

## APPENDIX A. Construction of the “Sludge O Matic”

Picture 3 shows the “Sludge O Matic” (SOM) fully assembled with the trap door in the closed position and the trigger line attached ready for remote use. The SOM is constructed simply by following the instructions below and referring back to Picture 3 for clarification of the fitting together of various pieces. One 19 cm x 24 cm rectangular base plate (body) of polycarbonate 0.6 cm thick is cut from stock material. Holes are drilled into the body in 13 locations and these holes are tapped to accept flat-head Phillips, ¼ x 20 316 stainless steel screws used for holding the frame pieces and spacers together (Figure A1-1). The following lengths are cut, for framing material, from 2 cm wide strips of 0.6 cm polycarbonate: two at 24 cm, two at 22 cm, three at 15.2, one at 19 cm, and one at 11 cm (Figure A1-2). The following lengths are cut for spacing material from 1.3 cm wide strips of 0.6 cm polycarbonate: one at 16.5 cm, and two at 24 cm (Figure A1-2). Holes are drilled into the frame pieces and spacers with care given to match the hole configuration in the base as shown in Figure A1-1 and A1-2. The holes in all the top pieces of framing are countersunk to allow the flat-head screws to be seated flush into the framing. The pieces are assembled in the order shown in Figure A1-2. Screws are inserted and loosely tightened until all framing and spacing materials are in place. Piece “10” is glued in place 4 cm from the edge and acts as the sill when the shutter door is opened to sub-sample sediment (Figure A1-2). Piece “11” is the shutter stop and is not assembled until after the shutter door is slid in place. A shutter door is constructed by cutting 0.6 cm polycarbonate stock material into a 16.3 cm x 30 cm rectangle (Figure A1-3). One narrow side of the shutter is beveled to 45 degrees to act as a cutting edge during closing of the door. The side of the shutter containing the sharp

edge of the bevel has both edges rabbet down 0.5 mm by 0.6 cm length wise into the edge the entire 30 cm length (Figure A1-3). Handles are made using 1.25" (3.175 cm) polycarbonate round stock. One handle is cut to a length of 10 cm and a 0.5 cm x 0.5 cm groove is cut into the handle 1.5 cm from the base. Three holes are drilled and tapped into the base of the handle. This handle is fastened opposite the cutting edge side positioned 2.5 cm from the end and centered widthwise (Figure A1-3). Three stainless steel screws are used to attach the handle to the shutter and the screws are counter sunk into the shutter (Figure A1-3). A second handle is cut to a length of 29 cm and 26 cm of the shaft is taken down to a diameter of 2.6 cm on a lathe (Figure A1-4). A 0.5 cm x 0.5 cm groove is cut 2 cm from the base (non-lathed end) of the handle. A 1.0 cm wide notch is cut 2.5 cm deep into the narrow diameter end of the handle. A 6.0 mm diameter hole was drilled through the end of the handle across the center of the notch. The notch will accept the loop of a deployment line and the hole will accept a stainless steel aircraft pin used to lock off the deployment line or pole. A "handle attachment plate" is cut from 0.6 cm thick polycarbonate stock into a 10 cm x 19 cm piece to which the handle is fastened (Figure A1-4). Three holes are drilled then tapped in the base of the handle and stainless steel screws are used to attach the handle to the "handle attachment plate." The screws are counter sunk into the handle attachment plate allowing a flush fit when the plate is attached to the sampler body. Holes are drilled in the "handle attachment plate" to match the configuration of the tapped holes in the base (Figure A1-4 and A1-5). The holes in the "handle attachment plate" will align with and accept four of the screws used to hold the framing and spacers together on the body (Figure A1-5). These four screws are long enough to extend through the framing, spacing, body, and handle attachment

plate with enough threads left over to add lock washers and nuts. In this way the handle attachment plate and handle is securely fastened to the sampler body. The shutter door is slid into the grooves on the sampler body with the handle facing up in the same direction as the handle on the sampler body. The shutter stop is secured to the sampler body preventing the shutter door from being removed completely from the sampler. The sampler is now fully assembled and ready for use. If the sampler is going to be used remotely additional steps are as follows. A block system is rigged by attaching a double block to the shutter door handle using a plastic tie seated in the groove of the handle (Figure A1-6). A double block with becket is attached to the main handle on the sample body using a plastic tie seated in the groove of the handle. The desired length trigger line is rigged through the blocks and fastened securely to the becket giving a 4:1 pulling ratio. A pole or line may then be attached to the main handle and inserting a stainless steel pin through either the pole or line to lock it off. If a pole is used holes must be drilled in the pole to match the hole in the handle. If line is used prepared lead weights must be added to the sampler. Lead blocks are prepared at the desired weight simply by drilling a center hole in the lead and then painting the block to prevent contamination. The desired amount of weight is added to the sampler before attaching the deployment line.

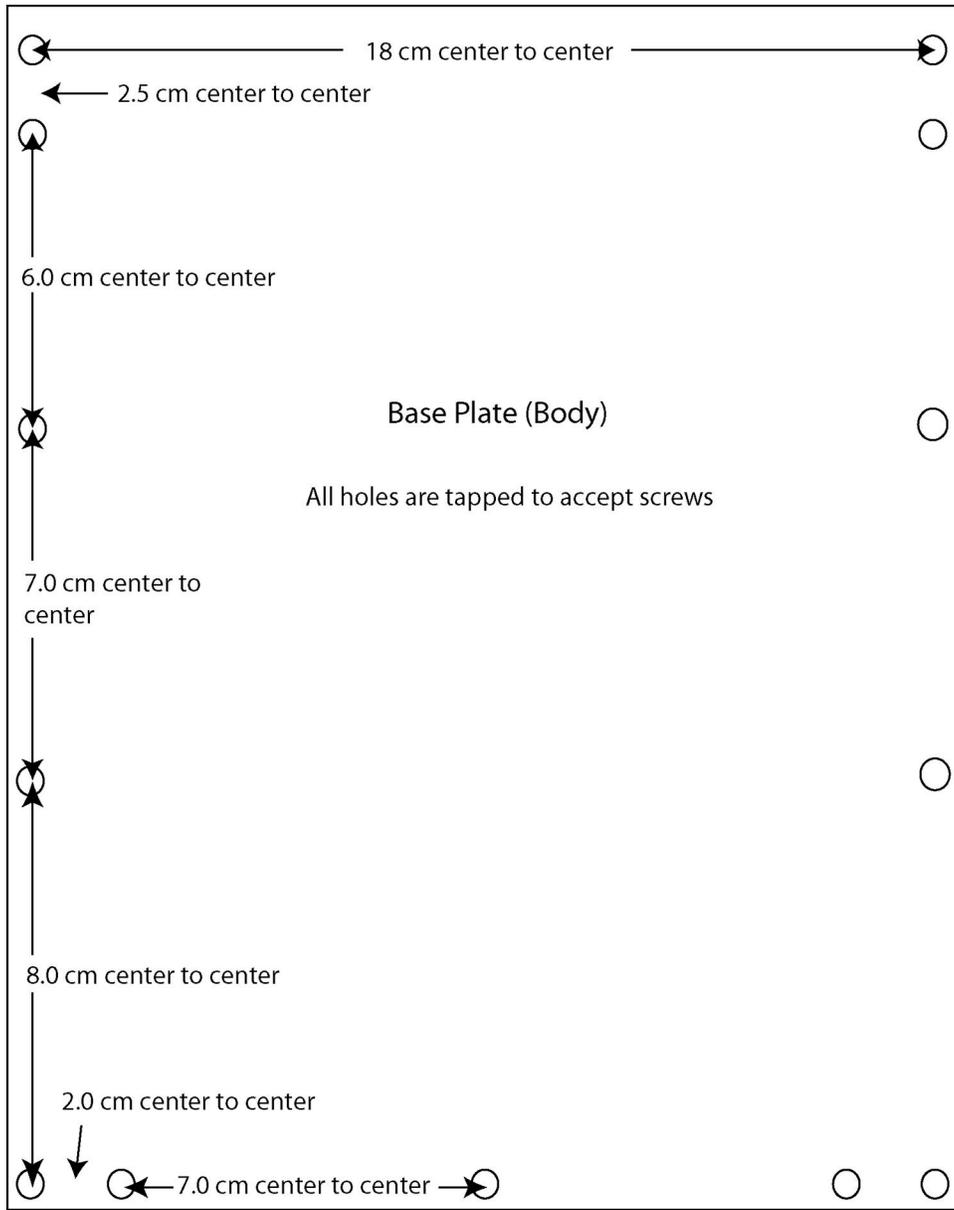


Figure A1-1. Base plate (body) of sampler showing the locations of holes drilled and tapped to accept screws for holding the framing.

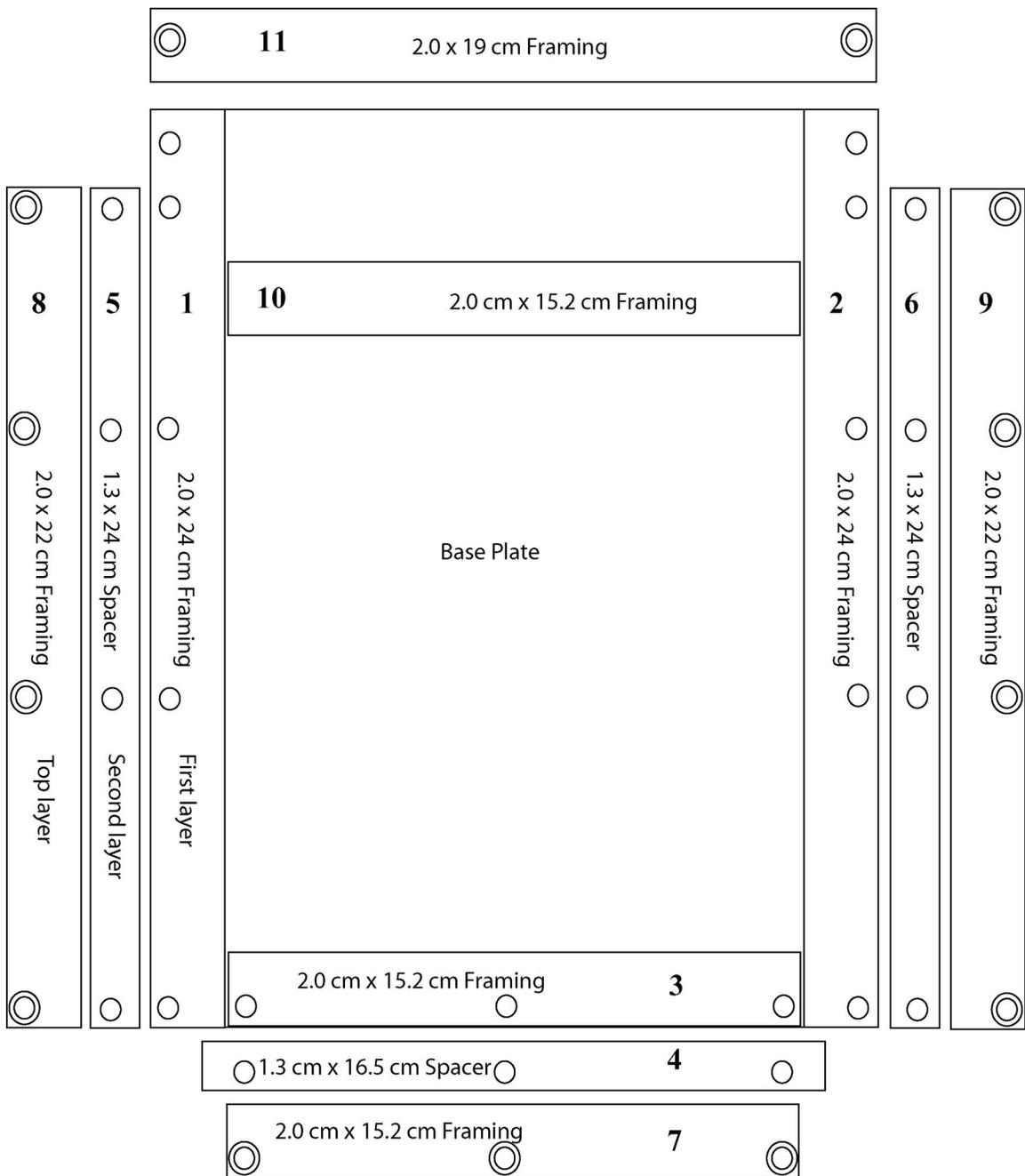


Figure A1-2. Framing pieces and spacing pieces are shown in their prospective position in relation to the base plate. The numbering in bold identifies the piece and order in which the piece should be assembled, with the lowest number assembled first. “Top pieces” 7-9 & 11 have counter sunk holes to accept counter sinking Philips head screws. Piece 10 is glued in place. Piece 11 is not installed until the shutter is slid in place.

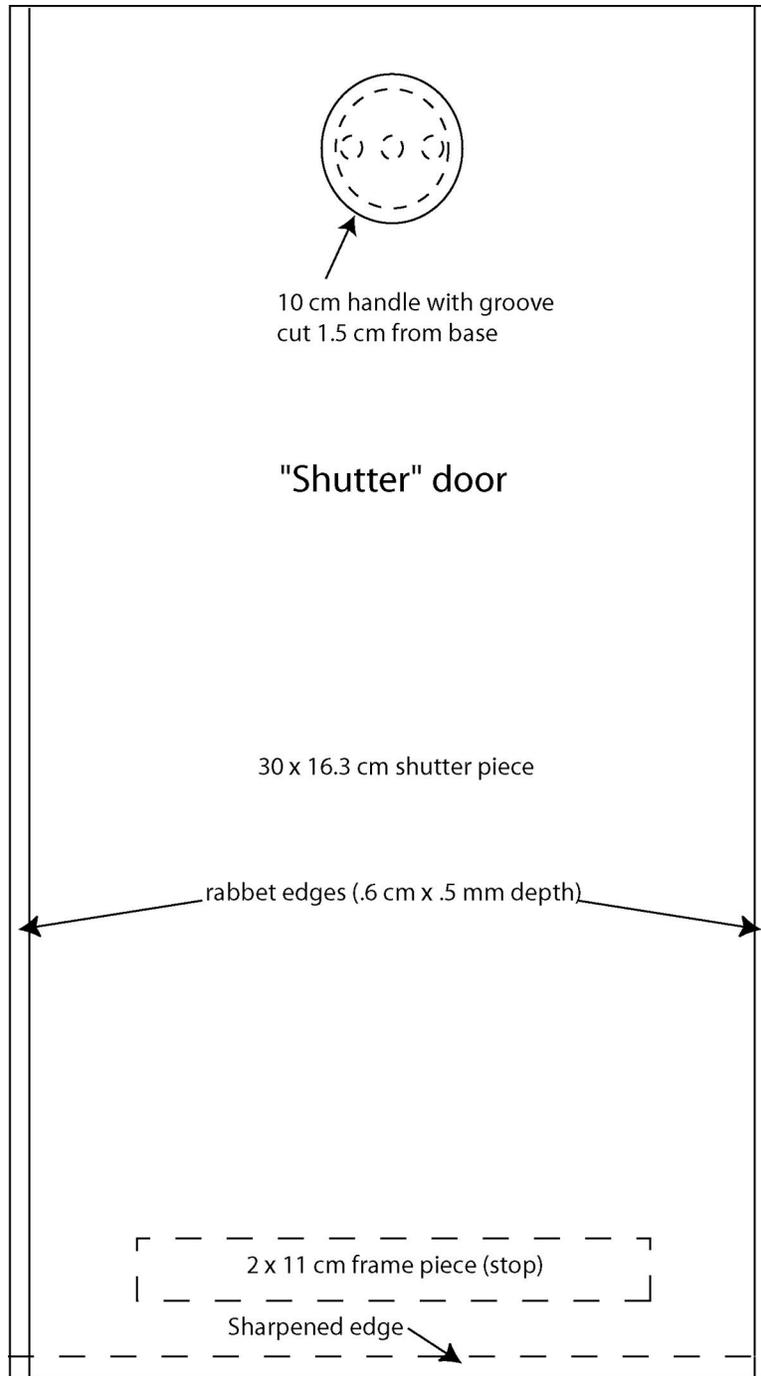


Figure A1-3. Shutter door with a sharpened cutting edge on one end and handle on the other. The shutter body has a stop piece glued to it on the opposite side to which the handle is attached. The handle is attached with 3 stainless Philips head counter sinking screws. The shutter body has counter sunk holes to accept these screws. Rabet edges 0.6 cm from the edge on the same side of the handle.

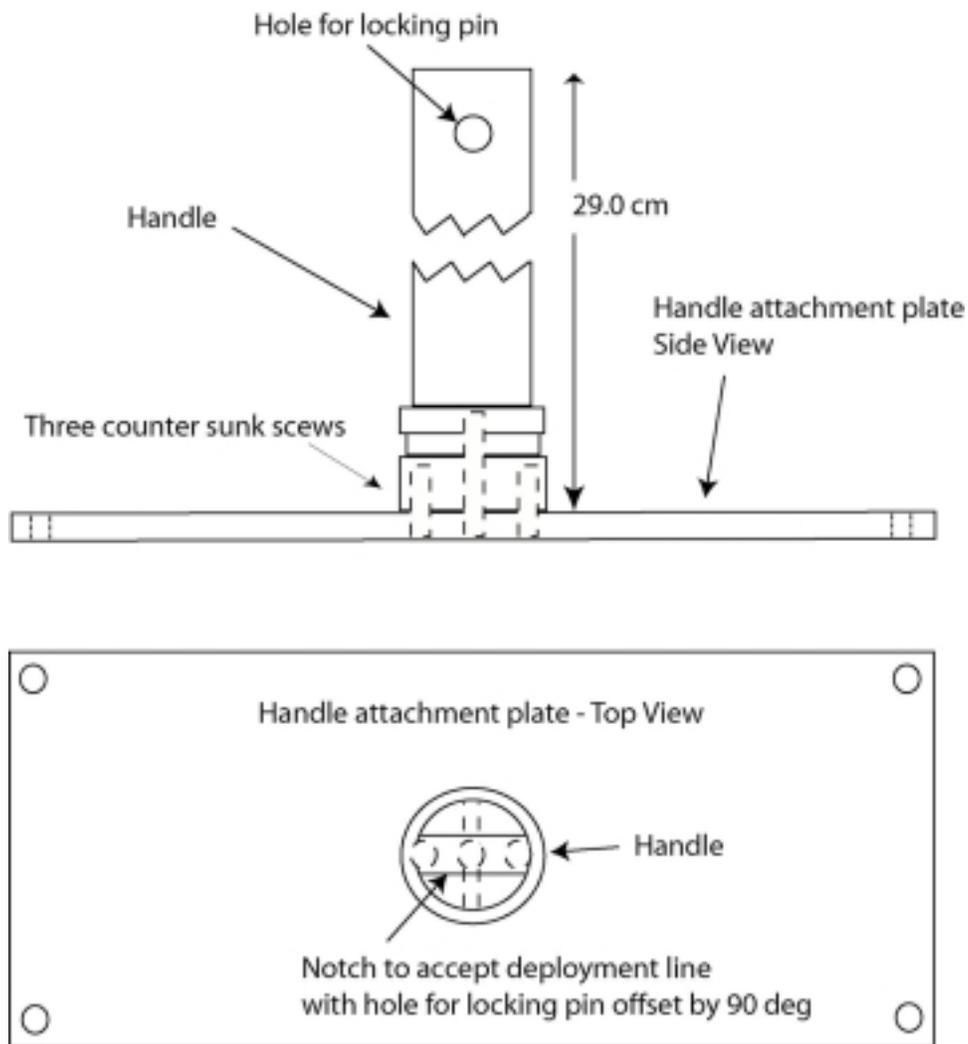


Figure A1-4. Handle attachment plate shown in two views, downward looking and side view. The screw hole pattern in the handle attachment plate matches the screw configuration of the sampler body. The notch to accept a deployment line is shown as is the hole to accept a locking pin. Note the hole is offset by 90 deg to the notch. Three countersunk Phillips head screws are used to attach the handle to the plate.

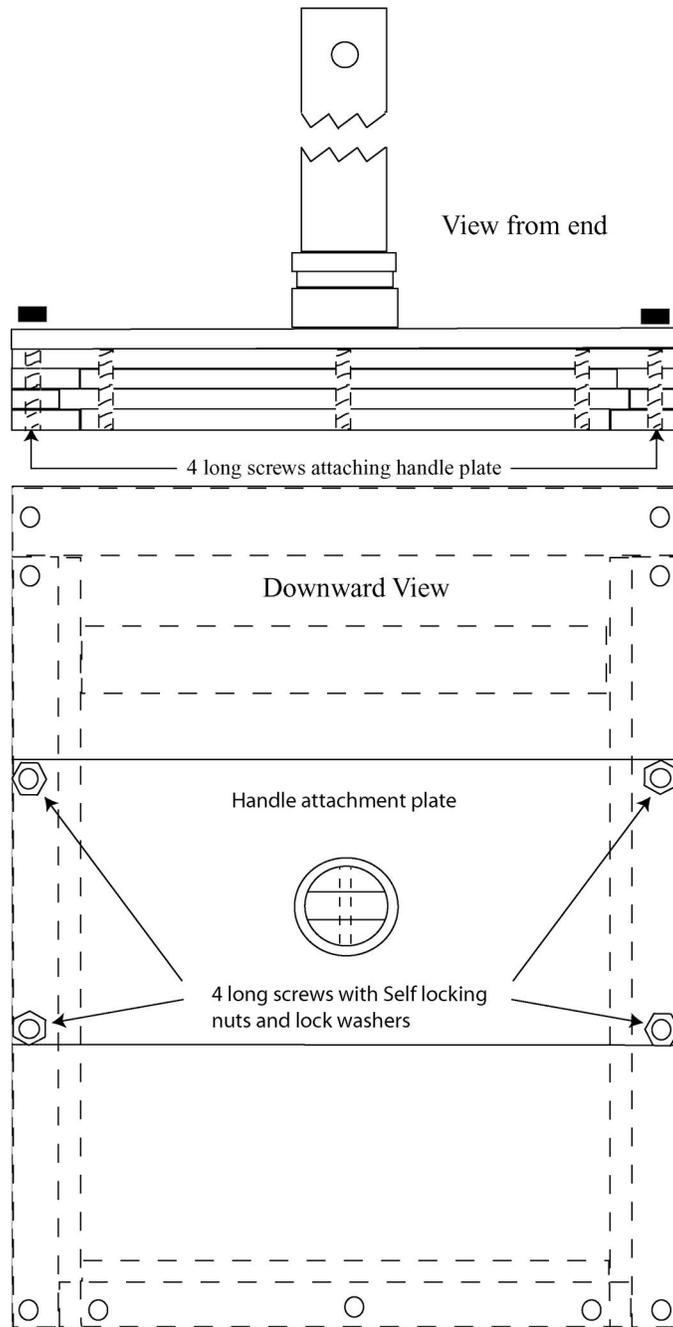


Figure A1-5. The handle attachment plate is shown securely fastened to the sampler body with four long screws, lock washers, and self locking nuts.

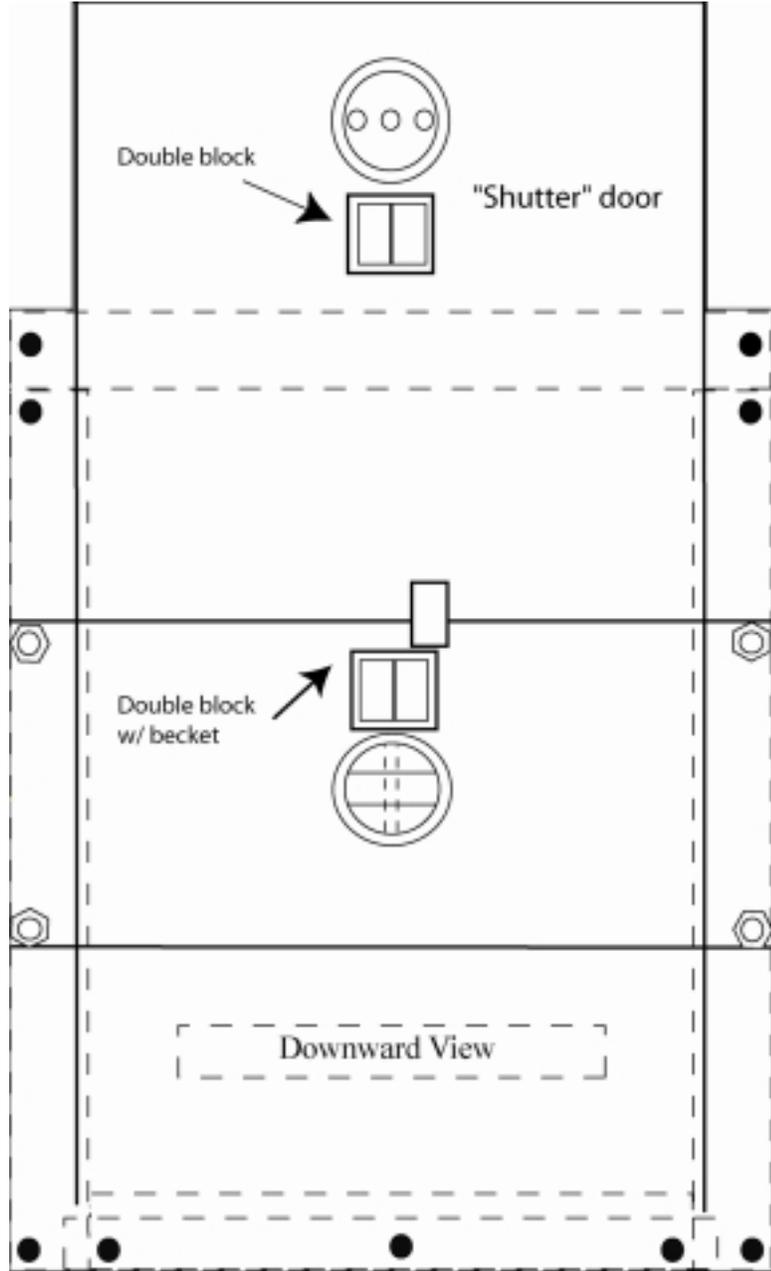


Figure A1-6. Downward view of sampler with shutter door installed. The block system positioning is shown with one block attached to each handle with a plastic tie seated in the groove of the handle.