

# International Journal of Innovative Research in Science, Engineering and Technology

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## Direct Material Feeding and Power Savings

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**ABSTRACT:** The crusher is the important one to crush the large size limestone. The limestones are taken from mines by blasting. But nowadays the limestone is imported from Dubai. The imported limestone size is 70mm for that the crusher is no need to crush the material. We can directly feed to the reclaimers. By using this the total power for running the crusher is saved. The pollution free by using this idea. The crusher runs to crush the material the power usage is high. The power to run the crusher is high we planned to save the power. The maintenance work is also less by using our idea direct material feeding and power saving.

### I. INTRODUCTION

Cement is a building material it is applied in the form of a paste in water mixed with sand. Portland cement is defined as finely ground calcium aluminates and silicates varying Compositions which hydrate, when mixed with water to form initially a plastic-mass and end up as a rigid concrete structure with good Compressive strength. Cement production is a resource-intensive practice involving large amounts of raw materials, energy, labor, and capital. Cement is produced from raw materials such as limestone, chalk, shale, clay, and sand. These raw materials are quarried, crushed, finely ground, and blended to the correct chemical composition. Small quantities of iron ore, alumina, and other minerals may be added to adjust the raw material composition. Typically, the fine raw material is fed into a large rotary kiln (cylindrical furnace) where it is heated to about 1,450 degrees Celsius (2,640 degrees Fahrenheit). The high temperature causes the raw materials to react and form a hard nodular material called "clinker." Clinker is cooled and ground with gypsum and other minor additives to produce cement. Beyond the mining of the raw materials, there are five major process steps in cement production. Each of these steps has specific energy requirements and consumption patterns, as well as various energy efficiency measures that can be applied to reduce energy use and increase productivity depending on the characteristics of and conditions at each individual cement plant. The remaining energy consumption at cement plants is used for final-product packaging, lighting, and building services.

Crushers are used mainly for size reduction, from larger size particle into the smaller size particle. First raw material i.e., Limestone is primarily size reduced in the mines and are being taken to the plant by Lorries for crushing. They are unloaded at the laminated conveyors, which is taking into the crusher.

The mill has a cylindrical casing the rotor shaft is mounted inside the casing. The mill has two rotor shafts. The shafts rotate in opposite direction, on the shaft disks hammer are mounted. The rotor shaft rotates inside the casing.

The limestone is fed to the top of the mill by laminated conveyor. The limestone is hit by hammer against breaker plates on the casing. The limestone is broken into pieces. The mill has 20 numbers of hammers. Each rotor shafts have 10 hammers.

The grate set is used to allow the correct size product only. The grate plate is set fed to pass about 80% of the 100-mm size limestone. The gap between the grate plates is adjustable.

The flywheel is attached to the motor shaft. This is used prevent the breakage of motor shaft. In the crusher the secondary size reduction is achieved there is a screen, that allows 3" particle only. Maximum size of 3" particle only coming to the belt conveyor. They particle only coming to the belt conveyor. They are sent through the magnetic separator.

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### II. PROPOSED MODEL

The crusher is used to crush the limestone from large size to 50 to 70 mm. but now the limestone is imported from Dubai and Oman. The size is 50 to 70mm so we don't need to crush the limestone for that we directly feeding the material.

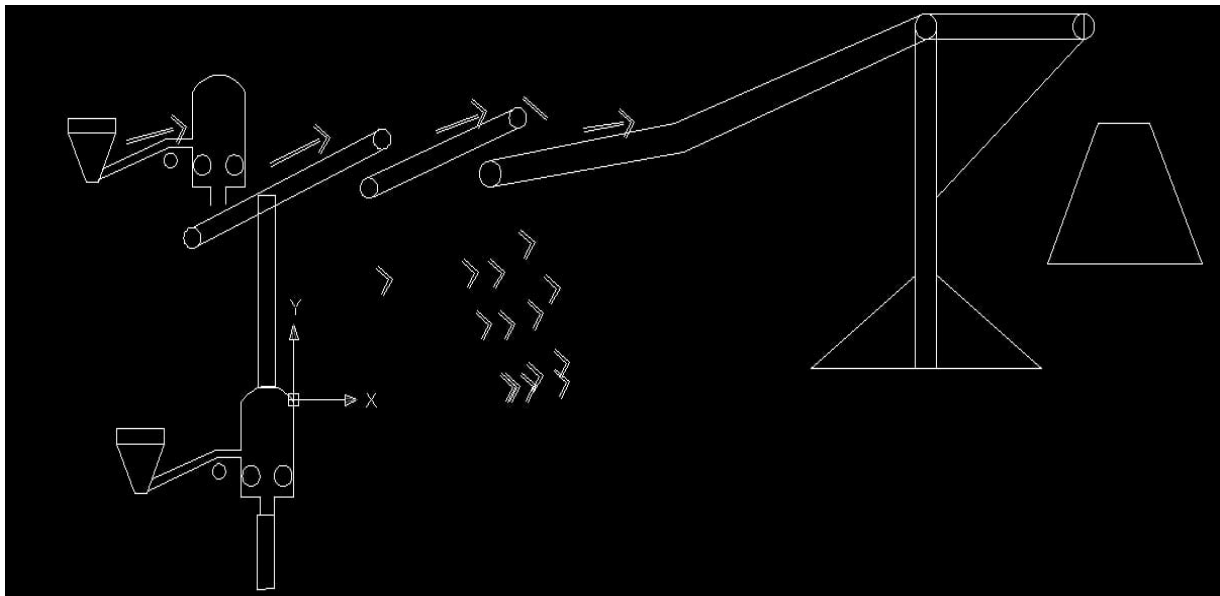


Figure.1 Existing model

FINAL MODEL:

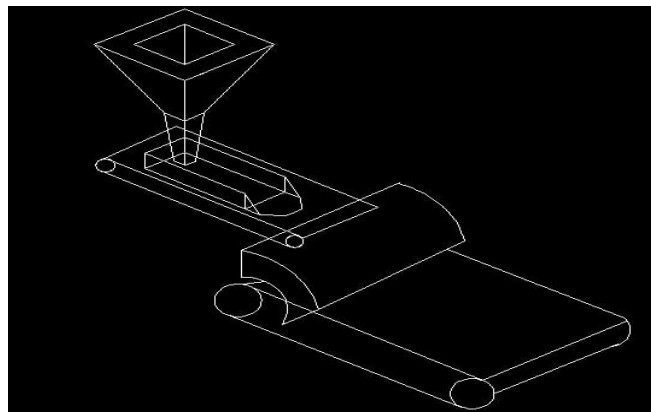


Figure 2 Proposed model

Limestone is a sedimentary rock composed mostly of the mineral calcite and comprising about 15% of the Earth's sedimentary crust. It is a basic building block of the construction industry (dimension stone) and a chief material from which aggregate, cement, lime and building stone are made.

Limestone. Limestone is a sedimentary rock which is often composed of the skeletal fragments of marine organisms such as coral, foraminifera and molluscs. Its major materials are the minerals calcite and aragonite, which are different crystal forms of calcium carbonate ( $\text{CaCO}_3$ ).

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But now a days limestone taken from Dubai and Oman. Imported limestone is used as the raw material in cement industry.

### III. WORKING MODEL

The problem is identified, waste of using the crusher for the imported limestone as a raw material for the cement. Our idea is to feed the raw materials in the hopper directly in to the reclaimer for that we use our ideas.

**Step1:** We use the hopper to feed the material into the hopper is used to move the material in flow.

**Step 2:** Below the hopper, chute is placed its in rectangular in shape and it is made up of mild steel plate and its opening is 700mm because the materials will remove from the hopper in fast manner.

**Step 3:** Then we used the vibrator to feed out the raw materials out from the hopper on the belt conveyor. For the support of the vibrator we use the ISM Beam and channel.

**Step 4:** One end of the ISM Beam is fixed on the ground by using the Anker bolt M16 and the other end is fixed on the vibrator to give the grip when vibration occurs.

**Step 5:** In the vibrator, the vibrator motor is used to start the vibration for that we use the vibrator motor of 3kw MVE External Electric Motor to the vibration.

**Step 6:** The vibrator also fabricated in Mild Steel plate of 16mm. the open coil helical spring also used for the compression of the vibrator when loading, the open coil spring is used for the compression purpose the coils are 6coils in a spring.

**Step 7:** Then the belt conveyor, is used to transfer the material from the hopper to the reclaimer for that there are three nos. to transfer the raw materials from one place to the another.

**Step 8:** To run the belt conveyor the roller is used to run the belt there are two drums are used

- I. Head drum
- II. Tail drum

**Step 9:** These drums are placed in the ground its just above the ground level. The tail drum is placed after the vibrator to return the belt when running the conveyor.

**Step 10:** The motor is placed on the head drum, the motor is used to run the belt conveyor for the speed reduction the gear assemblies are used in the company.

**Step 11:** Finally we get the practical view of our project and it runs in successful manner.

### IV. CONCLUSION

As the proposed system ensures low power consumption, uniform flow Easy access, easy maintenance and less pollution, the new proposed system can be Implemented. The production rate can be increased by the proposed system. The transfer of the raw material can be done in fast manner.

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