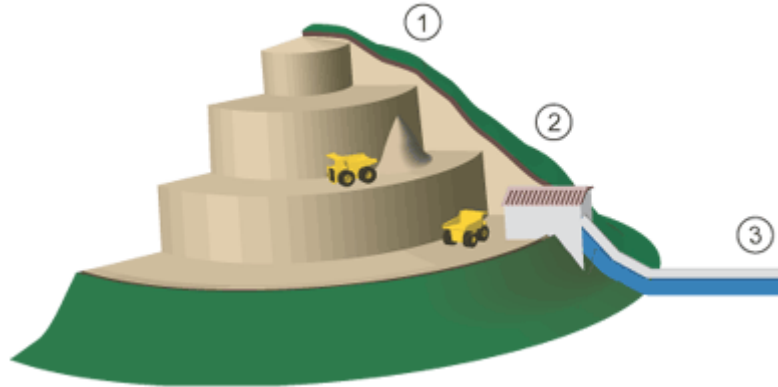
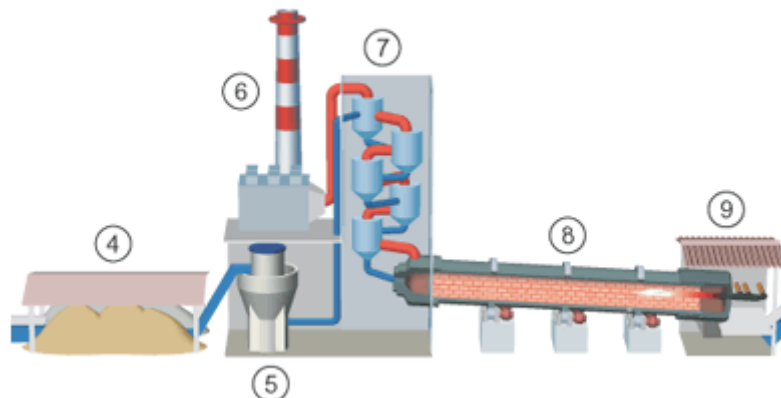


## Cement Production Process

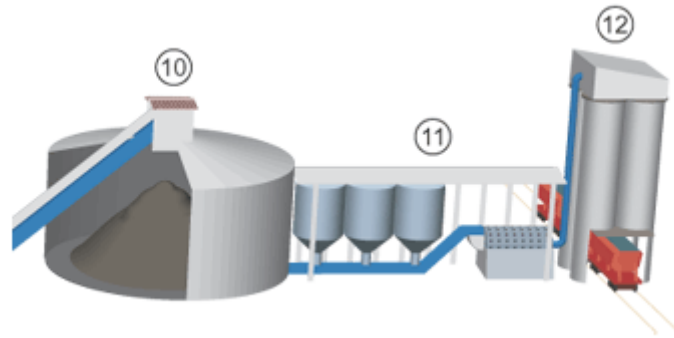
1. Quarry: Typically limestone, marl and clays as well as other materials containing the required proportions of calcium, silicon, aluminium and iron oxides are extracted using drilling and blasting techniques.
2. Crusher: The quarried material is then reduced in size by compression and/or impact in various mechanical crushers. Crushed rock is reduced in size from 120 cm to between 1.2 and 8 cm. Drying of raw material may also be necessary for efficient crushing and pre-blending.
3. Conveyor: Raw material is then transported from the quarry using conveyors, rail wagons or other suitable logistics solutions specific to the cement plant.



4. Mixing bed: The crushed limestone and clay is homogenized by stacking and reclaiming in a long layered stockpile. This material is then ready for milling and drying in the kiln.
5. Raw mill: The raw materials are milled and dried in a roller mill. Heavy rollers are held over a rotating table and the coarse material is milled until it is fine enough to be carried by air to a homogenizing silo.
6. Filter: Bag filters comprise filters of either woven fabric or needle felts to remove particles from kiln exhaust. The exhaust gas from many kilns is used for drying raw materials, thus improving the energy efficiency of the plant.
7. Preheater: Cyclone preheaters enable the raw material of cement production to be preheated before entry into the kiln. This increases the energy efficiency of the kiln as the material is 20-40% calcined at the point of entry into the kiln.
8. Kiln: The kiln is designed to maximize the efficiency of heat transfer from fuel burning to the raw material. In the preheater tower the raw materials are heated rapidly to a temperature of about 1000°C, where the limestone forms burnt lime. In the rotating kiln, the temperature reaches up to 2000°C. At this high temperature, minerals fuse together to form predominantly calcium silicate crystals - cement clinker.
9. Cooler: The molten cement clinker is then cooled as rapidly as possible. The ambient air used to cool the clinker is then fed into the kiln as combustion air - ensuring high utilization of the heat produced.



10. Clinker silo: Clinker may be either stored on site in preparation for grinding to form cement, or transported to other sites.
11. Cement mill: Finish milling is the grinding together of cement clinker, with around 5% of natural or synthetic gypsum. Other cementitious materials such as slag, flyash or other pozzolans may also be incorporated into the final cement powder.
12. Logistics: Final cement may be transported pre-bagged or as a bulk powder. The method of transport selected varies according to location - and may include transport via truck, rail or ship.



**Reference:**

<http://www.caricement.com>