



# 26' GROWING DOME ABOVE GROUND POND STAGE 1

## MATERIALS LIST

The Growing Dome® above ground pond consists of the following:

1. 4 pieces of galvanized pre-primed or pre-painted (black or other dark color) 22-gauge sheet metal: 2 pieces 4' by 10' and 2 pieces 4' by 4' (Available from local sheet metal shop)
2. 1 quart of muriatic acid (if metal is not primed or painted)
3. 1 quart of paint suitable for metal - any dark color (if metal is not pre-painted)
4. \*2 pieces of aluminum angle (2" x 2" x 4' with 3" on center holes)
5. \*1/4"-20 x 1/2" ss bolts and nuts
6. \*Six spacer blocks - 24" high (fabricated from 2x6 pressure-treated wood provided – 2 @ 3 pieces, 2 @ 4 pieces, and 2 @ 5 pieces) for behind pond metal supports
7. \*5/16" x 2" lag screws (pond metal to pond spacer blocks)
8. Duct tape for covering bolt heads and lag screw heads
9. One piece 2" x 6", 14' long of pressure-treated lumber for bottom brace
10. Sand for bottom of pond
11. \*Vinyl pond liner, 22 mil thick, 14' by 24' flat (Stage 2)
12. \*Pond liner retainer 28' (1 @ 14' for front of pond / 1 @ 14' for back of pond) (Stage 2)
13. One piece 2" x 6", 14' long for top horizontal "T" beam bracing, redwood (Stage 2)  
One piece 2" x 6", 14' long for top vertical "T" beam bracing, redwood (Stage 2)
14. \*5/16" x 3" lag screws and washers (pond top "T" beam) (Stage 2)

\* Provided by Growing Spaces® (Other items from Owner Supplied List)

## FABRICATION OF ABOVE GROUND POND METAL

If you didn't purchase pre-primed or pre-painted metal, you will have to pre-treat the metal for the paint to adhere properly. You will only be painting the outside of the two front pieces. Lay out one 4' x 10' and one 4' x 4' piece of 22-gauge sheet metal on a flat surface in preparation for etching with muriatic acid. Care should be taken when using acid and proper hand and eye protection is recommended. Always add acid to the water. Make a dilution of 1:3, acid:water. You will need about a quart of solution total. Apply the muriatic acid with a clean brush, broom, or spray bottle. Wait about 10 minutes or until metal is etched, then wash thoroughly with water.

With the metal completely dry (if you had to etch it), apply paint with a roller on the etched side or pre-primed side of the two pieces of sheet metal. The paint should be a dark color, such as black, dark blue, dark green, dark brown, or even dark purple, to absorb the sun's energy more easily. A second coat of paint is sometimes required. You can paint before or after drilling the holes. Only the front outside of the pond metal needs to be pre-primed or etched and painted.

The front and back sides of the pond each consist of one 10' plus one 4' piece of sheet metal (4 pieces total) overlapped and connected by 1/2" stainless steel bolts. See "Pond Metal Assembly and Installation" Video 18-V2 for a visual on this step. Using one of the pieces of 2" angle in your kit as a template, overlap by 3" the two pieces of painted sheet metal on a piece of scrap lumber. It is best to secure the two pieces of overlapped sheet metal, the 2" angle, and the scrap lumber together with clamps or vice grips during drilling. You may also use hex head screws to secure the angle and sheet metal on each end to the scrap lumber so it doesn't slip. Then with a 1/4" bit, drill holes through 2" angle (template) through the center of the overlap of both sheets at the 3" spacing. This is the front of the pond metal. Repeat this step with the two unpainted pieces of sheet metal. This is the back side of the pond metal. (Mark the joining sections with numbers so they will match up properly when bolted together, if you are not able to bolt them immediately.)

Next, bolt the front painted sections together. This is best done by placing bolts and nuts through as many holes as you can while it is lying flat and then standing it on end to finish. Make sure that all the bolts are pushed through the holes from the inside of the pond metal so that the nuts end up on the outside of the pond metal when

finished. Do not tighten until all the bolts have been inserted. Then bolt the back unpainted sections together. Secure all bolts and nuts firmly with one person on the one side of the pond metal with a screwdriver to hold the bolts in place and another person on the other side with a ratchet to tighten the nuts.

Place a piece of the 2" angle on one end of the painted sheet metal and use as a template for drilling holes in the end of the sheet metal. Place the angle so the sheet metal ends up inside the angle. Again, it is best to clamp the angle, the sheet metal, and the piece of scrap lumber together, so the angle does NOT shift while drilling. You may also secure the angle to the sheet metal in the first hole with the bolts provided to ensure it doesn't slip. If the angle (template) shifts, it will be near impossible to get the bolts through the holes. Mark, with numbers, the painted sheet metal end and the edge of the 2" aluminum angle used as the template so that they can be matched up later when attaching it to the back section. Using the other side of the same piece of 2" aluminum angle, repeat this step with the unpainted sheet metal end that will match up with the appropriate end of the front painted sheet metal. After drilling the holes, bolt this piece of 2" aluminum angle to the back (unpainted) section of sheet metal. Make sure to place the 2" aluminum angle on the outside of the pond metal. Also make sure that the nuts will be on the outside of the pond metal. Now repeat the above for the other end of the front (painted) and back (unpainted) sections of pond metal.

## POND METAL SUPPORT SPACER BLOCKS

You will need 6 spacer blocks 24" high which will be used to support the metal for the above ground pond. They will be fabricated in position using 2x6 pressure treated lumber provided in kit and "married" together in place using 3" deck screws.

Start with 3 pieces of the 2x6 by 24" wood to fabricate the first two support spacer blocks, the two on either side of the north point. See "Pond Fabrication Step 1" Diagram 18-D1 for layouts and screw patterns. Pre-drill the 4 holes in the first piece of wood. It will attach to the top and bottom wall plates. The foundation wall liner (galvanized sheet metal) goes around the entire inside of the foundation wall and you will need to screw through it. Start the screws in the holes with the pointed end sticking out about 1/8". With the position of the block marked and the block in position, press it tightly against the wall and tap the heads of the screws with a hammer to pierce through the sheet metal. This should "start" the screw into the wood. *NOTE: You will need to remove any hex head screws holding the foundation wall liner in place if it interferes with the spacer blocks fitting tightly against the top and bottom plates.*

After the first piece of wood is in place, pre-drill the second piece of wood per the screw pattern. This pattern should ensure that the screws will not hit the screws in the first piece of wood. Lining up the wood with the first piece, screw in all four 3" deck screws. Then pre-drill the third piece of wood, line up, and screw in all four screws. Repeat the process for the other side of the north point.

Next, line up and repeat the entire process for the inside spacer blocks on either side of the north point. These two spacer blocks will include a 4<sup>th</sup> piece of 2x6 with the screw pattern as shown on "Pond Fabrication Step 1" Diagram 18-D1.

The last two spacer blocks that attach near the outside ends of the pond metal will include a 5<sup>th</sup> piece of 2x6 using the same screw pattern as shown on "Pond Fabrication Step 1" Diagram 18-D1. Repeat the process to secure the last two spacer blocks to the foundation wall.

## POND SITE PREPARATION

Follow instructions for laying out the pond metal as shown on the "Pond Fabrication Step 2" Diagram 18-D2. The finished pond will be approximately 12' 6" long and approximately 5' wide and 4' deep. Dig down 3" to 6" total below the bottom of the spacer blocks (depends on ease of digging and at least 2" to 3" below dirt level in dome) in the shape of the elliptical pond. Also watch "Above Ground Pond Excavation" Video 18-V1 for a more complete explanation of checking for the necessary depth of the pond area. Use a 4' level or 4' straight edge and place it vertically along the pond side of one of the spacer blocks at the north point with one end in the bottom of the dugout area. If the other end of the level hits one of the "E" struts, you will need to dig deeper, or else the "E" strut will prevent the 4' sheet metal from standing upright. (The claw side of a hammer is a very handy tool for digging.) The entire floor of the pond area must then be dug out and leveled to that depth.

## INSTALLATION OF THE BACK POND METAL

Attach the back section of the pond metal to the spacer blocks with 5/16" by 2" lag screws (2 per spacer block) to secure the pond metal to the north wall of the Growing Dome. See "Pond Metal Assembly and Installation" Video 18-V2 for a visual on this part of the installation. Make sure the bottom edge of the sheet metal goes to the bottom of the dugout area and the **pond metal is level** (use 4' level or transit). It is very important for the pond metal to be level. Once it is filled with water, the metal can buckle if it is not level. (If you opted to use hardware cloth for rodent protection, make sure the pond metal sits on top of the hardware cloth.) Then make sure the back pond metal is centered left and right. The lag screws securing the pond metal to the spacer blocks should be centered on the blocks and approximately 1" from the top and bottom edges of the spacer blocks. You will need to measure from behind the pond metal to find out exactly where the spacer blocks are then you can mark their positions directly on the metal. Mark an "X" on the inside of the back section for position of each lag screw on each spacer block. Double check to make sure that the back section of the pond metal is still level; adjust until it is level. Pre-drill using a 5/16" bit for the pond metal and a 1/4" bit for the wood, then ratchet in one lag screw. Then double check one more time for level. When level is verified, continue until all lag screws are in.

## BEHIND THE POND INSULATION

Once the back pond metal is in place, you will need to backfill dirt into any gaps at the base (just at the base) between the back of the pond metal and the foundation wall. Use the excavated dirt. With the toes of your shoes against the inside of the pond metal to hold it in place, drop in dirt and pound it down as best you can with a sledge hammer or piece of scrap 2x4 taking care not to push in the metal at the base (where your toes are) or damage the reflectix.

We have found it is best to install some kind of additional insulation contacting the back piece of sheet metal of the pond minimizing the heat loss through the back of the pond. Materials used for this can vary – if plastic wrapped insulation (aka encapsulated or poly-faced insulation) is available at your local hardware store, this is a preference we would recommend, but you can use rigid foamboard insulation (cut into strips is easier to install) or reflectix insulation in the air space behind the pond metal. It is difficult to reach behind the pond metal once the pond is completely installed and filled with water making this the perfect time to install additional insulation.

## INSTALLATION OF THE FRONT POND METAL

Bring in the front section of pond metal so that the two ends will match up with the angles you used as templates for drilling. (Again, if you opted to use hardware cloth for rodent protection, make sure the pond metal sits on top of the hardware cloth.) Attach the front section to the back section of the pond metal with 1/4" x 1/2" stainless steel bolts and nuts through the pre-drilled holes, making sure the metal is on the inside of the 2" aluminum angle. Secure all bolts and nuts firmly with one person on the inside of the pond metal with a screwdriver to hold the bolts in place and another person on the outside with a ratchet or an electric drill to tighten the nuts. It is easier to tighten the nuts from the outside, so you don't strip the bolts with the screwdriver. If you use an electric drill on the outside, be careful not to strip the threads. You will need a ladder or two to get in and out of the pond area.

You should have an elliptical pond. Check to make sure that the front section of the pond metal is level along the whole length from end to end and from front to back. If it is not, adjust until it is level. The front section needs to be fully supported for its entire length. Wood blocks or leftover siding shims are useful to place under the bottom edge of the front pond metal. Tape all lag screw heads and bolt heads inside the pond metal with two layers of duct tape to prevent rupturing the pond liner.

(If you chose to use hardware cloth as a rodent protection under the pond, double check that the hardware cloth extends beyond the pond metal and that the pond metal actually sits on the hardware cloth below. This ensures that the hardware cloth will not curl up and possibly puncture the pond liner.)

## POND BASE PREPARATION

Make sure the floor of the pond area is free of all rocks and clods, and rake level. If you needed to use wood blocks to support the front section, you will need to bring the dirt level up to the bottom of the front section sheet

metal both inside and outside of the pond area. Start with the inside of the pond area and compact the dirt with a hand tamper or 'stomp' on it. Any wood blocks used to support the front of the pond metal can be covered with dirt at this time. When you backfill the outside of the front pond metal, remember the 'toe trick' to keep the pond metal in place. Use the 4' level to ensure that the front pond metal is plumb and still level with the back.

If you chose to use hardware cloth as a rodent protection under the pond, make sure the hardware cloth is under the pond metal ensuring it won't curl up at the edges and that the hardware cloth has been covered completely with cardboard before you put in the bottom brace and sand. (If you needed to add dirt to bring the dirt level up to the bottom of the front section sheet metal, it doesn't matter if the dirt is on top of or below the hardware cloth. You will still need to cover the bottom of the pond area with cardboard before installing the bottom wood brace and sand.) Double check that the front section is still level and plumb. Also make sure the soil is high enough and firm enough to keep the bottom wood brace from sinking below the pond metal and angle pieces.

## POND BOTTOM BRACE

The wood brace for the bottom of the pond metal is cut from the owner-supplied pressure-treated 14' long 2x6. It sits with the 6" width flat on the base of the pond area. It should be evenly supported underneath its entire length by 'stomped' on dirt. It is important that the wood brace does NOT slip under the metal. Measure and angle cut on both ends to fit snugly and to brace the pond metal at the bottom between the corners of the 2" aluminum angle.

Once in position, place sand in the bottom of the pond area to ensure a smooth bottom for the pond liner. Slope the sand up the edges of the sheet metal 6" to 8" and up to the top of the bottom wood brace. Make sure there is plenty of sand sloping up at each end of the bottom wood brace. See "Pond Metal Assembly and Installation" Video 18-V2 for a visual on this part of the installation.