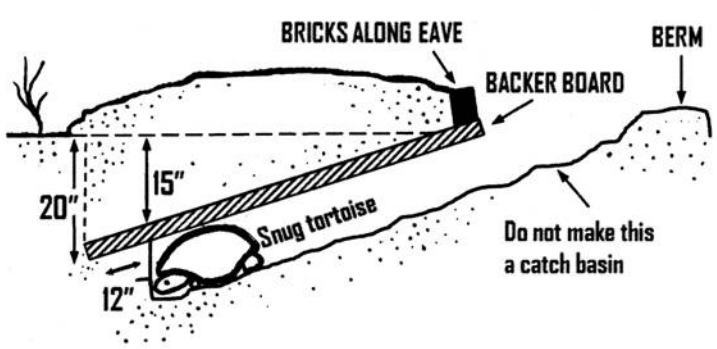
Desert Tortoise Underground Burrow Design for Bullhead City, Lake Havasu, Kingman, and Yuma

(Information and photos used with permission from the Tortoise Group)

This burrow is designed specifically for captive tortoises in Bullhead City, Lake Havasu, Kingman, and Yuma, where the climate is extremely dry and hot. The burrow is underground, which provides humidity and good insulation from cold and hot temperatures. The burrow design includes an eave to protect the burrow from sun and rain. You will create a ramp on which the ceramic tile backer board (e.g., Hardieboard™) or sandstone roof will rest. The ramp should be at a 15-20º angle from horizontal. Below the ramp (and roof) you will dig a channel, which is the burrow itself. The burrow has a mound of soil on top which insulates the tortoise from extreme aboveground temperatures and prevents it from flooding during heavy rainfall. We recommend renting a soil breaker to dig the ramp and channel, which will cut the digging time in half (to about 4 hours). A soil breaker can be rented at any major hardware store. Allow a full day for completion of the burrow.



Side view of the underground burrow

Supplies

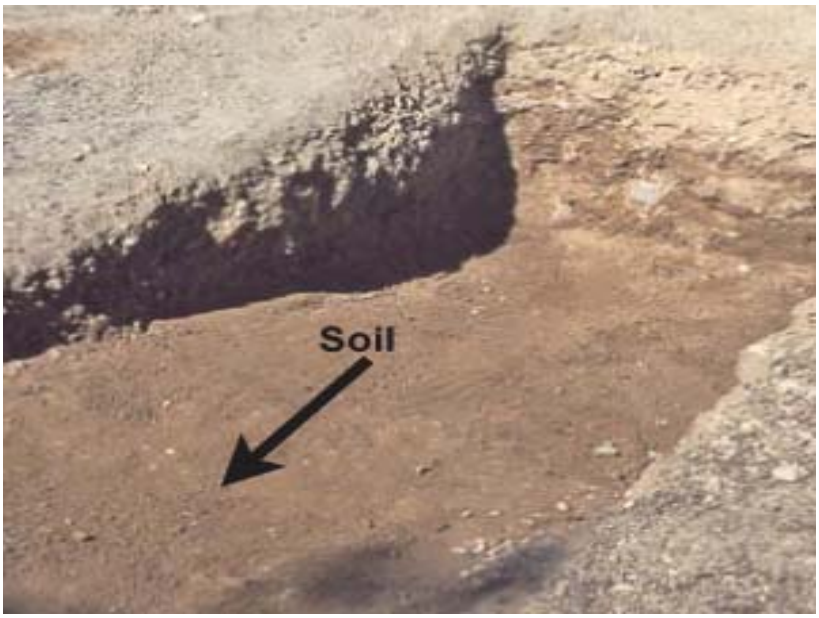
1 piece	32” x 48” sandstone (1½” thick) for the roof
OR	
2 piece	32” x 48” ceramic tile backer board (3/4” thick) for the roof
1	electric soil breaker (available for rent from Home Depot)
1 piece	20’ (or so) long rope or string
6	tent stakes
4	bricks or flagstones
¼ ton	topsoil or some other clay-heavy soil

Directions

1. Choose a high, shaded area for the burrow location.
2. Mark the site of the burrow by laying the sandstone or one of the pieces of ceramic tile backer board on the ground where you plan to dig the burrow.
3. Pound the 2 stakes at the two front corners of the backer board (the front will be the opening of the burrow).
4. Take the rope and lay it across the front edge of the backer board, and extend it 2’ to the right and left of each corner. Pound a stake in the ground at each of these outer corners (2’ from front corners).
5. Tie the rope to one of these 2 outer corner stakes. Keeping it taut and at ground level, wrap it around the base of the other 3 stakes and tie it off.
6. To make the eave of the burrow, slide the backer board 10” forward, past the rope.
7. Pound a stake in each of the 2 new rear corners of the backer board.
8. Wrap the rope tightly around the 4 corner stakes to create an outline around of the backer board.

Backer board moved 10” forward to create the eave, with rope creating an outline around the 3 sides of the backer board

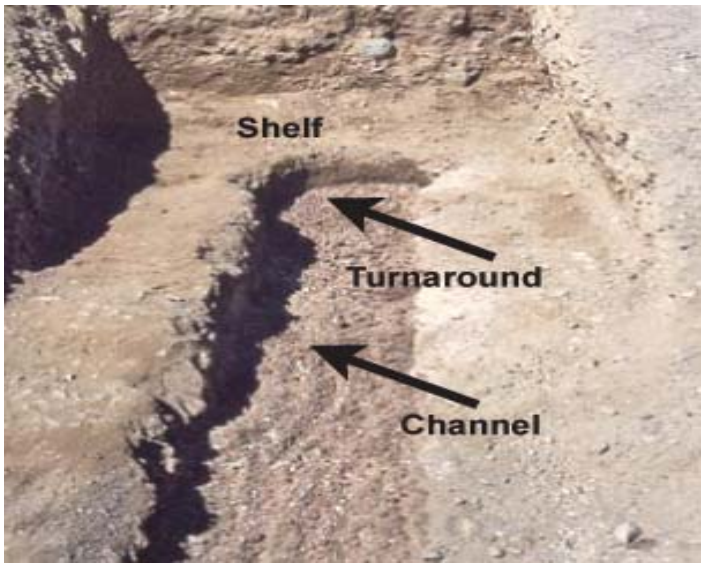
9. Set the backer board aside.
10. To create the ramp, start digging with the soil breaker at the rear end. Dig the ramp 12” deep at the end of the ramp, where the ramp will be the deepest. Dig only inside the rope line.
11. Create a smooth, even, and very gradual ramp from the deep end to the rope front. The ramp should be at a 15-20º angle from surface of the ground. Dig gradually, because the ground must be kept firm for support. Remove rocks as you go so the surface is smooth.



The ramp (where the roof will rest), before the channel has been dug

12. Check the snugness of the roof on the ramp occasionally by slipping the backer board in the front. It should rest tightly along the length and edges of the ramp.

13. When you are done digging the ramp, the backer board should fit tightly in the ramp. Stand on the roof to make sure that it does not rock back and forth. If it does, you will need to fill any depressions or remove rocks until the backer board fits tightly.
14. The roof should touch the rope as it crosses it at the front of the burrow and then project above ground.
15. Next dig the channel. It should be only slightly higher and wider than the tortoise (allow an inch or two). The channel height needs to be the same throughout the length of the channel. Keeping the channel snug provides insulation and prevents too much air circulation. Create a rear shelf for the roof by leaving 12" of the ramp behind the channel. The channel should be at least 2' long (or up to 6' if you have a large tortoise; if you create a longer channel, keep in mind that you will need a piece of roofing material that is 12" longer than the length of the channel).
16. Start digging the channel at the front end, staying within the ropes. Do not stand on the ramp, as it may collapse.
17. Widen the channel at the far end so that the tortoise can turn around.



The inside of the burrow, showing the ramp and the shelf on which the roof sits, and the channel showing the turnaround at the far end

18. Replace the roof. No light should shine through any cracks. If it does, make the necessary adjustments.
19. Loosen the soil on the floor of the channel so that the tortoise can adjust the fit to its burrow. The floor soil will need to be loosened to a depth of 6". The soil needs to be loosened from the turn around to 10" beyond the burrow entrance. Crush lumps of soil and remove rocks and roots along the way. When you finish loosening the soil, the height of the channel should not be different from when you started. Replace the roof. If you are using backer board for the roof, use both pieces, since 2 pieces will last longer than one.
20. Next create the soil mound. Shovel the soil onto the backer board, packing it down as you go. Remove rocks as you go, as rock-free soil will prevent rain from seeping into the burrow. Continue adding soil after the excavation becomes filled to ground level. Allow the soil to extend onto firm, unexcavated soil to seal where you broke the surface. Do not put any plastic or waterproof material over the burrow, because it will make the burrow hotter.

Creating the mound of insulating soil on the top, sides, and back of the burrow

21. Place the flagstone or bricks in a line on the edge of the eave, and pile soil behind them to protect the roof from rain. The surface of the eave should be level so that the tortoise can walk safely along it without falling into the burrow entrance.
22. Create a berm in front of the burrow opening by making a ridge of soil to keep water from flowing in. The berm should be a mound that requires the tortoise to walk up the outside of the berm and down the inside, directly into the burrow. There should be no depression in front of the burrow.

Entrance of the burrowing showing the eave and the burrow mound (berm) in front