



Vertical Shaft Brick Kiln construction at Mulanje, Malawi

Development Alternatives has worked on an extensive action research that strives to deliver socially equitable, environmentally feasible and economically scalable technological solutions. One such example is the Eco-Kiln (Vertical Shaft Brick Kiln (VSBK) – energy efficient and environment-friendly technology for firing clay bricks. This technology reduces coal usage by 40–50 per cent and allows small-scale entrepreneurs to earn carbon revenues by negotiating as a cluster. Several eco kilns have been rolled out in various states of India. With the similar mandate, we have started the VSBK construction work in Malawi.

Prior to the construction activities all the vegetation (shrubs, bushes etc) was removed from the site. All undulations were leveled to obtain a leveled surface and the excavated soil was kept aside for future use. Arrangements of the water for general use were made by digging a well near the site. While conducting the layout process for VSBK, the orientation of the kiln was kept from east to west to block the prevalent wind direction in this country (south to north) through an unloading tunnel. After excavation, the layout was established for the kiln perimeter and transferred to the wooden profiles upon pegs. This was transferred to the ground by means of a spirit level instrument and the outlines for the stone soiling were set after the pits for the hydraulic shafts were marked and excavated in the soil bed. After the laying of the first layer of the stones, interstitial voids were rammed with wet mortar and small stones to improve the particle packing and the PSD of the section, followed by other layers of stone soiling in similar fashion right up-to the RCC level. After the pits were cleared of the excavated earth, base of the hydraulic shaft was treated with stone soiling followed by PCC. Rebar detailing was provided along with shuttering as per the scope of RCC work for the shaft base. Constant curing and ramming with mortar and small stones led to the PCC work for foundation (1:2:4) after checking of the level. The voids were topped by a layer of wet cement.

After sufficient curing, dimensions as denoted for the brick masonry work was marked upon the PCC by means of a thread and spirit level instrument. First brick laying was done with a mortar of 1:6 and the stepping was further continued to the second layer to the ground level. Extreme care was taken in filling

and flushing the mortar with the bricks so that all joints are filled with mortar. For purposes of curing, the fresh cement brick work was covered with locally available gunny bags or clothes.

These series of events mark the end of laying down the foundation for the VSBK. The structure will be completely laid in the coming month along with initiation of similar construction activities at other locations in Malawi.