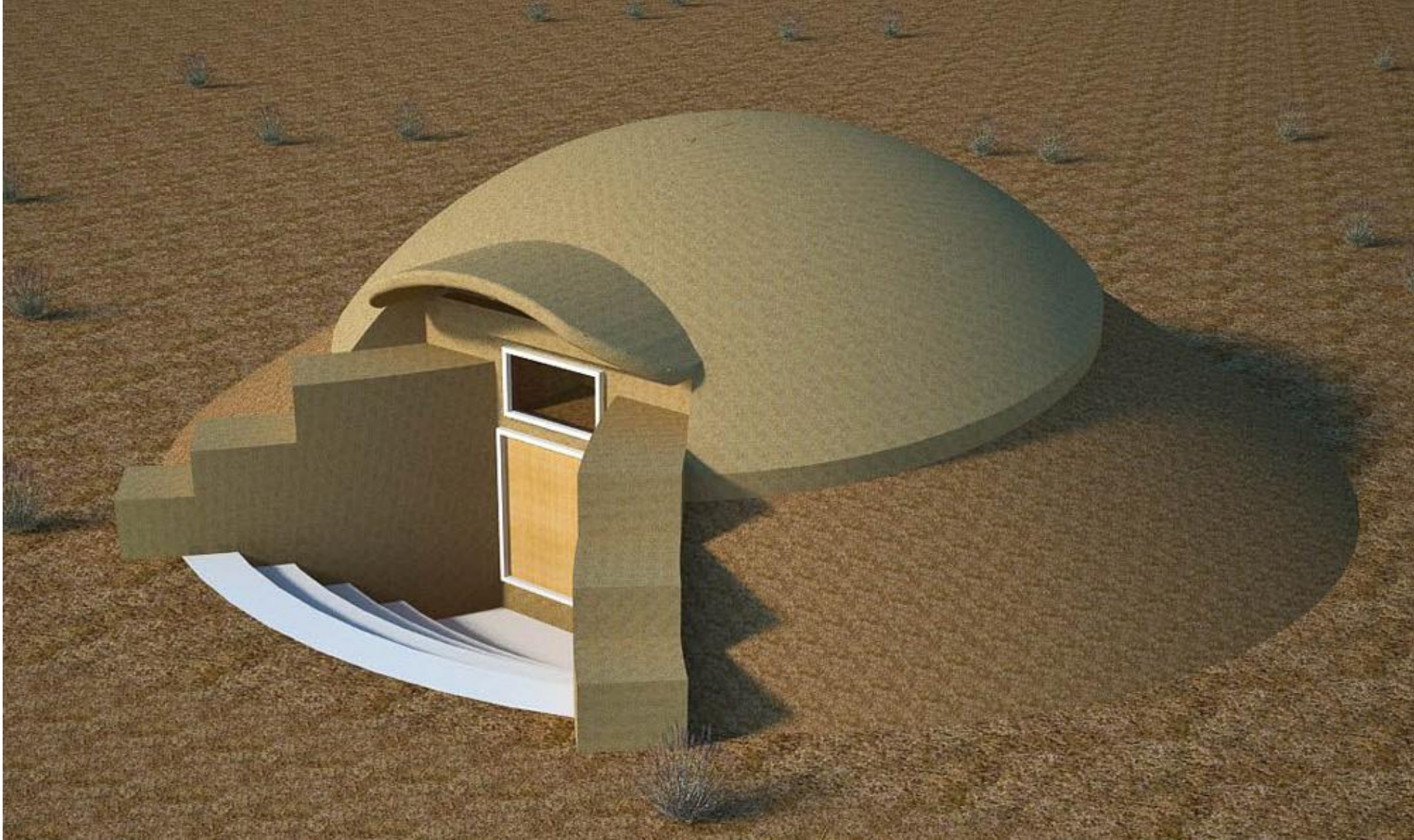
Desert Shelters

Owen Geiger

Introduction

The idea for many of these low cost desert shelters came from reading Phillip Garlington's website at [Rancho Costa Nada](#) ("the cost nothing ranch"), where he tells his story of chucking a regular 9-5 job and creating a new life in the desert. Economic woes are driving millions of people out of the economy, many of whom become economic refugees with no place else to go except the cheapest land available – the desert. As a result, desert communities are springing up throughout the southwest US deserts.

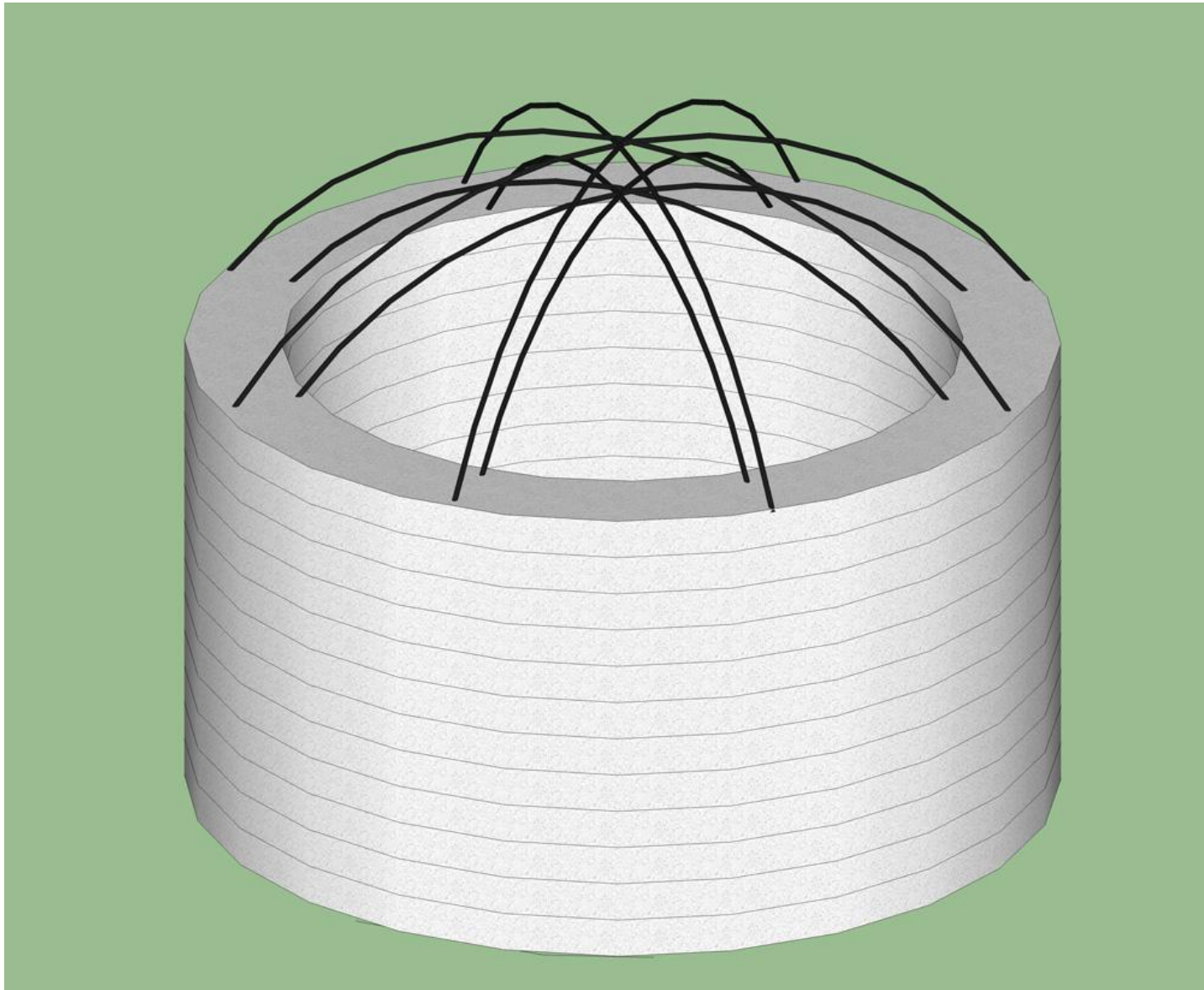
There's an obvious lack of suitable desert shelter, and that's why I got involved. Most of these desert dwellers are living in tents that quickly succumb to the wind or in old trailers and motor homes that are unbearably hot and uncomfortable, and create an eyesore on the environment. I knew there had to be a better way, and so I set out to create a series of desert shelters that anyone could build with little or no training, using sand bags, primarily salvaged materials and some store bought supplies. I set an upper limit of \$300 per shelter. Go to the end of this PDF for links to extensive information about earthbag building.



Desert Dome
Owen Geiger

Desert Dome Shelter

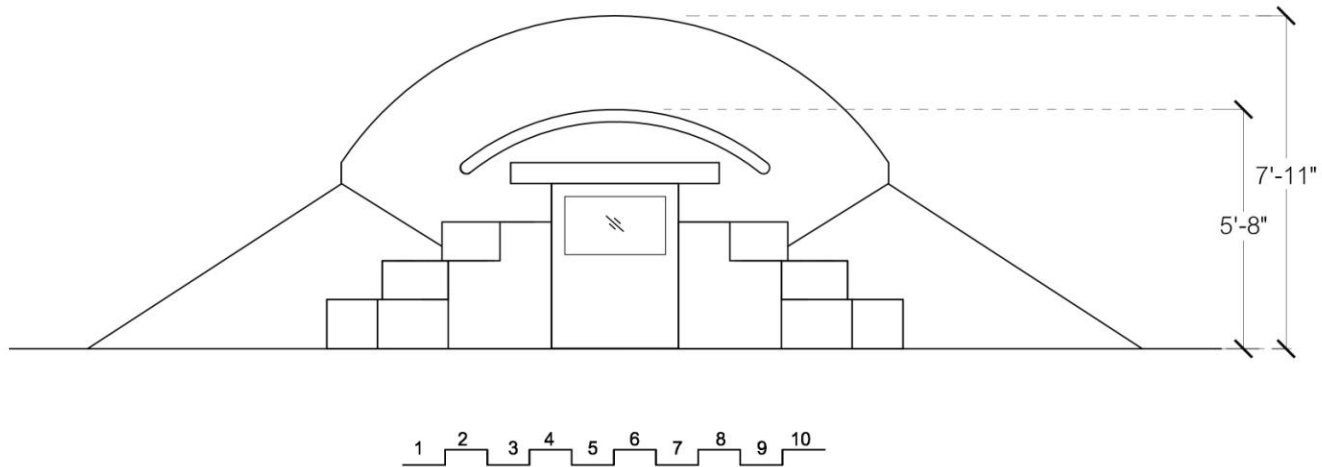
The Desert Dome Shelter has 78 square feet living space and is designed for simplicity of construction using sand and sand bags as the main building materials. Vertical sand bag walls are stacked in a circle since sand-filled bags would slump and collapse if stacked in a dome shape. The domed roof is made of a double layer of ½" steel rebar bent into a curve. Top and bottom surfaces are covered in doubled chicken mesh and plaster, and the space between filled with insulation such as foam packaging peanuts. Building two feet into the ground and berming the sides provides greater comfort and protection from harsh winds. A two foot raised threshold helps prevent flooding, and with added lip, keep snakes out (Phil's idea). Air flows through vents in the back of the structure and out the tilt-open window above the door. Internal temperature is projected to be 15 degrees cooler than the outside air.



Desert Dome



Desert Dome Plan



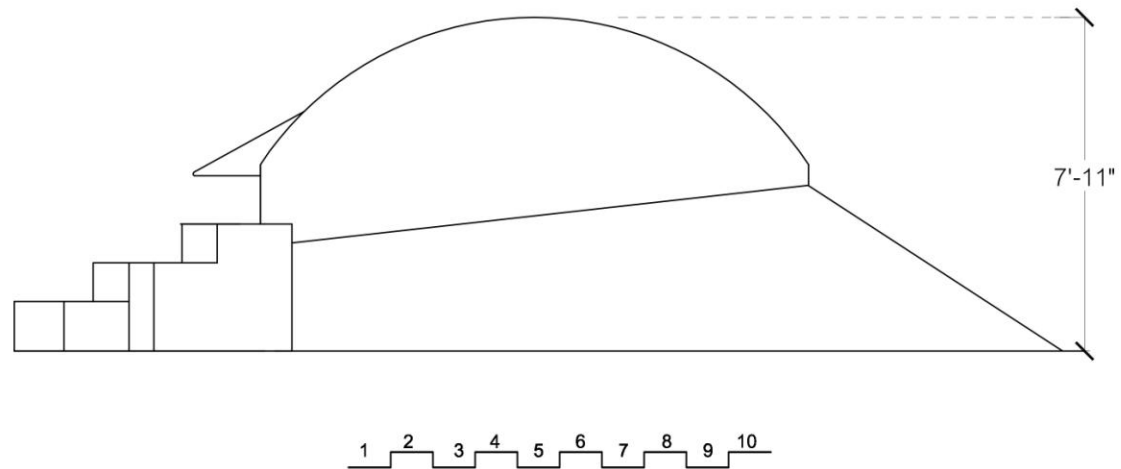
Project: Desert Dome

Scale: $\frac{1"}{4} = 1'$

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Dr. Owen Geiger

Desert Dome South



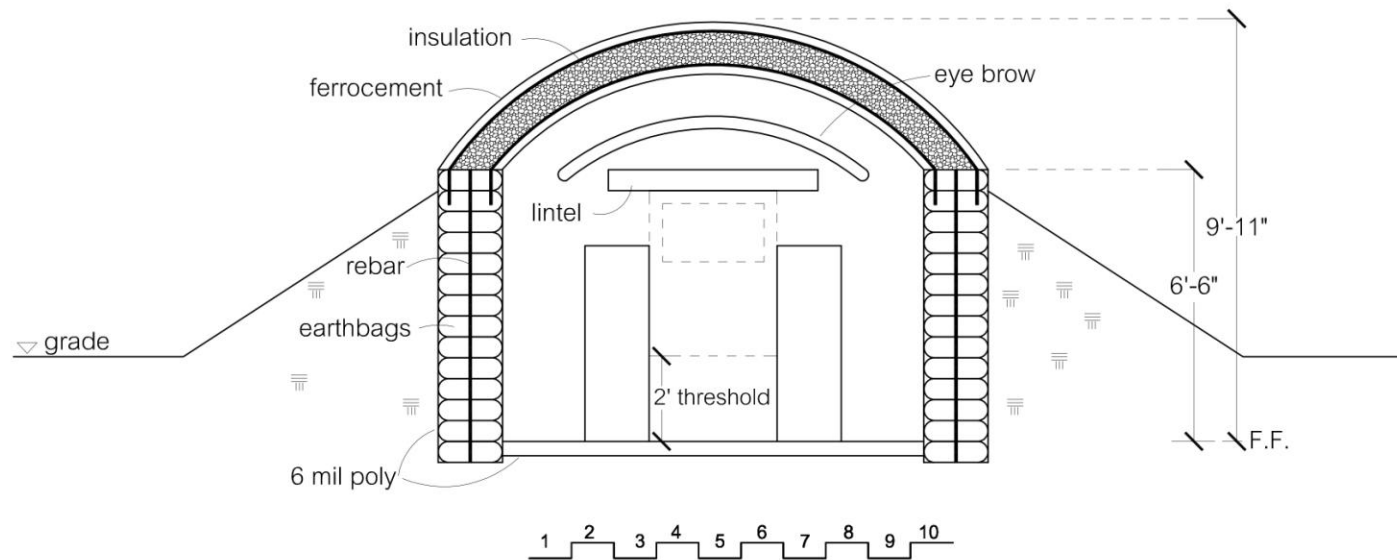
Project: Desert Dome

Scale: $\frac{1}{4}" = 1'$

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Desert Dome East



Project: Desert Dome

Geiger Research Institute of Sustainable Building

Scale: $\frac{1}{4}" = 1'$

Dr. Owen Geiger

Desert Dome Section

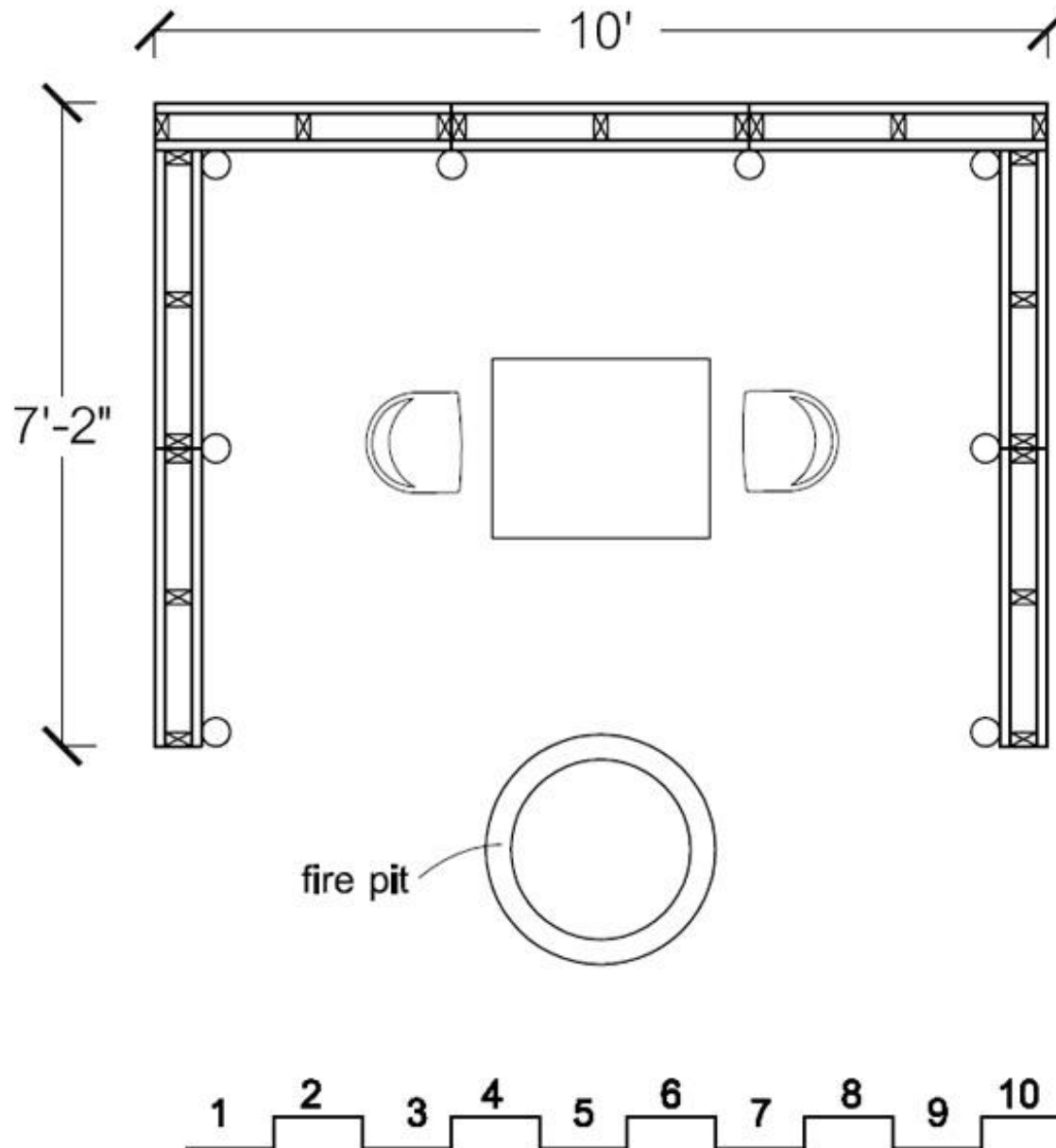
Pallet Desert Shelter



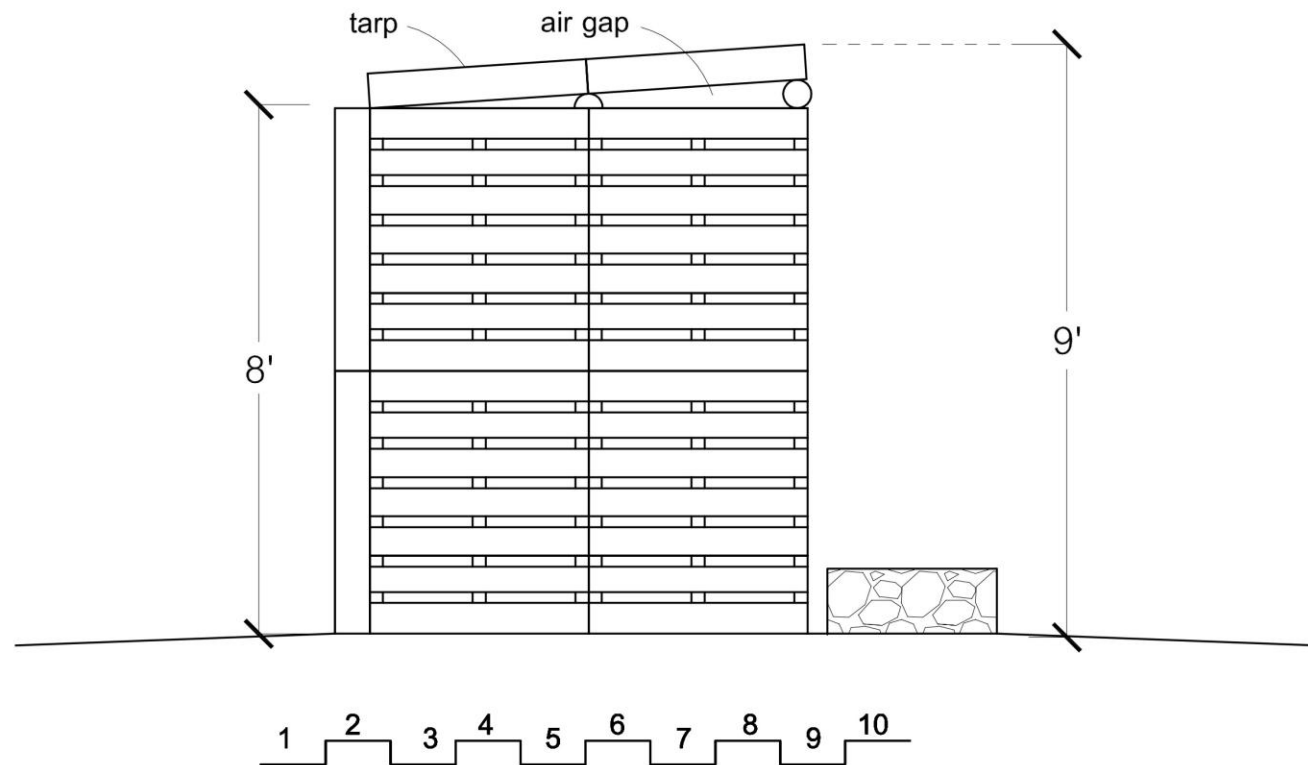
Pallet Desert Shelter

Phil Garlington – author of [Rancho Costa Nada](#) – and I both agree on the importance of starting out with quick, easy, simple shelter. One of the easiest ways to build a quick shelter at little or no expense is with recycled pallets. Pallets are typically available for free most anywhere in the world. A few pallets, nails and some posts can be turned into a shelter in about one day. You could build something more comfortable and durable later once you have basic shelter. The main idea here is to block the wind and sun so you have a place to relax and cook, thus the 3-sided design covered in blue tarps.

The 63-square foot Pallet Desert Shelter could be upgraded over time if needed. It could be enlarged by adding more pallets and posts, and/or enclosed with a fourth side, door, windows and so on. There are almost no limits to what is possible. You could even turn this into a nice little house with enough time and effort. As an example, my [Economizer house plan](#) is based on standard pallet sizes, although it could also be built with earthbags, straw bales and other materials.



Desert Pallet Shelter Plan



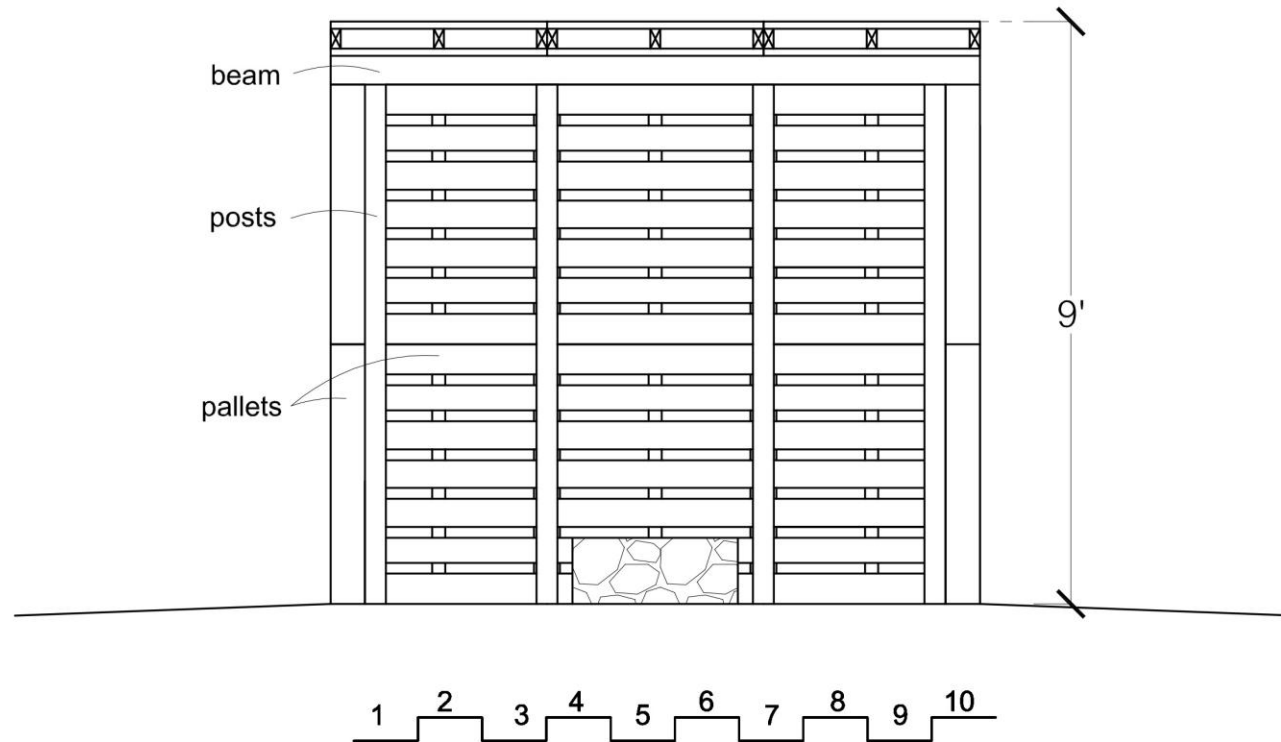
Project: Outdoor Desert Shelter

Scale: $\frac{3}{8}" = 1'$

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Outdoor Desert Shelter 1



Project: Outdoor Desert Shelter

Scale: $\frac{3}{8}"=1'$

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Outdoor Desert Shelter 2

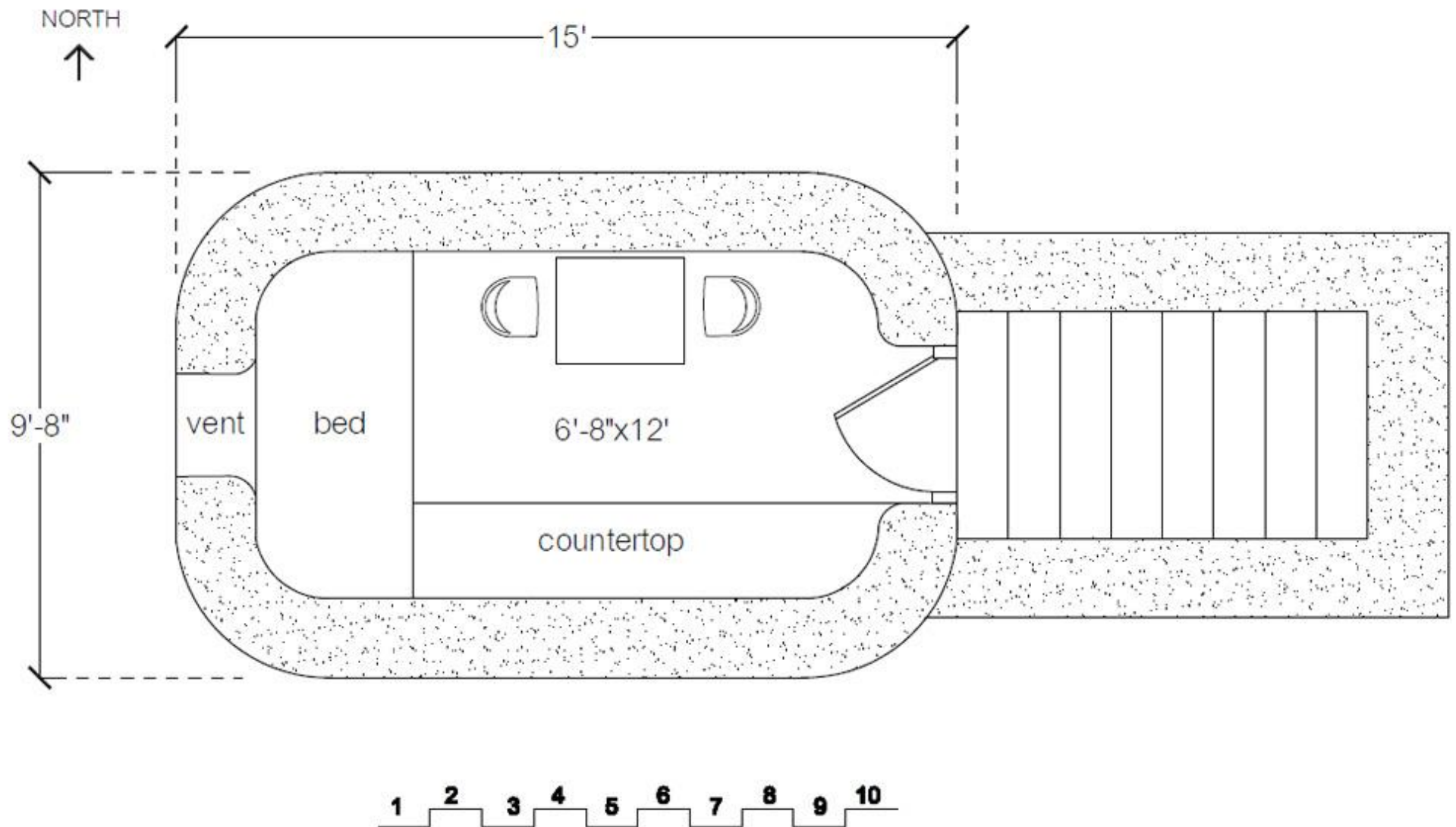


Earthbag Desert Shelter

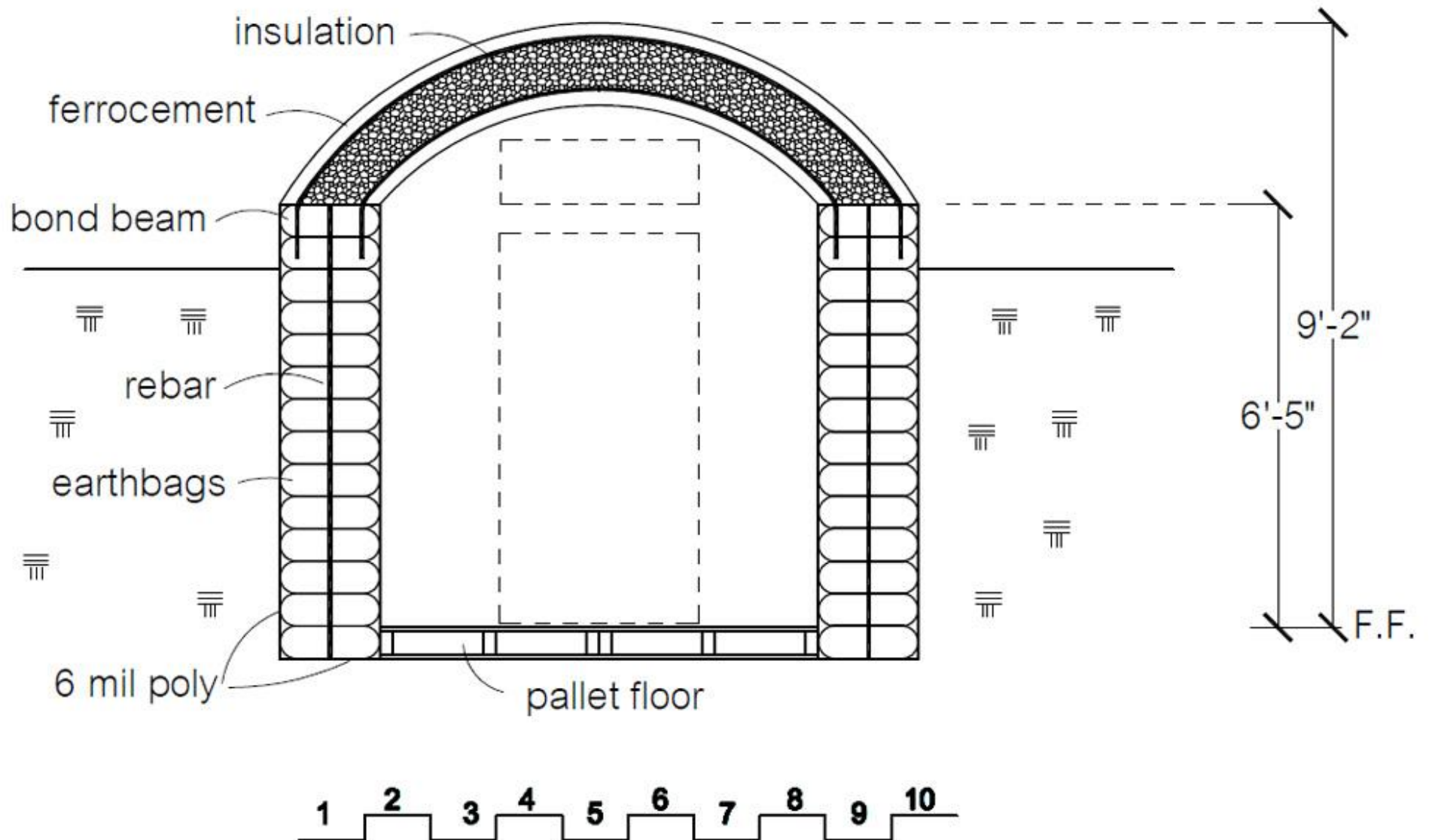
Earthbag Desert Shelter

The subterranean Earthbag Desert Shelter is built 5'-5" below grade to capture the coolness of the earth. This is the easiest way to maintain a comfortable indoor temperature without mechanical cooling systems when you're surrounded by searing desert temperatures. Building below ground is how desert dwellers have escaped the heat for centuries. Earthbags, in this case sand-filled polypropylene bags spiked together with ½" rebar reinforcing, make exceptionally strong walls to resist the thrust of the surrounding soil. The excavated sand is used to fill the bags. An outer layer of 6 mil plastic sheeting (6 mil poly) serves as a low cost moisture barrier. The roof is built similarly as the [Desert Dome Shelter](#)— double layers of ferrocement (rebar, mesh and cement plaster) with recycled insulation such as foam packing peanuts. Pallet floors, possibly covered with scrap wood, plywood or salvaged carpet, are shown as one option. Soil cement (sandy soil mixed with about 10% cement and just enough water to make a stiff mix) would be another good, affordable option. A cellar door is used to protect the entryway from rain, snakes and other pests. Breezes flow through a vent on one end and out the tilt-out window above the door. The vent can be screened to block most of the blowing sand and dirt. One possible option to reduce labor (at a slight loss in comfort), is to build only two or three feet below grade and berm the sides with sand as high as possible to prevent overheating.

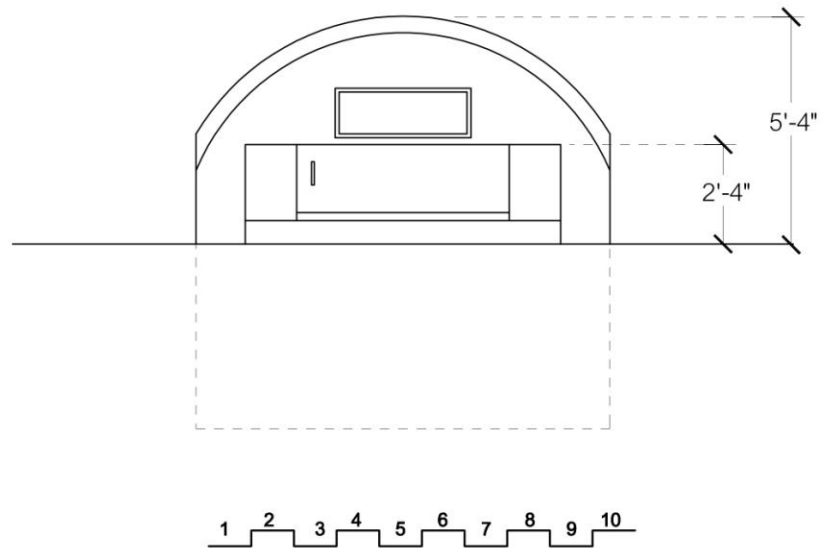
Concerned about water getting into the shelter? This shelter is for desert regions where there's almost no rain. Features include a cellar door (raised door frame not shown), overhang over the window and vent, plastic sheeting on the outside of the earthbag walls. Plus, rain will readily drain away through the sandy soil next to the shelter.



Earthbag Desert Shelter Plan



Earthbag Desert Shelter Section



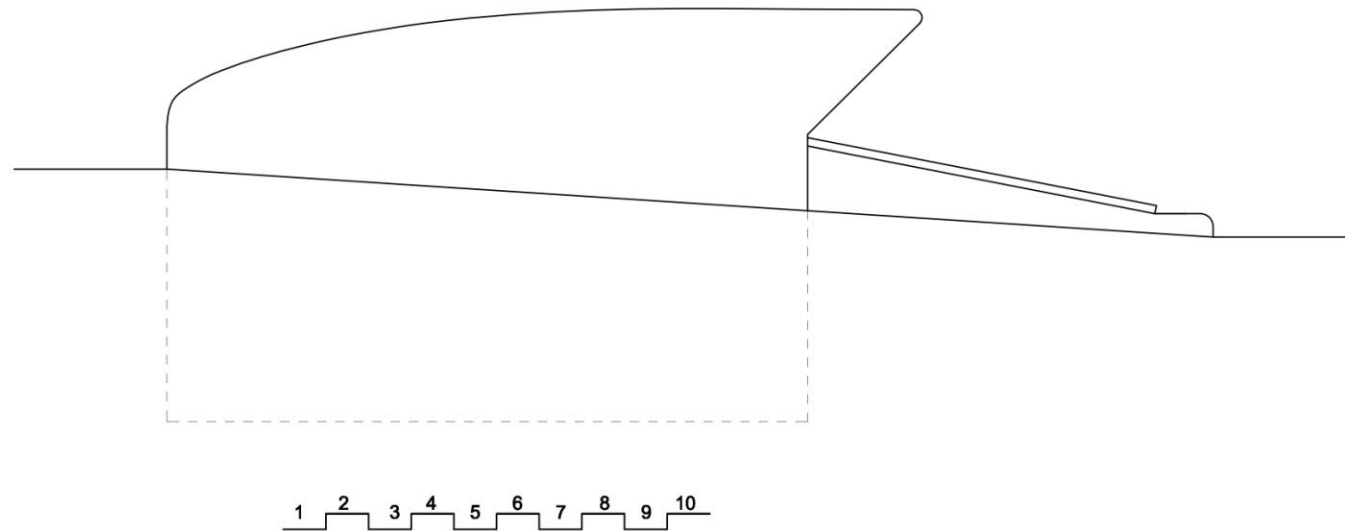
Project: Desert Shelter

Scale: $\frac{1}{4}"=1'$

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Earthbag Desert Shelter East



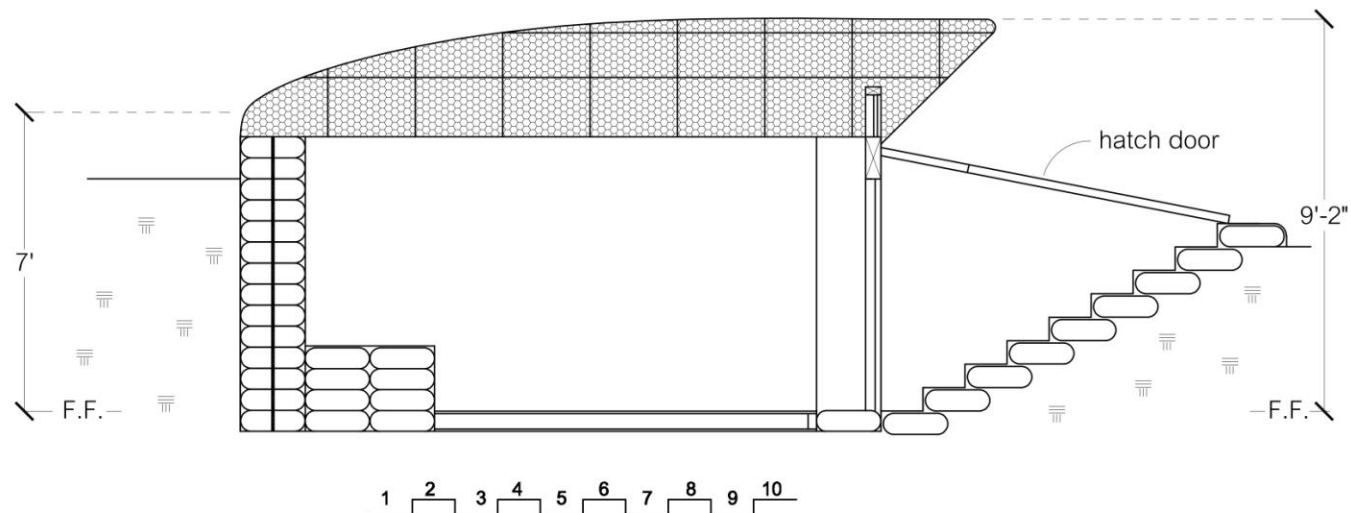
Project: Desert Shelter

Scale: $\frac{1}{4}"=1'$

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Earthbag Desert Shelter South



Project: Desert Shelter

Geiger Research Institute of Sustainable Building

Scale: $\frac{1}{4}"=1'$

Dr. Owen Geiger

Earthbag Desert Shelter South Section



Hidey Hole Shelter

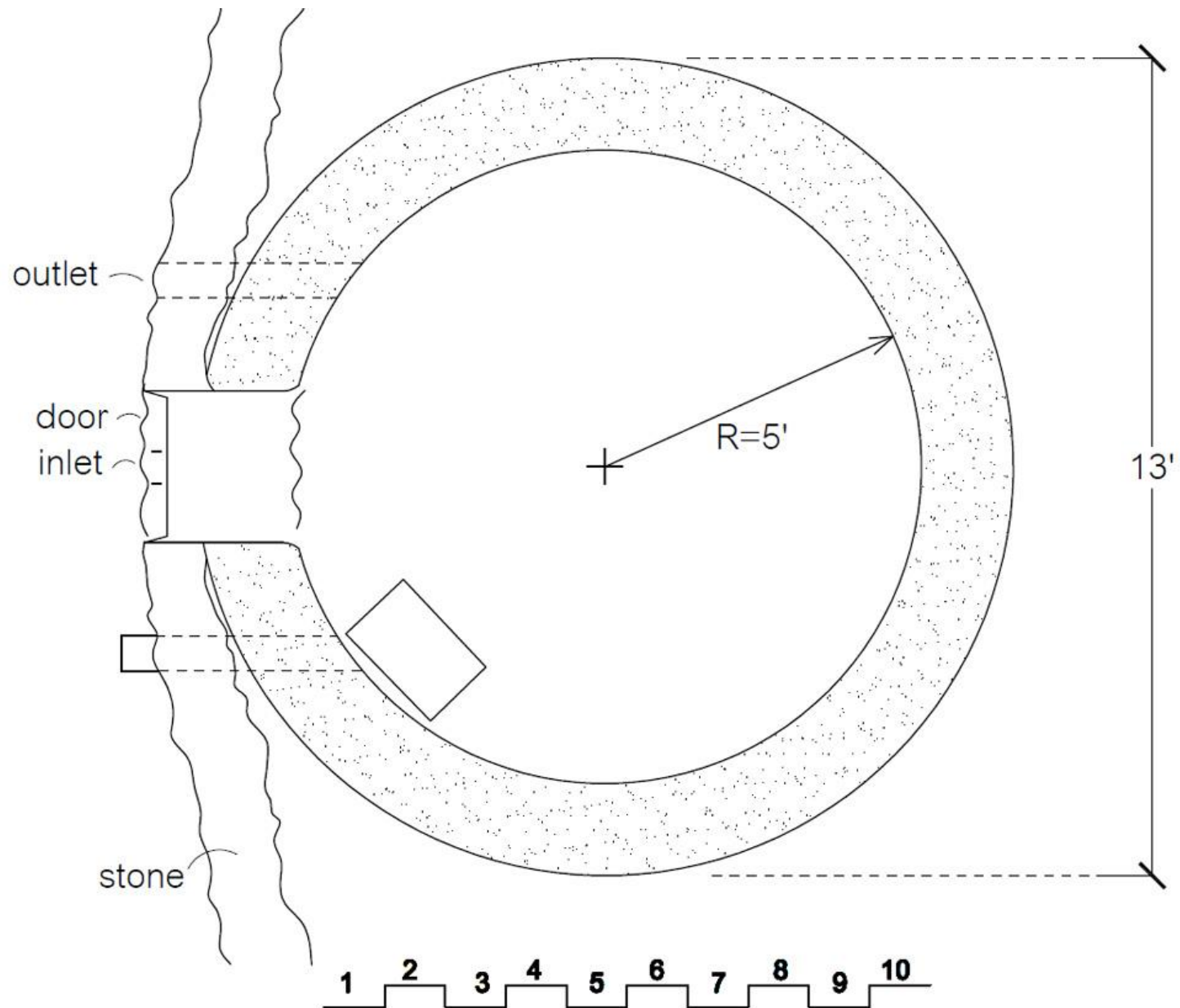
Hidey Hole Shelter

I originally designed the Hidey Hole a few years ago as a concealed forest shelter. It's been reworked here as a desert shelter. (That explains the grass on the section drawing below.) The main concept is to provide dirt cheap shelter for emergencies such as economic collapse and a breakdown in society. The Hidey Hole could also be used to provide storage space for emergency supplies in case of a SHTF scenario. You could even build more than one to spread the risk of your supplies being stolen or damaged. It could be completely concealed in forested/mountainous terrain using stone, logs, soil and vegetation. I don't have any drawings of the concealed forested version because it would look just like a natural hillside if built correctly. The closest thing I've seen to the Hidey Hole is Ran Prieur's shelter. I can't seem to find any photos of Ran's shelter. Please leave a comment if you locate a photo or video online.

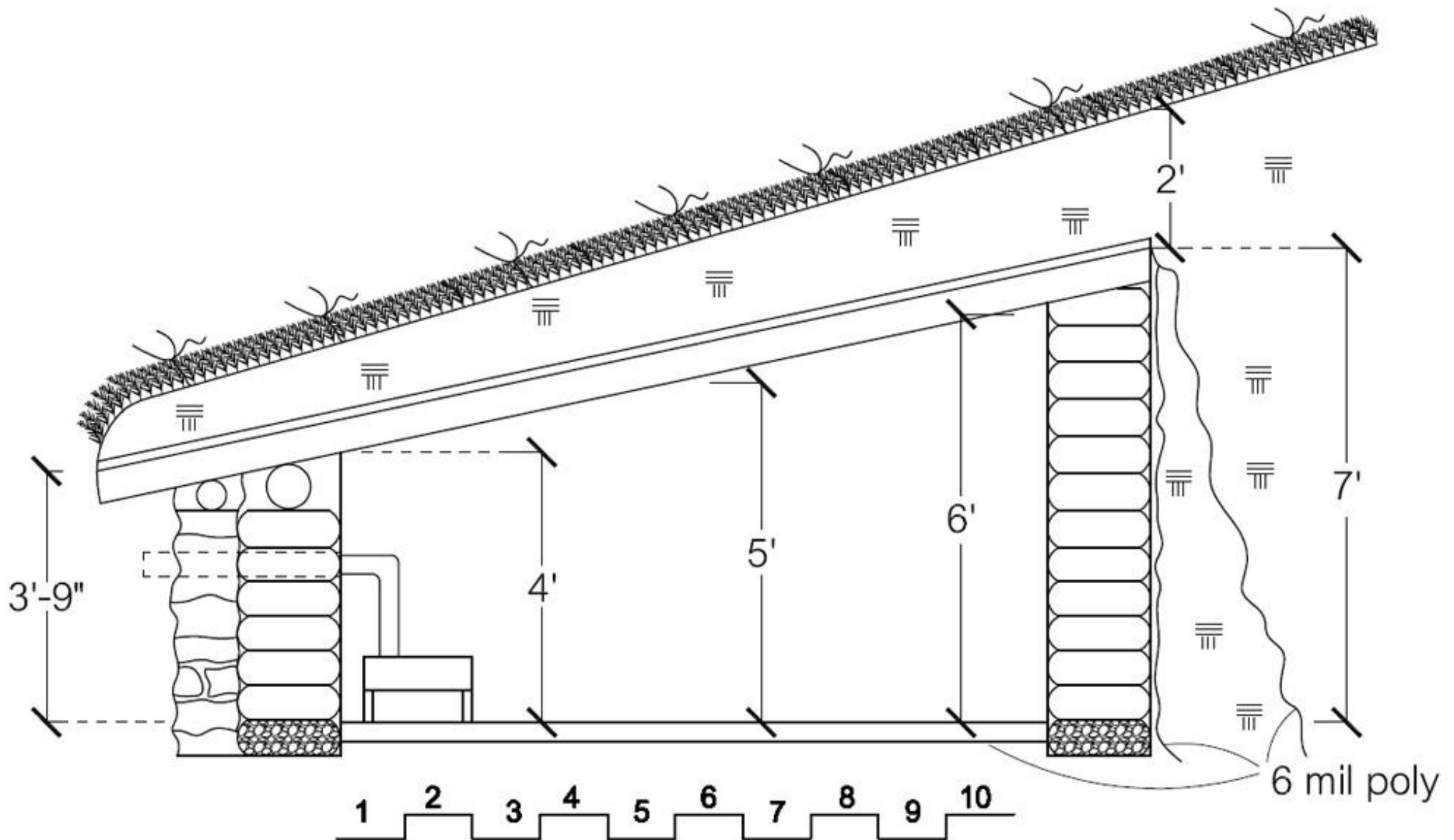
Hidey Hole shelter details:

- 79 square feet interior
- circular shape resists thrust of surrounding soil
- earth-sheltering helps keep living space comfortable
- excavated sand or soil can be used to fill the earthbags
- use 6 mil plastic sheeting on all sides, floor and roof as a moisture barrier
- curved roof provides additional headroom inside and helps shed water
- the dry stacked stone wall (no mortar) doesn't have to be perfectly constructed stone masonry (make it look as natural as possible)
- you could build in a rocky area and use the existing stone to maintain a natural appearance
- tiny twig stove for heating and cooking can be handmade from salvaged materials
- the door could be made of slab wood or recycled wood at no cost and simply wedged into place without hinges or door frame (a door just large enough to crawl through would provide additional concealment)
- easy to adapt the basic concept to make something that suits your needs

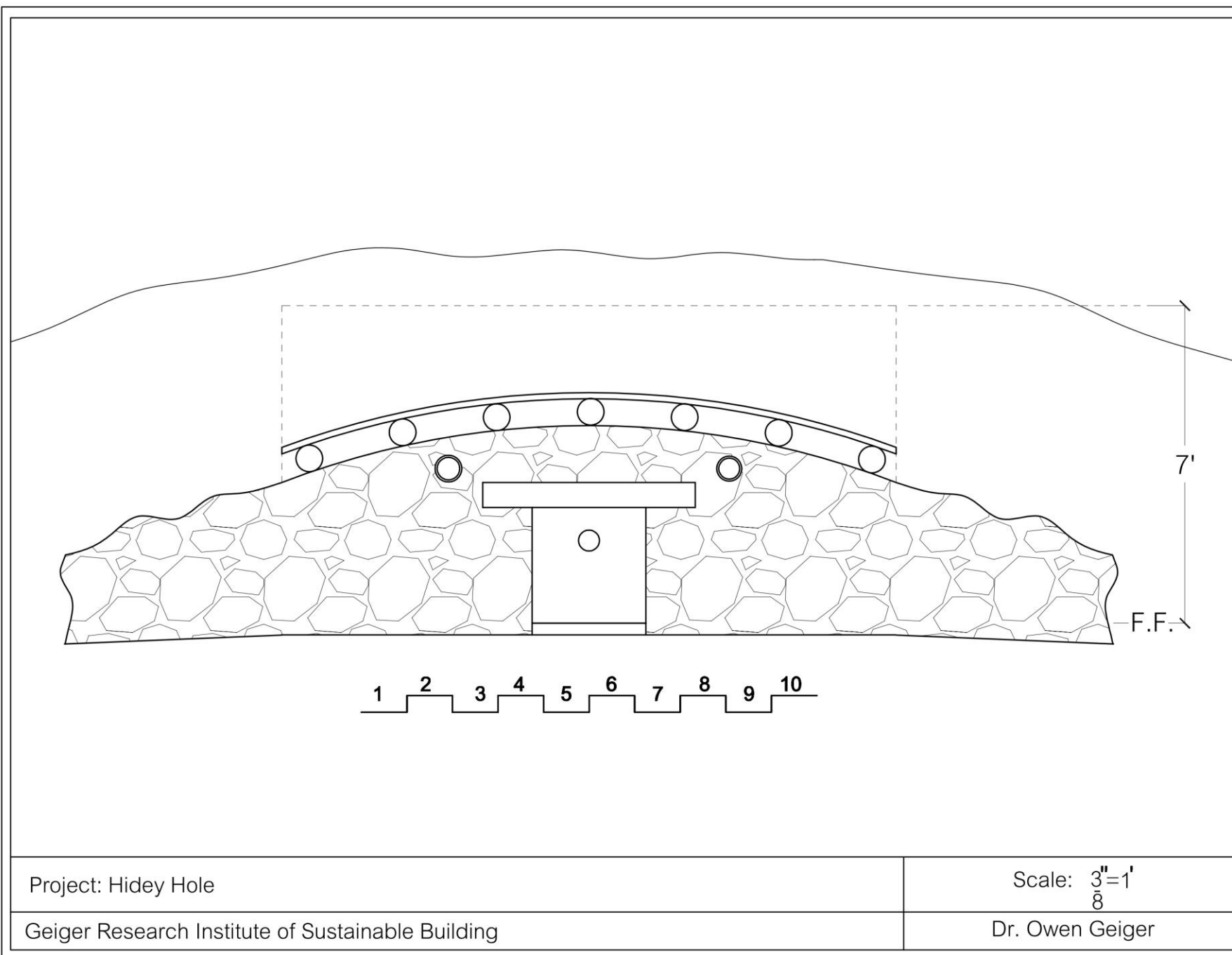
These desert shelters were inspired by Phillip Garlington's website at [Rancho Costa Nada](#). The Hidey Hole shelter was also inspired by Ran Prieur's shelter. Ran Prieur is the author of [Ran Prieur.com](#) as well as numerous texts such as his free novel [Apocalypsopolis](#) and his essay on [How to Drop Out](#). Here's an interesting article about the [cabin he is building](#) and his [Frugal Early Retirement FAQ](#). Both Phil Garlington and Ran Prieur write extensively on how to simplify life, live more sustainably and, as a result, have a better life.



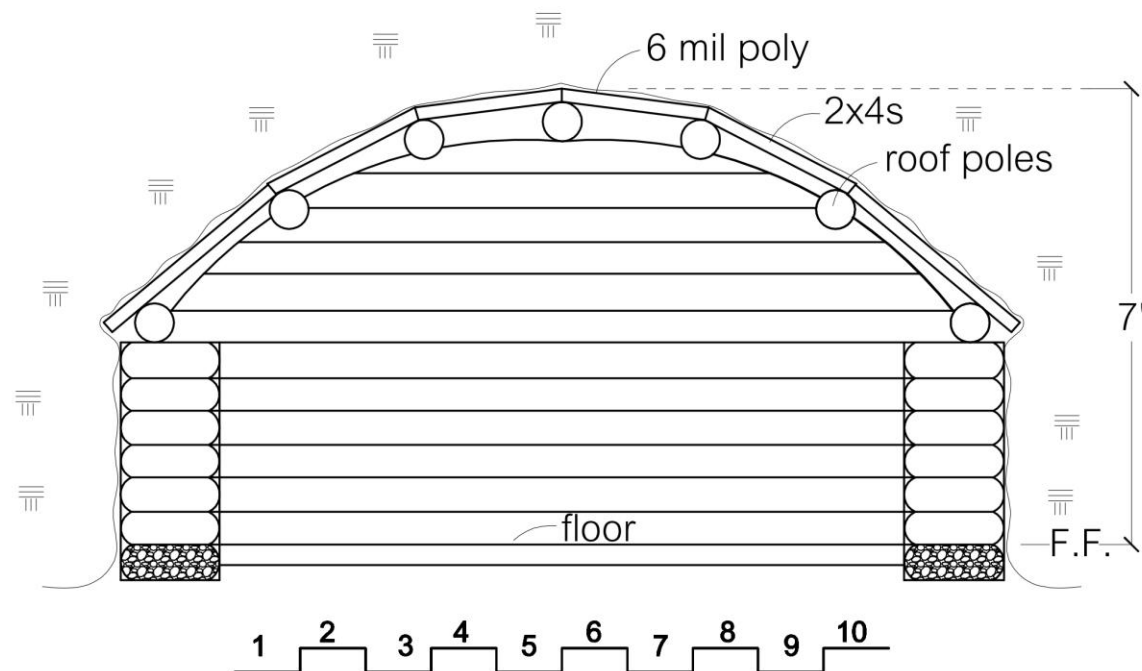
Hidey Hole Shelter Plan



Hidey Hole Shelter Section



Hidey Hole South



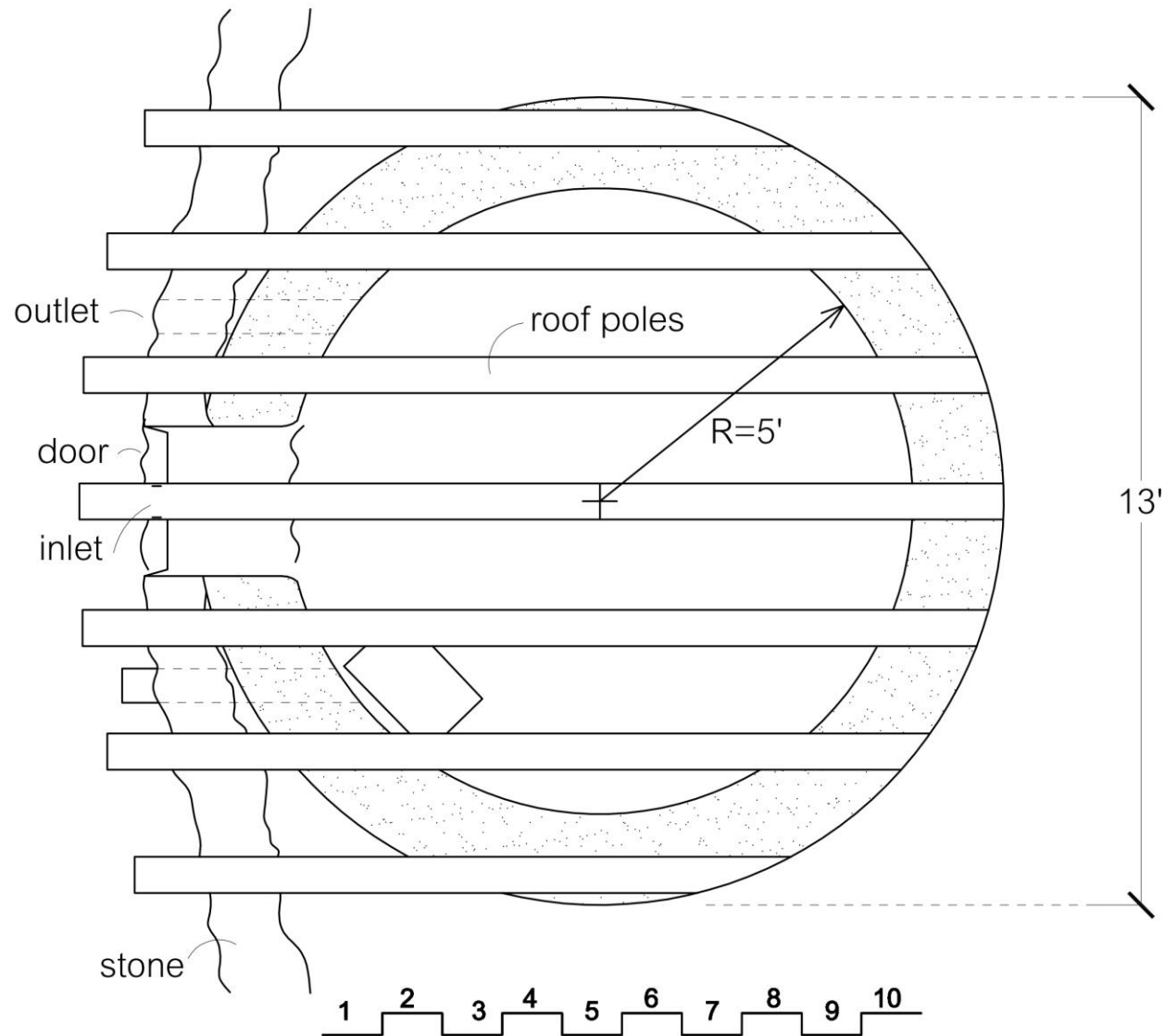
Project: Hidey Hole

Scale: $\frac{3}{8}" = 1'$

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Hidey Hole Section



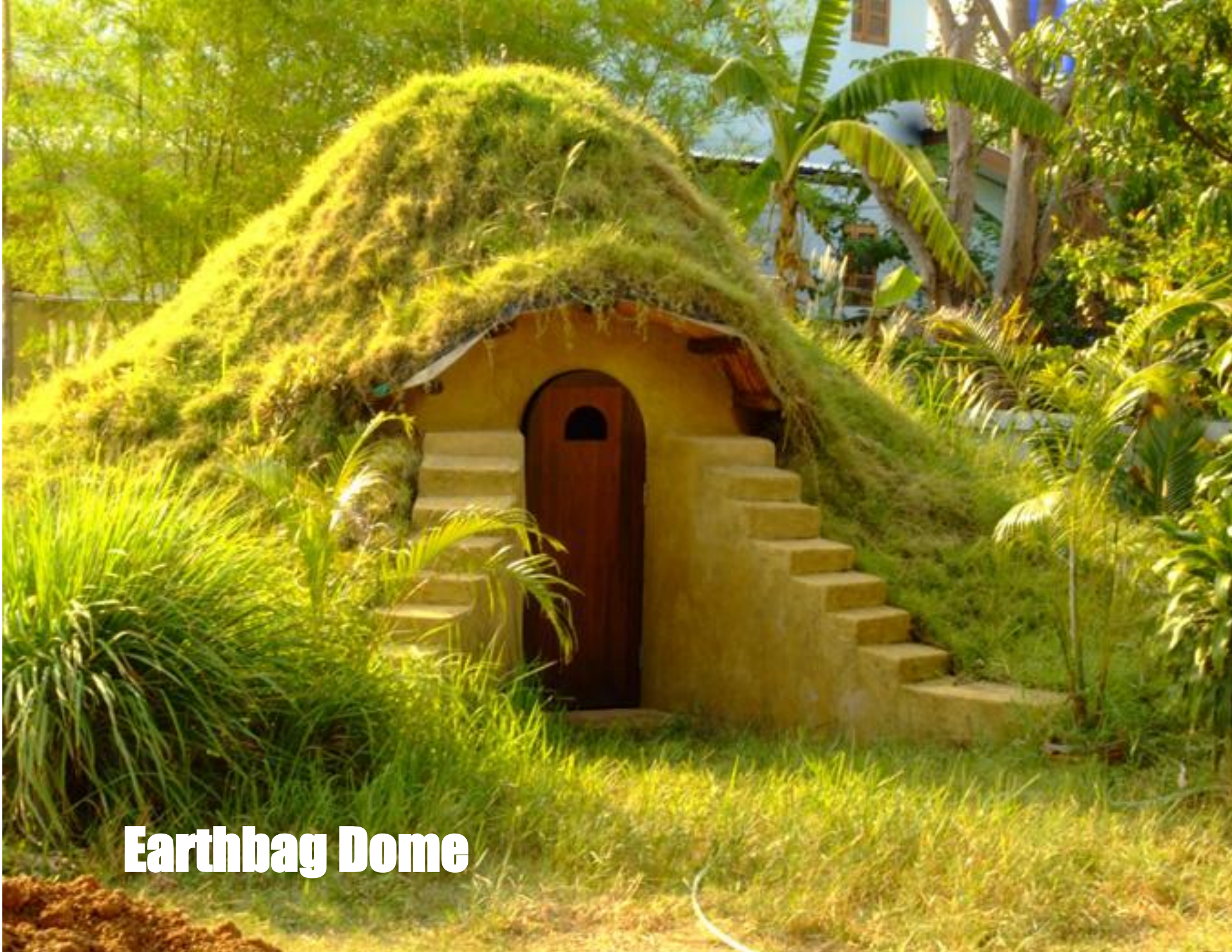
Project: Hidey Hole

Scale: $\frac{3''}{8} = 1'$

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Hidey Hole Roof Plan



Earthbag Dome

Earthbag Dome

Specifications: 8' diameter interior, 50 sq. ft. interior, Footprint: 11' diameter plus buttress/retaining walls

Description: This dome was designed and built for Mother Earth News magazine, which is now available in print (August/September 2009) and [online](#).

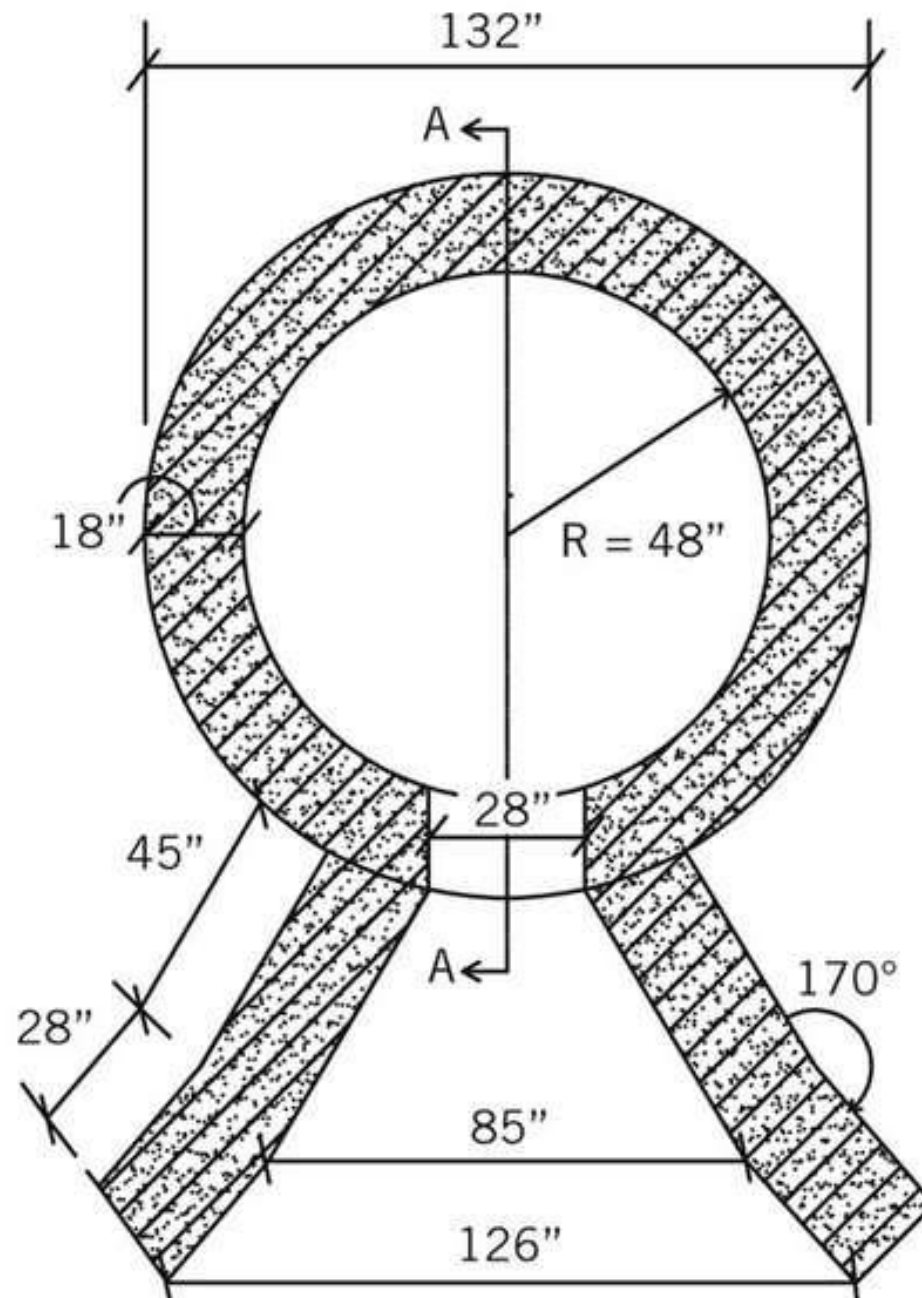
It was designed as a low-cost multipurpose farmstead structure that could be used as a rootcellar, storm shelter, garden shed, cool pantry or even chicken coop. We use ours as a tool shed. It's worked great for the last five years – cool inside, no structural problems other than a tiny leak that was quickly patched with some more plastic. Add ventilation tubes or windows to create a living space such as a shelter or home.

Complete details with 15 color photos are freely available at Instructables.com
<http://www.instructables.com/id/How-to-Build-an-Earthbag-Dome/>

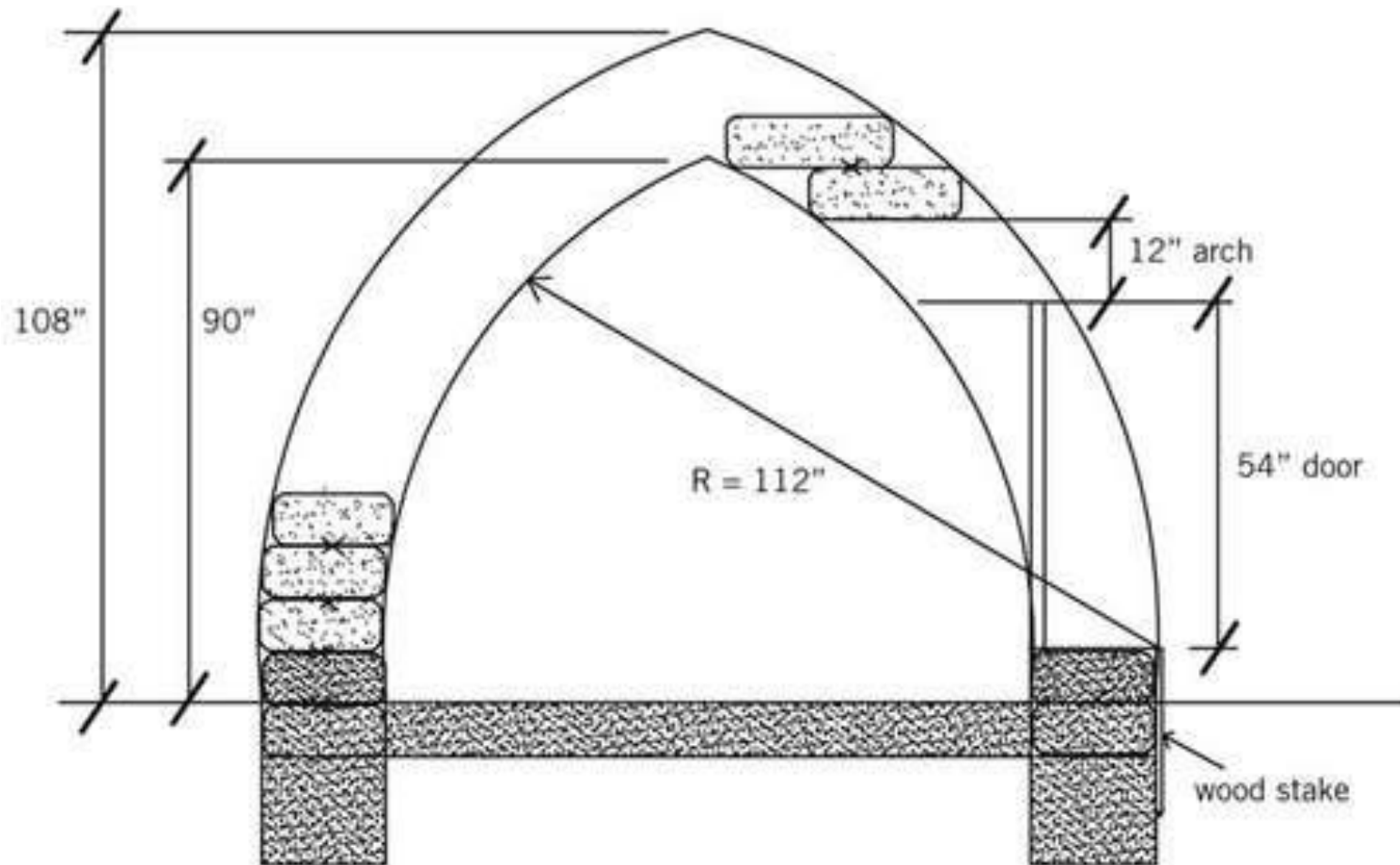
Building an Earthbag Dome video: <http://www.youtube.com/watch?v=6ODplmnpSts>

Watch all my videos at my Natural Earthbag Houses YouTube channel that show every step of building with earthbags: <http://www.youtube.com/user/naturalhouses>

These earthbag domes also make excellent low cost tornado and hurricane shelters. This blog post explains the basics: naturalbuildingblog.com/2012/05/03/how-to-build-a-low-cost-earthbag-tornado-shelter/



Earthbag Dome Plan



Earthbag Dome Section

UN Earthbag Shelter

Owen Geiger and Patti Stouter

Size: 2m by 3- 3.5m (about 6-8' x 11' or 74 sq. ft. interior)

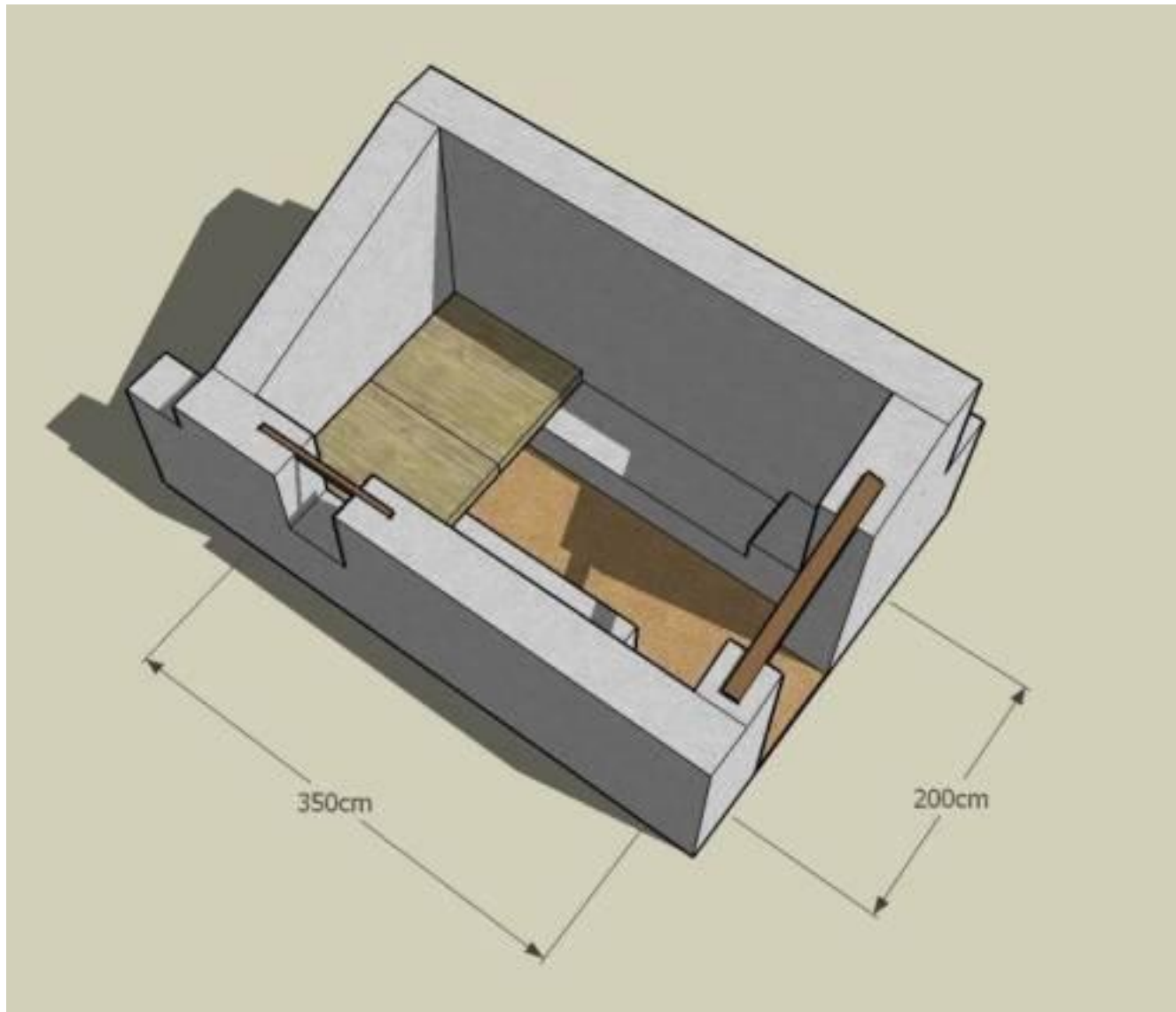
Many times tarps alone do not provide sufficient shelter for humanitarian relief operations, while tents may not be available or cost effective. What is often needed is a simple family shelter solution that is easy to transport and erect, less expensive than tents and uses standard materials that are globally available.

The building concept outlined here consists of sandbag (earthbag) walls filled with sand or soil from the site, and tarps for roofing. These emergency shelters would only be slightly more expensive than tarps by themselves, but provide superior protection against wind, rain, heat, cold, snow, bullets, fire, flooding, hurricanes and noise.

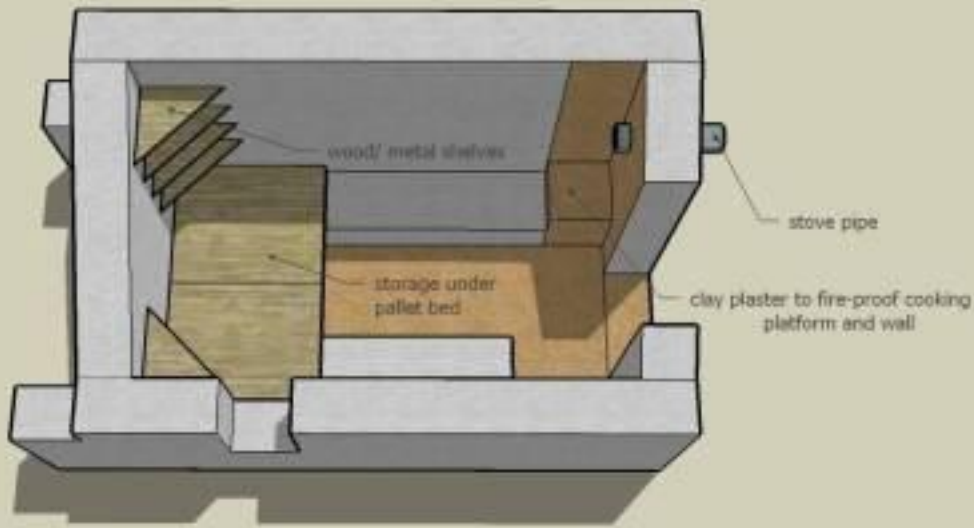
The following PDF explains all the benefits and how the basic shelter can be improved with added features and expanded in size.

Emergency Earthbag Shelter Proposal

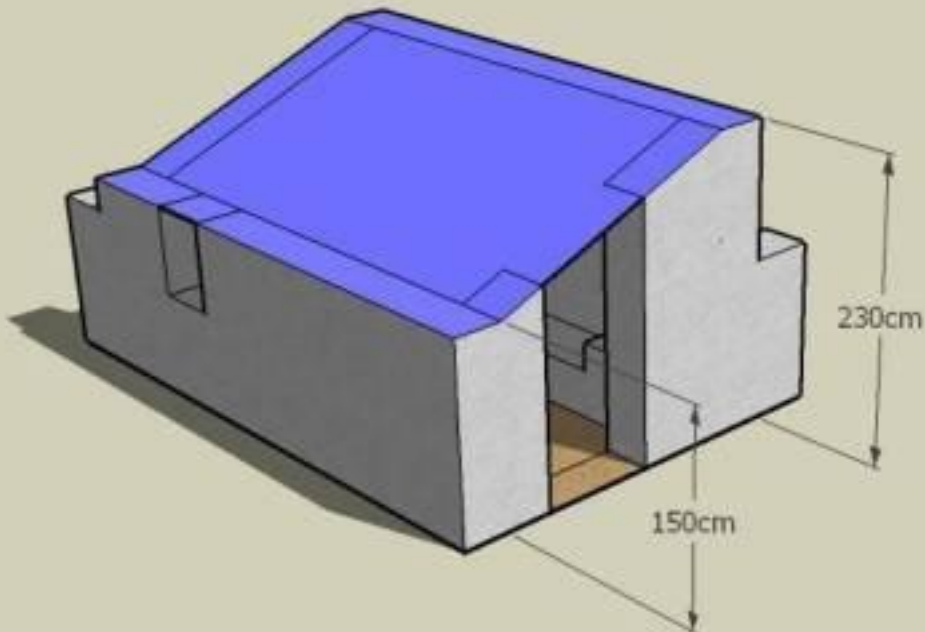
<http://www.earthbagbuilding.com/pdf/UN%20earthbag%20shelters.pdf>



UN Earthbag Shelter



**UN Earthbag
Shelter Interior**



**UN Earthbag Shelter
with Tarp Roof**

More Information

Kelly Hart and I have published over 1,000 pages of free information about earthbag building. After years of work, both of us still believe that this building method can and will change the world in significant ways. The following links list some of the most helpful resources.

Earthbag Building.com (mega site where all articles, test results, best projects, videos etc. are warehoused)

Natural Building Blog <http://naturalbuildingblog.com> (over 1,200 blog posts)

FAQs <http://naturalbuildingblog.com/faqs/> (explains how to search our sites to find answers to common questions)

Instructables.com <http://www.instructables.com/id/Step-by-Step-Earthbag-Building/>

(includes step-by-step earthbag building directions)

Natural Houses Earthbag YouTube channel (about 100 videos show every step of earthbag construction, plus more low cost building methods) <http://www.youtube.com/user/naturalhouses>

Earthbag Structures.com (best site for those building in disaster areas and developing countries)

<http://www.earthbagstructures.com/>

Earthbag Plans.com (over 130 plans that can be purchased)

<http://earthbagplans.wordpress.com/>

Earthbag Building Guide (most current book on the subject, now available as a \$20 ebook download) <http://naturalbuildingblog.com/owens-book-dvd/>

Basic Earthbag Building DVD <http://naturalbuildingblog.com/owens-book-dvd/>