PATRIOTS PLAN

CONTAINER BUNKER PLANS

ELITE PREPPERS

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Contents

Purpose of the Project

Storage of Survival Supplies

Knowing that you have some stores of food, water, and other survival supplies can lead to a great peace of mind in the face of systemic, economic, ecological and political uncertainty. This ebook describes how to construct an underground survival bunker from a shipping container. Due to excellent temperature regulation, ease of concealment, and abundance of space, this can make an ideal place to store a large quantity of preparedness supplies.

An underground space kept dry makes an ideal place to store food.

Emergency Shelter

Beyond storing extra food, water, and other supplies as insurance against any number of potentially catastrophic events, this space may also work well as an emergency shelter in which to protect your loved ones during tornados, storms, social unrest, and nuclear fallout events. Underground shelters are some of the safest places to wait out tornados. If well-concealed, it could even be a self-sufficient home in which to live through periods of major social unrest. This shelter is also adequate as a basic fallout shelter in case of nuclear disaster. The shielding of a fallout reduces gamma ray exposure by at least 1000x. The 8” concrete cap covered by 24” of compacted soil in this plan accomplishes that.

If anticipating using this as a longer-term shelter, consider what things you might store there not just for survival and sanitation, but also for mental and emotional comfort during a potentially trying time. Some of the simplest things -- a favorite book, items of beauty, journals, basic art supplies for children -- could make a big difference in maintaining emotional well-being if using this as a shelter for an extended period of time. Individual and group morale becomes one of the greatest assets in a survival situation, and having a safe, reasonably comfortable and beautiful place to shelter can go a long way toward supporting positive morale.

In addition, if planning on using this as an emergency shelter, should the need arise, it will be very important to take care in planning it such that the space is one conducive to the physical, mental, and emotional health of the occupants. This means minimizing any toxicity within the structure, having a good plan to prevent moisture buildup and the ensuing problems with mold

and mildew, and providing for adequate ventilation and lighting. In addition, if your situation is unique, please consult with a qualified engineer to ensure that your intended design will be structurally sound in your environment.

Choosing a Location

So you have a place in mind where you intend to create an underground shelter? Great! Let's see how well-suited it is to this purpose. If you do not yet have a potential site selected, here are some considerations that will dramatically increase the ease with which this will work out well.

Space for Delivery

The truck initially delivering a container will typically require a 60 foot clear swath in line with where you would like it delivered. It could certainly be moved on the property by other means, but this is what is required by the initial delivery for a 20' container.

Drainage & Depth to Groundwater

All told, the bottom of the container will be roughly 12' underground. Though it is watertight, there will be complications with water damage if you try to build it at a depth that is below the local water table. One excellent resource for knowing the depth to water table in a local area is a local well-driller, and perhaps to a lesser extent, local farmers and property owners. The water table is often not static across the seasons, so make sure and take that into account and give yourself some buffer. It won't be much good as an underground fish tank!

As far as positioning the shelter relative to hills and valleys, it would definitely be preferable to build on a well-drained hillside or top of a hill rather than a low-lying or marshy area where water would have a tendency to collect. There is also a benefit to building on a hillside in that it would be ideal to open the door right out of the hillside and it is possible to set up an effective passive air circulation system.

Depth of Soil

Achieving a hole that is 12' deep will be dramatically cheaper if the soil is over 12' deep where you are digging, otherwise blasting rock becomes quite costly. Is the soil deep enough in your proposed location? Often, numerous rock outcrops might indicate that the soil is shallow. Local agricultural offices can also be helpful in many places as they have either personal familiarity with the land or official soil maps. In the US, NRCS is the agency that maintains these maps (see http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm).

Type of Soil

The actual properties of the local soil will determine somewhat if additional measures are needed for protection of the container from rust. Factors that would increase tendency to rust include: soil that holds water well (as opposed to sand that drains well) and a more acidic pH. The stability of the soil will also become relevant in the excavation process.

Camouflage of Entrance and Escape Route

For the purpose of a SHTF shelter, it would be highly valuable for the presence of the shelter to be easily concealed from the main homesite, from the air, and from surrounding roads. Small hills and areas near native vegetation could be helpful here. In either case, planning a little for this in determining placement will make it easier to accomplish.

Choosing a Container

Dealers

The website www.containeralliance.com has helpful resources and links for purchasing a container in North America. In other places, a google search will yield many options. Containers are often listed on sites such as Ebay. Location and cost of transport must be taken into account. Buying a container in a nearby market will be cheaper overall, as will (generally) buying one near a seaport.

New or Used?

The standard material for constructing shipping containers is the Corten corrugated steel, an alloy that contains copper, chromium, silicon, and nickel to enhance its resistance to atmospheric corrosion. This material has some natural corrosion resistance; however, by the time it is buried underground, it will be very important that there are no holes, and that any rust has been completely removed and the area repainted (or covered with roofing tar). This leaves several levels of options, each requiring a different balance of money and renovation/repair.

One end of the Storage Container will be fully sealable. The door is to be installed on the opposite end.

A 20' container may be found for sale in the range of generally $1200-8000 US. Units are likely to be more abundant and require lower shipping costs near sea ports. When examining a container you are considering buying, a dealer will describe it as one of the following: "New," "one-tripper," "water and air tight," "certified" or "as-is."

New containers have not yet been used for transport, but you will pay more. Also sometimes referred to as "new" or as a "one tripper," are containers that have carried a load on one trip and are being sold to avoid the cost of shipping them back to the source empty. They will generally be in nearly new condition, but may have some dings, and potential for spillage of contents. If you are looking for a container that will likely need minimal, if any, repair before burial, this would be a good place to look.

Slightly more worn containers may be labeled as "cargo worthy," meaning it has passed an inspection, or "water and air tight," meaning it appears to be so, but has not been officially inspected. These will have more dings, may have patches of rust, multiple layers of paint and

other signs of use. If you go inside and seal the door, it should still be completely dark (and airtight).

The cheapest and potentially most worn containers will be sold "as is." These will probably need some repair and resurfacing work done to be sound for burial. These will also likely be the cheapest options, and may have multiple labels from different shipping companies painted on the exterior, which will not be important as it will be underground.

Pesticides

In order to comply with Australian pest-control standards, which are some of the the most stringent in the world, most shipping containers worldwide have the floors treated with an insecticide containing copper (~25%), chromium (~45%), and arsenic (~35%). Pesticides may also be used to fumigate the cargo, and these will most penetrate any porous surface, such as wood and be slowly off gassed over time. There should be a placard on the outside of the box that identifies which pesticides have been used on that container, both in manufacture and in transport. For this reason, if you can find a container that has a metal floor, that may be preferable. Otherwise you will want to either replace or thoroughly coat the existing wood with a durable sealant.

How to Transport to your Site

Most companies that will sell you a container will also include in the price delivery within a roughly 200 km radius. They will typically deliver the container on a truck that resembles a flat bed tow truck. It is a "tilt bed" roll off style truck. Generally these trucks will require 60 feet in line with where you want the container placed. The final installation underground will require a different service, such as that of a septic tank company who can hoist it into the hole.

Preparing Container for Burial

Deep Cleaning Interior

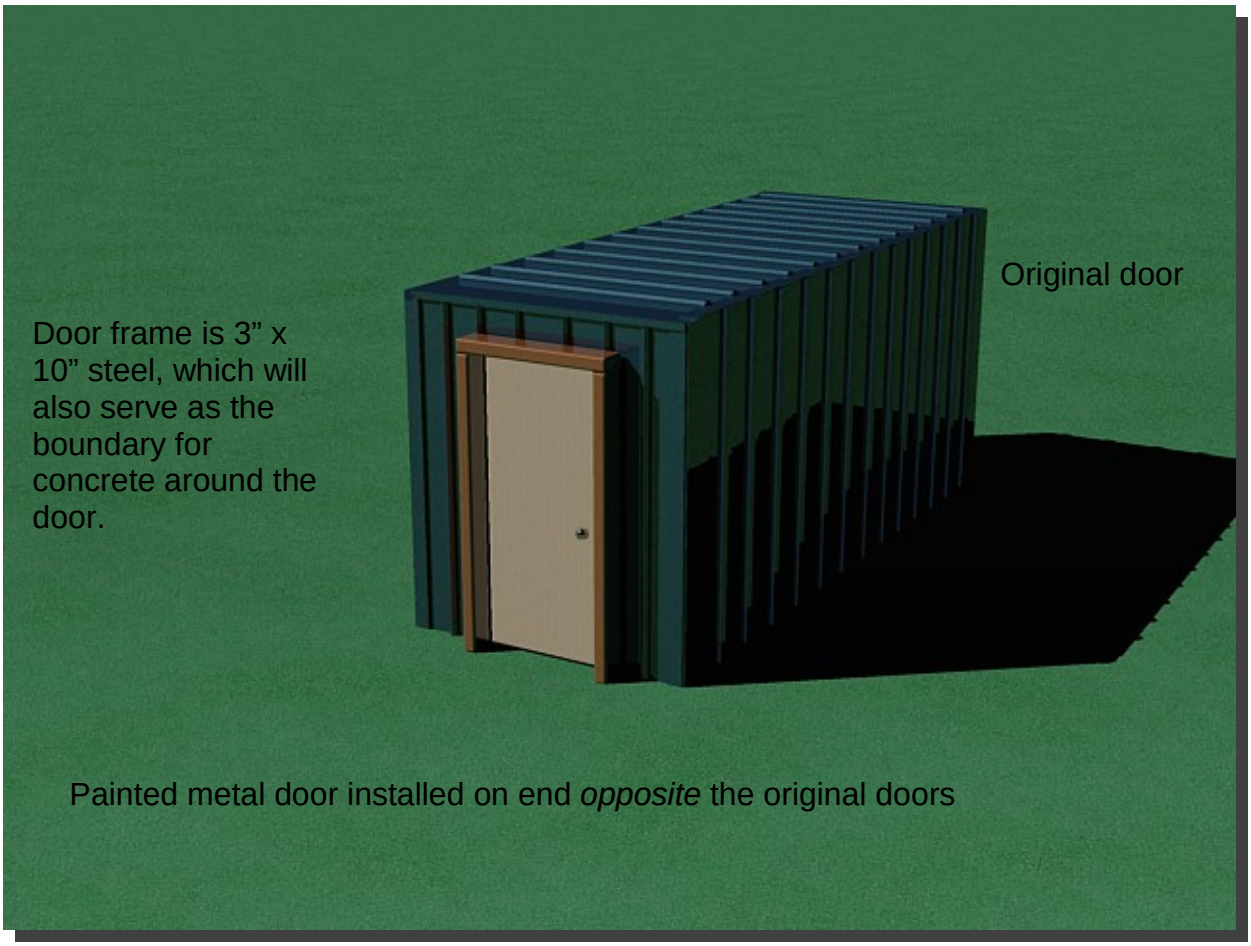
If you decide to use a used container, you will want to refer to the panel on the outside that will identify which pesticides may have been used on the container or its contents. For safety, it would be ideal to have the wood flooring removed and disposed of safely as that is one of the larger reservoirs of pesticides that could penetrate the packaging of food stores and cause illness in those sheltering in the space. It would also be a good idea to have the full interior sandblasted down to bare metal to remove most traces of toxic paint, pesticides or any toxic materials that may have leaked during shipment. The interior may then be repainted with several coats of light colored non-toxic paint, and new (or recycled) flooring may be installed as desired. Especially if there are elderly or very young in the household, having secure and even footing inside would be ideal. Metal also tends to get very slick when wet, so if considering a metal flooring, do be sure to install grip strips as well and/or paint with a textured (grip) paint.

Repairing Exterior

While you have use of the sandblaster would be a good time to remove any rust patches on the exterior. Smaller areas of rust may be removed by hand with a sturdy wire brush. Any holes may be repaired by bonding metal sheeting over the hole with epoxy. Once secure, bare metal areas may be coated with at least one coat of rust protection paint (i.e. Rustoleum).

Door

Seal the existing doors closed. In the center of the opposite end of the container, install an inward-swinging metal door. Make sure to install quality weatherproofing to protect against water, and 3 x 10” metal framing around the door for additional strength.



Door installed in end opposite original opening. Note: thick extension of metal door frame will serve to contain concrete around outside of door (as permanent formwork)

Reinforcing for Adequate Strength

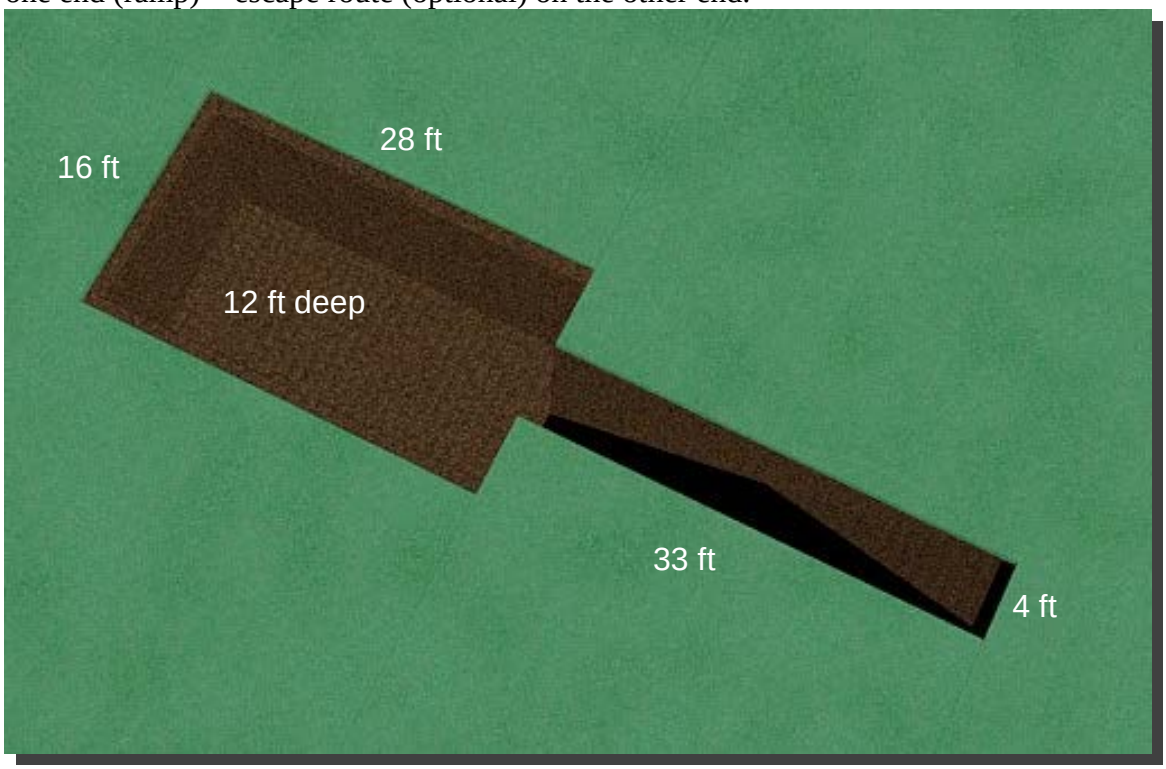
Burying a storage container with no reinforcement is dangerous. It has resulted in collapse. Though the containers are strong, they are designed for the forces to be applied in specific ways, and are not reinforced for the flat panels to receive loading.

To safely use a container to create an underground shelter and avoid these potentially tragic consequences, it is imperative to provide additional reinforcement to the structure that will transfer much of the weight of soil on the flat surfaces to the structurally adequate vertical (corner) supports and add additional support in the middle of the flat surfaces. This particular design accomplishes this with the use of reinforced concrete poured on all sides of the container and a reinforced concrete cap.

Preparing the Hole

Size

To install a 20 foot container with an accessible ramp entrance, you will need to excavate to the following dimensions: 12’ deep x 16’ wide x 28’ long + 33’ at an 18 degree angle to surface on one end (ramp) + escape route (optional) on the other end.



Excavation dimensions demonstrated. Length: 28’, Width: 16’, Depth: 12’. For ramp, even incline 4’ wide reaching surface at 33’ from front of hole. For Stairs, even incline 4’ wide reaching surface 6’ from entrance end of the main hole.

Safe Excavation Practices

The easiest and safest way to create the hole would be to hire an excavator. If you would rather do the excavation yourself, learn about safe excavation practices, especially as they relate to your local soil conditions. A great reference that is updated yearly and available free online is: http://www.excavationsafetyguide.com.

Concrete Pad and Ramp

Concrete Pad

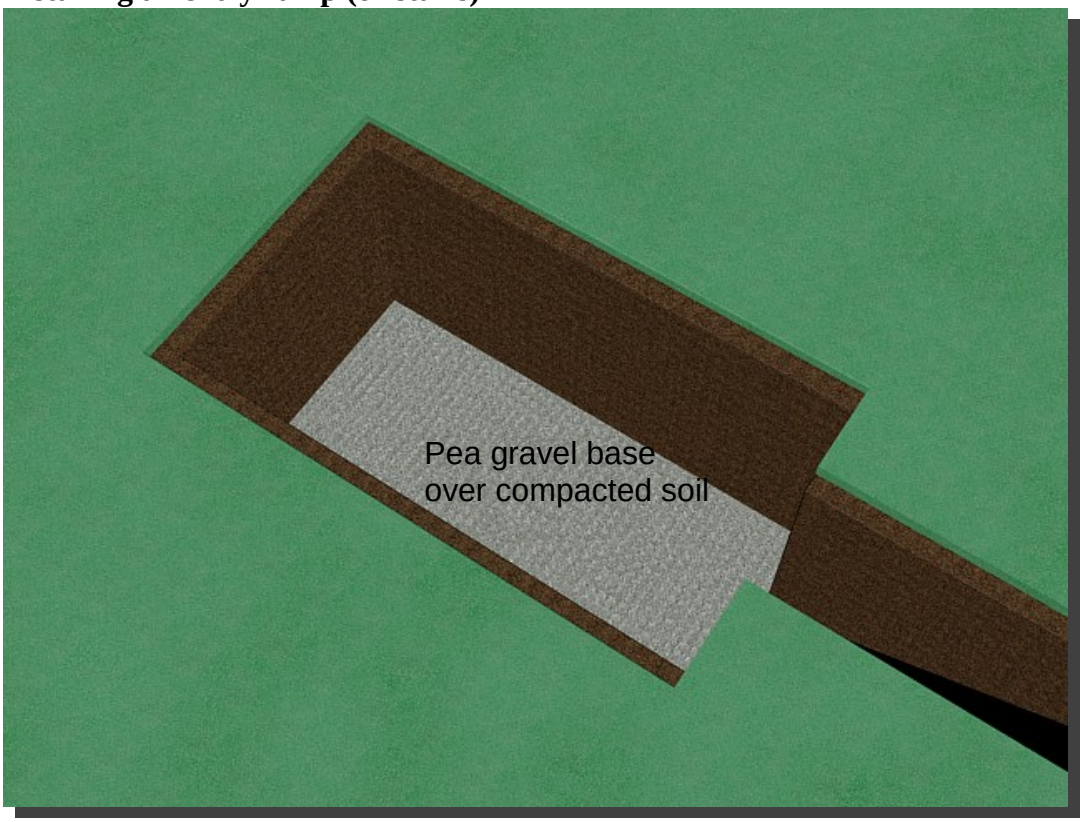
Once the hole has been excavated to the correct dimensions it is time to begin preparing the base. First, level the bottom of the hole, packing the soil very firmly. You want a level and very well compacted surface at this point. This will be a firm base on which to construct the rest of the structure.

If you have moderately moist soil, now smooth in a 3" layer of pea gravel. This will allow water to drain around the container more effectively. A sump pump or drainage system with perforated drainage pipes may be necessary if water is more of a concern. This is something to modify based on your local conditions. The basic design will include 3" of pea gravel topped by a 6" reinforced concrete pad for the container to sit

Soil Compactors may be rented and are used to firmly compact the soil underneath the bunker

With 2' of clearance on back, front and sides, place forming for a reenforced concrete pad that will fit exactly underneath the footprint of the container with a depth of 6 inches. One option is to rent such formwork, another is to use re-bar stakes and 2x12 boards, marked at the 6" from the ground level with a chalk line to indicate where the concrete has reached the goal depth. After this has cured, remove the forms and seal the concrete with an asphalt (tar) foundation sealer.

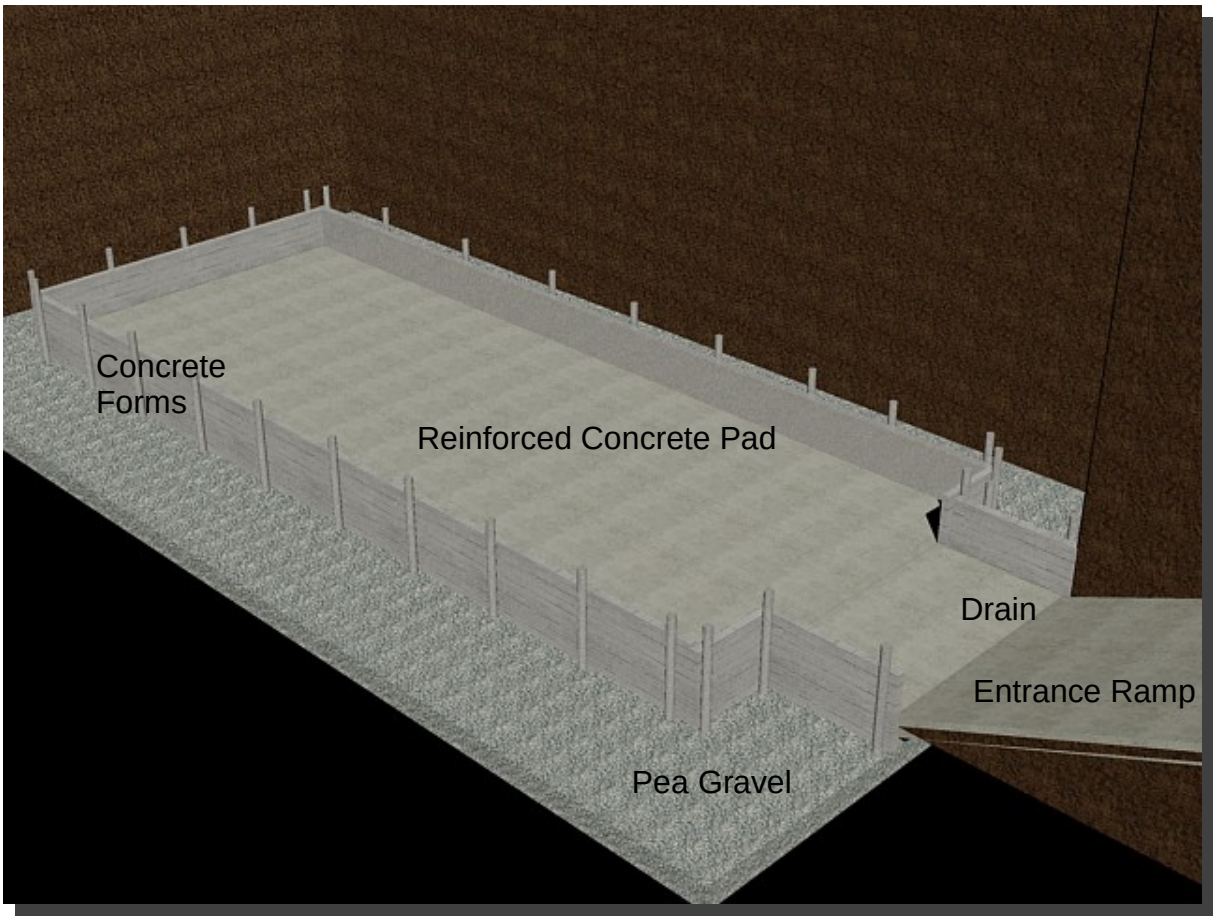
Installing an entry ramp (or stairs)



Gravel spread on the bottom of the hole to a depth of 3 in. Note: additional drainage such as perforated drain tubing, and or a sump pump may be needed in wet environments.

In order to maintain quick and easy access for all individuals in a household, including those who may be elderly or injured, a ramp is the recommended route of entry. If a simpler, cheaper entry is desired and there are individuals with the strength to assist others down, a ladder entry through the roof may be an option. Stairs are also an intermediate possibility and would follow much of the same procedure as for a ramp, but with a shorter slope.

First, make sure the soil under the ramp is WELL PACKED and smooth. The bottom edge will join up against the foundation. The upper edge will emerge near ground level, approximately 33 feet from the bottom.



Pouring the reinforced concrete pad on top of gravel layer. Depth of concrete is marked on inside of forms with a chalk line.

The ADA recommends a maximum of 2:12 slope for home wheelchair ramps, which is 1 foot of ramp for every 2 inches in rise. Thus, a 144 inch rise would yield a 72 foot long ramp. If you wish to follow that guideline, you will need to adjust accordingly, however, for simplicity and resource savings, we will be describing using a slope twice that steep, with a ratio of 1:3. That means it may be more likely that someone else would need to help an elderly, disabled or injured individual on the slope. To descend 11 feet to the floor level, the ramp will be 36 feet long, over a distance of 33 feet at a slope of 18 degrees. For safety, there will be a 3' long landing pad at the bottom of the ramp.

Once surface is even and well-compacted, pour concrete and spread it to a 4 inch thickness through the entire ramp, distributing the concrete with a shovel, spreading with a trowel and texturing with a broom. Use of a grip enhancer, such as Grip It, which can be spread while wet to increase texture, is highly recommended.

Placing Container in Hole

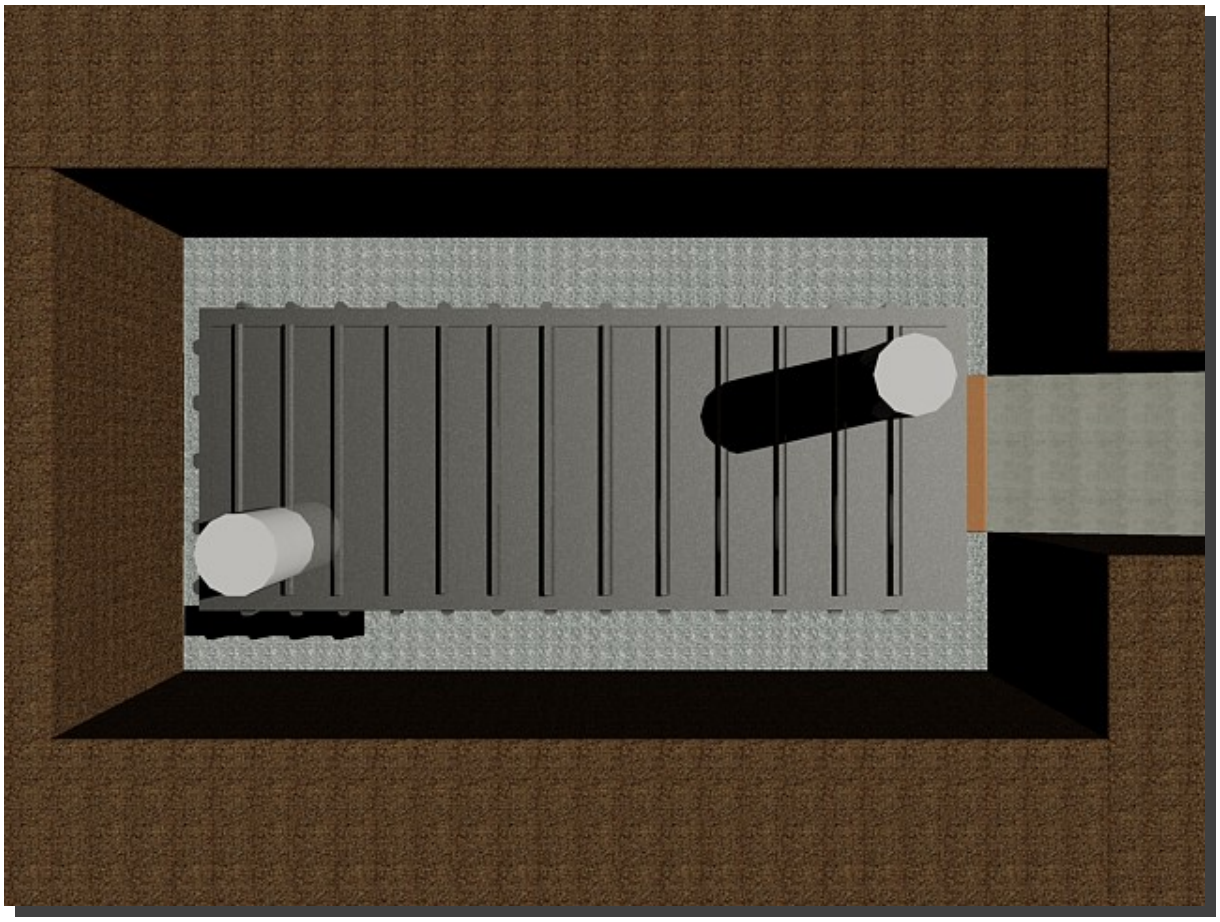
At this point, you are ready to place the container into the hole. If you do not own a tractor, the easiest way will be to hire a septic company to come out with the appropriate equipment and lower it straight in place safely and with minimal effort. There are holes on the upper corners, which can be connected to chains which will hold the container. It should be lowered gently onto the concrete pad, which serves as the guide to placement.

Container within the hole (soil walls not shown). First layer is gravel, then reinforced concrete pad on which the container rests. The ramp is also shown leading down to the entrance. The door is installed to swing inward and sturdily weatherproofed.

Air Vents

The air vents are installed to create the possibility for adequate air flow during use as a shelter. During non-occupancy and occupancy when air quality may not be safe, they can be capped. The design is simple, two 5' sections of 12" PVC pipe. They will be sealed in place with epoxy and waterproofed with tar and then additionally held in place by the 8" concrete cap which will surround their bases.

1) Mark the location of the centerpoints of the air vents on the surface of the roof of the container with a Sharpee marker. This can be wherever you like, as long as the centerpoint is >12" from any edge and one is roughly on each end of the container.
2) Use a compass or a marker on a 5.5" string to draw a circle with a diameter of 11 in centered at the point you marked.
3) Drill a 1/2" diameter hole in the spot you marked using a cordless drill with a metal bit.
1) Use a cordless metal shear to cut from the center hole to the edge of the circle marked.
2) Cut around the circle as evenly as possible and remove the metal circle scrap.
3) Set the PVC pipe vertically, aligned with the hole to ensure it fits.
4) Mix epoxy and apply to both the top edge of the container where the pipe will fit and to the bottom face of the pipe. Press them together and support with bracing while epoxy cures.
5) Repeat on other vent.
6) Allow epoxy to cure for 24 hours with support.
7) A cord may be tied between the two air vents and between each and an anchor on the ground for additional support until the concrete and soil will hold it in place.



Air vent installation locations and sealing of exterior with tar. The positioning of an air vent on each end will allow for the creation of an air current through the cellar during occupation. Each vent is a 5' section of 12" PVC pipe. When not occupied, cover the 12" PVC pipes with an end cap to keep out rain.

Tar Waterproof Coating (optional)

To add additional water-protection, a layer of tar may be applied to the exterior surface of the container. This may be applied with a squeegee, or a mastic type spray gun. Due to the viscosity of the tar, it is easier to do this in relatively warm temperatures. If it is cooler outside, keep the product warm until ready to use. Apply 2 coats, allowing 48 hours in-between for it to dry. After final coat, allow 48 hrs before handling the container again. The coverage is typically 35 square feet per gallon, so you would want roughly 4-5 gallon containers to cover the exterior of the container.

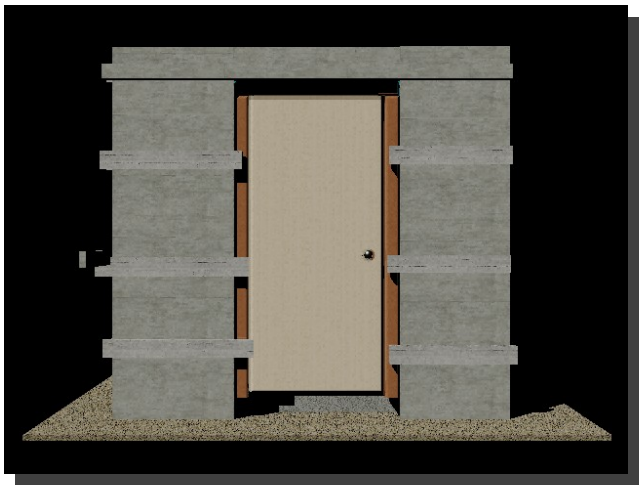
Spray-on Insulation (optional)

A little insulation can help with temperature regulation, as well as minimizing condensation and thus moisture problems, allowing the space to remain usable for much longer. Once it is installed in the hole, spray closed cell plastic foam on all sides of container for insulation and additional waterproofing to a thickness of 1 inch. Alternately, tape ground-rated, 1 cm thick closed cell plastic foam on sides, top, bottom of container before lowering into the hole.

Once all openings to the metal container have been created and sealed, and optionally tar coated, the exterior may be spray insulated with closed cell plastic foam insulation. This should be sprayed evenly over the surface to a thickness of approximately 1 inch. This will help reduce condensation inside the container and protect from mold and corrosion. It should cure for 48 hours before concrete is poured over it.

Reinforced Concrete Walls

The Corten steel walls of the container are not designed to hold the load of soil pressing in from the side over the entire surface. If the container were buried with no reinforcements on the sidewalls, it would risk collapse -- either sudden or gradual -- due to the pressure of the soil on the sidewalls.



View of the door end of the container with concrete forms in place for the pouring of the 9-12" thick concrete walls which will support the sides of the container from soil pressure and also provide a base for the concrete cap (ramp and landing pad are removed for clarity). Forms may be rented and are removed once the concrete is set. In this case, the exterior wall of the container serves as the other surface to hold the concrete.

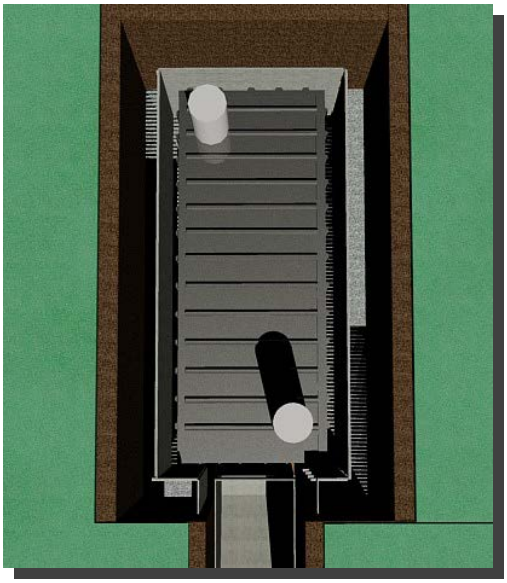
There may be locations where concrete wall reinforcements are not necessary, but for general purposes, the design will require reinforcement of the lateral walls to resist buckling in under the weight of the soil. For safety and water management, it is important that no open space be left unfilled alongside the container as a vertical wall of soil will generally collapse and the space could collect water. If access is needed for water or electric connections, the walls can be moved outward from alongside the doorway to the full width of the container, requiring very little additional concrete.

The thickness of concrete and specs for the reinforcement would be best gained from consulting your local building codes. We will use a 12" thick wall for this example. The cheapest and easiest way to accomplish the formwork if you do not hire a concrete contractor to do it, is to rent pre-made segmented forms as well as spreading tools from an equipment rental company.

1) Determine the appropriate thickness of the sidewall concrete and type of metal reinforcement for your specific location. Local building codes, extension and engineering offices may be of assistance with this.
2) Set up or create forms to contain the exterior surface of the concrete wall. Renting modular forms is highly recommended for cost and time savings.
3) Brace the forms from the wall of the hole with 2x4 scraps for additional support
4) Place metal reinforcements inside the forms per the specs determined for your locale. Make sure no metal is touching the forms (which would end up exposed and vulnerable to rust).
5) To speed the transition to pouring the cap, on the interior, install two parallel rows of 2x4 temporary bracing, each 2.5 ft from the (long) side wall. This should be supported with vertical supports every 3' along each row. Install 2x4 bracing with two vertical supports to support the sheet metal in the doorway as well. For maximum strength and minimal twisting of the vertical supports, two 2x4s should be bolted together lengthwise, with one short edge

aligned in the center of the other long edge to form a long "T." These can be bolted together with horizontal 2x4s along the ceiling.

6) To be most prepared to move on to pouring the cap, have all metal reinforcements ready to place, and know how they will go before beginning.
7) BEFORE POURING, ENSURE THAT ALL PEOPLE AND ANIMALS ARE OUT OF THE CONTAINER AND HOLE.
8) For access, secure a sturdy board across the gap from the top of the container to the edge of the hole.
9) Begin pouring the concrete within the forms, moving in a circular direction around the container. Add no more than 2' to any given section at once, rather continue in a circle, adding relatively thin layers. One or more people may be involved in following the using a large concrete vibrator to remove any air bubbles. Pounding on the edges of the form with a hammer can also help with this, but it would not be recommended to have individuals working within the hole in case a form slips. All work would ideally be done from the TOP of the container (before metal reinforcements are placed) or the edge of the hole.

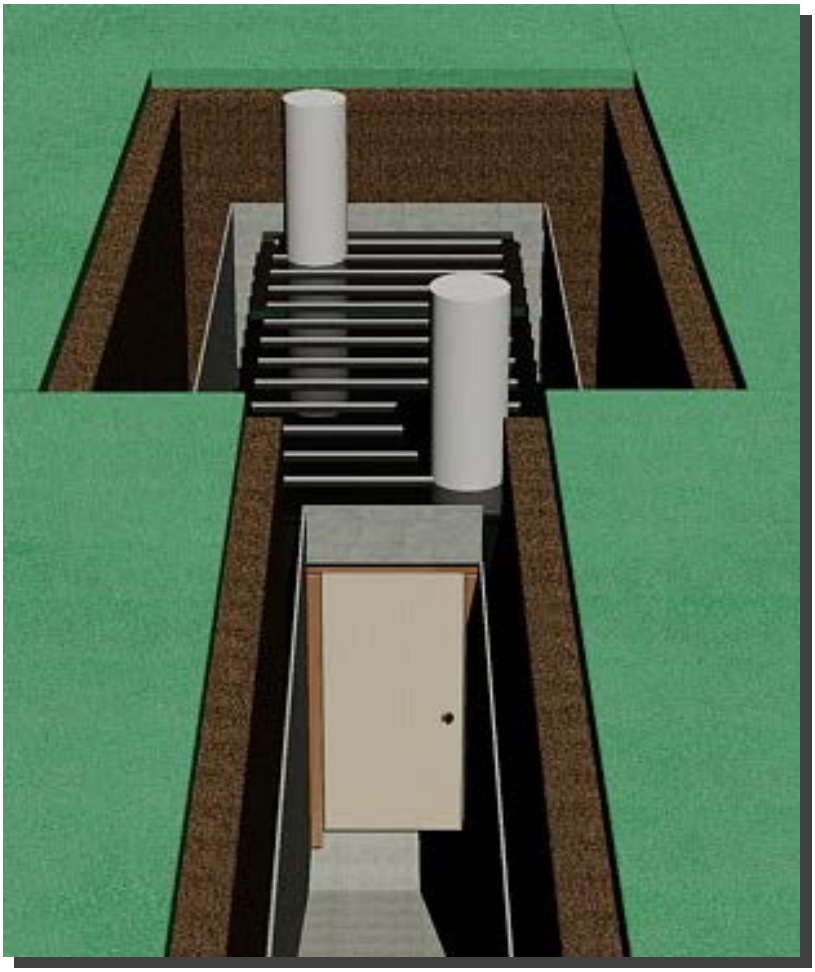


Top View of the concrete forms in place for pouring the reinforced concrete walls around the container and ramp. The same forms will be used for pouring the concrete cap over the container in a separate step.

10) Once the concrete has been smoothed evenly at the level of the top of the container, proceed to the next section, creating the concrete cap.

Reinforced Concrete Cap

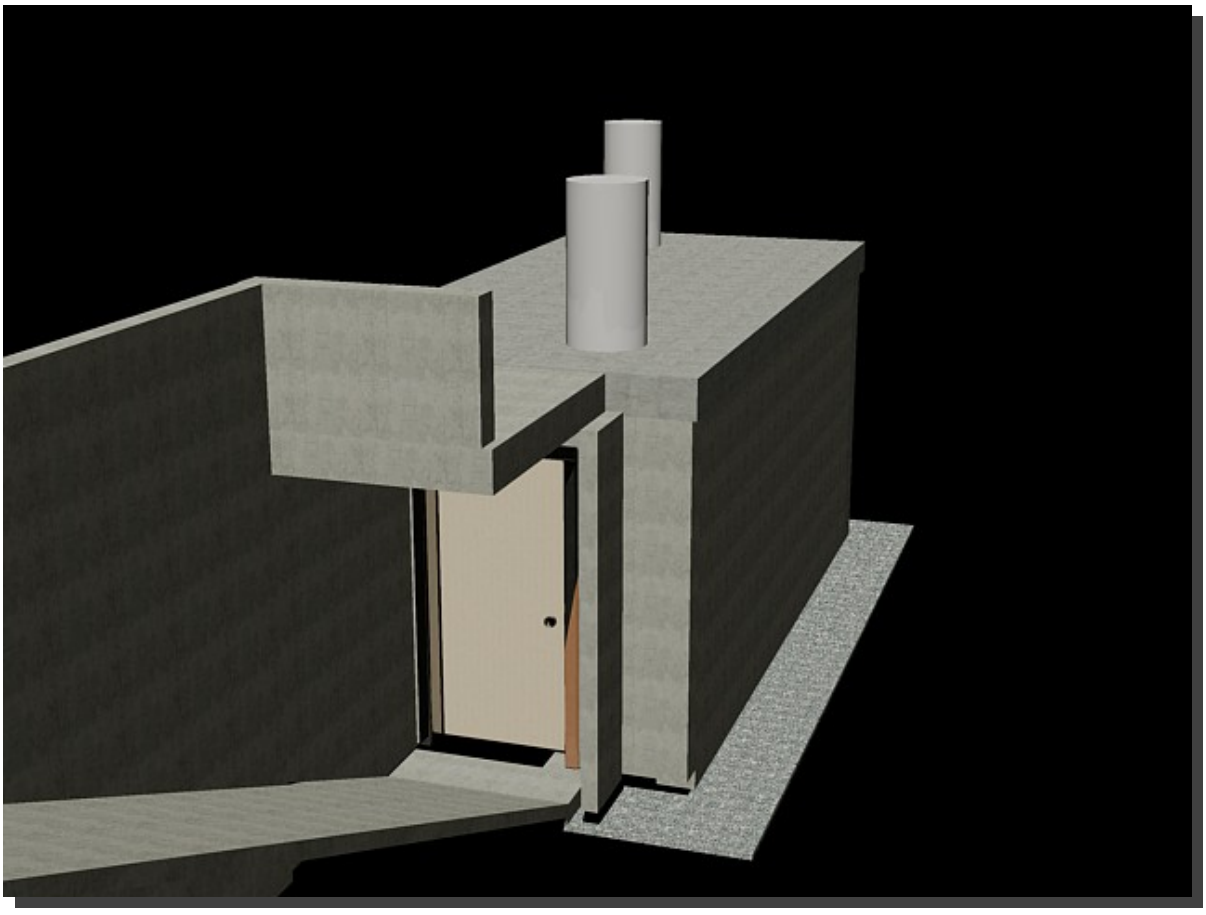
The concrete cap will distribute the weight of the soil covering to the reinforced concrete walls and the corner posts of the container. If you have any uncertainty about your specific conditions, please contact a local engineer or local building codes to determine the best specifications for your particular setting.



The same molds mostly will be used to pour the concrete cap, which is poured at the same time as the walls of the entranceway.

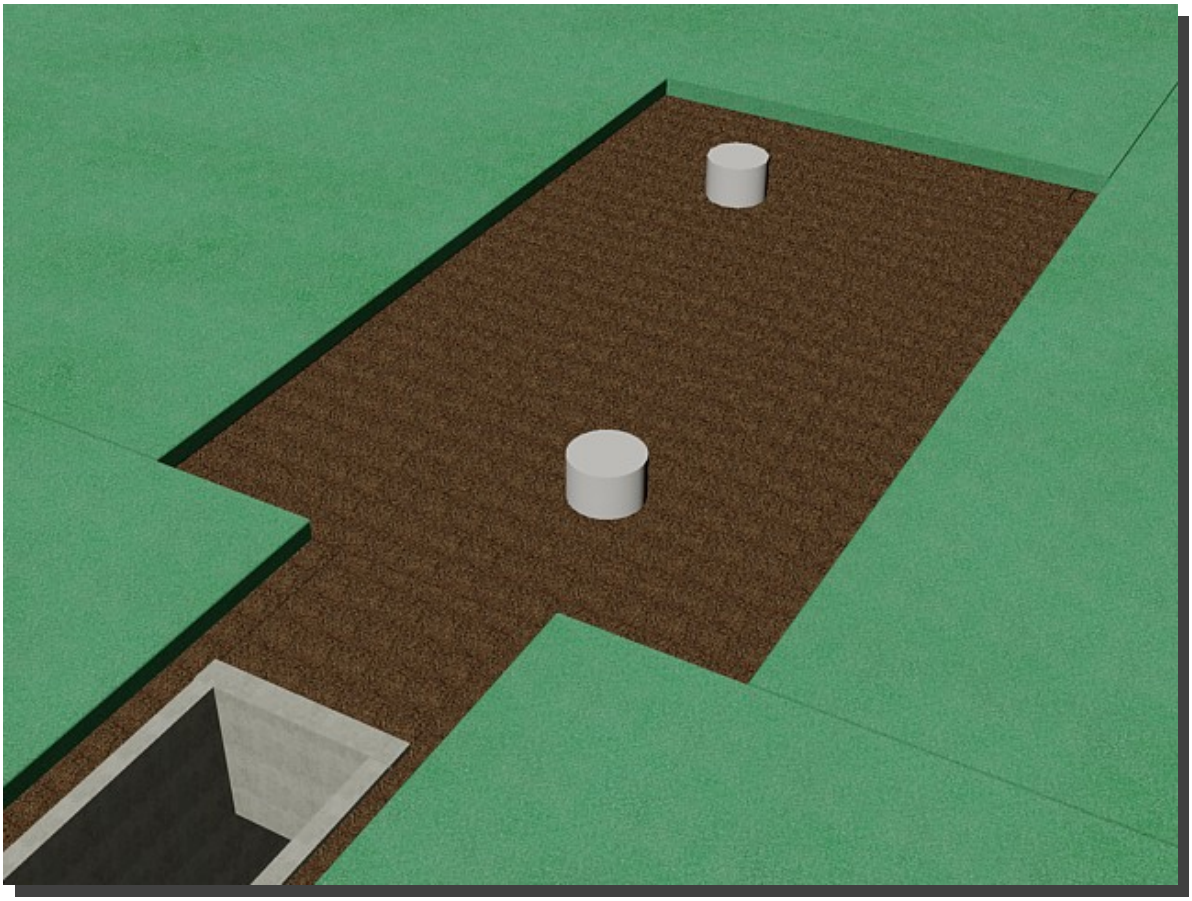
1) The formwork which was used for the sidewalls extended 12” above the surface of the container, so it will also provide the outside edges for the reinforced concrete cap.
2) Place a sheet of corrugated sheet metal over the stem walls covering the doorway to create a foundation for this section of the cap. This section should extend as far as necessary given your entrance style to achieve a minimum ground-to-ceiling height of 6 feet as you progress up the stairs/ramp.

3) On top of container, lay the first layer of rebar grid, supporting it away from the surface of the container with plastic blocks made for this purpose. The exact specs of the grid used should be according to your local building codes.
4) Lay the second layer of re-bar grid, separated from the first by 4" by metal supports.
5) Lay a row of concrete blocks flush with the front of the opening and fill with concrete.
6) Pour and spread concrete evenly inside the forms to 8" deep, ensuring all re-bar components are completely covered.
7) Pour concrete and tamp out the bubbles in the forms to create the walls of the entranceway.
8) Allow concrete to fully cure (overnight).
9) Remove all formwork and recycle or return to rental location.
10) Coat concrete exterior well with cap a layer of tar waterproofing
11) Let the tar sit for 48 hours undisturbed.



Cutaway view of entrance via ramp. At this stage, the concrete pouring is complete, and the formwork has been removed. The container is ready to be coated with a tar sealant and then covered.

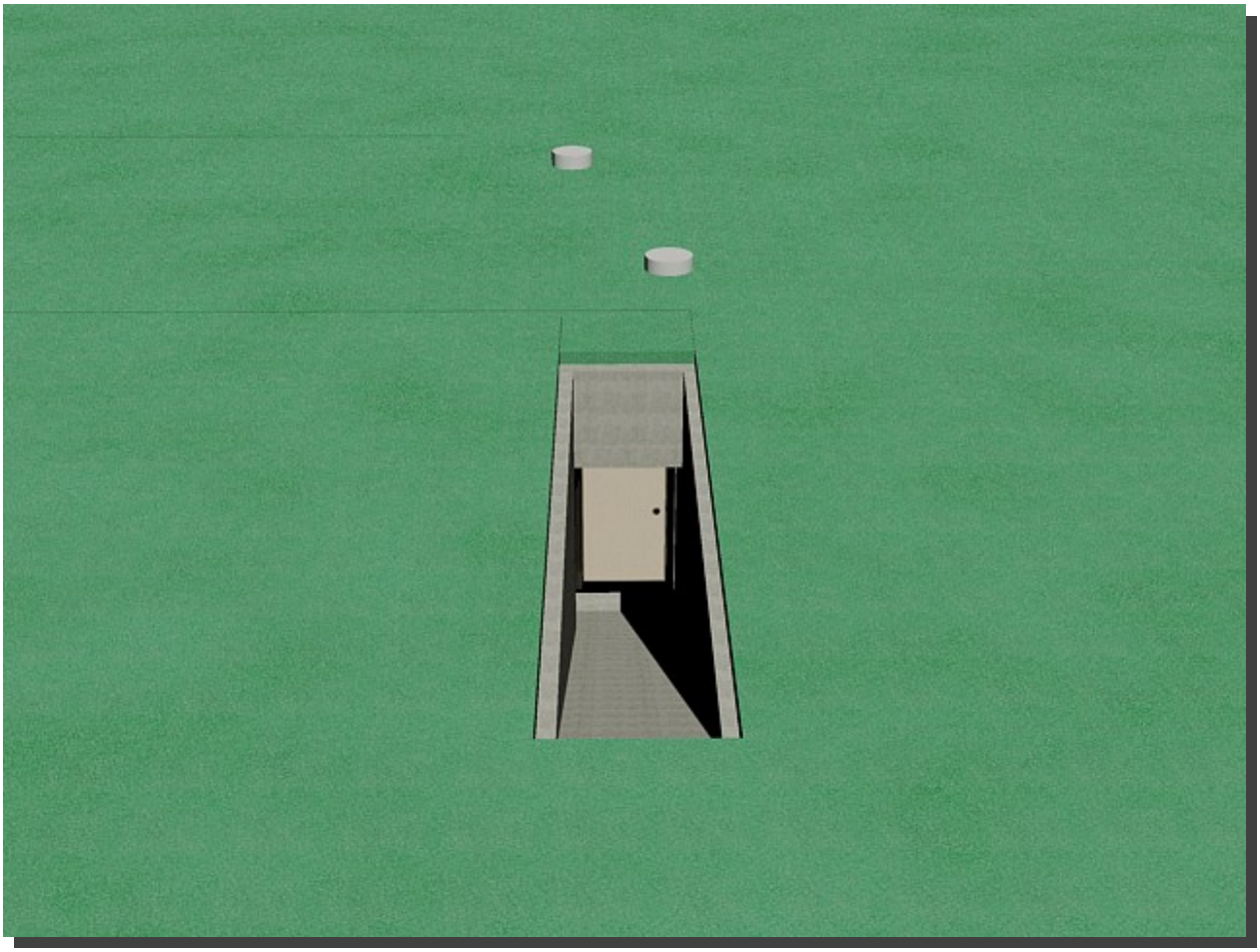
Covering and Landscaping



Filling in around the container. Ideally, the excess fill soil should form somewhat of a mound over the container to promote rain to runoff the area rather than seep down. Soil from the deeper areas should be put into the deeper sections, and the topsoil preserved for the surface layers for ease of growing plants on top.

1) Use soil that had been set aside to backfill alongside the concrete walls, compacting it well in layers, putting the soil from the deeper layers back into the deeper parts of the hole, and reserving the quality topsoil for the surface layer.
2) Once the soil is well compacted to the upper surface of the container, spread the remaining topsoil over the top to a depth of 24 inches.
3) Use high quality topsoil to create a slight dome over the top of the structure. The dome may extend over an area larger than the container. This will help to keep water flowing away from the ground over the structure.
4) Plant grass or other landscaping over the disturbed soil. Trees with deep roots would be best avoided in this space as they can break through concrete over time, however vines might do very well to add some height and concealment for the air vents. A garden shed could be a simple concealment for a smaller entranceway.

Finishing Touches



View of entrance to completed shelter (with ramp). The opening may be guarded with decorative fencing, or in an environment with any significant rain, covered with a rolling metal door. A metal cellar door would be a very effective covering for a stair entrance, as would a trap door in the floor of a garden shed or art studio. Caps should remain on the air vents while not in use.

1) Cover the air vents with removable PVC caps, which could be pushed off from inside with a long broom handle if needed.
2) Install a handrail along the length of the stairs or ramp, drilling and bolting the handrail connections into the concrete sidewall.
3) Protect the entranceway from the elements and the accumulation of water by building a shed over the top or by use of a rolling metal door (ramp) or traditional cellar door (stairs). This could potentially be avoided in a very dry desert environment with infrequent heavy rains.

Interior Comfort

Ventilation

After having installed the ventilation ports, it will be essential for any period of habitation to have active ventilation of the space. This can be with grid-tied, or solar-powered fans. A 2'x2' square fan will move air well, especially if placed on the ceiling over one of the vents. Special ventilation fans which fit inside one of the 12" pipes could also be an option. Additionally, a hand-powered option is the KAP fan system, which is fairly straightforward to construct. See instructions at: http://www.ki4u.com/webpal/d_resources/survival/kap/kap.htm.

Bright Light Colored or White Interior Paint

Having light colored walls will increase the feeling of spaciousness within the shelter. Adding a little of some uplifting colors may also be of interest. Yellow or green at a very light, bright hue will be less sterile and can be uplifting.

Ample Lighting

Lighting may be from electric battery sources, such as LED lanterns. Care should be used with sole reliance on burning substances for light in an enclosed space, and if they are used, it should be only with active ventilation.

Monitoring Interior for Moisture and Mold

Set up a schedule of checking in on the shelter on a regular basis. This can ensure that your investment remains in good and working condition for a long time.

Enjoy and be safe!