

## CHAIRMAN'S MESSAGE



The third King, His Majesty Jigme Dorji Wangchuck, opened the doors of Bhutan to the outside world in the 1960's, shedding centuries of isolation. He led the nation on the path of development under a policy of modernization without compromising the nation's unique culture and tradition.

Several areas of development such as roads, schools and hospitals were indentified under the first Five Year Plan. As more and more infrastructure mushroomed through subsequent plans, the responsibility of taking the nation forward passed on to His Majesty the fourth King, Jigme Singye Wangchuck.

His Majesty the fourth King broadened the scope of development through industrialization, encouragement of the private sector and entrepreneurship, and the opening of its doors to outside trade and education. One of the primary needs felt, amongst others, was to establish cement industries to ensure self-sufficiency in the development of infrastructure. It was under this initiative that Lhaki Cement Private Limited was established in 1990.

Since establishment, Lhaki Cement has continued to contribute to nation building by supplying quality cement to the satisfaction of every customer. In the process of extraction and production, the company has spared no efforts to ensure that the environment is not compromised at any cost. The company also promotes all-round interaction for the development of its employees. Sports, technical training courses and socio-cultural activities integrate seamlessly with its manufacturing and commercial operations.

Lhaki Cement is a part of the Lhaki Group of Companies.

## THE COMPANY

Lhaki Cement was quick to realize that success in the business hinged on ushering in technological advancements to maintain quality and meet the growing demand. The company's in-depth understanding of the market and its strict adherence to quality control measures has made it one of the foremost producers of superior quality Cement in Bhutan.

Situated in Gomtu at the foothills of the Pugli Range, the company keenly observes the need to sustain ecological balance in the area, through several highly effective pollution control measures and systematic afforestation programmes.

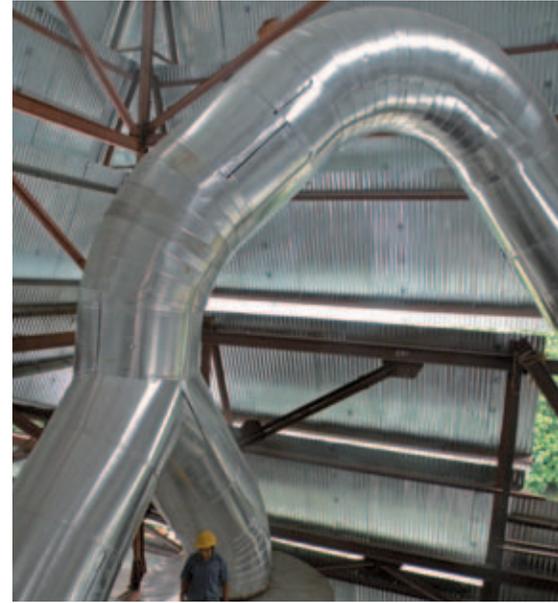
Lhaki Cement is managed, operated and maintained by a team of dynamic, highly qualified and experienced managers, engineers, technicians and workers.



### TECHNOLOGY

Lhaki Cement has ushered in a new technological era with the replacement of the 150 TPD CRI Vertical Shaft Kilns by a 450 TPD Dry Process Rotary Kiln with 5 stage Suspension Pre-heater, for manufacture of high quality cement Clinker.

In the augmentation process, Lhaki Cement has considered efficiency as the most important parameter in the selection and has installed the latest machinery and equipment to achieve optimum output. Emphasis has been laid on pollution control measures and substantial amount of the allocated budget has been utilized on pollution control equipment alone. The plant operation is centrally controlled from the central control room by the world renowned "Rockwell" Programmable Logic Control(PLC) system and ABB field instruments



### THE PROCESS

Limestone, the basic raw material for manufacture of Cement is extracted by drilling and blasting in the mines at Titi, about 13 Kms. away from the plant. The Limestone boulders are then transported to the plant at Gomtu by tippers. The main operations involved in the production of cement in the plant are crushing and grinding of Raw meal, sintering and burning of ground raw meal to obtain Clinker, cooling the clinker and grinding of clinker to produce cement.

Limestone is crushed by a rotary impact hammer crusher to less than 25 mm size and fed to Ball Mills(Raw mill) along with sandstone and iron ore in predetermined proportion through weigh feeders and ground to fine powder to form the Raw meal. This Raw meal is transported by pneumatic gravity conveyors, bucket elevators and weigh feeders at a uniform set feed to the suspension pre-heater. The Raw meal then assumes its travel through different stages of the Pre-heater, undergoing chemical and physical changes before it enters the Rotary Kiln where it is burnt by fine coal fired into the Rotary kiln to attain a temperature of 1300 to 1400 degrees centigrade for the formation of Clinker. The hot clinker is cooled in the Reciprocating Grate Cooler to maintain the Clinker exit temperature of around 80 degrees centigrade.

Clinker is transported by deep pan conveyor and belt conveyors to the stock yard. This Clinker, after weathering for a week, is fed to a Ball mill(Cement mill) along with gypsum in predetermined proportion to be ground to cement of required fineness, to produce Ordinary Portland Cement(OPC). In another Ball Mill, predetermined proportion of Clinker, Blast Furnace Slag and Gypsum are ground together to the desired fineness to produce Portland Slag Cement(PSC). Cement is then conveyed to the storage silos and extracted to be packed in 50 Kg/ 25 Kg bags by digital stationary packing machines and dispatched to various destinations by trucks.



## QUALITY CONTROL

The principles of total quality management are followed at every stage and in all aspects of cement production activities.

Lhaki Cement complies to I.S. 269 for 33 grade Portland cement, I.S. 8112 for 43 grade Ordinary Portland Cement I.S. 455 for Portland slag cement which are widely used in different construction activities.

Limestone is a major raw material, which is mined from the captive mines. An additive material, sandstone is available in Sanglay khola adjacent to Lhaki Cement Plant and iron ore is procured from India. Slack coal, used as a fuel, is procured from S/jonkhar, Bhutan and also from India, where as high purity Gypsum a retarding material for cement setting is procured from the mines in Pemagatshel Bhutan. High Glass content Blast Furnace Slag is sourced from Durgapur, India.

A rigid quality control system is strictly followed for all the raw material and intermediate products like raw meal and clinker as well as the end product CEMENT. Hourly / daily / weekly & monthly tests are conducted for chemical & physical properties as per I.S. standards.

Samples of different types of cement, is collected hourly from the cement grinding mills & packing plant. The cumulative cement sample is tested for fineness, setting time, compressive strength and soundness to ensure its workability, strength and durability. Cement is packed in BIS approved 50 kgs bags and the weight of each bag is maintained as per the I.S standards.



## ENVIRONMENT

Situated in Gomtu at the foothills of the Pugli Range, the Company upholds the need to sustain ecological balance in the area. To achieve and maintain minimum emission, highly effective pollution control equipments like the Reverse Air Bag house for preheater stack, Pulse jet Bag Filters for venting of Mills, transport systems and transfer points and a Multiclone dust collector for cooler gas have been installed. The installed pollution Control system alone constitutes about 10% of the total cost of the project.

## ENVIRONMENTAL CELL

Lhaki Cement has set up a dedicated in-house Environment Cell, staffed with qualified, experienced and dedicated personnel, responsible for monitoring of stack emission, ambient air quality, work environment, noise level measurement, process monitoring and the operation and maintenance of air pollution control equipments. The environment cell performs its responsibilities in very close co-ordination with other technical departments, viz. mechanical, electrical, instrumentation, process and production to maintain the emission below the specified levels. With the enhancement of production capacity from 150 TPD to 450 TPD of Clinker, Lhaki Cement has assumed greater responsibility towards maintaining cleaner working environment for its employees and also to reduce the effect of pollution on the natural habitat in and around the plant. To this effect, The environment cell is equipped with the latest monitoring equipments like stack sampler, stack velocity monitor, respirable dust sampler, flue gas analyzer, digital thermometer, digital pressure meter, sound level meter and personal sampler to monitor and create a data base to facilitate timely maintenance and upgrade pollution control systems when necessary.



## STAFF

Lhaki cement lays great emphasis on Human Resources Development programmes. Staff welfare is enhanced on a regular basis through periodic sponsorship of social events, improving social services and training programmes. The company also encourages physical activities like sports and other non business activities.



## OCCUPATIONAL SAFETY AND HEALTH (OSH)

Owing to the nature of work involved in an industry, OHS is a serious concern and cannot be ignored. Hence, the management of Lhaki Cement has taken measures to keep all its employees safe, healthy and comfortable. Welfare and safety is an integral part of our operational system. Thus, Lhaki Cement has maintained very good safety track record.

Personnel Protective Equipments and molasses are provided to every worker and good housekeeping is always maintained. Unsafe areas are identified with safety posters and sign boards to create awareness among the employees. Every department is provided with first aid box with emergency medicines for immediate first aid when the need arises. Lhaki Cement also actively participates and initiates Social/Cultural activities and helps in inculcating moral and cultural awareness among its employees and their family. This helps in maintaining discipline and preserving mental agility.

## THE PRODUCT

Lhaki Cement after the augmentation of the cement plant to 450 TPD clinker with the installation of rotary kiln and P.L.C. is now all set to produce higher volume of ordinary Portland cement Grade 33, Grade 43 and blended cements. These types of cements can be widely used from ordinary construction as well as construction of bridges, dams, hydel projects, high rise buildings and other mega structures.

Several prestigious projects have used Lhaki Cement extensively. They stand testimony to the high quality of Lhaki Cement. Prime examples are the Sikkim Legislative Assembly, the High Court and Central Jail in Gangtok, Sikkim, Several constructions of the hydroelectric Project at Rangit, Sikkim and NRTI, BGTS complexes, numerous schools and buildings in Bhutan.



## MARKETS

In the 16 years of operational history, Lhaki Cement has stood the test of time. "Lhaki Super" and "Lhaki Classic" are established brands and "Lhaki Top", the newly launched Portland Slag Cement(PSC) is also a widely accepted brand in the market.

Almost 80% of total production is exported to India with 20% consumption in the domestic market where PWD remains the major buyer. The projection for future domestic demand is a trajectory of growth with the increase in the construction activities and power projects coming up in the near future.

### Lhaki Cement Market Scenario with major Institutional Buyers:

