

PRESENTED  
BY  
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( Deputy General Manager )

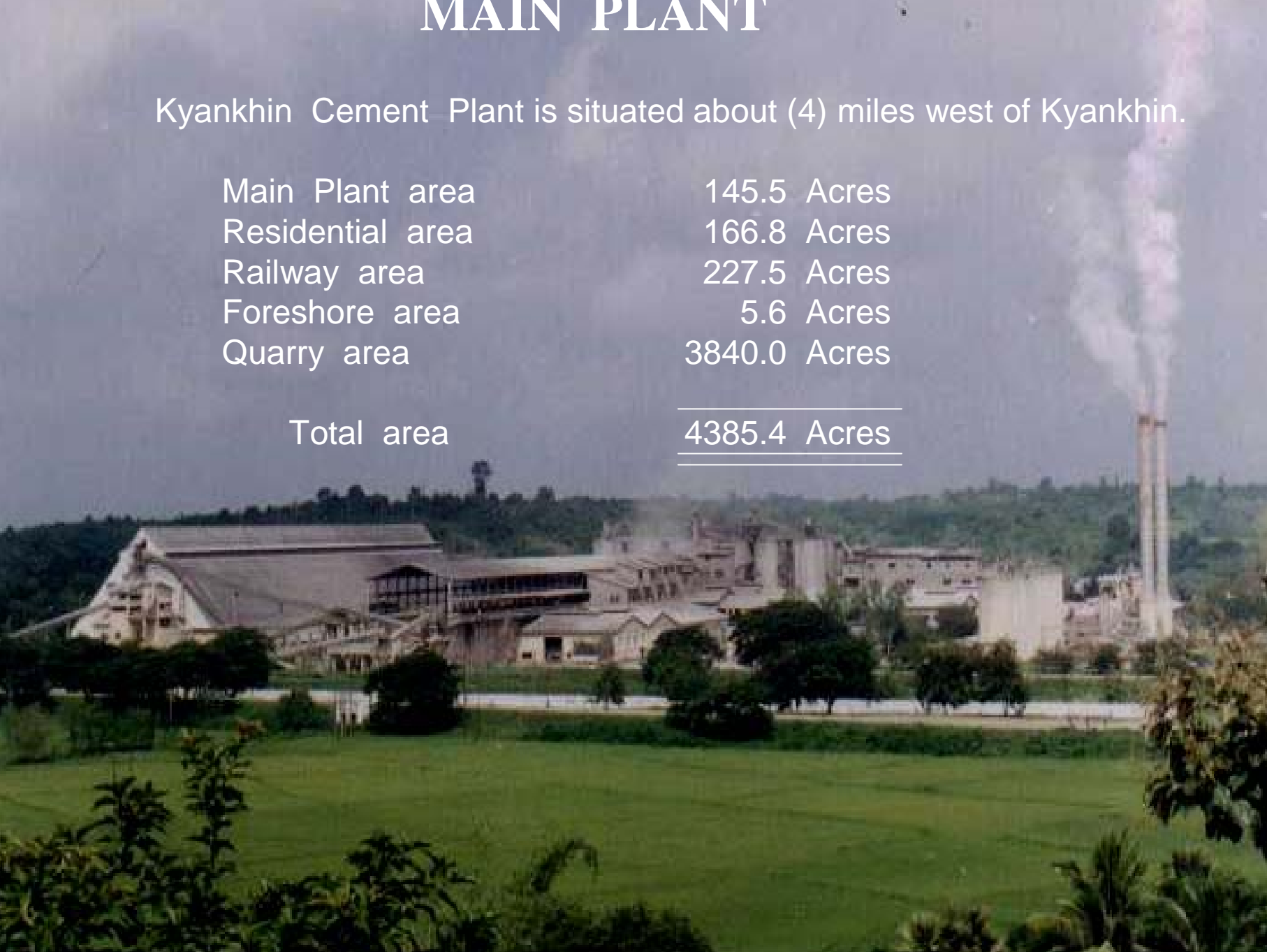
KYANKHIN CEMENT PLANT



# MAIN PLANT

Kyankhin Cement Plant is situated about (4) miles west of Kyankhin.

Main Plant area	145.5 Acres
Residential area	166.8 Acres
Railway area	227.5 Acres
Foreshore area	5.6 Acres
Quarry area	3840.0 Acres
Total area	<u>4385.4 Acres</u>



# LIMESTONE QUARRY

The Quarry is situated 5½ miles south of the plant. The area is 3840 acres. The reserve of limestone Quarry is-

- |  |                 |
|--|-----------------|
| (a) Above 300 Feet   | 49 Million Tons |
| (b) Between 100 Feet<br>and 300 Feet                                 | 41 Million Tons |
| (c) Total reserve is 90 Millions Tons and can be used for 180 years. |                 |

# LATERITE QUARRY

Laterite Quarry is situated 8 miles south west of limestone quarry.

(a) Area

246 Acres

# PRIMARY CRUSHER

## **GYRATORY CRUSHERS**

Input Size - 1070 mm

Output Size - 150 mm

### **Year of Operation**

No.(1)

1975-76

No.(2)

1985-86

### **Installed Capacity**

(1)No.

300 Ton/hour

### **Actual Capacity**

(1)No.

240 Ton/hour





# Electric Locomotive



# SECONDARY CRUSHER

## IMPELLER BREAKER

Input Size - 150 mm

Output Size - 25 mm

### Year of Operation

No.(1)

1975-76

No.(2)

1985-86

### Installed Capacity

(1)No.

150 Ton/hour

### Actual Capacity

(1)No.

120 Ton/hour



# OVERHEAD TRAVELLING CRANE

## **Overhead Travelling Cranes**

Hoisting Load – 8 tons

(Bucket wt.4.3ton+Rated Hoisting Load 3.7ton)

Bucket Capacity – 2.32 cubic meter

Supplier - Kawasaki Heavy Industries

### Year of putting into use

No.(1)	1975-76
No.(2)	1975-76
No.(3)	1985-86
No.(4)	2002-03

### Capacity

Lifting Capacity    3.7 Ton





# RAW GRINDING MILL

Type of grinding system-Wet process,

Open circuit system

Tube mill, (3) compartments

Dimension – 2.5M dia. , 12.5M length

Supplier – Kawasaki Heavy Industries

## Year of Operation

No.(1) & (2)

1975-76

No.(3) & (4)

1985-86

## Installed Capacity

(1)No.

35 Ton/hour

## Actual Capacity

(1)No.

32.5 Ton/hour



# ROTARY KILN

Type of Kiln- Wet process with chain system,

6-supports, All welded

Dimension – 3.3M dia. , 125M length

Supplier – Kawasaki Heavy Industries

## Year of Operation

No.(1) & (2)

1975-76

No.(3) & (4)

1985-86

## Installed Capacity

(1)No.

400 Ton/day

(4)No.

1600 Ton/day

## Actual Capacity

(1)No.

32.5 Ton/hour



# FINISH GRINDING MILL

Type of grinding system-Closed circuit,

Side drive type

Ball mill, (2) compartments

Dimension – 2.75M dia. , 8.219M length

Supplier – Kobe Steel Co;Ltd.

## Year of Operation

No.(1) & (2)

1975-76

No.(3) & (4)

1985-86

## Installed Capacity

(1)No.

22.50 Ton/hour

## Actual Capacity

(1)No.

20 Ton/hour



# PACKING PLANT

Type of Packers – All Four Spouts Inline Packer

Number of Packers – (4) Nos.

Capacity of each Packer – 50 ton/hr.

Supplier – Kawasaki Heavy Industries

## Year of Operation

No.(1) & (2)

1975-76

No.(3) & (4)

1985-86

## Installed Capacity

1)No.

50 Ton/hour

## Actual Capacity

1)No.

35 Ton/hour



# Thermal Saving Potential



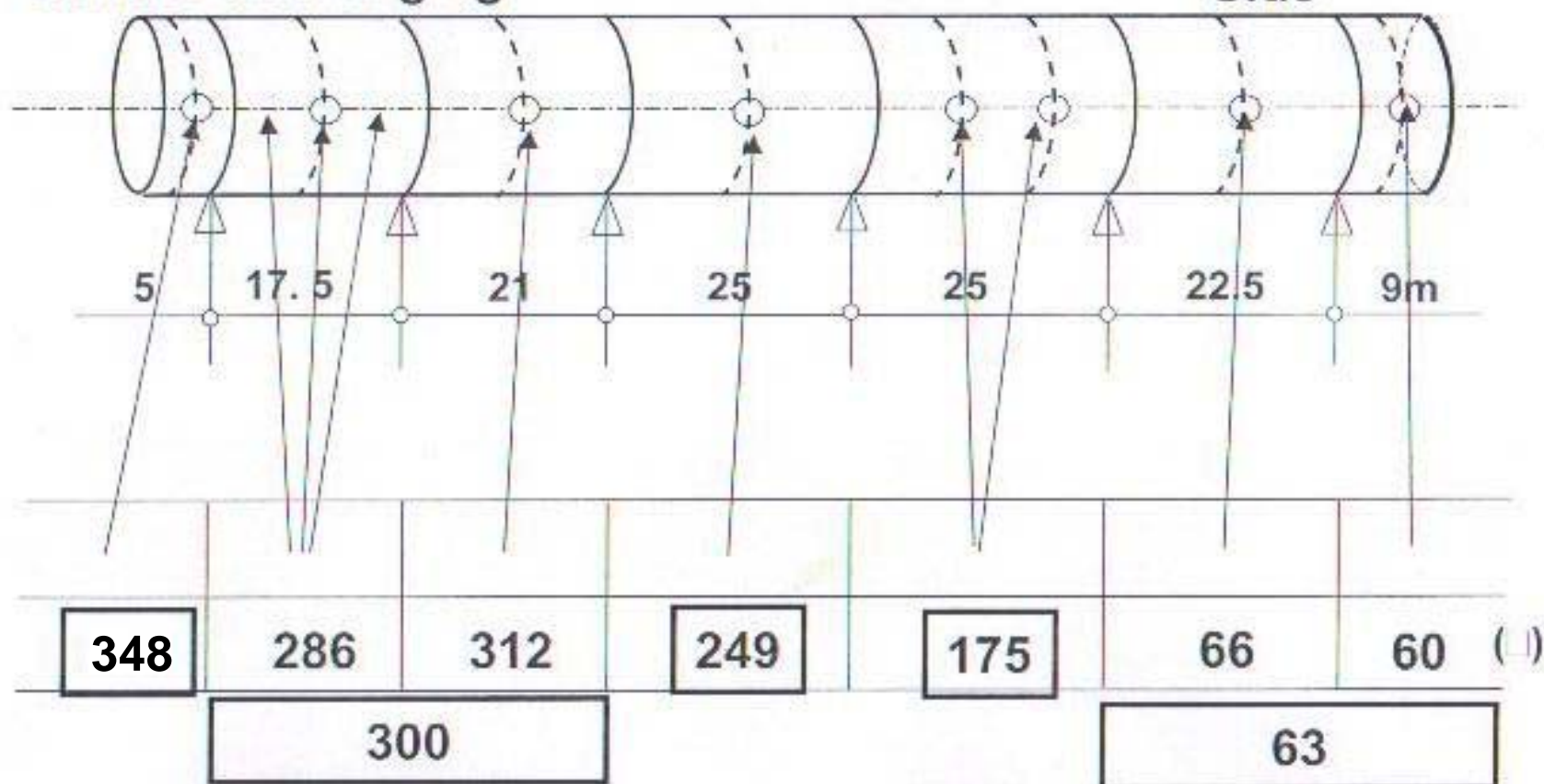
# ROTARY KILNS



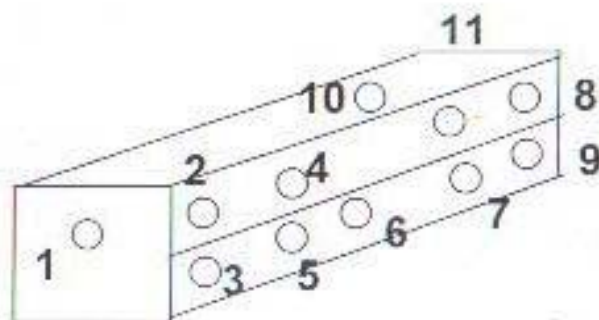
# Measurement of No.3 Kiln Surface Temperature

Burner side &  
Clinker discharging

Slurry charging  
Side



# Measurement of Clinker Cooling Chamber Surface Temperature



1	2	3	4	5	6	7	8	9	10	11
73	50	65	65	67	74	98	96	86	42	118
65						98				

Cooled clinker side
Top dust
Kiln side

Top and bottom temperatures are assumed as same as ambient temperature.

# Collecting Data (Wet Process)-1

Dry raw material (dry RM)	t/h	
Water content in wet raw material	wt% on wet RM	43
Clinker yield	-	0.625
Clinker temp at cooler exit	deg C	80
Heat of clinkering (calcination & sintering)	kcal/kg-cl HC	-
Specific heat of clinker (Cp)	kcal/kg-cl deg C	(0.192)
Fuel rate (kiln)	m <sup>3</sup> N/h	2500 ~ 2800
Specific gravity of fuel	kg/m <sup>3</sup> N	0.62
Specific heat of fuel (Cp)	kcal/kg deg C	-
Low heat value of fuel	kcal/m <sup>3</sup> N	-
Fuel temperature	deg C	35
Fuel rate (precalciner)	kg/m <sup>3</sup> N HC	-
Exhaust gas temp at kiln or preheater exit	deg C	130 HC
O <sub>2</sub> in exhaust gas	Vol %	1.5 ~ 2.0
CO <sub>2</sub> generation in calcination	m <sup>3</sup> N/kg-cl	(0.27)
Specific heat of exhaust gas	kcal/m <sup>3</sup> N deg C	(0.338)



# Collected Data (Wet Process)-2

Kiln surface temperature (average)	Deg C	213.7
Surface area	m <sup>2</sup>	1320
Convection coefficient (hc)	kcal/m <sup>2</sup> ·hr·deg C	-
Radiation coefficient (hr)	kcal/m <sup>2</sup> ·hr·deg C	-
Emissivity	-	0.8
Preheater surface temperature (average)	deg C	NA
Surface area	m <sup>2</sup>	NA
Convection coefficient (hc)	kcal/m <sup>2</sup> ·hr·deg C	-
Radiation coefficient (hr)	kcal/m <sup>2</sup> ·hr·deg C	-
Emissivity	-	-
Cooler surface temperature (average)	deg C	88.5
Surface area	m <sup>2</sup>	106.92
Convection coefficient (hc)	kcal/m <sup>2</sup> ·hr·deg C	-
Radiation coefficient (hr)	kcal/m <sup>2</sup> ·hr·deg C	
Emissivity	-	0.8
Ambient temperature (outdoor)	deg C	35



## Items Listed on Heat Balance Table

Heat Input		Heat Output	
Heat of combustion of fuel	96715 MJ/h	Heat for clinkering	26565 MJ/h
Sensible heat of fuel		Sensible heat of clinker at cooler exit	380 MJ/h
Sensible heat of wet raw material		Sensible heat of cooler exhaust vent	6198 MJ/h
Sensible heat of combustion air	44 MJ/h	Heat for evaporating water in raw material	41288 MJ/h
		Sensible heat of kiln exhaust gas	9150 MJ/h
		Radiation heat on kiln surface	17782 MJ/h
		Radiation heat on kiln hood surface	62 MJ/h
		Radiation heat on cooler surface	237 MJ/h
		Unaccountable heat losses	
		Total	101662 MJ/h
			- 4903 MJ/h
Total	96759 MJ/h		96759 MJ/h

Base of temperature : Ambient air temperature

Base of heat amount : Kcal per kg of clinker (kcal/kg-cl)

# Electrical Power Saving Potential

# FANS & BLOWERS



**Exhaust Fan**



**Primary Air Blower**



**Air Cooling Fan**



**Discharge Cooling Fan**

## (2)No.1 Kiln □□

4 fan, blowers

	flow $Q_0$ [m <sup>3</sup> /min]	Pressure $P_0$ [kpa]	Motor $L_0$ [kw]	Input power $L_a$ [kw]	Damper $D_{cl}$ [%]
Air cooling fan	1100	2.45	75	52.9	25
Discharge Cooling fan	175	1.47	11	5.4	50
Primary air blower	120	11.77	45	29.7	30
Induced fan	900	1.47	45	29.7	25
Exhaust fan	2350	2.45	170	107.0	73

### (3)No.2 Kiln

4fan,blowers

	flow $Q_0$ [m <sup>3</sup> /min]	Pressure $P_0$ [kpa]	Motor $L_0$ [kw]	Input power $L_a$ [kw]	Damper $D_{cl}$ [%]
Air cooling fan	1100	2.45	75		25
Discharge Cooling fan	175	1.47	11		50
Primary air blower	120	11.77	45		45
Induced fan	900	1.47	45		45
Exhaust fan	2350	2.45	170		74



#### (4)No.3 Kiln □□

4fan,blowers

<div></div>	flow $Q_0$ [m <sup>3</sup> /min]	Pressure $P_0$ [kpa]	Motor $L_0$ [kw]	Input power $L_a$ [kw]	Damper $D_{cl}$ [%]
Air cooling fan	1100	2.45	75	54.0	20
Discharge cooling fan	175	1.47	11	6.6	50
Primary air blower	60	5.88	15	8.7	50
Induced fan	900	1.47	45	35.9	25
Exhaust fan	2350	2.45	170	107.0	80

## Cement mill ( fan,blower )

	flow Qo[m3/min]	Pressure Po[kpal]	Motor Lo[kw]	Input power La[kw]	Damper Dc[kw]
No.1 Induced fan	500	2.94	55	48.5	64
No.2 Induced fan	500	2.94	55	20.8	64
No.3 Induced fan	500	2.94	55		65
No.4 Induced fan	500	2.94	55		65

# Methods of Power-saving of Pumps, Fans, and Blowers

Viewpoint of Power-saving	Examples regarding Methods of Power-saving
a) Reduction of flow quantity	Anti-leak of water and air measure, prevention of excessive use, others
b) Reduction of pressure	Reduction of necessary pressure, Reduction of pressure loss ( filter, others)
c) Reduction of excessive specifications □ (Reduction to necessary specifications □	<input type="checkbox"/> To exchange to small capacity or machine of less pressure loss <input type="checkbox"/> To exchange of impeller □ to cut of outer diameter of impeller, and to decrease the step of multistage impeller <input type="checkbox"/> To change the numbers of the turns (change of motor or pulley, Addition to inverter)
d) Addition of variable flow quantity control and selection of operation numbers that adapt variable load	<input type="checkbox"/> Addition of the control of the numbers of running machine <input type="checkbox"/> To control the selection of big and / or small machines for operation <input type="checkbox"/> Addition of variable flow control (inverter, pole change type motor, fluid coupling, vane control, others)
e) Replace to high efficiency machine	<input type="checkbox"/> To replace or adapt to high efficiency machine
f) Pause at the time of uselessness in intermittent load	<input type="checkbox"/> To exchange or adapt to motor of high frequency start type <input type="checkbox"/> Addition of soft start with inverter <input type="checkbox"/> Addition of fluid coupling



THANK YOU



## Kyankhin Cement Plant

## Plant Location And Area

Kyankhin Cement Plant is situated about 10 miles west of Kyankhin.

Main Plant area	145.5	Acres
Residential area	166.8	Acres
Railway area	227.5	Acres
Foreshore area	5.6	Acres
Quarry area	3840.0	Acres
Total area	<u>4385.4</u>	<u>Acres</u>

## Establishment

Kyankhin Cement Plant is constructed and installed under the supervision of Kawasaki Heavy Industries Co., Ltd. After signing contract with Kawasaki Heavy Industries, the plant was established as follows:

	<u>Capacity</u>	<u>Year of Installation</u>	<u>Year of Production</u>
Existing Plant	400 Ton/day x 2 Nos	1971	1975
Extension Plant	400 Ton/day x 2 Nos	1981	1985

## Investment

	(Kyats in Million)		
	<u>Foreign currency</u>	<u>Local currency</u>	<u>Total</u>
(1) Existing Plant	102.842	1494.093	1596.935
(2) Extension Plant	325.440	468.182	793.622
Total	<u>428.282</u>	<u>1962.275</u>	<u>2390.557</u>

## Cement Producing Capacity

4. The installed capacity is ( 480000 ) Tons based on ( 300 ) working days per year , three shifts consisting of eight working hours per shift ( 24 hours a day).

Rated annual capacity 363800 Tons

## Type of Process

5. Crushed Limestone and laterite carefully blended with clay , are ground to the stage of slurry. Slurry when burnt becomes clinker. This process is called **Wet Process**.

6. Cement Type, Standard and Compressive strength

Type	- Ordinary Portland Cement
Standard	- BS 12/1978
Compressive strength	- 3 days-230Kg/sqcm (23N/sqmm) - 28 days-410Kg/sqcm (41N/sqmm)



## **Limestone Quarry**

The Quarry is situated 5 1/2 miles south of the plant. The area is 3840 acres. The reserve of limestone quarry is -

- (a) Above 300 Feet                      49 Million Tons
- (b) Between 100 Feet                  41 Million Tons  
and 300 Feet
- (c) Total reserve is 90 Millions Tons and can  
be used for 180 years.

## **Laterite Quarry**

Laterite quarry is situated 8 miles south west of limestone quarry.

- (a) Area                                      246 Acres.

## **Energy Requirement for Rotary Kilns**

The requirement of natural gas and electricity are as follows:

<u>No of</u> <u>Rotary Kilns</u>	<u>Natural gas</u> <u>(million cubic feet)</u>  <u>(Avg.)</u>	<u>Electricity</u> <u>(mega watt)</u>  <u>(Avg.)</u>
1	2.4	5.0
2	4.8	6.5
3	7.2	8.5
4	9.6	9.5

## **Electricity And Natural Gas Consumption**

### 10. According To Contract Agreement

- Electricity                      - 120 KWH per ton of  
cement.  
Tolerance 3% allowed.
- Natural Gas                  - 1650 Kcal per kg of  
clinker.  
(40% water content in  
slurry).  
Tolerance 3% allowed.

### 11. Cost of Energy

- Electricity
  - (a). Production                      -25Ks/Unit +  
100Ks/ HP+  
3000Ks for meter
  - (b). Factory Lighting              -25Ks/Unit +500Ks  
for meter
  - (c). Residential                      -25Ks/Unit+500Ks  
for meter
- Natural Gas                      -200Ks/1000 Cu-ft

## Kyankhin Cement Plant

### Plant Location And Area

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	(Kyats in Millions)		
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and 300 Feet
- (c) Total reserve is 90 Millions Tons and can  
be used for 180 years.

### **Laterite Quarry**

8. Laterite quarry is situated 8 miles south west of limestone quarry.

- (a) Area      246 Acres.

### **Energy Requirement for Rotary Kilns**

9. The requirement of natural gas and electricity are as follows:

No of Rotary Kilns	<u>Natural gas</u> (million cubic feet) (Avg.)	<u>Electricity</u> (mega watt) (Avg.)
1	2.4	5.0
2	4.8	6.5
3	7.2	8.5
4	9.6	9.5

### **Electricity And Natural Gas Consumption**

#### **10. According To Contract Agreement**

- Electricity      - 120 KWH per ton of  
cement.  
Tolerance 3% allowed.
- Natural Gas      - 1650 Kcal per kg of  
clinker.  
(40% water content in  
slurry).  
Tolerance 3% allowed.

#### **11. Cost of Energy**

- Electricity
  - (a). Production      -25Ks/Unit +  
100Ks/ HP+  
3000Ks for meter
  - (b). Factory Lighting      -25Ks/Unit +500Ks  
for meter
  - (c). Residential      -25Ks/Unit+500Ks  
for meter
- Natural Gas      -200Ks/1000 Cu-ft

Installed and present actual capacity of each individual machines

#### 1. Primary Crushers

	Year of Operation
No.(1)	1975-76
No.(2)	1985-86
	Installed Capacity
(1)No.	300 Ton/hour
	Actual Capacity
(1)No.	240 Ton/hour

#### 2. Secondary Crushers

	Year of Operation
No.(1)	1975-76
No.(2)	1985-86
	Installed Capacity
(1)No.	150 Ton/hour
	Actual Capacity
(1)No.	120 Ton/hour

#### 3. Overhead Travelling Cranes

	Year of putting into use
No.(1)	1975-76
No.(2)	1975-76
No.(3)	1985-86
No.(4)	2002-03
	Capacity
Lifting Capacity	8.0 Tons

#### 4. Raw Grinding Mills

	Year of Operation
No.(1) and (2)	1975-76
No.(3)and (4)	1985-86
	Installed Capacity
(1)No.	35 Ton/hour
	Actual Capacity
(1)No.	32.5 Ton/hour

#### 5. Rotary Kilns

	Year of Operation
No.(1) and (2)	1975-76
No.(3)and (4)	1985-86
	Installed Capacity
(1)No.	400 Ton/day
(4)No.	1600 Ton/day
	Actual Capacity
(1)No.	320 Ton/day

#### 6. Finished Grinding Mills

	Year of Operation
No.(1) and (2)	1975-76
No.(3)and (4)	1985-86
	Installed Capacity
(1)No.	22.50 Ton/hour
	Actual Capacity
(1)No.	20 Ton/hour

#### 7. Packers

	Year of Operation
No.(1) and (2)	1975-76
No.(3)and (4)	1985-86
	Installed Capacity
(1)No.	50 Ton/hour
	Actual Capacity
(1)No.	35 Ton/hour