



DOME CONSTRUCTION



Super adobe dome

The super adobe technique of sustainable construction has been around for hundreds of years. The method has been refined throughout the past 40 years to utilize simplified assembly so non-architects and non-engineers can build their own domes.



Ventilation

Long or short poly bags are filled with on-site earth and arranged in layers of long coils. Strands of barbed wire between them act as both mortar and reinforcement. PVC pipes are added between courses to provide year round ventilation.



Buttressing Openings

Metal form work is put in place to support the buttressing of the main door opening.



Completed Bagwork

Stabilizers such as cement, lime, asphalt emulsion may be added. The waterproof exterior finish is applied last. The mud inside the bags must be allowed to dry and cure for three additional months before the next processes can be executed.



Exterior Plastering

For the exterior plaster to properly adhere to such an intricate and curved surface, several techniques were experimented with. The most effective method entailed applying an eco-friendly, breathable adhesive to the entire dome and allow it to cure.



Scratch Coat

Once the breathable adhesive had properly cured, a medium to light grade combination of sand and grit are lightly dusted into place. This will allow for the first layer of exterior plaster something to hold on to.





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Strengtheners

A special combination of natural fibers are added to the sand-based exterior plaster. These fibers serve both to increase the overall strength of the plaster while prevent future cracking.



First Layer of Plaster

After the initial grit layer has cured, the first thin layer of plaster can be applied to the surface.



Plastic Mesh

Next, a strong plastic mesh is laid on top of the wet plaster. The mesh will allow the second, thicker layer of plaster an additional surface to adhere to. With the curved shape, this is one of the most important steps.



Curing Process

After experimenting with several different techniques of layering the plaster, the final process is determined upon with the desired results.



Complex Geometry

Two master masons were hired to ensure proper techniques would be consistently followed. Despite their combined knowledge and skills, the domes still proved to be challenging.



Ready for Monsoon

The dome will be fitted with a wooden door reminiscent of the ones used in the nearby villages. The next months will subject the dome to rain, cold and then the heat of summer.





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Larger Dome

After the experiments with plastering the smaller dome, the larger dome is prepared for the same process.



Monolithic Structure

Just as the weaving of the plastic poly-bags served to strengthen and stabilize the overall structure, the plaster should have a similar effect of sealing all the connection points.



Interior Finishout

Once the wooden exterior doors and windows are fitted on the larger dome, the electrical, plumbing, and tile work will be added.