26’ GROWING DOME
UNDERSOIL VENTILATION SYSTEM

INSTALLING THE UNDERSOIL DUCT

This system is installed after growing beds are built. The main function of the undersoil system is to help control the temperature of the perimeter beds since they are more exposed to the outside temperature. These ducts (two on each side of the dome) start at each of the two corner edges of the pond and follow the inside of the foundation wall to the south point of the dome. They curve up out of the soil at the one end next to the pond and at the other end where the four ducts meet at the south point. See “Undersoil Duct Layout” Diagram 23-D1 for specifics on layout. If you are planning on raised beds, simply lay the duct on grade and put your soil on top of the pipe. If you place “fill” in the bottom of your beds, place the pipes on top of the fill. If you are not planning on raised beds, you will need to dig trenches for the ducts to fit into. In any case, when you meet the doorway as you place these ducts, you will need to dig down a little so that the ducts do not obstruct the entryway. Where the undersoil ducts come out of the soil at the pond and at the south point, they will need to be trimmed to approximately 4” above finished soil level. If your doorway is located in the south pentagon, simply have the four ducts curve up and meet on one side of the door or the other. (You can put nylon screen over the ends of the ducts to prevent dirt and debris from falling into them.)

FABRICATING THE BOX

If your box is not already assembled, using 1-3/4” bronze star drive screws, screw together the four sections of the undersoil distribution box through the pre-drilled holes. See “Undersoil Ventilation System Installation” Video 23-V1. One side only of the box overlaps its neighboring side. The small hole in one side is for the wire from the solar panel to come into the box. The piece with the 4” hole in it (with the attached fan) is the top of the box.

INSTALLING THE SOLAR PANEL

The solar panel is installed on the south side of the dome, so that it slopes at approximately 45 degrees to the horizon (or 15° + latitude) in order to get maximum solar input, especially in the winter months. See “Solar Panel(s) Installation” Video 23-V2 for visual on mounting the solar panel. The panel is held in place by three 2” roofing screws with washer screwed through the mounting brackets of the panel, through the glazing, and into the dome struts that are underneath. Only three of the brackets will be used. Having a fourth bracket gives you more flexibility of attaching locations.

Drill a 1/4” hole through the glazing next to a strut for the wire to go inside the dome. Seal around this hole on the outside with silicone. Run the electrical wire in such a way that it runs down the side of the struts that can be used to make the shortest pathway from the panel to the box. Use the wire staples to secure the wire along the sides of the struts. Push the end of the wire into the box through the pre-drilled hole and connect it to the fan. The white wire from the panel is usually used for the positive pole and this wire is connected directly to the red (+ve) wire of the fan, and the black wire is connected directly to the black (-ve) wire from the fan. The fan will not run if the polarity is reversed. With auxiliary wire, the grooved side is positive and the smooth is negative.

INSTALLING THE BOX

The undersoil box is installed over the top of the four undersoil ducts and is partially buried in the soil so that 6” of the box are beneath the finished soil level and 6” are above soil. When the fan is running, the only place for the air to travel is through the ducts.