

LIME STONE KILN – using a ‘wattle and daub’ technique

This method of limestone burning uses a Kiln constructed of Clay mixed with sand and straw and will stand about 4/5 ft tall, mounted on four small legs, bricks or similar material. By raising the kiln off the ground we create the possibility for an updraft supply of air to aid the combustion of the coal.

This type of Limestone burning kiln was used in France where the Kiln was constructed near to the supply of the Limestone and on the site for a new building. The burnt lime being the chief ingredient along with sand that made up the lime mortars that were used in building before the introduction of the modern cements. After burning the limestone the kiln had to be broken open to empty out the burnt lime; (calcium Oxide, caustic lime)

METHOD OF CONSTRUCTION



The clay kiln is constructed on a willow and hazel structure. The structure has the shape of a tapering chimney, measurements at base of chimney is 3 ft Diameter made with 8

4/5ft straight hazel rods stuck into the ground. The 8 spaces between the hazel rods are divided by 2 further rods, hazel or willow, giving a total of 24 upright rods. The first four rods are placed in the ground in a cross formation a further four rods bisect this cross to form a second one. Then the sixteen remaining rods are placed in the eight spaces.

The base of this chimney is woven up with a 'Pairing stroke' started in several places. After a while the stroke can be changed to 'English Slewing'. The chimney is woven to the desired height remembering to pay attention to the taper.

CLAY MIXTURE:

Two / three wheelbarrows clay - sand & straw, water to mix.

To 'Daub' the willow structure, clay is mixed with 'sand' and 'straw'.

To 1 part 'Tight Clay' add 2 Parts sand, or to a clay that has already a high content of sand just add 1 part Clay to 1 part sand. Add water to mix. Towards the end of mixing add one third bale of dry straw chopped to about three/ four inches length.



When the mixture has achieved the right kind of consistency start to place it onto the willow structure. Take moderate hand full of clay and make a round 'Pat' Each 'pat' is placed on the basket so that they slightly overlap each other. Start the building up process from the bottom working completely around the basket before going on to the next layer. It will take at least two/ three layers to build up the required overall thickness of about 3 / 4 inches.

Let the completed kiln air dry for as long as possible. Small fires can be built out side of the four firebox entrances. When it is thought that the kiln is sufficiently dry it can be loaded with the fuel and

limestone.

LIMESTONE

Obtained locally is broken up into fist sized lumps ready to be loaded into kiln.

FUEL

Smokeless coal or Coke can be used at a ratio of 1 part coal to 4 parts Limestone.

This is added to the kiln laced in between the limestone, starting with a layer of coal.

FIRING THE KILN

When the kiln is loaded the drying fires are moved under the grate in the fire box. The fire should be maintained until you are certain that the coal is burning well.



The kiln should not be allowed to rise above 900 Centigrade a pyrometer should be used to gauge the temperature. This is placed at interval through the sides of the up the kiln as the fire burns upwards through the Limestone.

Firing takes up to 10/12 hours to complete, leave to cool down over night.

On the following morning make a hole in the base of the kiln slightly above the grate and carefully extract the 'caustic lime'. Be extremely cautious as burnt lime is potentially dangerous and can cause serious burns. Remove Limestone to Slaking area.

SLAKING THE BURNT LIMESTONE - QUICK LIME

Place small quantities of lime into water only for experimental purposes add small quantities of water to a burnt piece of limestone. Very high temperature are achieved,
250 degrees centigrade by exothermic reaction.

Note: By law working with Lime, all persons especially the children should wear the appropriate safety wear. After contact with lime or slaked Lime wash in plenty of running water.

The Limestone Cycle

1. Rain from the Heavens falling,
Almost every night -
And nearly every morning.

Lash, lash, lashing.
Splash, splash slashing.



2. Upon the rock is telling.
Their substance slowly
dissolving.

Dissolve, revolve, solve.
Solve, revolve, dissolve.

3. Plenty of water in the
ground,
In limestone country can be
found.

Rushing clear
here and there.

4. Under ground can be
found,
Much of calcium Compound.

Drip, drop, plop.
Plop, drop, drip.

5. From the roof and the floor
Growths appear and plenty
more.

Dissolve, dissolving, dissolved.
Dissolved, dissolving, dissolve .

6. Stalactites and Stalagmites,
Grow by day and by nights.

Drip, dripping, dropped.
Dropped, dripping, drip.

7. Down streams and river,
Flowing hither and thither.

Dissolve it, deposit, resolve it.
Resolve it, deposit, dissolve it.

8. Out to sea and oceans,
Flows the calcium motion.

Selfish, shellfish, shelter.
Shelter, shellfish, selfish.

9. Laid on the ocean floor.
Shellfish and molluscs more.

Sedimentary, elementary, deposit,
Deposit, elementary, sedimentary.

10. Chalk cliff and Limestone Mountains'
Marble statues in Roman fountains.

Carboniferous, Jurassic, Cretaceous.
Cretaceous, Jurassic, Carboniferous.

11. Calcium carbonate, what to do ?
Into the Lime Kiln, with you.

Burn, turn, turn.
Turn, turn, burn .

12. Calcium oxide, water Hydroxide,
Lime, Sand and Carbon dioxide.

Quick lime lick.
Lick lime quick.

Acid gas .
Alkaline ash.

Bernard Graves