How to sleep in your garden

My heart goes out to the homeless people within our cities who have no shelter and no hope of rejoining society.

Taxpayer funding cannot prevent homelessness from continuing to devour prosperity as we know it today. Without access to a system in which people can begin meeting their own needs, our descent into crime and squalor will continue. So we need to develop an opportunity for the more visionary among them to earn their keep. Our technical solutions are only tools, that can reward the efforts of those willing to use them.

Christianity has long offered a culture of giving and coordination for cooperative efforts. One tool of this culture is to empower people to thrive as economically as possible. In this project, a garden and a living structure are joined as a single unit. This union saves space and materials. These units could provide shelter and sustenance for brothers and sisters who are accountable to solid regular fellowship – whether through individuals or not profits.

We must first develop a model to help people visualize what we are doing. We will then refine this model into a prototype, to be multiplied and refined by those interested.

The first goal would be to integrate a living space for one person with enough garden space to support them. Expert gardeners will then be essential to determine the crops, and define the seasonal needs, spaces, and care required to support them. Greater scales will be built upon the experiences gained.

Second, in order to minimize conflicts with government agencies, these living/gardening units must be removable with negligible environmental impact.

Thirdly, the materials costs must be low enough for a homeless person living on a recycling income to pay off within six months.

As of this writing, only some of the features have been proven by actual experience. So the readers must use their own best judgment with regard to any real or potential applications or hazards – to include dependence upon the concepts.

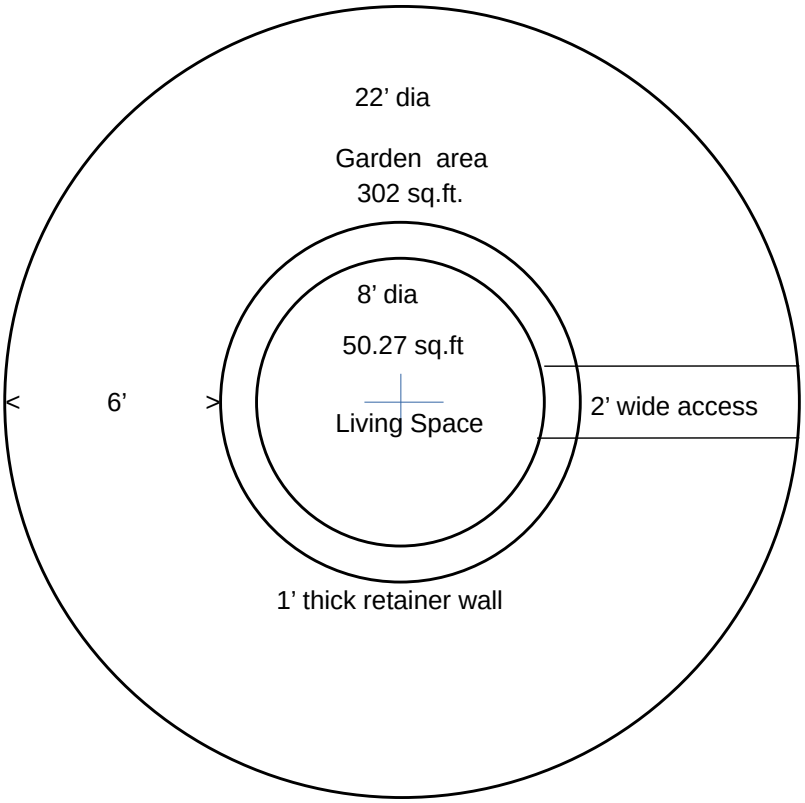
Structure

Consider an eight foot diameter living space of about fifty square feet. This is surrounded by an additional foot of earth-bag retaining wall. This ten foot diameter area is sculpted into the earth to a depth of two or more feet. Keep in mind that the area enclosed is only half of what is required by law for a legal bedroom, and must never be sealed off from the flow of outside air. I recall a personal experience while sleeping in a small tent: I woke up gasping for breath and clawing for the doorway.

This wall is surrounded by a raised bed ring of garden at least six feet wide, covering about three hundred square feet. This scale is based upon internet claims that just two hundred square feet of garden can supply enough food for one person.

The reasoning behind the circular format contains multiple threads: One is simplicity – in that the structure contains only one continuous surface.

Expense comes second, in that a circle with the same total perimeter of a square, will encompass thirteen percent more area.



A third reason would be that if three hundred square feet of garden proves inadequate, the outer diameter of the garden could be expanded without affecting the living area. This will also allow for expansion, for growing additional food for others.

A fourth reason is that the outer perimeter of the garden could be very economically supported by the tension of wire mesh, backed by landscape fabric. Solid retaining walls are far more complex and expensive than those supported by tension.

Besides eliminating the need for two compression-based walls, the length of the inside retaining wall will be about half as long as the one used in the outer perimeter.

By using a shallow dome shell for a roof, the materials needed for a dome structure are far less than those required for framing conventional rectangular formats.

If we’re still looking for excuses, consider the space savings on the plot of land, gained by eliminating pathways between the residence and the garden.

There are also multiple reasons for lowering the living space into the ground. One would be that the thermal mass of of the surrounding earth would greatly reduce the energy required for heating and cooling. A second consideration would be that the volume of earth excavated from the living space would provide elevation for the garden. Yet another would be that the reduced level of the roof – relative to the surface of the garden – would reduce the shading of the garden by the dwelling. The low-profile dome outline of the roof would also help with this.

Tooling begins with a stake, a pounded into the ground (hammer not included) at the center of the project. This is used as a pivot point from which radii of the living, retaining wall, and garden areas are defined.

The earth from the excavation is piled into the garden ring, well away from the retaining wall, until the wall is established. Happy digging.

I would suggest digging a narrow trench down another six inches or more below the floor grade, behind the internal retaining wall ring. This will allow for a waterproof membrane to protect this wall from external moisture.

Consider using earth bags as the material for the inside retaining wall, in that they could be removed without leaving an environmental trace. These are commonly available at hardware and building supply stores, and weigh about fifty pounds each when filled with earth.

Per my calculations, it would take about twenty five bags per layer at a cost of about a dollar apiece, to surround the eight foot diameter living space. About five layers would give you a little over two feet of height. You then may want an additional layer or two to keep this wall reasonably above the garden level. If greater permanence is later desired, the inner surface of these bags could be meshed and plastered over (as long as you don't tell too many people).

Once the retaining wall and the outside tension wall are in place, work could focus upon the garden plot. This category of design is out of my league, and none of this work would have any value if suitable gardens and menus cannot be designed.

Developing the covering and features for the living space may now be addressed. For these I offer a few of my own experiences in the text and photos below. Notice however, that the retaining wall in this case was a couple of layers of wire mesh, infused with an off-the-shelf mixture of masonry cement.

If the ground isn't sandy enough, a thin layer of sand or DG would make it practical to cover the floor with used or indoor/outdoor carpet.

Due to the light or portable nature of the structural components, safety and security would depend upon secure fences, alarms maybe, or perhaps a rottweiler or an exceptionally talented chihuahua.

From experience gained from this model, Variations in the scale could house from one to a half dozen citizens. Larger scales could be used for community services.

Four major components are required for this project: A location, the structure, gardening expertise, and administration. My own talents are only adequate for one of these.

Cottage Covering

The section of wall between the retaining wall and the roof would be strip of wire mesh, cut to the desired width. This is covered with landscape fabric that has been painted with a couple layers of solar roof coating.

The roof would be a low profile section of a parabolic dome – likewise covered with a weatherproof coating

A high efficiency cook stove with the exhaust exiting through an adaptation within the garden ring would provide for cooking and warmth.

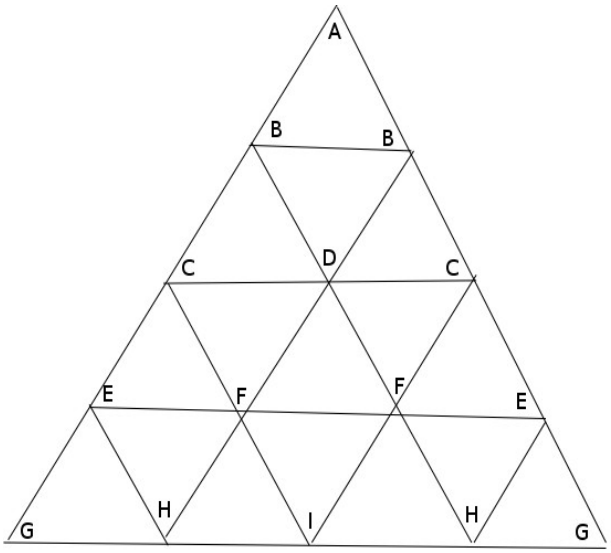
These ideas and many more are available free of charge and copyright, in the lifestyle section of technosmith.com

Parabolic Dome Worksheet

The triangular pattern shown below is repeated six times around the dome. The struts (AB, BB, etc.) are defined by their respective letters. Their lengths are determined by multiplying the “factors” by the radius of the dome filled in by the user. The “+0.1ft” would be added to these lengths when bolt holes centered 0.05ft from the ends would be required for assembly

The first table is for calculating domes where the height equals the radius. The second table is for domes in which the height is only one half of the radius. Print out this worksheet, enter radius, and fill in the other columns as indicated.

	factor	Radius	length	+0.1 ft.	Qty	length
AB	0.2577				6	
BB	0.2500				6	
BC	0.3125				6	
BD	0.3621				12	
CD	0.2588				12	
CE	0.4532				6	
CF	0.4002				12	
DF	0.4142				12	
EF,FF	0.2605				18	
EG	0.5039				6	
EH	0.5523				12	
FH	0.5095				12	
FI	0.5260				12	
GH,HI	0.2611				24	
				SUMS>>	156	



Alternatively, a temporary lid might be fabricated from any suitable sticks, wired together as shown here. These could support plastic or a tarp. But weight from puddles of water could become a problem during a rain storm. NOTE: Each end of each stick is either near the middle of another stick, or on the edge.

Height = Radius/2 (Low Profile)						
			Radius X chord factor			Qty X length
	Chord		Strut	+1" or		total
	factor	Rad.	length	+0.1 ft.	Qty	length
AB	0.25195				6	
BB	0.25000				6	
BC	0.26700				6	
BD	0.32370				12	
CD	0.25882				12	
CE	0.36352				6	
CF	0.29481				12	
DF	0.31354				12	
EF,FF	0.26047				18	
EG	0.33219				6	
EH	0.40182				12	
FH	0.34068				12	
FI	0.36488				12	
GH,HI	0.26105				24	
				SUMS>>	156	

By this means, a comfortable temporary shelter could be established by the use of a shovel to set it into the ground, a retaining wall of sandbags, sticks, and a tarp.