

X-1 Rehabilitation and Modernization Plan

X-1-1 Standards

The standards accepted internationally such as, JIS, JEC, JEM (Japan); DIN, VDE (German); BS, IEE (UK); NF, UTE (France); ANSI, NEMA (USA); and standards recommended by IEC.

X-1-2 Installed Load Capacity and Electric Power Consumption

The planned installed electric load and electric power consumption are shown in the following tables, No. X-1-2-1 and X-1-2-2.

Table X-1-2-1, Installed Load Capacity

(Unit of load capacity : kW)

Department	Q'ty of motors			Load capacity		
	H/T	L/T	Total	H/T	L/T	Total
R/M Receiving	3	13	16	780	167.7	947.7
R/M Storage	0	21	21	0	340.8	340.8
Raw Mill	3	32	35	4,450	186.6	4,636.6
Blending Silo	0	47	47	0	384.0	384.0
Burning	12	46	58	3,330	710.0	4,040.0
Coal Mill	2	33	35	680	241.0	921.0
Utility	0	15	15	0	256.0	256.0
No.1 F/Mill	6	17	23	3,270	136.0	3,406.0
No.2 F/Mill	6	17	23	3,270	133.7	3,403.7
No.1 C/Packing	0	25	25	0	248.2	248.2
No.2 C/Packing	0	23	23	0	216.0	216.0
W/Shop & Office	0	-	-	0	60.0	60.0
Total	32	289	321	15,780	3,080.0	18,860.0

Note: 1) Abbreviation: R/M-Raw Material, F/ -Finish  
C/ - Cement, W/ - Work

2) The above data are calculated with the material from ICC and with the planned data.

Table X-1-2-2 Electric Power Consumption

(Unit: kWh/t-cement)

Department	Actual #1	Typical in Japan #1	After renovation	
			Load capacity	Plan #2
R/M Receiving	2.07		947.7(kw)	2.07
R/M Grinding	42.11	33.7	5,020.6	32.51
Burning	25.72	25.4	4,040.0	27.33
Coal Grinding	6.21	4.9	921.0	5.25
Finish Mill	53.09	46.9	6,809.7	53.09
Cement Packing	2.33	1.1	464.2	2.33
Utility	9.05		#3	
Office	0.85	1.6	656.8	4.82
Total	141.43	113.6	18,860.0(kw)	127.4

Note: #1 - Data from Table VIII-8-5

#2 - Clinker consumption is assumed as  
0.955 t-clinker/t-cement.

#3 - The value includes load of water pumps, and of  
equipment in material storage and workshop.

### X-1-3 Necessary Electric Power

The necessary electric power requirement in the renovated plant is calculated to be 16,100 kW maximum or 13,200 kW average as follows, based on the load factor and demand factor estimated from the load capacity shown in Table X-1-2-2, and taking account of the scale of the renovated plant.

Unit power consumption : 127.4 kWh/t-cement  
 Average power #1 : 13,200 kW  
 Load factor #2 : 82%  
 Maximum power #3 : 16,100 kW  
 Demand factor #4 : 85%

Note:

- #1 - Average power is calculated by multiplying the unit power consumption by the hourly cement production capacity in ton.
- #2 - As the process flow is somewhat simple in the plant and fluctuation of load is considered a few, the load factor can be assumed to be higher by about 10% than that in typical cement plant.
- #3 - The maximum power is calculated by dividing the average power by the load factor.
- #4 - Demand factor is calculated by dividing maximum power by the installed load capacity.

#### X-1-4 Electric Supply System

The electric supply system to be applied to the plant is planned as follows (same idea as existing system).

- (1) Extra high voltage (for power receiving)
  - AC 34.5 kV, 60 Hz, 3 phase, 3 wires, 1 circuit
- (2) High voltage (for the power generator, distribution lines and motors with large capacity)
  - AC 4.16 kV, 60 Hz, 3 phase, 3 wires
- (3) Low voltage (for general-use motors and heaters with large capacity) -
  - AC 440 V, 60 Hz, 3 phase, 3 wires
- (4) For control and lighting
  - AC 220 V, 60 Hz, 3 phase, 3 wires
- (5) For instruments and special use
  - AC 100/110 V, 60 Hz, single phase and DC 24 V

X-1-5 Mechanical Equipment

X-1-5-1 Raw Material Grinding Department (B1000)

Item No.

B1021	Limestone Hopper		1 set
(Existence)	Type	: Reinforced concrete	
	Capacity	: 50 m <sup>3</sup>	
	Dimension	: 6,000W x 6,000L x 4,500H	
B1022	High-Silica Hopper		1 set
(Existence)	Type	: Reinforced concrete	
	Capacity	: 50 m <sup>3</sup>	
	Dimension	: 6,000W x 6,000L x 4,500H	
B1023	Low-Silica Hopper		1 set
(Existence)	Type	: Reinforced concrete	
	Capacity	: 50 m <sup>3</sup>	
	Dimension	: 6,000W x 6,000L x 4,500H	
B1024	Pyrite Cinder Hopper		1 set
(Existence)	Type	: Reinforced concrete	
	Capacity	: 50 m <sup>3</sup>	
	Dimension	: 6,000W x 6,000L x 4,500H	
B1031	Limestone Weighing Feeder		1 set
	Type	: With Belt feeder and load cell	
	Capacity	: 190 - 19 t/h	
	Dimension	: Width 1,500 mm	
		: Length 10,000 mm	
	Motor	: 2.2 kW	

Item No.

B 1032	High-Silica Weighing Feeder	1 set
	Type : With Belt feeder and load cell	
	Capacity : 26 - 2.6 t/h	
	Dimension : Width 600 mm	
	Length 6,000 mm	
	Motor : 1.5 kW	
B 1033	Low Silica Weighing Feeder	1 set
	Type : With Belt feeder and load cell	
	Capacity : 4.6 - 0.5 t/h	
	Dimension : Width 400 mm	
	Length 6,000 mm	
	Motor : 1.5 kW	
B 1034	Pyrite Cinder Weighing Feeder	1 set
	Type : With Belt feeder and load cell	
	Capacity : 2.6 - 0.3 t/h	
	Dimension : Width 400 mm	
	Length 6,000 mm	
	Motor : 1.5 kW	
B 1040	Belt Conveyor	1 set
	Type : 3 roller	
	Capacity : 230 t/h	
	Dimension : Width 600 mm	
	Length 92,000 mm	
	Motor : 5.5 kW	
B 1050	Belt Conveyor	1 set
	Type : 3 roller	
	Capacity : 230 t/h	
	Dimension : Width 600 mm	
	Length 95,000 mm	
	Height 25,000 mm	
	Motor : 18 kW	

Item No.

B1060	Hopper		1 set
	Type	: Load cell weighing system	
	Capacity	: 20 ton	
	Dimension	: Diameter $\phi$ 3,000 mm	
		Height 5,000 mm	
B1070	Belt Feeder		1 set
	Type	:	
	Capacity	: 230 t/h	
	Dimension	: Width 1,000 mm	
		Length 3,500 mm	
	Motor	: D.C 1.5 kW	
B1080	Mill		1 set
	Type	: Vertical roller mill similar LM38 Ube-Loesche	
	Capacity	: 220 t/h	
		where	
		Feed size : smaller than 50 mm	
		Fineness : residue of 15% on 88 microns sieve	
	Motor	: Mill : IMW 2,100 kW	
		Separator : VSM 55 kW	
		Oil unit : IM 1.5 kW x 2 sets	
B1091	Cyclone		2 sets
~ 2	Type	: Mild steel with liner	
	Capacity	: 115 t/h	
	Dimension	: Diameter 5,000 mm	
		Height 18,000 mm	

<u>Item No.</u>			
B1101	Rotary Valve		2 sets
~2	Capacity	: 115 t/h	
	Dimension	: Diameter 600 mm	
		: Height 800 mm	
	Motor	: 1.5 kW	
B1110	Air Slide		1 set
	Type	: U-450	
	Capacity	: 230 t/h	
	Dimension	: Width 450 mm	
		: Length 5.500 mm	
B1120	Air Slide		1 set
	Type	: U-450	
	Capacity	: 230 t/h	
	Dimension	: Width 450 mm	
		: Length 7,000 mm	
B1130	Bucket Elevator		1 set
	Type	: Continuous	
	Capacity	: 250 t/h	
	Dimension	: Width 300 mm(bucket)	
		: Height 26,500 mm	
	Motor	: 37 kW	
B1140	Air Slide		1 set
	Type	: U-450	
	Capacity	: 250 t/h	
	Dimension	: Width 450 mm	
		: Length 9,000 mm	

Item No.

B1150	Air Slide				1 set
	Type	:	U-450		
	Capacity	:	250 t/h		
	Dimension	:	Width 450 mm		
			Length 2,500 mm		
B1160	Air Slide				1 set
	Type	:	U-450		
	Capacity	:	250 t/h		
	Dimension	:	Width 450 mm		
			Length 61,000 mm		
B1170	Distributor				1 set
	Type	:	Air slide		
	Capacity	:	0 - 250 t/h		
	Accessories	:	Gate dumper with manual	}	9 sets
			Shut dumper with motor		
B1181	Air Slide				8 sets
	Type	:	U-450		
	Capacity	:	250 t/h		
	Dimension	:	Width 450 mm		
			Length 11,000 mm		
B1190	Turbo Blower				1 set
	Capacity	:	62 m <sup>3</sup> /min x 650 mmAq		
	Motor	:	15 kW		
B1200	Turbo Blower				1 set
	Capacity	:	15 m <sup>3</sup> /min x 650 mmAq		
	Motor	:	3.7 kW		



<u>Item No.</u>			
B1211	Bag Filter		2 sets
~2	Type	: Pulse jet	
	Capacity	: 150 m <sup>3</sup> /min	
	Filter area	: 67 m <sup>2</sup>	
B1221	Rotary Valve		2 sets
~2	Capacity	: 5 t/h	
	Dimension	: Diameter 200 mm	
	Motor	: 0.4 kW	
B1230	Compressor		1 set
	Type	: Portable	
	Capacity	: 250 l/min x 7 kg/cm <sup>2</sup>	
	Motor	: 2.2 kW	
B1241	Fan		2 sets
~2	Capacity	: 150 m <sup>3</sup> /min x 200 mmAq	
	Motor	: 11 kW	

X-1-5-2 Raw Meal Silo Department (B2000, 3000)

Item No.

B2001 ~ 9 (Modification)	Storage Silo			9 sets
	Type	:	RC made	
	Capacity	:	700 t	
	Dimension	:	Diameter 10,000 mm	
			Height 9,000 mm	
	Accessories	:	Silo discharge device	
 B2011 ~ 9	 Cut Dumper			 9 sets
	Dimension	:	Width 450 mm	
			Length 450 mm	
 B2021 ~ 9	 Control Dumper			 9 sets
	Capacity	:	50 - 230 t/h	
	Dimension	:	Width 450 mm	
	Motor	:	0.4 kW	
 B2031 ~ 3	 Air Slide			 3 sets
	Type	:	U-450	
	Capacity	:	250 t/h	
	Dimension	:	Width 450 mm	
			Length 28,000 mm	
 B2040	 Trough Chain Conveyor			 1 set
	Type	:	F-41	
	Capacity	:	250 t/h	
	Dimension	:	Width 410 mm	
			Length 28,000 mm	
	Motor	:	15 kW	

Item No.

B2050	Bucket Elevator				1 set
	Type	:	Continuous		
	Capacity	:	250 t/h		
	Dimension	:	Width	300 mm (bucket)	
			Height	17,500 mm	
	Motor	:	15 kW		
B2060	Air Slide				1 set
	Type	:	U-450		
	Capacity	:	250 t/h		
	Dimension	:	Width	450 mm	
			Length	40,000 mm	
B2070	Bucket Elevator				1 set
	Type	:	Continuous		
	Capacity	:	250 t/h		
	Dimension	:	Width	300 mm (bucket)	
			Height	40,000 mm	
	Motor	:	37 kW		
B2080	Two-way Damper				1 set
	Capacity	:			
	Dimension	:	Width	450 mm	
			Length	450 mm	
			Height	1,000 mm	
	Motor	:	Motor cylinder	0.75 kW	
B2090	Air Slide				1 set
	Type	:	U-450		
	Capacity	:	230 t/h		
	Dimension	:	Width	450 mm	
			Length	10,000 mm	

Item No.

B2100	Air Slide			1 set
	Type	:	U-450	
	Capacity	:	250 t/h	
	Dimension	:	Width 450 mm	
			Length 6,000 mm	
B2111 ~6	Distributor			1 set
	Type	:	Air Slide	
	Capacity	:	0 - 230 t/h	
	Consisting of	:	Gate damper	
			Shut damper	
B2121 ~6	Air Slide			6 sets
	Type	:	U-450	
	Capacity	:	230 t/h	
	Dimension	:	Width 450 mm	
			Length 4,500 mm	
B2201 ~2	Roots Blower			2 sets
	Capacity	:	36 m <sup>3</sup> /min x 2,000 mmAq	
	Motor	:	22 kW	
B2211 ~3	Roots Blower			3 sets
	Capacity	:	18 m <sup>3</sup> /min x 2,000 mmAq	
	Motor	:	11 kW	
B2220	Roots Blower			1 set
	Capacity	:	24 m <sup>3</sup> /min x 2,000 mmAq	
	Motor	:	15 kW	

Item No.

B2230	Roots Blower		1 set
	Capacity	: 12 m <sup>3</sup> /min x 2,000 mmAq	
	Motor	: 7.5 kW	
B2241 ~3	Fan		3 sets
	Capacity	: 18 m <sup>3</sup> /min x 650 mmAq	
	Motor	: 3.7 kW	
B2250	Blower		1 set
	Capacity	: 45 m <sup>3</sup> /min x 650 mmAq	
	Motor	: 11 kW	
B2300	Bag Filter		1 set
	Type	: Pulse jet	
	Capacity	: 500 m <sup>3</sup> /min	
	Filter area	: 250 m	
B2310	Rotary Valve		1 set
	Capacity	: 5 t/h	
	Dimension	: Diameter 150 mm	
	Motor	: 0.4 kW	
B2320	Fan		1 set
	Capacity	: 500 m <sup>3</sup> /min x 250 mmAq	
	Motor	: 37 kW	
B2330	Compressor		1 set
	Type	: Rotary piston	
	Capacity	: 3.4 m <sup>3</sup> /min x 7 kg/cm <sup>2</sup>	
	Motor	: 22 kW	

Item No.

B3000	Blending Silo		1 set
	Type	: RC made	
	Capacity	: 6,000 t	
	Dimension	: Diameter 18,000 mm	
		: Height 33,000 mm	
	Accessories	: Gate damper, Motor damper etc.	
B3011	Air Slide		6 sets
~6	Type	: U-400	
	Capacity	: 180 t/h	
	Dimension	: Width 400 mm	
		: Length 2,500 mm	
B3020	Air Slide		1 set
	Type	: U-400	
	Capacity	: 200 t/h	
	Dimension	: Width 400 mm	
		: Length 10,000 mm	
B3030	Bucket Elevator		1 set
	Type	: Continuous	
	Capacity	: 200 t/h	
	Dimension	: Width 300 mm (bucket)	
		: Height 26,500 mm	
	Motor	: 22 kW	
B3101	Roots Blower		3 sets
	Capacity	: 36 m <sup>3</sup> /min x 2,500 mmAq	
	Motor	: 30 kW	
B3110	Blower		1 set
	Capacity	: 7 m <sup>3</sup> /min x 650 mmAq	
	Motor	: 2.2 kW	

X-1-5-3 Dust Equipment Department (B4000)

Item No.

B4010	Electrostatic Precipitator		1 set
(Existing)	Type	: Dry type, horizontal gas flow, flat panel	
	Capacity	: 5,800 m <sup>3</sup> /min at 110°C	
	Dimension	: Width 8,130 mm Length 13,000 mm	
B4020	E.P Fan		1 set
(Existing)	Type	: Double suction turbo	
	Capacity	: 5,800 m <sup>3</sup> /min	
	Motor	: 550 kW x 6P	
B4031	Screw Conveyor		3 sets
~3	Type	: U-200	
(Existing)	Capacity	: 10 t/h	
	Dimension	: Diameter 200 mm Length	
	Motor	: 0.75 kW	
B4041	Rotary Valve		3 sets
~3	Capacity	: 10 t/h	
(Existing)	Dimension	: Diameter 250 mm Height	
	Motor	: 0.4 kW	
B4050	Screw Conveyor		1 set
(Existing)	Type	: U-300	
	Capacity	: 10 t/h	
	Dimension	: Diameter 300 mm	
	Motor	: 1.5 kW	

Item No.

B4060	Trough Chain Conveyor				1 set
(Existing)	Type	:	U-150		
	Capacity	:	10 t/h		
	Dimension	:	Width	150 mm	
	Motor	:	1.5 kW		
B4070	Bucket Elevator				1 set
(Existing)	Type	:	Continuous		
	Capacity	:	10 t/h		
	Dimension	:	Width	360 mm	
			Height	11,000 mm	
	Motor	:	1.5 kW		
B4080	Trough Chain Conveyor				1 set
	Type	:	U-200		
	Capacity	:	20 t/h		
	Dimension	:	Width	200 mm	
			Length	4,000 mm	
	Motor	:	2.2 kW		
B4090	Screw Conveyor				1 set
	Type	:	U-400		
	Capacity	:	20 t/h		
	Dimension	:	Diameter	400 mm	
			Length	11,000 mm	
	Motor	:	2.2 kW		
B4100	Rotary Valve				1 set
	Capacity	:	20 t/h		
	Dimension	:	Diameter	300 mm	
	Motor	:	0.75 kW		



Item No.

B4110	Trough Chain Conveyor			1 set
	Type	:	U-270	
	Capacity	:	20 t/h	
	Dimension	:	Width 270 mm	
			Length 31,000 mm	
	Motor	:	3.7 kW	
B4120	Trough Chain Conveyor			1 set
	Type	:	U-270	
	Capacity	:	20 t/h	
	Dimension	:	Width 270 mm	
			Length 36,000 mm	
	Motor	:	3.7 kW	
B4130	Trough Chain Conveyor			1 set
	Type	:	U-270	
	Capacity	:	20 t/h	
	Dimension	:	Width 270 mm	
			Length 8,000 mm	
	Motor	:	1.5 kW	
B4140	Two-way Damper			1 set
	Capacity	:	20 t/h	
	Dimension	:	Width 300 mm	
			Length 300 mm	
	Motor	:	Motor cylinder 0.4 kW	

X-1-5-4 Hot Gas Equipment (B5000)

Item No.

B5010	Hot Gas Generator		1 set
	Type	: Horizontal cylindrical	
	Dimension	: Diameter 2,500 mm	
		: Length 3,000 mm	
	Capacity	: 800 kg-oil/h	
B5020	Fan		1 set
	Capacity	: 300 m <sup>3</sup> /min x 100 mmAq	
	Motor	: 11 kW	
B5030	Damper		1 set
	Dimension	: Diameter 800 mm	
	Motor	: 0.75 kW	
B5040	Circulation Fan		1 set
	Capacity	: 9,500 m <sup>3</sup> /min x 950 mmAq at 110°C	
	Motor	: 2,200 kW	
B5050	Damper		1 set
	Dimension	: Diameter 2,000 mm	
	Motor	: 0.75 kW	
B5060	Damper		1 set
	Dimension	: Diameter 2,900 mm	
	Motor	: 0.75 kW	
B5070	Damper		1 set
	Dimension	: Diameter 2,600 mm	
	Motor	: 0.75 kW	

Item No.

B5080	Stabilizer		1 set
	Type	: Vertical cylinder	
	Dimension	: Diameter 7,000 mm	
		Height 30,000 mm	
	Volume of spray water:	20 t/h	
B5090	Pump		1 set
	Type	: Turbine pump	
	Capacity	: 20 t/h x 30 kg/cm <sup>2</sup>	
	Motor	: 37 kW	
B5100	Water Tank		1 set
	Capacity	: 10 t	
	Dimension	: Diameter 2,500 mm	
		Height 2,500 mm	
	Accessories	: Level indicator, level switches	

X-1-5-5 Raw Meal Feed to Kiln Department (C1000)

Item No.

C1010	Bin			1 set
		Capacity	: 25 t	
		Dimension	: Diameter 3,000 mm	
			: Height 4,500 mm	
		Accessories	: Load cell indicator	
C1020	Rotary Feeder			1 set
		Capacity	: 200 - 20 t/h	
		Dimension	: Diameter 500 mm	
		Motor	: 2.2 kW	
C1030	Constant Feed Weigher			1 set
		Capacity	: 200 - 20 t/h	
		Dimension	: Width 1,200 mm	
			: Length 2,500 mm	
		Motor	: 1.5 kW	
C1040	Air Slide			1 set
		Type	: U-400	
		Capacity	: 180 t/h	
		Dimension	: Width 400 mm	
			: Length 17,000 mm	
C1050	Air Lift			1 set
		Capacity	: 180 t/h	
		Dimension of vessel:		
			Diameter 1,250 mm	
			Height 6,000 mm	

Item No.

C1061 ~3	Roots Blower		3 sets
	Capacity	: 80 m <sup>3</sup> /min x 6,300 mmAq at 30°C	
	Motor	: 120 kW	
C1070	Blower		1 set
	Capacity	: 18 m <sup>3</sup> /min x 650 mmAq	
	Motor	: 3.7 kW	
C1080	Expansion Joint	various kinds of size	14 sets

Burning Department (D1000 - 3000)

Item No.

D1010	Induced Draft Fan		
	Capacity	:	7,000 m <sup>3</sup> /min x 690 mmAq at 330°C
	Motor	:	DC 1,200 kW x 6P
	Accessories	:	Suction damper with damper motor
D1020	NSP Tower		
	Type	:	Steel structure
	Cyclone	:	5 stages
	Calciner	:	Burning ratio 30 - 50%
D1030	Kiln		1 set
(Modification)	Capacity	:	2,600 t/d
	Dimension	:	Diameter 4,400 mm, 4,850 mm Length 71,500 mm
	Inclination	:	3.987%
	Motor	:	VSM 190 kW x 2 sets
D1040	Kiln Burner		1 set
	Type	:	Coal & oil combination type
	Capacity	:	10 t/h
D1050	Cooler		1 set
	Type	:	Fuller type grate cooler
	Capacity	:	120 t/h
D1060	Clinker Breaker		1 set
	Type	:	Impact type
	Capacity	:	120 t/h
	Motor	:	75 kW

Item No.

D1070	Spillage Conveyor		1 set
	Capacity	: 55 t/h	
	Dimension	: Width 450 mm	
		: Length 24,000 mm	
	Motor	: 11 kW	
D1080	Flap Damper		1 set
	Capacity	: 55 t/h	
	Dimension	: Width 450 mm	
		: Length 450 mm	
	Motor	: 0.75 kW	
D1090	Cooler Fan		1 set
	Capacity	: 370 m <sup>3</sup> /min x 650 mmAq	
	Motor	: IM 55 kW x 6P	
D1100	Cooler Fan		1 set
	Capacity	: 570 m <sup>3</sup> /min x 600 mmAq	
	Motor	: IM 110 kW x 4P	
D1110	Cooler Fan		1 set
	Capacity	: 750 m <sup>3</sup> /min x 500 mmAq	
	Motor	: IM 110 kW x 4P	
D1120	Cooler Fan		1 set
	Capacity	: 750 m <sup>3</sup> /min x 450 mmAq	
	Motor	: IM 90 kW x 4P	
D1130	Cooler Fan		1 set
	Capacity	: 1,450 m <sup>3</sup> /min x 400 mmAq	
	Motor	: IM 160 kW x 4P	

Item No.

D1140	Cooler Fan		1 set
	Capacity	: 1,810 m <sup>3</sup> /min x 250 mmAq	
	Motor	: IM 130 kW x 4P	
D1150	Primary Air Fan		1 set
	Capacity	: 160 m <sup>3</sup> /min x 900 mmAq at 30°C	
	Motor	: IM 45 kW x 6P	
D1160	Shell Cooling Fan		1 set
	Capacity	: 150 m <sup>3</sup> /min x 75 mmAq	
	Motor	: 3.7 kW	
D1211 ~4	Expansion Joint for Cooler Exhaust Gas Duct		4 sets
	Dimension	: Diameter 2,200 mm	
D1221 ~9	Expansion Joint		9 sets
	Dimension	: Diameter 2,000 mm for recouped duct	
D2010	Electric Precipitator		1 set
	Type	: Dry type, horizontal gas flow, flat panel	
	Capacity	: 5,800 m <sup>3</sup> /min at 250°C	
D2100	E.P Fan		1 set
	Type	: Double suction turbo	
	Capacity	: 5,800 m <sup>3</sup> /min x 150 mmAq at 250°C	
	Motor	: 210 kW	
D2111 ~2	Rotary Valve		2 sets
	Capacity	: 15 t/h	
	Dimension	: Diameter 150 mm	
	Motor	: 0.75 kW	



Item No.

D2120	Screw Conveyor				1 set
	Type	:	U-250		
	Capacity	:	15 t/h		
	Dimension	:	Diameter	250 mm	
			Length	8,000 mm	
	Motor	:	2.2 kW		
D3010	Drag Chain Conveyor				1 set
	Capacity	:	120 t/h		
	Dimension	:	Width	700 mm	
			Length	40,000 mm	
	Motor	:	37 kW		
D3020	Bucket Conveyor				1 set
(Existing)	Capacity	:	100 t/h		
	Dimension	:	Width	700 mm	
			Length	7,500 mm	
	Motor	:	3.7 kW		
D3030	Bucket Conveyor				1 set
(Existing)	Capacity	:	100 t/h		
	Dimension	:	Width	700 mm	
	Motor	:	7.5 kW		
D3040	Belt Conveyor				1 set
(Existing)	Type	:	3 roller		
	Capacity	:	70 t/h		
	Dimension	:	Width	500 mm	
			Length	100,000 mm	
	Motor	:	11 kW		

Item No.

D3050	Belt Conveyor			1 set
(Existing)	Type	:	3 roller	
	Capacity	:	140 t/h	
	Dimension	:	Width	600 mm
		:	Length	50,000 mm
	Motor	:	3.7 kW	

X-1-5-7 Coal Equipment Department (E1000)

Item No.

E1010 Receiving Hopper 1 set  
(Existing)

E1020 Apron Conveyor 1 set  
(Existing) Type : Heavy duty type  
Capacity : 65 t/h  
Dimension : Width 710 mm  
Length 4,930 mm  
Motor : 7.5 kW

E1030 Belt Conveyor 1 set  
(Existing) Type : 3 roller  
Capacity : 80 t/h  
Dimension : Width  
Length  
Motor : 15 kW

E1040 Hopper 1 set  
(Existing) Type : Two way chute  
Capacity : 40 t/h

E1050 Chain Conveyor 1 set  
(Existing) Capacity : 3 - 30 t/h  
Dimension : Width 1,010 mm  
Length 4,545 mm  
Motor : 7.5 kW

Item No.

E1060	Rotary Feeder				1 set
(Existing)					
E2010	Coal Mill				1 set
(Existing)	Type	:	RMK 19/9/26		
	Capacity	:	15 t/h		
	Motor	:	IMW 230 kW		
E2030	Cyclone				1 set
(Existing)	Capacity	:	800 m <sup>3</sup> /min		
E2040	Rotary Valve				1 set
(Existing)	Capacity	:	15 t/h		
	Motor	:	0.75 kW		
E2050	Screw Conveyor				1 set
	Type	:	U-350		
	Capacity	:	15 t/h		
	Dimension	:	Diameter 350 mm		
			Length 7,000 mm		
	Motor	:	2.2 kW		
E2081	Bag Filter				2 sets
~ 2	Type	:	Pulse jet		
	Capacity	:	400 m <sup>3</sup> /min		
	Filter area	:	240 m <sup>2</sup>		
	Screw Conveyor				2 sets
	Type	:	U-250		
	Capacity	:	7.5 t/h		

Item No.

	Dimension	:	Diameter	250 mm	
			Length	7,000 mm	
	Motor	:	2.2 kW		
E2091	Rotary Valve				2 sets
~2	Capacity	:	7.5 t/h		
	Dimension	:	Diameter	250 mm	
	Motor	:	0.75 kW		
E2100	Screw Conveyor				1 set
	Type	:	U-350		
	Capacity	:	15 t/h		
	Dimension	:	Diameter	350 mm	
			Length	11,000 mm	
	Motor	:	3.7 kW		
E2110	Flow Conveyor				1 set
	Capacity	:	15 t/h		
	Dimension	:	Width	350 mm	
			Length	12,000 mm	
			Height	11,500 mm	
	Motor	:	15 kW		
E2120	Fine Coal Tank				1 set
	Type	:	Steel made		
	Capacity	:	25 t		
	Dimension	:	Diameter	2,800 mm	
			Height	6,300 mm	

Item No.

E2160 (Existing)	Exhaust Fan		1 set
	Type	: HF3S	
	Capacity	: 800 m <sup>3</sup> /min x 2,400 mmAq	
	Motor	: IM 450 kW	
	Control damper:	Hydraulic electro actuator	
E2200	Compressor		1 set
	Type	: Screw type	
	Capacity	: 3.4 m <sup>3</sup> /min x 7 kg/cm	
	Motor	: 22 kW	
E2210	Receiver Tank		1 set
	Type	: Vertical type	
	Capacity	: 0.4 m <sup>3</sup> x 7 kg/cm <sup>2</sup>	
E3011 ~2	Rotary Feeder		2 sets
	Capacity	: 15 t/h	
	Dimension	: Diameter 350 mm	
	Motor	: 0.75 kW	
E3021 ~2	Fine Coal Bin		2 sets
	Type	: Steel made	
	Capacity	: 5 t	
	Dimension	: Diameter 1,800 mm Height 3,100 mm	
	Accessories	: Cut damper with air cylinder	
E3051 ~2	Impact Line		2 sets
	Type	: ILE-37	
	Capacity	: Max. 10 t/h	
	Feeder accuracy:	±1%	

Item No.

E3061 ~2	Chamber			2 sets
	Dimension	:	Diameter 1,000 mm Height 1,000 mm	
E3071 ~2	Rotary Valve			2 sets
	Capacity	:	10 t/h	
	Dimension	:	Diameter 300 mm	
	Motor	:	0.4 kW	
E3081 ~2	Rotary Valve			2 sets
	Capacity	:	10 t/h	
	Dimension	:	Diameter 300 mm	
	Motor	:	0.4 kW	
E3091	Roots Blower			1 set
	Capacity	:	50 m <sup>3</sup> /min x 3,000 mmAq	
	Motor	:	37 kW	
E3092	Roots Blower			1 set
	Capacity	:	80 m <sup>3</sup> /min x 3,000 mmAq	
	Motor	:	45 kW	
E3093	Roots Blower			1 set
	Capacity	:	80 m <sup>3</sup> /min x 2,500 mmAq at 30°C	
	Motor	:	45 kW	
E3100	Bag Filter			1 set
	Type	:	Pulse jet	
	Capacity	:	15 m <sup>3</sup> /min	
	Filter area	:	16 m <sup>2</sup>	

Item No.

E3110	Fan		1 set
	Capacity	: 15 m <sup>3</sup> /min x 200 mmAq	
	Motor	: 1.5 kW	
E3120	Rotary Valve		1 set
	Capacity	: 1 t/h	
	Dimension	: Diameter 150 mm	
	Motor	: 0.75 kW	
E3130	Screw Conveyor		1 set
	Type	: U-200	
	Capacity	: 1 t/h	
	Dimension	: Diameter 200 mm	
		Length 4,000 mm	
	Motor	: 0.75 kW	
E3201 ~3	Receiver Tank		3 sets
	Type	: Steel made	
	Capacity	: 1.1 m <sup>3</sup> x 7.0 kg/cm <sup>2</sup>	
	Dimension	: Diameter	
		Height	
E3211 ~2	Cut Gate		2 sets
	Dimension	: 250 mm	
		with air cylinder	
E3300	Portable Compressor		1 set
	Type	: Oil free	
	Capacity	: 75 ℓ/min x 7 kg/cm <sup>2</sup>	
	Motor	: 0.75 kW	



Item No.

E4010	Cyclone				1 set
(Existing)	Capacity	:	80 m <sup>3</sup> /min		
E4020	Rotary Valve				1 set
(Existing)	Capacity	:	3 t/h		
	Dimension	:	Diameter	200 mm	
	Motor	:	0.4 kW		
E5010	Raw Meal Tank				1 set
	Type	:	Steel made		
	Capacity	:	3 t		
	Dimension	:	Diameter	1,800 mm	
			Height	3,000 mm	
	Accessories	:	Level indicator, level switches		
E5020	Bag Filter				1 set
	Type	:	Manual		
	Capacity	:	20 m <sup>3</sup> /min		
	Filter area	:	4 m <sup>2</sup>		
E5030	Screw Conveyor				1 set
	Type	:	U-200		
	Capacity	:	10 t/h		
	Dimension	:	Diameter	200 mm	
			Length	3,000 mm	
	Motor	:	1.5 kW		
E5040	Rotary Valve				1 set
	Capacity	:	13 t/h		
	Dimension	:	Diameter	250 mm	
	Motor	:	0.4 kW		
E5051	Expansion Joint (for coal grinding duct)				6 sets
~6					

X-1-6 Electrical equipment (including instruments)

X-1-6-1 Power factor improving equipment

Quantity : 1 set  
Type : Indoor, enclosed type  
Main specification : AC 4.16 kV, 60 Hz, 3 phase  
Improved by 95% lag

Consisting of;

- 1 - Capacitor cubicle, 6,000 kVA
- 1 - Series reactor
- 1 - Discharging coil
- 1 - High voltage switchgear
- 1 - Control equipment

Installation place : Existing power house

X-1-6-2 Power distributing equipment

(1) Major equipment

- 1 - High voltage switchgear
- 1 - Power transformer 4.16 kV/440 V  
(diverted existing transformer)
- 1 - Lighting transformer 4.16 kV/220 V  
(diverted existing transformer)
- 1 - Low voltage distributing board
- 1 - Motor control center

(2) Installation place

- 1 - Electric room for Raw Material Grinding Dept.
- 1 - Electric room for Burning Dept.
- 1 - Electric room for Coal Grinding Dept.

X-1-6-3 Motors

- Quantity : 1 lot
- Main specification :
- Protection - Totally enclosed, dust proof type for low voltage motors of general use
  - Drip proof type for motors except the above
  - Voltage - 4.16 kV for motors exceeding 94 kW
  - 440 V for motors 94 kW of smaller
  - 220 V for single phase small motors and for control motors
  - Insulation class - class B or F for high voltage motors
  - class B, E or F for low voltage motors
  - Temperature rise - The design ambient temperature is 45°C.
- Motors for special purpose
- DC motor, for kiln drive and ID fan
  - Wound rotor type motor, for motors 230 kW or larger
  - Low voltage induction motor with eddy current coupling, for variable speed drive
  - Gear motor, for low speed drive

Existing motors to be diverted:

- |   |   |               |
|---|---|---------------|
| 1 | - Motor for Raw Mill,                     | 2,100 kW 6P   |
| 1 | - Motor for EP Fan,                       | 550 kW 6P     |
| 1 | - Motor for Kiln, Generator,              | 1 - 500 kW 4P |
|   | Motors,                                   | 2 - 190 kW DC |
| 1 | - Motor for Coal Mill,                    | 230 kW 4P     |
| 1 | - Motor for Exhaust Fan<br>for Coal Mill, | 450 kW 6P     |

X-1-6-4 Central control panel (including instruments)

Quantity : 1 set  
Type : Indoor-use, dust proof, benchboard type inclusive of instruments, graphic panel, lamps, alarms etc.

X-1-6-5 Local control switchboard

Quantity : 1 lot  
Type : Indoor or outdoor use, dust proof, wall-mounting type inclusive of control switch

X-1-6-6 General instruments

Quantity : 1 lot  
Type : Indoor or outdoor use, dust proof type  
Input and output signal: DC 4 - 20 mA or DC 1 - 5 V

X-1-6-7 Lighting equipment

(1) Guide for illumination level

Indoor (on working surface)

Control room 300 - 600 lx.  
Working place more than 50 lx.

Outdoor

Working place more than 50 lx.  
Roads, storage more than 10 lx.

(2) Main specification

Distributing board - Sheet metal, wall-mounting type  
AC 220V 60 Hz

Mercury vapour lamp - Improved power factor type  
AC 220V 60 Hz, 200-1,000W, for  
outdoor and indoor illumination

- Fluorescent lamp - Improved power factor type  
AC 220V 60 Hz, 10-60W, for indoor  
general and emergency illumination
- Incandescent lamp - AC 220V 60 Hz, 100-200W, for  
spot illumination
- Distributing board for repairing works -  
Sheet metal, wall-mounting type  
AC 440/220V, 60 Hz
- Socket and outlet - 2P 15A, 3P 60A or more

#### X-1-6-8 Communication facilities

- Quantity : 1 lot
- Type : Sheet metal, wall-mounting type inclusive of a  
switch, lamp and bell
- Power source : AC 220V 60 Hz

#### X-1-6-9 Wiring and piping works

##### (1) Cables

##### Main specification:

- High tension cables for 6.6 kV:  
Butyl rubber insulated polychloroprene sheathed cable  
(existing) and cross-linked polyethylene insulated PVC  
sheathed cables (planned) for indoor or outdoor, and  
PVC insulated wire (existing) and polyethylene  
insulated wire (planned) for outdoor aerial line with  
22mm square or more.
- Low tension cables for 600V:  
The cables mentioned above and PVC insulated PVC  
sheathed cable with 3.5mm square or more
- Control cables for 600V:  
PVC insulated PVC sheathed cable with 2mm square

- Grounding wires:  
600V PVC insulated wire

(2) Outdoor wiring system

Main specification:

- Main route - Aerial line with existing wire way (8-12m above ground level), and cable rack system on steel lattice structure (5m or more above ground level)
- Branch route - Under-ground concrete trough system or directly embedded conduit system

(3) Indoor wiring system

Main specification:

- Main route - Cable rack system or cable pit system on the floor
- Branch route - Conduit system

(4) Grounding circuit

Main specification:

- Loop system consisting of copper grounding rods and wires network system

## X-2 Capital Requirement

### X-2-1 Basic Premise

The total capital requirement and financing plan for the renovation is described in this Section. The basic premises for calculation of capital requirement are as follows:

#### (1) Basic price

The prices and costs prevailing at the time of field survey in January, 1986 is applied and therefore no escalation is considered in the calculation. The same is applied to the calculation of construction cost.

#### (2) Exchange rate

Philippine currency portion is calculated in Peso(P), and foreign currencies, both Japanese Yen (Y) and US\$ are converted into Peso by using the exchange rate as of January, 1986 as described below:

1 U.S.Dollar (US\$) =19.103 Peso

1 U.S.Dollar (US\$) = 192.05 Yen

#### (3) Scope of the total capital requirement

Total capital requirement includes the capital for renovation of Antipolo plant and that for conversion of electricity power source from MERALCO to NPC.

## X-2-2 Total Capital Requirement

The total capital requirement is the total cost invested by the time when the commercial operation starts. The following table shows the results of calculation of the total capital requirement. (As to the details, refer to Table 10-2-2 and 10-2-3).

Table 10-2-1 Total Capital Requirement

	(1,000 Pesos)		
	Foreign Portion	Local Portion	Total
Fixed capital	415,818	304,210	720,028
Working capital	0	5,154	5,154
Total	415,818	309,364	725,182

### (1) Fixed capital requirement

In this study, the fixed capital requirement is defined as a sum of costs and expenses for plant equipment, ocean freight, inland transportation, erection of plant, civil works, engineering fee and contingency.

Interest during construction is capitalized and calculated in the fixed capital cost.

Table 10-2-2 shows the breakdown of the fixed capital requirement.



Table 10-2-2 Fixed Capital Requirement

(1,000 Pesos)

	Foreign Portion	Local Portion	Total
Construction cost			
1) Machinery & Equipment	253,600	67,000	320,600
2) Ocean freight	25,000	0	25,000
3) Inland transportation	0	12,000	12,000
4) Erection work	0	81,150	81,150
5) Civil & construction work	41,000	89,000	130,000
6) Engineering fee	42,650	5,000	47,650
7) Contingency	12,000	19,200	31,200
(Sub-total)	(374,250)	(273,350)	(647,600)
Interest during construction	41,568	30,860	72,428
Total	415,818	304,210	720,028

(i) Machinery & Equipment

The cost of machinery and equipment for the renovation is included in this item.

(ii) Ocean freight

The cost for ocean freight of machinery and equipment is estimated on the Manila-Japan basis.

(iii) Inland transportation

The inland transportation cost is the cost required for the transportation of imported equipment and materials from the unloading port to the plant site.

(iv) Erection work

This expense consists of the cost for the field works such as transport, storage, assembly and erection of the plant equipment at the plant site, and the cost for the equipment and materials necessary for the field works.

(v) Civil work

The costs required for land preparation, buildings, foundation, concrete and housing are estimated in the civil work cost.

(vi) Engineering fee

The engineering fee and supervising fee required for the renovation are estimated in this item.

(vii) Contingency

The contingency is estimated to be about five(5) percent of the sum of items (i) to (vi).

(viii) Interest during construction

The interest during construction is included in the fixed capital cost.

(2) Working capital

The working capital means the funds required to continue daily activities. Normally, the working capital is defined as a total of operating cash, raw materials, product inventories and account receivable minus account payable. However, ICC

plant is now under operation and necessary inventories of raw materials and products are already prepared.

Therefore, if the control of inventory is carried out properly, the present inventory will meet the requirement after renovation. Additional working capital may not be required.

Due to the change of wet process into dry process, raw meal (slurry) is not required, but raw meal under dry process is newly required. Considering the above, the additional working capital is estimated as about one(1) percent of direct cost.

Table 10-2-3 shows the average amount of inventory for 3 months from October to December 1985, and stocks for operation (days) at full production after renovation.

Table 10-2-3 Inventory and Stock to Last

	Inventory (t)	Stock (days)
Raw Materials		
Limestone	52,447	15.3
Hi-silica	10,278	32.8
Lo-silica	11,179	29.7
Pyrite cinder	1,993	30.3
Gypsum	8,641	61.3
Pozzolan	1,127	2.9
Consumables		
Coal	2,358	6.4
Paper bag	17,182	5.5
Raw meal (slurry)	4,594	1.5
Clinker	8,193	2.6
Product		
Cement	3,919	1.3

### X-2-3 Financing Plan

The total capital requirement is assumed to be covered by long-term loan under the following conditions:

(1) Long-term loan

(i) Long-term (foreign currency) loan

85 percent of the foreign portion and local portion equivalent to 15 percent of the foreign portion is to be covered by long-term (foreign currency) loan. The conditions are as follows:

- (a) Interest rate : 11% p.a.
- (b) Repayment of principal : 10 installments/10 years equal annual payment
- (c) Grace period : 0 year (after start of commercial operation)

(ii) Long-term (local currency) loan

The capital requirement which is not covered by long-term (foreign currency) loan is assumed to be financed by long-term (local currency) loan under the following conditions:

- (a) Interest rate : 12% p.a.
- (b) Repayment of principal : 5 installments/5 years equal annual payment
- (c) Grace period : 0 year (after start of commercial operation)

The interest during construction period for long-term loan is assumed to be deferred till the first year of repayment.

(2) Short-term loan

- (i) Short-term loan is borrowed when cash position shows deficit or the working capital is increased.

The conditions for short-term loan is as follows:

- (a) Interest rate : 12% p.a.  
(b) Repayment of principal : The debt is to be paid back in the year when cash portion shows surplus

Table 10-2-4 shows the summary of financing plan.

Table 10-2-4 Financing Plan

(1,000 Pesos)	
Item	Amount
Long-term (foreign currency) loan	415,818
Long-term (local currency) loan	304,210
Short-term (local currency) loan	5,154
Total	725,182

### X-3 Implementation Schedule

The schedule of the main work - after conclusion of the construction contract between owner and contractor - is described below.

Prior to conclusion of the contract, the following preparation period is necessary.

Preparation of tender documents	2 months
Preparation of tender by contractor	2 months
Evaluation of tender	2 months
Negotiation and award of contract	2 months
Total	8 months

It is recommended that consultants be hired to perform the preparation work and to supervise the construction.

#### X-3-1 Breakdown of Work

In order to implement this work, it is necessary to clarify and breakdown the work to be performed in the Philippines and the work to be performed in overseas countries.

##### X-3-1-1 Local Portion

###### Civil & building construction

All civil & building construction work, excluding design and supply of all materials, excluding steel frames for the tower.

###### Mechanical work

Manufacture and installation of prefabricated equipment (hopper, duct, tank, cyclone, inspection platform, frame, chute, pipe, etc.).

Installation of machinery and equipment, Supply of small parts, materials for fabrication and construction

Electrical work

Installation of electrical equipment (imported equipment) and execution of electrical work.

Supply of materials for construction and installation of electrical equipment such as cable, pipe, supporting fixture, small electrical parts and construction materials.

Others

Provision of temporary work, heavy equipment, construction materials, management of work, materials and supplies and supply as well as installation of material and equipment necessary for the work that are not included in the overseas portion.

X-3-1-2 Overseas Portion

Civil & building construction

Provision of design, supply of tower frame & parts and supervision.

Mechanical work

Provision of design, supply of main equipment & critical parts and supervision.

Electrical work

Provision of design, supply of control panel, electric motor, instrument, lighting equipment, etc. and supervision.

### X-3-2 Work Schedule (refer to addendum)

The work schedule may be broken down into the indirect work conducted in Japan, including design, determining specification of machinery & equipment and procuring machinery & equipment, and the direct construction work conducted locally.

#### X-2-2 1 Indirect Work

Indirect work includes design together with ordering, manufacturing, inspecting and shipping machinery & equipment which may be performed parallel to designing. The maximum delivery period for locally procured machinery & equipment is expected to be about eight months. The machinery & equipment supplied from overseas are expected to be delivered in one shipment by sea and land to the site 13 months after designing is started.

#### X-3-2-2 Local Work Schedule

The first work, after the contractor enters the site, will be disassembling and removing No.1 kiln and associated equipment (part of brick lining & kiln shell, No.1, 2, 6, 7 roll platforms, cooler, etc ) which is expected to start in the fifth month after contract and to last about 4 months.

Civil construction, including disassembling and removing is expected to take 13 months, and mechanical work which is expected to start in the 14th month after contract (after machinery & equipment reaches the site) and is expected to be completed in 10 months. Electrical work will progress parallel with mechanical work and the last one month will be the testing period for both mechanical and electrical equipment. During this one month test period, the existing electrical equipment will be changed over to the new equipment, therefore the No.2 kiln must be shut down during this period.



### X-3-2-3 Operation During Construction

The No.1 kiln may be operated until disassembly work commences (4 months after contract), furthermore the No.2 kiln may be operated during the construction period (23 months after contract). However, since slurry silos will be converted to raw material silos, the No.2 kiln must be operated by using only 4 silos among the 9 silos and after No.2 kiln is shut down, additional 4 silos will be converted to raw material silos. Consequently prior to the rehabilitation work, the slurry pipeline for the slurry silo of No.2 kiln must be changed when No.2 kiln is not in operation. The conversion of the additional 4 slurry silos will be performed during the first shut-down period after commissioning, so the final construction work will be extended up to this time.

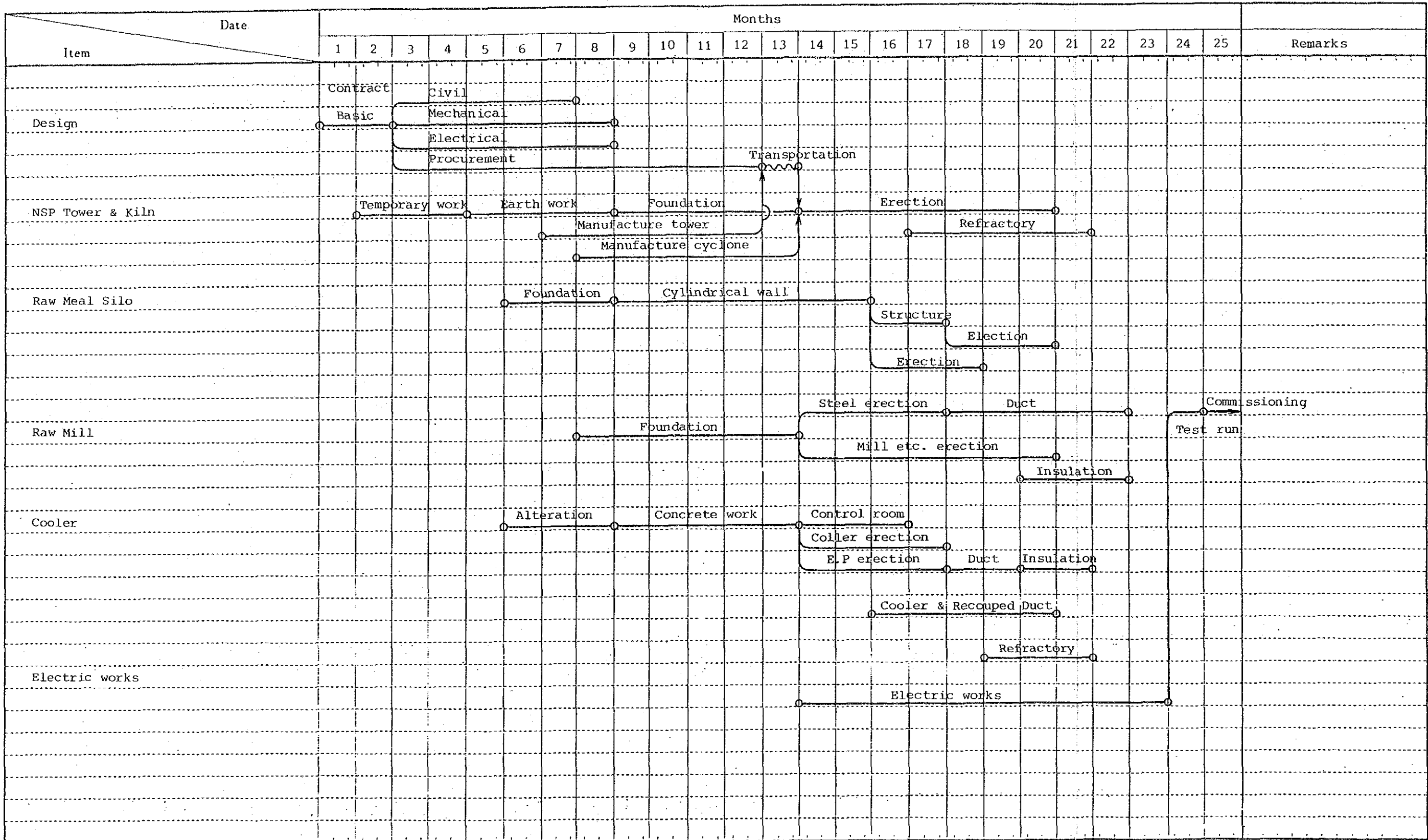
Name of Project : ICC Renvation Project

# WORK SCHEDULE

No. : .....

Date : Apr. 9, 1986

Legend :





## SECTION XI EVALUATION

### XI-1 Financial Analysis

#### XI-1-1 Premise for Financial Analysis

In this section, the production cost of cement after renovation is analyzed and the financial profitability of this renovation is evaluated by comparing the revenue and the cost before and after renovation.

In this financial analysis, the construction period before the start of commercial operation and operation life of plant is considered to be 2 years and 20 years respectively.

The profit and loss statement before and after renovation and cash flow statement formulating the difference before and after renovation are prepared. And the profitability of the renovation is assessed by the calculated value of financial internal rate of return (FIRR) of the capital requirement for the renovation.

The working kiln is considered to be No.1 and No.2 kiln before renovation, and only No.1 kiln after renovation. The production of clinker is assumed as 2,600 t/d. The major premises for financial analysis, disbursement schedule of total capital requirement, sales plan, production cost, results of financial analysis and sensitive analysis are described hereinafter.

#### XI-1-2 Basic Premises for Financial Analysis

##### (1) Project life

Construction period	:	2 years
Commercial operation period	:	20 years

(2) Plant capacity

(i) Kiln to be operated

Before renovation : No.1 kiln, No.2 kiln

After renovation : No.1 kiln

(ii) Production of clinker : 780,000 t/year (2,600 t/d)

(iii) Production of cement

Case I :

Ordinary portland cement/Pozzolan cement: 50/50(%)

Ordinary portland cement : 469,880 t/y (1,566 t/d)

Pozzolan cement : 469,880 t/y (1,566 t/d)

Total : 939,760 t/y (3,132 t/d)

Case II :

Ordinary portland cement/Pozzolan cement: 80/20(%)

Ordinary portland cement : 689,500 t/y (2,298 t/d)

Pozzolan cement : 172,380 (575 t/d)

Total : 861,880 t/y (2,873 t/d)

(3) Operation rate

300 days per year at 100% operation

Considering the expected sales volume of ICC (refer to Section III-3) the operation rate for Case I and Case II is assumed as follows:

Operation Rate

Case		Case I	Case II	Case	
Year	Year			Case I	Case II
1	68(%)	74(%)	11	85(%)	93(%)
2	69	76	12	87	95
3	71	78	13	89	97
4	73	80	14	91	99
5	75	81	15	93	100
6	77	83	16	95	100
7	78	85	17	97	100
8	80	87	18	99	100
9	82	89	19	100	100
10	83	91	20	100	100

(4) Price basis

The prices prevailing in January, 1986 is adopted as the fixed price basis in this financial analysis.

Therefore, no escalation and inflation of the prices and costs are considered in the calculation.

(5) Exchange rate (As of January, 1985)

1 U.S.Dollar (US\$) : 19.103 Peso

1 U.S.Dollar (US\$) : 192.05 Yen

(6) Fund

The total capital requirement for the renovation is explained in Section X-2, and this plan is applied to this financial analysis. That is, the total capital requirement for the renovation is assumed to be covered by long-term loan.

(i) Condition of long-term (foreign currency) loan

85% of the foreign currency portion and local currency portion equivalent to 15 percent of the foreign currency portion is to be covered by long-term (foreign currency) loan under the following conditions:

- (a) Interest rate : 11% p.a.
- (b) Repayment of principal : 10 installments/10 years equal annual payment
- (c) Grace period : 0 year (after start of commercial operation)

(ii) Condition of long-term (local currency) loan

The capital requirement which is not covered by the long-term (foreign currency) loan is assumed to be covered by long-term (local currency) loan under the following conditions:

- (a) Interest rate : 12% p.a.
- (b) Repayment of principal : 5 installments/5 years equal annual payment
- (c) Grace period : 0 year (after start of commercial operation)

The interest during construction period of long-term loan is assumed to be deferred till the first year of repayment.

(iii) Condition of short-term loan

The short-term loan is borrowed when cash position shows a deficit or the working capital is increased.

- (a) Interest rate : 12% p.a.
- (b) Repayment of principal : The debt is to be paid back in the year when cash position shows surplus.

(7) Taxes

Income tax : 35% of taxable income  
Sales tax : 10% of total revenue  
Import duty : 0% (to be exempted)

(8) Depreciation and amortization

The conditions for the calculation of depreciation and amortization are set as follows based on the discussion with ICC personnels.

<u>Item</u>	<u>Depreciation method</u>	<u>Salvage value</u>
Machinery and equipment	15 year straight line	1%
Civil and building	20 year straight line	1%
Vehicle	5 year streight line	1%
Interest during construction	10 year straight line	0%

(9) Others

0.5 Peso/bag (10.5 Peso/t · cement) is applied as export promotion fund.



### XI-1-3 Disbursement Schedule of Total Capital Requirement

Table 11-1-1 shows the disbursement schedule of the total capital requirement discussed in Section X.

Table 11-1-1 Disbursement Schedule of Total Capital Requirement

(1,000 Pesos)

Year Portion	-2		-1		Total	
	Foreign Portion	Local Portion	Foreign Portion	Local Portion	Foreign Portion	Local Portion
Construction cost	69,201	76,703	305,049	196,647	374,250	273,350
Interest during construction	6,852	4,827	40,863	19,886	47,715	24,713
Working capital	-	-	-	5,154		5,154
Total	76,053	81,530	345,912	221,687	421,965	303,217

Note: (-) in year means before completion of the renovation.

The financing schedule of borrowed long-term loan is shown in Table 11-1-2.

Table 11-1-2 Financing Schedule

(1,000 Pesos)

Year	-2	-1	Total
Loan (foreign currency)	50,127	365,691	415,818
Loan (local currency)	107,456	201,908	309,364
Total	157,583	567,599	725,182

Note: (-) in year means before completion of the renovation.

#### XI-1-4 Sales Price and Sales Plan

##### (1) Sales price

The ceiling price of cement (ex-factory price) is now controlled by the governmental authorities and the following prices are adopted for financial analysis.

Ordinary portland cement : 42.5 Peso/40kg-bag  
Pozzolan cement : 41.5 Peso/40kg-bag

Therefore, the following weight averaged prices are applied for financial analysis:

##### (i) For Case I

Sales price (weight averaged) : 42.0 Peso/bag

##### (ii) For Case II

Sales price (weight averaged) : 42.3 Peso/bag

##### (2) Sales plan

Based on the results of market study, (refer to Section III-3), sales volume and sales revenue are assumed as shown in Table 11-1-3.

Table 11-1-3 Sales Volume and Sales Revenue

Case Year	Case I		Case II	
	Sales Volume (ton)	Sales Revenue (1,000 Peso)	Sales Volume (ton)	Sales Revenue (1,000 Peso)
1	639,036	670,987	637,791	674,464
2	648,434	680,855	655,028	692,692
3	667,229	700,590	672,266	710,921
4	686,024	720,325	689,504	729,150
5	704,820	740,061	698,122	738,264
6	723,615	759,795	715,360	756,493
7	733,012	769,662	732,598	774,722
8	751,808	789,398	749,835	792,950
9	770,603	809,133	767,073	811,179
10	780,000	819,000	784,310	829,407
11	798,796	838,735	801,548	847,637
12	817,591	858,470	818,786	865,866
13	836,386	878,205	836,023	884,094
14	855,181	897,940	853,261	902,323
15	873,976	917,674	861,880	911,438
16	892,772	937,410	861,880	911,438
17	911,567	957,145	861,880	911,438
18	930,362	976,880	861,880	911,438
19	939,760	986,748	861,880	911,438
20	939,760	986,748	861,880	911,438

X-1-5 Production Cost

Table 11-1-4 shows the summary of production cost consisting of operating cost, depreciation and interest of loan.

Table 11-1-4 Production Cost

(1,000 Pesos)

Item	Case	Case I		Case II	
		Before Renovation	After Renovation	Before Renovation	After Renovation
Direct cost					
Raw materials		74,955	70,094	72,899	67,714
Fuel		194,359	107,189	209,908	115,764
Grinding media		9,691	2,616	10,297	2,591
Fire brick		17,550	8,775	18,954	9,425
Lubricant		7,048	7,048	6,981	6,981
Paper bag		73,465	73,465	72,766	72,766
Electric power		236,865	103,875	246,777	107,807
Repair expenses		13,391	13,391	13,264	13,264
Others		8,810	8,810	8,727	8,727
(Total of direct cost)		(636,134)	(395,263)	(660,573)	(405,039)
Fixed cost					
Labour cost		9,492	9,761	9,492	9,761
Administration		8,280	8,280	8,280	8,280
Depreciation		68,305	115,525	68,273	115,499
Interest		602	23,240	5,964	23,221
(Total of fixed cost)		(86,679)	(156,806)	(92,009)	(156,761)
Total		722,813	552,069	752,582	561,800
Unit cost (Peso/ton-cement)		1,026	783	1,078	805

Table 11-1-4 shows the production cost in the 5th year after commencement of commercial operation.

(1) Direct cost

(i) Cost for raw materials

Unit consumption of raw materials

(t/t-cement)

Item	Case	Case I		Case II	
		Before Renovation	After Renovation	Before Renovation	After Renovation
Limestone		1.253	1.095	1.367	1.194
Hi-silica clay		0.158	0.100	0.172	0.109
Lo-silica clay		0.058	0.120	0.063	0.131
Pyrite cinder		0.025	0.021	0.027	0.023
Gypsum		0.045	0.045	0.045	0.045
Pozzolana		0.125	0.125	0.050	0.050

Unit price of raw materials

Limestone	:	38 Peso/ton
Hi-silica clay	:	38 Peso/ton
Lo-silica clay	:	38 Peso/ton
Pyrite cinder	:	261 Peso/ton
Gypsum	:	700 Peso/ton
Pozzolana	:	100 Peso/ton

Unit raw materials cost per 1 ton of cement

(Peso/t-cement)

Case I		Case II	
Before Renovation	After Renovation	Before Renovation	After Renovation
106.35	99.45	104.42	97.00

## (ii) Cost for fuel (coal)

Item \ Case	Case I		Case II	
	Before Renovation	After Renovation	Before Renovation	After Renovation
Unit consumption (t/t-cement)	0.2136	0.1178	0.2329	0.1285
Unit price (Peso/t-coal)	1,291	1,291	1,291	1,291
Unit cost (Peso/t-cement)	275.8	152.1	300.7	165.9

Note: Calorific value of coal: 5,635 kcal/kg-coal

## (iii) Cost for grinding media

Item \ Case	Case I		Case II	
	Before Renovation	After Renovation	Before Renovation	After Renovation
[ Raw material mill ]				
Unit consumption (kg/t-cement)	0.9	-	0.98	-
Unit price (Peso/t)	12.5	-	12.5	-
Unit cost (Peso/t-cement)	11.25	1.21	12.25	1.21
[ Cement mill ]				
Unit consumption (kg/t-cement)	0.2	0.2	0.2	0.2
Unit price (Peso/t)	12.5	12.5	12.5	12.5
Unit cost (Peso/t-cement)	2.5	2.5	2.5	2.5
Total	13.75	3.71	14.75	3.71

For raw materials mill, a roller mill will be used after renovation.

The cost for replacement of table and tyres of roller mill is estimated as 1,091,000 Peso per year (for production of 900,000 ton-cement).

(iv) Cost for fire brick

Item	Case	Case I		Case II	
		Before Renovation	After Renovation	Before Renovation	After Renovation
Unit consumption (kg/t-cement)		1.66	0.83	1.81	0.90
Unit price (Peso/kg)		15	15	15	15
Unit cost (Peso/t-cement)		24.9	12.45	27.15	13.5

(v) Cost for lubricant oil

Item	Case	Case I		Case II	
		Before Renovation	After Renovation	Before Renovation	After Renovation
Unit cost (Peso/t-cement)		10	10	10	10

(vi) Cost for paper bag

Item	Case	Case I		Case II	
		Before Renovation	After Renovation	Before Renovation	After Renovation
Unit consumption (Bag/t-cement)		25.8	25.8	25.8	25.8
Unit price (Peso/bag)		4.04	4.04	4.04	4.04
Unit cost (Peso/t-cement)		104.2	104.2	104.2	104.2

Note: The breakage of paper bag is estimated as 3%.

(vii) Cost for electric power

Item \ Case	Case I		Case II	
	Before Renovation	After Renovation	Before Renovation	After Renovation
Unit consumption (kWh/t-cement)	130.17	117.94	136.92	123.58
Unit price (Peso/kWh)	2.5817	1.2496	2.5817	1.2496
Unit cost (Peso/t-cement)	336.06	147.38	353.49	154.43

Note: Source of power

Before renovation : MERALCO

After renovation : NPC

(viii) Repair expenses

Item \ Case	Case I		Case II	
	Before Renovation	After Renovation	Before Renovation	After Renovation
Unit cost (Peso/t-cement)	19	19	19	19

(ix) Others (Export promotion fund)

Item \ Case	Case I		Case II	
	Before Renovation	After Renovation	Before Renovation	After Renovation
Unit price (Peso/bag)	0.5	0.5	0.5	0.5
Unit cost (Peso/t-cement)	12.5	12.5	12.5	12.5



(2) Fixed cost

(i) Labor cost

Number of employee	:	before renovation	423
		after renovation	435
Average salaries and wages	:	1,870 Pesos/man·month	
Annual labor cost	:		
		before renovation	9,492,000 Pesos/year
		after renovation	9,761,000 Pesos/year

Note: As mentioned in Section IX-8, the number of employee after renovation will be increased by 12 persons in the Production department.

Note: Average salaries and wages for one employee include 1 month allowance as bonus payment

(ii) Cost for administration

No additional administration expenses will be required after renovation. However, considering increase of employee after renovation, 8,280,000 Pesos is estimated as the administration expenses after renovation.

(iii) Depreciation and amortization

The cost for depreciation and amortization for investment is estimated by using the following calculation method, in accordance with the discussion with ICC personnels.

Table 11-1-5 Depreciation

	Depreciation Cost (1,000 Peso)	Depreciation Method	Salvage Value	Depreciation per Year (1,000 Peso)
Machinery & Equipment	499,465	15 year straight line	1%	32,965
Civil and building	148,135	20 year straight line	1%	7,333
Vehicle	0	5 year straight line	1%	0
Interest during construction	72,428	10 year straight line	0%	7,243

The annual cost for depreciation and amortization before and after renovation is summarized in Table 11-1-6.

Table 11-1-6 Depreciation (per year)  
(1,000 Peso/year)

Item \ Case	Before Renovation	After Renovation
Machinery & Equipment	49,918	82,883
Civil and building	15,280	22,613
Vehicle	2,271	2,271
Interest during construction	0	7,243
Total	67,469	115,010

(iv) Interest

As to the loan conditions of long-term loan and short-term loan, please refer to Section XI-1-2, (6).

## XI-1-6 Analysis

### (1) Profitability

Based on the study results and premises so far described in the financial analysis, the profit and loss statement before and after renovation and cash flow statement formulating the difference before and after renovation is prepared.

Then the profitability of the renovation is assessed by the calculated value of FIRR.

#### (i) FIRROI (Financial Internal Rate of Return on Investment)

FIRROI stands for IRR (Internal Rate of Return) on investment with the premise that the total investment for renovation is covered by own funds.

FIRROI essentially indicates the profitability of the renovation itself, and effects of financing conditions such as loan conditions, debt and equity ratio, etc. are not considered.

#### (ii) FIRROE (Financial Internal Rate of Return on Equity)

FIRROE stands for IRR on Equity (own fund invested) and FIRROE indicates the profitability of own capital invested. Since no equity participation is considered in both Case I and II, there are no calculation results of FIRROE. However, a case study of equity participation is studied as sensitivity analysis.

Table 11-1-7 shows the results of profitability of this renovation.

Table 11-1-7 FIRR of Basic Case

	(%)	
Case	Case I	Case II
FIRROIBT	33.3	35.5
FIRROIAT	28.8	31.6

Note: FIRROIBT : FIRROI before tax  
 FIRROIAT : FIRROI after tax

As per Table 11-1-7, FIRROIBT and FIRROIAT show sound profitability of the renovation.

(2) Break-even point

It is assumed that full operation will be achieved in the 19th year after completion, and therefore, the break-even point in 19th year was calculated by using the following formula:

At the break-even point, the sum of sales revenue equals to the sum of production cost.

(i) Break-even point after renovation (x)

$$x(\%) = \frac{\text{Fixed cost}}{\text{Sales revenue} - \text{Direct cost}}$$

x(%) : The capacity utilization of plant at the break-even point

(ii) Cash break-even point after renovation (y)

$$y(\%) = \frac{\text{Fixed cost} - (\text{Depreciation} + \text{Amortization})}{\text{Sales revenue} - \text{Direct cost}}$$

Table 11-1-8 Break-even Point

Item \ Case	Case I		Case II	
	Year	%	Year	%
Break-even point	19	36.0	15 and 19	40.5
Cash break-even point	19	4.9	15 and 19	5.5

Note: Year is calculated from the commencement of commercial operation.

As per Table 11-1-8, the break-even point in Case I and Case II is 36.0% and 40.5% respectively, which shows high profitability of the renovation.

40% of production rate equals to 1,040 tons per day of clinker production, which is lower than the production of one kiln in 1986.

(3) Payout year

The payout year means the year in which the total investment (construction cost) equals to the cumulative cash amount of income after tax.

The results in Table 11-1-9 shows that the capital requirements for the renovation is recovered in short period.

Table 11-1-9 Payout Year

	Case I	Case II
Payout year	3 year 3 months	3 year 0 month

### XI-1-7 Sensitivity Analysis

Sensitivity analysis is carried out for changes of the following parameters:

- changes in sales price
- changes in construction cost
- changes in direct cost
- changes in operation rate
- changes in interest rate
- changes in equity rate

The following 2 cases are also studied in addition to the above sensitivity analysis. (refer to Section XI-1-6, (4), (vii))

Case Study A : Renovation by conversion of electricity power source from MERALCO to NPC

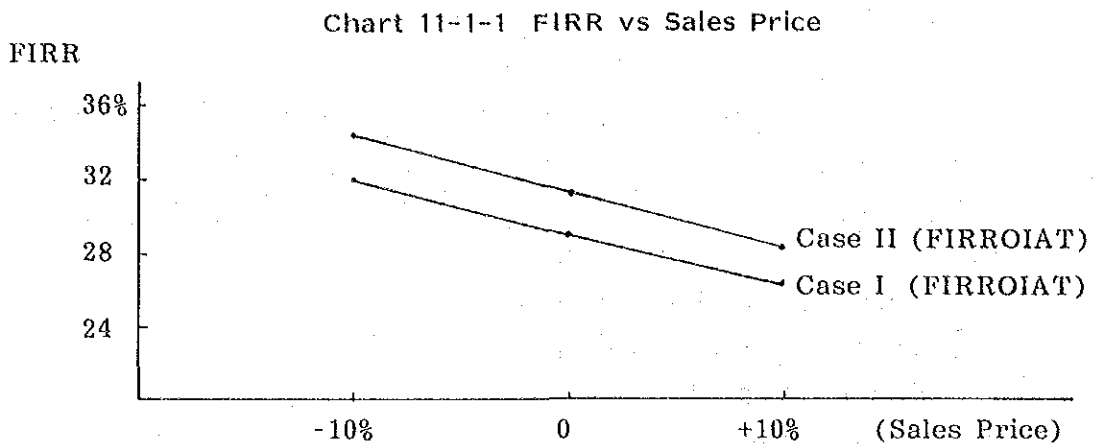
Case Study B : Renovation by conversion of production process (wet to dry)

#### (1) Change in sales price

The effects on the profitability are studied by varying the sales price by 10%.

Table 11-1-10 FIRR vs Sales Price and Break-even Point

Item \ Case	Case I			Case II		
	Base	+10%	-10%	Base	+10%	-10%
Sales price (Peso/t-cement)	1,050	1,155	945	1,057.5	1,163.25	951.75
FIRROIBT (%)	33.3	33.3	33.3	35.5	35.5	35.5
FIRROIAT (%)	28.8	26.3	32.0	31.6	28.4	34.4
Break-even point (%)	36.0	28.9	47.5	40.5	32.3	54.2



Because the profitability in this study is evaluated by the difference of cash flow before and after renovation. The effects of changes in sales price is offset.

Therefore, FIRROI become same in spite of changes in sales price.

On the other hand, when the sales price rises by 10%, the profit after renovation becomes large, then amount of sales tax becomes large, then the FIRROIAT become low.

As to the break-even point after renovation, the normal trend is found, i.e., low break-even point in case of high sales price.

(2) Changes in construction cost

The profitability is evaluated by varying the investment cost (construction cost) by  $\pm 10\%$ .

Construction cost (1,000 Pesos)

<u>Base Case</u>	<u>+10%</u>	<u>-10%</u>
647,600	712,360	582,840

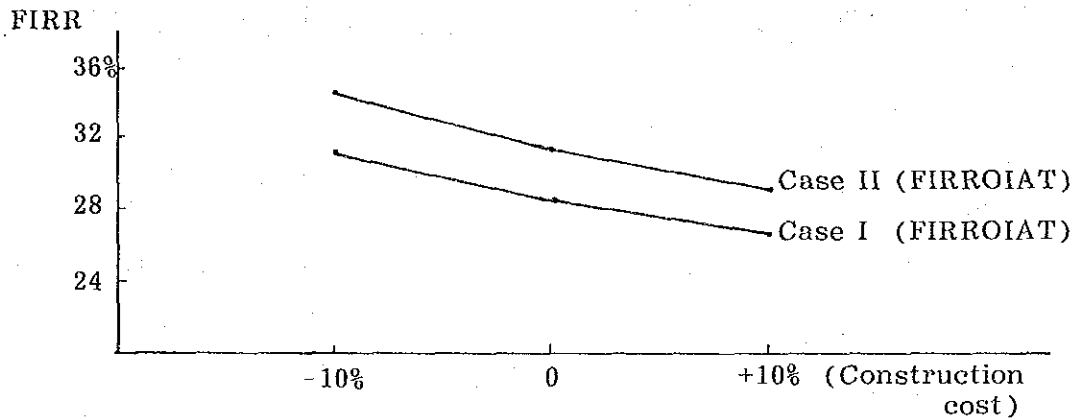
Note: The construction cost is the same as the Case I and II.

Table 11-1-11 FIRR vs Construction Cost and Break-even Point

(%)

Item \ Case	Case I			Case II		
	Base	+10%	-10%	Base	+10%	-10%
FIRROIBT	33.3	30.5	36.6	35.5	32.5	39.0
FIRROIAT	28.8	26.6	31.4	31.6	29.2	34.4
Break-even point	36.0	37.3	34.7	40.5	41.9	39.1

Chart 11-1-2 FIRR vs Construction Cost



Changes in the construction cost also cause changes of operating cost. The increase of the construction cost causes both FIRROIBT and FIRROIAT to become low.

The results in Chart 11-1-2 shows normal trend of FIRR and the changes of construction cost.

When the construction cost rises by 10%, the break-even point after renovation increases by 1.3% in Case I and 1.4% in Case II.



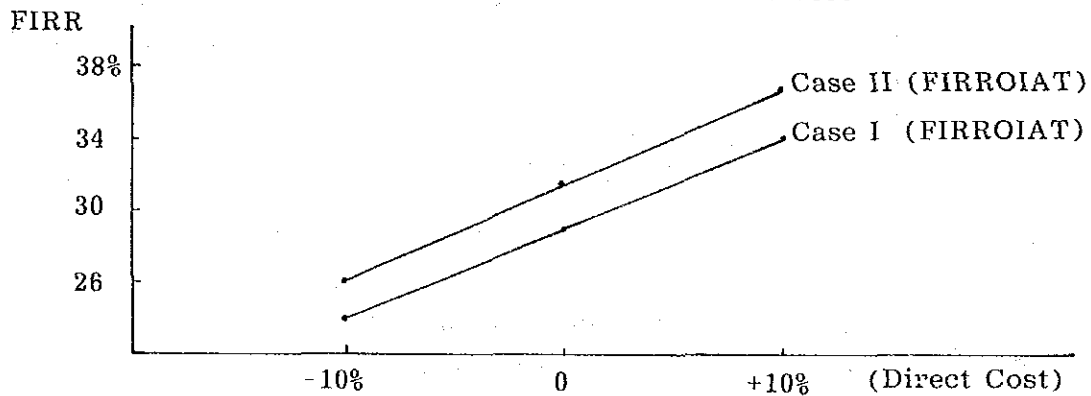
(3) Changes in direct cost

The effects of direct cost on the profitability is studied by varying the direct cost by  $\pm 10\%$ .

Table 11-1-12 FIRR vs Direct Cost and Break-even Point

Item	Case	Case I			Case II		
		Base	+10%	-10%	Base	+10%	-10%
FIRROIBT		33.3	36.3	30.2	35.5	38.7	32.2
FIRROIAT		28.8	33.9	24.1	31.6	36.8	26.1
Break-even point		36.0	41.8	31.6	40.5	47.6	35.2

Chart 11-1-3 FIRR vs Direct Cost



As mentioned before, the profitability of the renovation is evaluated by the difference of cash flow before and after renovation.

Therefore, when the direct cost increase, the cash flow before renovation become worse due to bigger amount of direct cost than that after renovation.

As a result, the difference of cash flow before and after renovation become big and the profitability become good.

When the direct cost increases, the break-even point after renovation become high which is a normal trend.

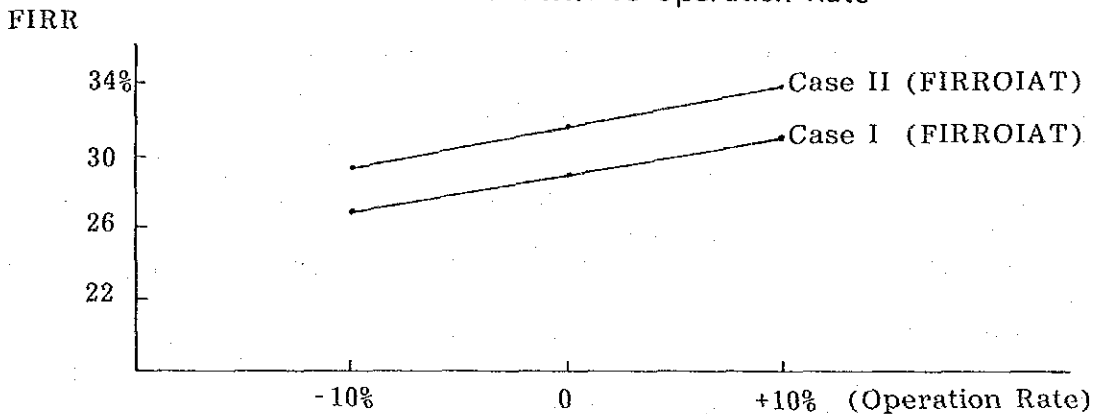
(4) Changes in operation rate

The effects of operation rate on profitability are analyzed by varying the operation rate by  $\pm 10\%$ .

Table 11-1-3 FIRR vs Operation Rate

Case \ Item	Case I			Case II		
	Base	+10%	-10%	Base	+10%	-10%
FIRROIBT	33.3	36.3	30.2	35.5	38.6	32.2
FIRROIAT	28.8	30.8	26.8	31.6	33.7	29.4
Break-even point	36.0	36.0	(36.0)	40.5	40.5	(40.5)

Chart 11-1-4 FIRR vs Operation Rate



When operation rate rises, the difference of cash flow before and after renovation becomes big and profitability is also improved. The break-even point after renovation is not affected by changes in operation rate, as explained in Section XI-1-6, (2).

However, when the operation rate decreases by 10%, the break-even point cannot be calculated, because the year of full operation is not found in the project life (20 years).

But the rate should be same as Case II.

(5) Changes in interest rate

Table 11-1-14 shows the effects of changes in interest rate on profitability.

Case (i)

Foreign currency loan : same as Base Case  
 Local currency loan : 20% p.a.  
 (interest)

Case (ii)

Foreign currency loan  
 interest rate : 3.5% p.a.  
 grace period : 10 year  
 repayment : 20 year  
 Local currency loan : same as Base Case

Table 11-1-14 FIRR vs Interest Rate

Case \ Item	Case I			Case II		
	Base	Case(i)	Case(ii)	Base	Case(i)	Case(ii)
FIRROIBT	33.3	33.3	33.3	35.5	35.5	35.5
FIRROIAT	28.8	29.5	28.0	31.6	32.2	30.7
Break-even point	36.0	36.5	35.2	40.5	41.1	39.6

As explained in Section XI-1-6, (1), the effects of financing conditions such as interest rate and loan conditions are not considered in calculations of FIRROI.

Therefore, FIRROIBT shows the same profitability in spite of change in interest rate.

When the interest rate rise, the profit and the amount of income tax become small, then high profitability is found in Table 11-1-14.

(6) Changes in equity ratio (30%)

Table 11-1-15 FIRR vs Equity and Break-even Point

(%)

Item \ Case	Case I		Case II	
	Base	Equity: 30%	Base	Equity: 30%
FIRROIBT	33.3	33.3	35.5	35.5
FIRROIAT	28.8	28.1	31.6	30.8
FIRROE	-	54.8	-	60.9
Break-even point	36.0	35.4	40.5	39.8

When the equity ratio increase from 0% of the Base Case to 30%, the FIRROE of Case I and Case II are 54.8% and 60.9% respectively. Since the FIRROI stands for the profitability against total investment, the results of FIRROI is the same as the Base Case. The break-even point after renovation shows lower percentage in comparison with the result of Base Case, because the amount of depreciation decrease since decrease of interest during construction.

## XI-1-8 Case Study

In the previous section, financial aspects of the renovation have been reviewed and evaluated for the Base Case. Base Case include the conversion of production process and installation of new transmission line between NPC and plant.

In this section, the profitability of the following cases are evaluated. The other conditions such as annual production, financing conditions etc. are based on the same premises in Base Case.

Case A : Renovation by conversion of electricity power source from MERALCO to NPC

Case B : Renovation by conversion of production process (wet to dry)

Major differences from the Base Case are summarized hereinafter.

(1) Case A: Renovation by conversion of electricity power source from MERALCO to NPC

The outline of this renovation is as follows:  
(refer to Section VIII-9)

(i) Total capital requirement

Table 11-1-16 Total Capital Requirement

(1,000 Pesos)

Item	Portion	Foreign Portion	Local Portion	Total
Machinery/Equipment		47,600	0	47,600
Erection		0	30,150	30,150
Engineering fee		4,650	0	4,650
Contingency		0	5,200	5,200
(Sub-total)		(52,250)	(35,350)	(87,600)
Interest during construction		6,015	2,529	8,544
Working capital		0	5,154	5,154
Total		58,265	43,033	101,298

(ii) Disbursement schedule of total capital requirement

Table 11-1-17 Disbursement Schedule of Total Capital Requirement

(1,000 Pesos)

Item	- 2 Year		- 1 Year		Total	
	Foreign Portion	Local Portion	Foreign Portion	Local Portion	Foreign Portion	Local Portion
Construction cost	20,901	5,303	31,349	30,047	52,250	35,350
Interest during construction	1,056	251	4,959	2,278	6,015	2,529
Working capital	0	0	0	5,154	0	5,154
Total	21,957	5,554	36,308	37,479	58,265	43,033

Note: (-) in year means before the completion of the renovation.

(iii) Other conditions

Other conditions is assumed same as those in section XI-1-2 (basic premises).

(iv) Major difference from the Base Case

(a) Decrease of investment cost

Investment cost for Case A is estimated to be about 14% of the Base Case due to the limited range of the renovation.

(b) Cost for electricity and fuel

Cost for electricity can be reduced greatly as same as the Base Case, while the advantage through the conversion of production process, i.e., the decrease of fuel cost is not be enjoyed. (refer to Section XI-1-5, (1), (viii))

(2) Case B: Renovation by conversion of production process  
(wet to dry)

The outline of this renovation is as follows:

(i) Total capital requirement

Table 11-1-18 Total Capital Requirement

(1,000 Peso)

Item	Portion	Foreign Portion	Local Portion	Total
Construction cost				
Machinery/Equipment		206,000	67,000	273,000
Ocean freight		25,000	0	25,000
Inland transport		0	12,000	12,000
Erection		0	51,000	51,000
Civil		41,000	89,000	130,000
Engineering fee		38,000	5,000	43,000
Contingency		12,000	14,000	26,000
(Sub-total)		(322,000)	(238,000)	(560,000)
Interest during Construction		41,700	22,184	63,884
Working capital		0	5,154	5,154
Total		363,700	265,338	629,038

(ii) Disbursement schedule of total capital requirement

Table 11-1-19 Disbursement Schedule of Total Capital Requirement

(1,000 Peso)

Item	-2 Year		-1 Year		Total	
	Foreign Portion	Local Portion	Foreign Portion	Local Portion	Foreign Portion	Local Portion
Construction cost	48,300	71,400	273,700	166,600	322,000	238,000
Interest during construction	5,796	4,576	35,904	17,608	41,700	22,184
Working capital	0	0	0	5,154	0	5,154
Total	54,096	75,976	309,604	189,362	363,700	265,338

Note: (-) in year means before the completion of the renovation.

(iii) Other conditions

Other conditions are assumed same as those in Section XI-1-2 (basic premises).

(iv) Major difference from the Base Case

(a) Decrease of investment cost

Investment cost for Case B is estimated to be about 86% of the Base Case.

(b) Cost for electricity and fuel

Cost for fuel can be reduced greatly as same as the Base Case, while the advantage through conversion of electricity power source, i.e., the decrease of electricity cost cannot be enjoyed.

Major parameters of the renovation for the Base Case, Case Study A and B have been summerized in Table 11-1-20.



Table 11-1-20 Premises of Case Study

Item	Case	Base (Case I)	Case A	Case B
1	Construction cost (1,000 Peso)	674,000	87,600	560,000
2	Cement production (t/year)	939,760	939,760	939,760
3	Unit consumption of raw materials (t/t-cement)	1,506	1,506	1,506
4	Unit cost of raw materials (Peso/t-cement)	99.45	106.35	99.45
5	Fuel Unit consumption x Unit price (t/t-cement) (Peso) Unit cost (Peso/t-cement)	0.1178x1,291 152.1	0.2136x1,291 275.8	0.1178x1,291 152.1
6	Electric power Unit consumption x Unit price (kWh/t-cement) (Peso) Unit cost (Peso/t-cement)	117.94x1.2496 147.38	117.94x1.2496 147.38	130.17x2.5817 336.06
7	Fire-bricks Unit consumption x Unit price (kg/t-cement) (Peso) Unit cost (Peso/t-cement)	0.83 x 15 12.45	1.66 x 15 24.9	0.83 x 15 12.45
8	Grinding media Unit cost (Peso/t-cement)	3.71	13.75	3.71
Total (4 + 5 + 6 + 7 + 8) (Peso/t-cement)		415.09	568.18	603.77

(3) Results of financial study - Case Study -

Financial analysis by the analysis method described in Section XI, have been made for Case Study A and B based on the parameters values indicated in Table 11-1-20.

Calculated FIRROIBT and FIRROIAT are summarized in Table 11-1-21.

Table 11-1-21 FIRR (Case Study)

	(%)		
	Base (Case I)	Case A	Case B
FIRROIBT	33.3	-	17.5
FIRROIAT	28.8	92.5	16.9

Note: FIRROIBT in Case A become over 100%.

Consideration of Case Study

- (i) The renovation by conversion of electricity power source from MERALCO to NPC (Case A) affect profitability greatly, because the decrease of electricity cost is very big compared to the amount of investment. However, as shown in Table 11-1-20, the direct production cost is still high by about 37% in comparison with the Base Case.
- (ii) The profitability of Case B is lower than that of Base Case, however, FIRROI is still at satisfactory level.

(iii) As shown in Table 11-1-20, the cost of fuel and electricity account for a big percentage in the direct production cost.

Since the Base Case can enjoy the advantages of both Case A and B, Base Case supported by the results of high profitability is most advisable.

XI-1-9 Others

In this financial analysis, the difference of cash flow before and after renovation is considered as profit against total investment. Therefore, when the cash flow before renovation is minus, the profit will become big.

For reference, the profitability of Base Case against profit after renovation is studied and summarized in Table 11-1-22.

Table 11-1-22 FIRR (Renovation)

	(%)	
	Base Case (I)	Base Case (II)
FIRROIBT	35.6	34.5
FIRROIAT	31.3	30.6

- (1) In Base Case I, the cash flow before renovation (before depreciation) is (+). Therefore, the cash flow after renovation is larger than the difference of cash flow before and after renovation.
- (2) In Base Case II, the cash flow before renovation (before depreciation) is (-), i.e., the cash flow after renovation is smaller than the difference of cash flow before and after renovation.  
Therefore, FIRROIBT and FIRROIAT after renovation is smaller than those for the difference of cash flow.
- (3) FIRROIBT and FIRROIAT in both Base Case I and II shows good profitability (over 30%).

The following case was studied in addition to the above study.

Premise (1) The debt to DBP/PNB (1,209 million Peso) and the present capital (15 million Peso) is considered as total capital.

(2) The amount in (1) plus capital requirement for the renovation is considered as total capital requirement.

The results of FIRR calculation are summarized in Table 11-1-23.

Table 11-1-23 FIRR (Case Study)

	Case I	Case II
FIRROIBT	12.2	11.6
FIRROIAT	9.4	8.9
FIRROE	12.2	11.5

The above premises are very severe to evaluate the profitability of total capital requirement, i.e., approx. 2.7 times of capital requirement for the renovation.

However, FIRROIAT of Case I and Case II is around 9% which show high profitability of the renovation.

A T T A C H M E N T

	<u>Page</u>
1. Base Case I	377 ~ 386
2. Base Case II	387 ~ 396
3. Base Case I (After Renovation)	397 ~ 406
4. Base Case II (After Renovation)	407 ~ 416



Base Case I

Base Case I - Before Renovation

PROJECT YEAR	STATEMENT (1/3)							
	PROFIT AND LOSS	1	2	3	4	5	6	7
SALES VOLUME (TON/YEAR)	0	639036	648434	667229	686024	704820	723615	733012
RATIO OF DOMESTIC SALES (%)	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SALES REVENUE	0	670987	680855	700590	720325	740061	759795	769662
EXCISE DUTY	0	0	0	0	0	0	0	0
SALES TAX	0	60998	61895	63690	65484	67278	69072	69969
NET SALES REVENUE	0	609989	618960	636900	654841	672783	690723	699693
COST AND EXPENSE								
DIRECT-COST	0	67959	68938	70957	72956	74955	76953	77953
RAW MATERIAL	0	0	0	0	0	0	0	0
CONSUMABLES	0	31080	31546	32460	33374	34289	35203	35660
FUEL	0	176219	178810	183993	189176	194359	199542	202133
ELECTRIC POWER	0	214758	217916	224232	230549	236865	243182	246340
REPAIR EXPENSES	0	12141	12319	12677	13034	13391	13748	13926
BAGS	0	74596	75693	77807	80081	82275	84469	85566
TOTAL OF DIRECT COST	0	576761	585242	602206	619170	636134	653097	661578
FIXED COST	0	0	0	0	0	0	0	0
SALARIES AND WAGES	0	9492	9492	9492	9492	9492	9492	9492
ADMINISTRATIVE-EXPENSES	0	8280	8280	8280	8280	8280	8280	8280
MISCELLANEOUS EXPENSES	0	0	0	0	0	0	0	0
DEPRECIATION	0	67469	67469	67469	67469	67469	67469	67469
AMORTIZATION	0	836	836	836	836	836	836	836
TOTAL OF FIXED COST	0	86077	86077	86077	86077	86077	86077	86077
EARNINGS	0	-52849	-52359	-51383	-50406	-49428	-48451	-47962
FINANCIAL-CHARGE	0	0	0	0	0	0	0	0
INTEREST LONG TERM (1)	0	0	0	0	0	0	0	0
INTEREST LONG TERM (2)	0	0	0	0	0	0	0	0
INTEREST-SHORT-TERM	0	1003	903	803	702	602	502	401
TOTAL	0	1003	903	803	702	602	502	401
TOTAL OF PRODUCTION COST	0	663841	672222	689086	705949	722813	739676	748056
NET-EARNINGS-BEFORE-TAX	0	-53852	-53262	-52186	-51108	-50030	-48953	-48363
INCOME TAX	0	0	0	0	0	0	0	0
NET EARNINGS-AFTER TAX	0	-53852	-53262	-52186	-51108	-50030	-48953	-48363



Base Case I

Base Case I - Before Renovation

PROJECT YEAR	8	9	10	11	12	13	14	15	16	17
SALES VOLUME (TON/YEAR)	751608	776603	780600	798796	817591	836386	855181	873976	892772	911567
RATIO OF DOMESTIC SALES (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SALES REVENUE	789398	809133	819000	838735	858470	878205	897940	917674	937410	957145
EXCISE DUTY	0	0	0	0	0	0	0	0	0	0
SALES TAX	71763	73557	74454	76248	78042	79836	81630	83424	85219	87013
NET SALES REVENUE	717635	735576	744546	762487	780428	798369	816310	834250	852191	870132
COST AND EXPENCE										
DIRECT-COST										
RAW MATERIAL	79952	81950	82950	84949	86947	88946	90945	92944	94943	96941
CONSUMABLES	36575	37489	37946	38861	39775	40689	41604	42518	43433	44347
FUEL	207316	212499	215091	230274	235457	230639	235822	241005	246188	251371
ELECTRIC POWER	252656	258973	262131	268447	274764	281080	287397	293713	300029	306346
REPAIR EXPENSES	14284	14641	14819	15176	15533	15890	16248	16605	16962	17319
BAGS	87760	89954	91051	93245	95439	97633	99827	102021	104215	106409
TOTAL OF DIRECT COST	678543	695506	703988	720952	737915	754877	771843	788806	805770	822733
FIXED COST	9492	9492	9492	9492	9492	9492	9492	9492	9492	9492
SALARIES AND WAGES	8280	8280	8280	8280	8280	8280	8280	8280	8280	8280
ADMINISTRATIVE-EXPENSES	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS EXPENSES	67469	67469	67469	67469	67469	67469	67469	67469	67469	67469
DEPRECIATION	836	836	840	840	840	840	840	840	840	840
AMORTIZATION	0	0	0	0	0	0	0	0	0	0
TOTAL OF FIXED COST	86077	86077	86081	85241	85241	85241	85241	85241	85241	85241
EARNINGS	-46985	-46007	-45523	-43706	-42728	-41749	-40774	-39797	-38820	-37842
FINANCIAL-CHARGE										
INTEREST LONG TERM (1)	0	0	0	0	0	0	0	0	0	0
INTEREST LONG TERM (2)	0	0	0	0	0	0	0	0	0	0
INTEREST-SHORT-TERM	301	301	301	301	301	301	301	301	301	301
TOTAL	301	301	301	301	301	301	301	301	301	301
TOTAL OF PRODUCTION COST	764921	781784	780169	806193	823156	840118	857084	874047	891011	907974
NET-EARNINGS-BEFORE-TAX	-47286	-46208	-45623	-43706	-42728	-41749	-40774	-39797	-38820	-37842
INCOME TAX	0	0	0	0	0	0	0	0	0	0
NET EARNINGS AFTER TAX	-47286	-46208	-45623	-43706	-42728	-41749	-40774	-39797	-38820	-37842

Base Case I - Before Renovation

PROFIT AND LOSS STATEMENT (3/3)

PROJECT YEAR	18	19	20
SALES VOLUME (TON/YEAR)	930362	939760	939760
RATIO OF DOMESTIC SALES (%)	100.00	100.00	100.00
SALES REVENUE	976880	986748	986748
EXCISE DUTY	0	0	0
SALES TAX	88807	89704	89704
NET SALES REVENUE	888073	897044	897044
COST AND EXPENCE			
DIRECT COST			
MAN-MATERIAL	98940	99940	99940
CONSUMABLES	45261	45719	45719
FUEL	256554	259146	259146
ELECTRIC-POWER	312662	315821	315821
REPAIR EXPENSES	17676	17855	17855
RAGS	108603	109700	109700
TOTAL OF DIRECT COST	899696	848181	848181
FIXED COST			
SALARIES AND WAGES	9492	9492	9492
ADMINISTRATIVE EXPENSES	8280	8280	8280
MISCELLANEOUS EXPENSES	0	0	0
DEPRECIATION	67469	67469	67469
AMORTIZATION	0	0	0
TOTAL OF FIXED COST	85241	85241	85241
EARNINGS	-36864	-36378	-36378
INTEREST LONG TERM (1)	0	0	0
INTEREST LONG TERM (2)	0	0	0
INTEREST SHORT TERM	0	0	0
TOTAL	0	0	0
TOTAL OF PRODUCTION COST	924937	933422	933422
NET EARNINGS BEFORE TAX	-36864	-36378	-36378
INCOME TAX	0	0	0
NET EARNINGS AFTER TAX	-36864	-36378	-36378

Base Case I

Base Case I - After Renovation

PROJECT YEAR	PROFIT AND LOSS STATEMENT (1/3)									
	-3	-2	-1	2	3	4	5	6	7	
SALES VOLUME (TON/YEAR)	0	0	0	639036	648434	667229	686024	704820	723615	733012
RATIO OF DOMESTIC SALES (%)	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SALES REVENUE	0	0	0	670987	680855	700590	720325	740061	759795	769662
EXCISE DUTY	0	0	0	0	0	0	0	0	0	0
SALES TAX	0	0	0	60998	61895	63690	65484	67278	69072	69969
NET SALES REVENUE	0	0	0	609989	618960	636900	654841	672783	690723	699693
COST AND EXPENSE										
DIRECT-COST	0	0	0	63552	64486	66355	68225	70094	71963	72898
RAW MATERIAL	0	0	0	16718	16964	17456	17947	18439	18931	19177
CONSUMABLES	0	0	0	97184	98614	101472	104330	107189	110047	111476
FUEL	0	0	0	94180	93565	98335	101105	103875	106645	108030
ELECTRIC POWER	0	0	0	12141	12319	12677	13034	13391	13748	13926
REPAIR EXPENSES	0	0	0	74596	75493	77887	80081	82275	84469	85566
BAGS	0	0	0	358371	363641	374182	384722	395263	405809	411073
TOTAL OF DIRECT COST	0	0	0	8280	8280	8280	8280	8280	8280	8280
FIXED COST	0	0	0	9761	9761	9761	9761	9761	9761	9761
SALARIES AND WAGES	0	0	0	0	0	0	0	0	0	0
ADMINISTRATIVE EXPENSES	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS EXPENSES	0	0	0	0	0	0	0	0	0	0
DEPRECIATION	0	0	0	115010	115010	115010	115010	115010	115010	115010
AMORTIZATION	0	0	0	515	515	515	515	515	515	515
TOTAL OF FIXED COST	0	0	0	133566	133566	133566	133566	133566	133566	133566
EARNINGS	0	0	0	118052	121753	129152	136553	143954	151354	155054
FINANCIAL CHARGE										
INTEREST LONG TERM (1)	0	0	0	41165	36591	32017	27443	22869	18295	13721
INTEREST LONG TERM (2)	0	0	0	29204	21903	14602	7301	0	0	0
INTEREST-SHORT-TERM	0	0	0	618	556	494	433	371	309	247
TOTAL	0	0	0	70987	59050	47113	35177	23240	18604	13968
TOTAL OF PRODUCTION COST	0	0	0	552924	556257	554861	553465	552069	557973	558607
NET-EARNINGS-BEFORE-TAX	0	0	0	47065	62703	82039	101376	120714	132750	141086
INCOME TAX	0	0	0	16472	21946	28713	35481	42249	46462	49380
NET EARNINGS AFTER TAX	0	0	0	30593	40737	53326	65895	78465	86288	91706

Base Case I

Base Case I - After Renovation

PROJECT YEAR	8	9	10	11	12	13	14	15	16	17
SALES VOLUME (TON/YEAR)	751808	770503	780000	798796	817591	836386	855181	873976	892772	911567
RATIO OF DOMESTIC SALES (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SALES REVENUE	789398	809133	819000	838735	858470	878205	897940	917674	937410	957145
EXCISE DUTY	0	0	0	0	0	0	0	0	0	0
SALES TAX	71763	73557	74454	76248	78042	79836	81630	83424	85219	87013
NET SALES REVENUE	717635	735576	744546	762487	780428	798369	816310	834250	852191	870132
COST AND EXPENCE										
DIRECT COST										
KAW MATERIAL	74767	76636	77570	79440	81309	83178	85047	86916	88786	90655
CONSUMABLES	19668	20160	20406	20898	21389	21881	22373	22864	23356	23848
FUEL	114335	117193	118622	121481	124339	127197	130056	132914	135773	138631
ELECTRIC POWER	110800	113570	114935	117725	120495	123265	126035	128805	131575	134345
PEPAIR EXPENSES	14284	14641	14819	15176	15533	15890	16248	16605	16962	17319
RAGS	87760	89934	91031	93245	95439	97633	99827	102021	104215	106409
TOTAL OF DIRECI COST	421614	432154	437423	447965	458504	469044	479586	490125	500667	511207
FIXED COST										
SALARIES AND WAGES	9761	9761	9761	9761	9761	9761	9761	9761	9761	9761
ADMINISTRATIVE-EXPENSES	8280	8280	8280	8280	8280	8280	8280	8280	8280	8280
MISCELLANEOUS EXPENSES	0	0	0	0	0	0	0	0	0	0
DEPRECIATION	115010	115010	115010	115010	115010	115010	115010	115010	115010	115010
AMORTIZATION	515	515	519	0	0	0	0	0	0	0
TOTAL OF FIXED COST	133566	133566	133570	133051	133051	133051	133051	133051	133051	133051
EARNINGS	162455	169956	173553	181471	188873	196274	203673	211074	218473	225874
FINANCIAL CHARGE										
INTEREST LONG TERM (1)	9147	4573	0	0	0	0	0	0	0	0
INTEREST LONG TERM (2)	0	0	0	0	0	0	0	0	0	0
INTEREST-SHORT-TERM	185	124	62	0	0	0	0	0	0	0
TOTAL	9332	4697	62	0	0	0	0	0	0	0
TOTAL OF PRODUCTION COST	564312	570417	571055	581016	591555	602095	612637	623176	633718	644258
NET-EARNINGS-BEFORE-TAX	153143	165159	170491	181471	188873	196274	203673	211074	218473	225874
INCOCHE TAX	53593	57805	60721	63514	66105	68695	71285	73875	76465	79055
NET EARNINGS AFTER TAX	99530	107354	112770	117957	122768	127579	132388	137199	142008	146819

PROFIT AND LOSS STATEMENT (3/3) Base Case I - After Renovation

PROJECT YEAR	18	19	20
SALES VOLUME (TON/YEAR)	930362	939760	939760
RATIO OF DOMESTIC SALES (Z)	100.00	100.00	100.00
SALES REVENUE	976680	986748	986748
EXCISE DUTY	0	0	0
SALES TAX	88807	89704	89704
NET SALES REVENUE	888073	897044	897044
COST AND EXPENCE			
DIRECT COST			
RAW MATERIAL	92524	93459	93459
CONSUMABLES	24340	24586	24586
FUEL	141489	142919	142919
ELECTRIC POWER	137115	138500	138500
REPAIR EXPENSES	17676	17855	17855
BAGS	108603	109700	109700
TOTAL OF DIRECT COST	521747	527019	527019
FIXED COST			
SALARIES AND WAGES	9761	9761	9761
ADMINISTRATIVE EXPENSES	8280	8280	8280
MISCELLANEOUS EXPENSES	0	0	0
DEPRECIATION	115010	115010	115010
AMORTIZATION	0	0	0
TOTAL OF FIXED COST	133051	133051	133051
EARNINGS	233275	236974	236974
INTEREST LONG TERM (1)	0	0	0
INTEREST LONG TERM (2)	0	0	0
INTEREST SHORT TERM	0	0	0
TOTAL	0	0	0
TOTAL OF PRODUCTION COST	654798	660070	660070
NET EARNINGS BEFORE TAX	233275	236974	236974
INCOME TAX	81646	82940	82940
NET EARNINGS AFTER TAX	151629	154034	154034

Base Case I

Base Case I

PROJECT YEAR	CASH	FLOW	STATEMENT (1/3)	1	2	3	4	5	6	7
	-3	-2	-1	1	2	3	4	5	6	7
STARTING AT BEGINNING OF YEAR	0	0	0	0	46035	107118	186461	284063	399925	587588
EARNINGS	0	0	0	-170901	174112	180535	186959	193382	199805	203016
DEPRECIATION	0	0	0	47541	47541	47541	47541	47541	47541	47541
AMORTIZATION	0	0	0	-321	-321	-321	-321	-321	-321	-321
LES-INCREASE-IN-ACCOUNT-RECV	0	0	0	0	0	0	0	0	0	0
TOTAL FROM PRODUCTION	0	0	0	218121	221332	227755	234179	240602	247025	250236
PAID IN EQUITY	0	0	0	0	0	0	0	0	0	0
LOAN-BORROWING(LONG-TERM-1)	0	91004	324812	0	0	0	0	0	0	0
LOAN-BORROWING(LONG TERM-2)	0	66579	237633	0	0	0	0	0	0	0
LOAN-BORROWING(SHORT TERM)	0	0	-3210	0	0	0	0	0	0	0
TOTAL-SOURCE-OF-CASH	0	-157583	559235	218121	267367	334873	420640	524665	646950	837824
INVESTMENT	0	145904	501696	0	0	0	0	0	0	0
PRE-OPERATION EXPENSES	0	0	0	0	0	0	0	0	0	0
WORKING-CAPITAL-INCREASE	0	0	3210	0	0	0	0	0	0	0
INCOME TAX REPAYMENT	0	0	0	16472	21946	28713	35481	42249	46462	49380
LOAN REPAYMENT(LONG TERM-1)	0	0	0	41581	41581	41581	41581	41581	41581	41581
LOAN-REPAYMENT(LONG-TERM-2)	0	0	0	60842	60842	60842	60842	60842	60842	60842
LOAN REPAYMENT(SHORT TERM)	0	0	0	-321	-321	-321	-321	-321	-321	-321
INTEREST (LONG TERM-1)	0	1364	40204	41163	36591	32017	27443	22869	18395	13721
INTEREST (LONG-TERM-2)	0	10315	30545	39204	21903	14602	7301	0	0	0
INTEREST (SHORT TERM)	0	0	0	-395	-347	-309	-269	-231	-193	-154
TAX FOR PROFIT DISTRIBUTED	0	0	0	0	0	0	0	0	0	0
DIVIDENDS	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATION FOR CASH	0	157583	559235	172086	160249	148412	136577	124740	59362	54827
NET CASH INCREASE	0	0	0	46035	61083	79343	97602	115862	187663	195409
BALANCE-AT-END-OF-YEAR	0	-145904	0	46035	107118	186461	284063	399925	587588	782997
SALVAGE VALUE	0	0	0	0	0	0	0	0	0	0
CASH FLOW (ROE)	0	0	0	46035	61083	79343	97602	115862	187663	195409
CASH-FLOW-(ROIE)	0	-145904	501696	-218121	221332	227755	234179	240602	247025	250236
CASH FLOW (ROIAT)	0	-145904	-501696	201649	193386	190442	198698	198353	200563	200856
CUMULATIVE CASH FLOW(ROIAT)	0	-145904	-647600	-445951	-246565	-47523	151175	349528	550091	750947

Base Case I

PROJECT YEAR	8	9	10	11	12	13	14	15	16	17
CASH FLOW STATEMENT (2/3)										
BALANCE AT BEGINNING OF YEAR	783997	989366	1206693	1431767	1704485	1983627	2269191	2561179	2859591	3164425
EARNINGS	209440	215863	219076	225177	231601	238023	244447	250871	257293	263716
DEPRECIATION	47541	47541	47541	47541	47541	47541	47541	47541	47541	47541
AMORTIZATION	-321	-321	-321	0	0	0	0	0	0	0
LES-INCREASE-IN-ACCOUNT-RECV	0	0	0	0	0	0	0	0	0	0
TOTAL FROM PRODUCTION	256660	263083	266296	272718	279142	285564	291988	298412	304834	311257
PAID IN EQUITY	0	0	0	0	0	0	0	0	0	0
LOAN-BORROWING(LONG-TERM-1)	0	0	0	0	0	0	0	0	0	0
LOAN BORROWING(LONG TERM-2)	0	0	0	0	0	0	0	0	0	0
LOAN BORROWING(SHORT TERM)	0	0	0	0	0	0	0	0	0	0
TOTAL-SOURCE-OF-CASH	1099657	1252449	1422989	1704485	1983627	2269191	2561179	2859591	3164425	3475682
INVESTMENT	0	0	0	0	0	0	0	0	0	0
PRE-OPERATION EXPENSES	0	0	0	0	0	0	0	0	0	0
WORKING CAPITAL-INCREASE	0	0	0	0	0	0	0	0	0	0
INCOME TAX REPAYMENT	53593	57805	60721	63514	66105	68695	71285	73875	76465	79055
LOAN REPAYMENT(LONG TERM-1)	41581	41581	41581	0	0	0	0	0	0	0
LOAN-REPAYMENT(LONG-TERM-2)	0	0	0	0	0	0	0	0	0	0
LOAN REPAYMENT(SHORT TERM)	-321	-321	-321	0	0	0	0	0	0	0
INTEREST (LONG TERM-1)	9147	4573	0	0	0	0	0	0	0	0
INTEREST (LONG-TERM-2)	0	0	0	0	0	0	0	0	0	0
INTEREST (SHORT TERM)	-116	-77	-38	0	0	0	0	0	0	0
TAX FOR PROFIT DISTRIBUTED	0	0	0	0	0	0	0	0	0	0
DIVIDENDS	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATION FOR CASH	50291	45756	41222	0	0	0	0	0	0	0
NET CASH INCREASE	206369	317327	225074	272718	279142	285564	291988	298412	304834	311257
BALANCE-AT-END-OF-YEAR	989366	1206693	1431767	1704485	1983627	2269191	2561179	2859591	3164425	3475682
SALVAGE VALUE	0	0	0	0	0	0	0	0	0	0
CASH FLOW (ROE)	206369	317327	225074	272718	279142	285564	291988	298412	304834	311257
CASH-FLOW-(ROIAT)	256660	263083	266296	272718	279142	285564	291988	298412	304834	311257
CASH FLOW (ROIAT)	203067	205278	205575	209204	213037	216869	220703	224537	228369	232202
CUMULATIVE CASH FLOW(ROIAT)	954014	1159292	1364867	1574071	1787108	2000977	2224680	2449217	2677586	2909788

Base Case I

PROJECT YEAR STATEMENT (3/3)

	18	19	20
CASH			
PROJECT YEAR			
PARANCE AT BEGINNING OF YEAR	3475682	3793362	4114255
EARNINGS	270199	273332	273352
DEPRECIATION	47541	47541	47541
AMORTIZATION	0	0	0
LES INCREASE IN ACCOUNT RECV	0	0	0
TOTAL FROM PRODUCTION	317680	320893	320893
PAID IN EQUITY	0	0	0
LOAN BORROWING(LONG TERM-1)	0	0	0
LOAN BORROWING(LONG TERM-2)	0	0	0
LOAN BORROWING(SHORT TERM)	0	0	0
TOTAL SOURCE OF CASH	3793362	4114255	4435148
INVESTMENT	0	0	0
PRE-OPERATION EXPENSES	0	0	0
WORKING CAPITAL INCREASE	0	0	0
INCOME TAX REPAYMENT	81646	82940	82940
LOAN REPAYMENT(LONG TERM-1)	0	0	0
LOAN REPAYMENT(LONG TERM-2)	0	0	0
LOAN REPAYMENT(SHORT TERM)	0	0	0
INTEREST (LONG TERM-1)	0	0	0
INTEREST (LONG TERM-2)	0	0	0
INTEREST (SHORT TERM)	0	0	0
TAX FOR PROFIT DISTRIBUTED	0	0	0
DIVIDENDS	0	0	0
TOTAL APPLICATION FOR CASH	0	0	0
NET CASH INCREASE	317680	320893	320893
SALVAGE VALUE	0	0	0
SALVAGE VALUE	0	0	0
CASH FLOW (ROE)	317680	320893	320893
CASH FLOW (ROIRT)	317680	320893	320893
CASH FLOW (ROIAT)	235034	237953	237953
CUMULATIVE CASH FLOW(ROIAT)	3145622	3389775	3621728



----- DCF RATE -----

1. DCF RATE (FIRROE) = NOT FOUND

2. DCF RATE (FIRROET) = 0.3329

3. DCF RATE (FIRROIAT) = 0.2883

----- BREAK-EVEN POINT -----

1. ORDINARY BREAK-EVEN POINT	19 YEAR , SALES VOLUME = 100.0 ,	BREAK-EVEN POINT =	36.0 %
	19 YEAR , SALES VOLUME = 100.0 ,	BREAK-EVEN POINT =	36.0 %

2. CASH BREAK-EVEN POINT	19 YEAR , SALES VOLUME = 100.0 ,	BREAK-EVEN POINT =	4.9 %
	19 YEAR , SALES VOLUME = 100.0 ,	BREAK-EVEN POINT =	4.9 %

----- PAYOUT -----

ZERO POINT OF PAYOUT = 3 YEAR 3 MONTH

Base Case I

Base Case II

PROJECT YEAR	STATEMENT (1/3)							
	PROFIT AND LOSS	1	2	3	4	5	6	7
SALES-VOLUME-(TON/YEAR)	0	637791	655028	672266	689504	698122	715360	732598
RATIO OF DOMESTIC SALES (%)	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SALES REVENUE	0	674464	692692	710921	729150	738264	756493	774722
EXCISE DUTY	0	0	0	0	0	0	0	0
SALES TAX	0	61314	62972	64639	66286	67114	68772	70429
NET SALES REVENUE	0	613150	629720	646292	662864	671150	687721	704293
COST-AND-EXPENSE								
DIRECT COST								
RAW MATERIAL	0	66599	68399	70199	71999	72899	74699	76499
CONSUMABLES	0	33101	33996	34890	35785	36232	37127	38022
FUEL	0	191768	196950	202133	207316	209908	215091	220274
ELECTRIC POWER	0	225450	231543	237637	243730	246777	252870	258963
REPAIR EXPENSES	0	12118	12445	12773	13100	13264	13592	13919
FRS	0	74450	76462	78475	80487	81493	83505	85517
TOTAL OF DIRECT COST	0	603486	619795	636107	652417	660573	676884	693194
FIXED COST								
SALARIES AND WAGES	0	9492	9492	9492	9492	9492	9492	9492
ADMINISTRATIVE EXPENSES	0	8280	8280	8280	8280	8280	8280	8280
MISCELLANEOUS EXPENSES	0	0	0	0	0	0	0	0
DEPRECIATION	0	67469	67469	67469	67469	67469	67469	67469
AMORTIZATION	0	804	804	804	804	804	804	804
TOTAL OF FIXED COST	0	86045	86045	86045	86045	86045	86045	86045
EARNINGS	0	-76381	-76120	-75860	-75598	-75208	-74946	
FINANCIAL CHARGE								
INTEREST LONG TERM (1)	0	0	0	0	0	0	0	0
INTEREST LONG TERM (2)	0	0	0	0	0	0	0	0
INTEREST SHORT TERM	0	965	2034	3241	4540	5964	7543	9281
TOTAL	0	965	2034	3241	4540	5964	7543	9281
TOTAL OF PRODUCTION COST	0	690496	707894	725393	743002	752582	770472	788520
NET EARNINGS BEFORE TAX	0	-77346	-78174	-79101	-80138	-81432	-82751	-84227
INCOME TAX	0	0	0	0	0	0	0	0
NET EARNINGS AFTER TAX	0	-77346	-78174	-79101	-80138	-81432	-82751	-84227

Base Case II

Base Case II - Before Renovation

PROFIT AND LOSS STATEMENT (2/3)

PROJECT YEAR	8	9	10	11	12	13	14	15	16	17
SALES VOLUME (TON/YEAR)	749935	767073	784310	801548	818786	836023	853261	870499	887737	904975
RATIO OF DOMESTIC SALES (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SALES REVENUE	792950	811179	829407	847637	865866	884094	902323	911438	911438	911438
EXCISE DUTY	0	0	0	0	0	0	0	0	0	0
SALES TAX	72086	73743	75400	77057	78715	80372	82029	82858	82858	82858
NET SALES REVENUE	720864	737436	754007	770380	787151	803722	820294	828580	828580	828580
COST AND EXPENSE										
DIRECT COST										
RAW MATERIAL	78299	80099	81899	83699	85499	87299	89099	89999	89999	89999
CONSUMABLES	38916	39811	40706	41600	42495	43390	44284	44732	44732	44732
FUEL	225457	230639	235822	241005	246188	251371	256554	259146	259146	259146
ELECTRIC POWER	265056	271150	277243	283336	289429	295523	301616	304663	304663	304663
REPAIR EXPENSES	14247	14574	14902	15229	15557	15884	16212	16376	16376	16376
WAGES	87529	89542	91554	93566	95578	97590	99602	100609	100609	100609
TOTAL OF DIRECT COST	709504	725815	742126	758435	774746	791057	807367	815525	815525	815525
FIXED COST	9492	9492	9492	9492	9492	9492	9492	9492	9492	9492
SALARIES AND WAGES	8280	8280	8280	8280	8280	8280	8280	8280	8280	8280
ADMINISTRATIVE EXPENSES	0	0	0	0	0	0	0	0	0	0
MISCELLANEOUS EXPENSES	67469	67469	67469	67469	67469	67469	67469	67469	67469	67469
DEPRECIATION	804	804	811	0	0	0	0	0	0	0
AMORTIZATION	86045	86045	86045	85241	85241	85241	85241	85241	85241	85241
TOTAL OF FIXED COST	-74685	-74424	-74171	-73096	-72836	-72576	-72314	-72186	-72186	-72186
EARNINGS										
FINANCIAL CHARGE										
INTEREST LONG TERM (1)	0	0	0	0	0	0	0	0	0	0
INTEREST LONG TERM (2)	0	0	0	0	0	0	0	0	0	0
INTEREST SHORT TERM	11195	13307	15643	18228	21091	24266	27790	31707	36077	40973
TOTAL	11195	13307	15643	18228	21091	24266	27790	31707	36077	40973
TOTAL OF PRODUCTION COST	806744	825167	843821	861904	881078	900564	920398	932473	936843	941739
NET EARNINGS BEFORE TAX	-85880	-87731	-89814	-91324	-93927	-96842	-100104	-103893	-108263	-113159
INCOME TAX	0	0	0	0	0	0	0	0	0	0
NET EARNINGS AFTER TAX	-85880	-87731	-89814	-91324	-93927	-96842	-100104	-103893	-108263	-113159

Base Case II

PROJECT AND LOSS STATEMENT (3/3) Base Case II - Before Renovation

	18	19	20
PROJECT YEAR			
SALES VOLUME (TON/YEAR)	861800	861800	861000
RATIO OF DOMESTIC SALES (%)	100.00	100.00	100.00
SALES REVENUE	911438	911438	911438
EXCISE DUTY	0	0	0
SALES TAX	82858	82858	82858
NET SALES REVENUE	828580	828580	828580
COST AND EXPENSE			
DIRECT-COST			
RAW MATERIAL	89999	89999	89999
CONSUMABLES	44732	44732	44732
FUEL	259146	259146	259146
ELECTRIC POWER	304663	304663	304663
REPAIR EXPENSES	16376	16376	16376
BAGS	100609	100609	100609
TOTAL OF DIRECT COST	815525	815525	815525
FIXED COST			
SALARIES AND WAGES	9492	9492	9492
ADMINISTRATIVE-EXPENSES	8280	8280	8280
MISCELLANEOUS EXPENSES	0	0	0
DEPRECIATION	67469	67469	67469
AMORTIZATION	0	0	0
TOTAL OF FIXED COST	85241	85241	85241
EARNINGS	-72186	-72186	-72186
INTEREST-LONG TERM-(1)	0	0	0
INTEREST LONG TERM (2)	0	0	0
INTEREST SHORT TERM	46455	52596	59474
TOTAL	46455	52596	59474
TOTAL OF PRODUCTION COST	947221	953362	960240
NET EARNINGS BEFORE TAX	-118641	-124782	-131660
INCOME-TAX	0	0	0
NET EARNINGS AFTER TAX	-118641	-124782	-131660

Base Case II

Base Case II - After Renovation

PROJECT YEAR	STATEMENT (1/3)							
	PROFIT AND LOSS	1	2	3	4	5	6	7
SALES-VOLUME (TON/YEAR)	0	-637791	655028	672266	689504	698122	715360	732598
RATIO OF DOMESTIC SALES (%)	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SALES REVENUE	0	674464	692692	710921	729150	738264	756493	774722
EXCISE DUTY	0	0	0	0	0	0	0	0
SALES TAX	0	61314	62972	64629	66286	67114	68772	70429
NET SALES REVENUE	0	613150	629720	646292	662864	671150	687721	704293
COST-AND-EXPENSE								
DIRECT COST								
RAW MATERIAL	0	61862	63534	65206	66878	67714	69386	71058
CONSUMABLES	0	17355	17825	18294	18763	18997	19466	19935
FUEL	0	105760	108618	111476	114935	115764	118622	121481
ELECTRIC POWER	0	98491	101152	103814	106476	107807	110469	113131
REPAIR EXPENSES	0	12118	12445	12773	13100	13264	13592	13919
BASE	0	74450	76462	78475	80487	81493	83505	85517
TOTAL OF DIRECT COST	0	370036	380036	390038	400039	405039	415040	425041
FIXED COST								
SALARIES AND WAGES	0	9761	9761	9761	9761	9761	9761	9761
ADMINISTRATIVE EXPENSES	0	8280	8280	8280	8280	8280	8280	8280
MISCELLANEOUS EXPENSES	0	0	0	0	0	0	0	0
DEPRECIATION	0	115010	115010	115010	115010	115010	115010	115010
AMORTIZATION	0	489	489	489	489	489	489	489
TOTAL OF FIXED COST	0	133540	133540	133540	133540	133540	133540	133540
EARNINGS	0	109574	116144	122714	129285	132571	139141	145712
FINANCIAL CHARGE								
INTEREST LONG TERM (1)	0	41165	36591	32017	27443	22869	18295	13721
INTEREST LONG TERM (2)	0	29204	21903	14602	7301	0	0	0
INTEREST SHORT TERM	0	587	528	469	411	352	292	234
TOTAL	0	70956	59022	47088	35155	23221	18588	13955
TOTAL OF PRODUCTION COST	0	574532	572598	570666	568724	561800	567168	572536
NET EARNINGS BEFORE TAX	0	38618	57122	75626	94130	109350	120553	131757
INCOME TAX	0	13516	19992	26469	32945	38272	42193	46114
NET EARNINGS AFTER TAX	0	25102	37130	49157	61185	71078	78360	85643

Base Case II - After Renovation

PROFIT AND LOSS STATEMENT (2/3)

PROJECT YEAR	8	9	10	11	12	13	14	15	16	17
SALES-VOLUME (TON/YEAR)	749835	767073	784310	801548	818786	836023	853261	861880	861880	861880
RATIO OF DOMESTIC SALES (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SALES REVENUE	792950	811179	829487	847637	865866	884094	902323	911438	911438	911438
EXCISE DUTY	0	0	0	0	0	0	0	0	0	0
SALES TAX	72086	73743	75400	77057	78715	80372	82029	82858	82858	82858
NET SALES REVENUE	720864	737436	754007	770580	787151	803722	820294	828580	828580	828580
COST-AND-EXPENSE										
DIRECT COST										
RAW MATERIAL	72730	74402	76074	77746	79418	81090	82762	83598	83598	83598
CONSUMABLES	20404	20874	21343	21812	22281	22750	23219	23454	23454	23454
FUEL	124339	127197	130056	132914	135773	138631	141489	142919	142919	142919
ELECTRIC POWER	115793	118455	121117	123779	126441	129103	131765	133096	133096	133096
REPAIR EXPENSES	14247	14574	14902	15229	15557	15884	16212	16376	16376	16376
RAOS	87529	89542	91554	93566	95578	97590	99602	100609	100609	100609
TOTAL OF DIRECT COST	435042	445044	455046	465046	475048	485049	495049	500052	500052	500052
FIXED COST										
SALARIES AND WAGES	9761	9761	9761	9761	9761	9761	9761	9761	9761	9761
ADMINISTRATIVE EXPENSES	8280	8280	8280	8280	8280	8280	8280	8280	8280	8280
MISCELLANEOUS EXPENSES	0	0	0	0	0	0	0	0	0	0
DEPRECIATION	115010	115010	115010	115010	115010	115010	115010	115010	115010	115010
AMORTIZATION	489	489	491	0	0	0	0	0	0	0
TOTAL OF FIXED COST	133540	133540	133542	133051	133051	133051	133051	133051	133051	133051
EARNINGS	152282	158852	165419	172483	179052	185623	192194	195477	195477	195477
FINANCIAL CHARGE										
INTEREST LONG TERM (1)	9147	4573	0	0	0	0	0	0	0	0
INTEREST LONG TERM (2)	0	0	0	0	0	0	0	0	0	0
INTEREST SHORT TERM	176	117	58	0	0	0	0	0	0	0
TOTAL	9323	4690	58	0	0	0	0	0	0	0
TOTAL OF PRODUCTION COST	577905	583274	588646	598097	609099	618099	628100	633103	633103	633103
NET EARNINGS BEFORE TAX	142959	154162	165361	172483	179052	185623	192194	195477	195477	195477
INCOME TAX	50035	53956	57876	60369	62668	64968	67267	68416	68416	68416
NET EARNINGS AFTER TAX	92924	100206	107485	112114	116384	120655	124927	127061	127061	127061

Base Case II

PROFIT AND LOSS STATEMENT (3/3) Base Case II - After Renovation

PROJECT YEAR	18	19	20
SALES VOLUME (TON/YEAR)	861880	861880	861880
RATIO OF DOMESTIC SALES (%)	100.00	100.00	100.00
SALES REVENUE	911438	911438	911438
EXCISE DUTY	0	0	0
SALES TAX	82858	82858	82858
NET SALES REVENUE	828580	828580	828580
COST AND EXPRENCH			
DIRECT COST			
RAW MATERIAL	83598	83598	83598
CONSUMABLES	23454	23454	23454
FUEL	142919	142919	142919
ELECTRIC POWER	133096	133096	133096
REPAIR EXPENSES	16376	16376	16376
BAGS	100609	100609	100609
TOTAL OF DIRECT COST	500052	500052	500052
FIXED COST			
SALARIES AND WAGES	9761	9761	9761
ADMINISTRATIVE EXPENSES	8280	8280	8280
MISCELLANEOUS EXPENSES	0	0	0
DEPRECIATION	115010	115010	115010
AMORTIZATION	0	0	0
TOTAL OF FIXED COST	133051	133051	133051
EARNINGS	195477	195477	195477
INTEREST-LONG-TERM (1)	0	0	0
INTEREST LONG TERM (2)	0	0	0
INTEREST SHORT TERM	0	0	0
TOTAL	0	0	0
TOTAL OF PRODUCTION COST	633103	633103	633103
NET EARNINGS BEFORE TAX	195477	195477	195477
INCOME TAX	68416	68416	68416
NET EARNINGS AFTER TAX	127061	127061	127061

Base Case II

PROJECT YEAR	-3	-2	-1	1	2	3	4	5	6	7
BALANCE AT BEGINNING OF YEAR	0	0	0	0	51205	120914	209127	315844	437781	631763
EARNINGS	0	0	0	185935	192264	198574	204882	208039	214349	220658
DEPRECIATION	0	0	0	47541	47541	47541	47541	47541	47541	47541
AMORTIZATION	0	0	0	-315	-315	-315	-315	-315	-315	-315
LES INCREASE IN ACCOUNT RECV	0	0	0	0	0	0	0	0	0	0
TOTAL FROM PRODUCTION	0	0	0	333181	239490	245800	252109	255265	261575	267884
PAID IN EQUITY	0	0	0	0	0	0	0	0	0	0
LOAN BORROWING(LONG TERM-1)	0	91004	324812	0	0	0	0	0	0	0
LOAN BORROWING(LONG TERM-2)	0	66579	237633	0	0	0	0	0	0	0
LOAN BORROWING(SHORT TERM)	0	0	-3155	-9877	-10705	-11632	-12669	-13963	-15282	-16758
TOTAL SOURCE OF CASH	0	157583	559230	233304	279990	355082	448567	557146	684074	882389
INVESTMENT	0	145904	501636	0	0	0	0	0	0	0
PRE-OPERATION EXPENSES	0	0	0	0	0	0	0	0	0	0
WORKING CAPITAL INCREASE	0	0	-3155	0	0	0	0	0	0	0
INCOME TAX REPAYMENT	0	0	0	13516	19992	36469	32945	38272	42193	46114
LOAN REPAYMENT(LONG TERM-1)	0	0	0	41581	41581	41581	41581	41581	41581	41581
LOAN REPAYMENT(LONG TERM-2)	0	0	0	60842	60842	60842	60842	60842	60842	60842
LOAN REPAYMENT(SHORT TERM)	0	0	0	-315	-315	-315	-315	-315	-315	-315
INTEREST (LONG TERM-1)	0	1364	40204	41165	36591	32017	27443	22869	18295	13721
INTEREST (LONG TERM-2)	0	10315	20545	25204	21903	14602	7301	0	0	0
INTEREST (SHORT TERM)	0	0	0	-378	-1526	-2772	-4129	-5612	-7250	-9047
TAX FOR PROFIT DISTRIBUTED	0	0	0	0	0	0	0	0	0	0
DIVIDENDS	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATION FOR CASH	0	157583	559230	173099	159076	145355	132723	119365	52311	45940
NET CASH INCREASE	0	0	0	61082	80414	99845	119386	135900	209264	221944
BALANCE AT END OF YEAR	0	0	0	51205	120914	209127	315844	437781	631763	836949
SALVAGE VALUE	0	0	0	0	0	0	0	0	0	0
CASH FLOW (ROE)	0	0	0	61082	80414	99845	119386	135900	209264	221944
CASH FLOW (ROIAT)	0	-145904	-501696	233181	239490	245800	252109	255265	261575	267884
CASH FLOW (ROIAT)	0	-145904	-501696	219665	219498	319931	219164	216993	219382	221770
CUMULATIVE CASH FLOW(ROIAT)	0	-145904	-647600	-427935	-208437	10894	230058	447051	666433	889203



Base Case II

PROJECT YEAR	8	9	10	11	12	13	14	15	16	17
CASH FLOW STATEMENT (2/3)										
PARANCE AT BEGINNING OF YEAR	836949	1053337	1280928	1519718	1807211	2101273	2401906	2709110	3019597	3330084
EARNINGS	226967	233276	239590	245579	251888	258199	264508	267663	267663	267663
DEPRECIATION	47541	47541	47541	47541	47541	47541	47541	47541	47541	47541
AMORTIZATION	-315	-315	-320	0	0	0	0	0	0	0
LES INCREASE IN ACCOUNT RECV	0	0	0	0	0	0	0	0	0	0
TOTAL FROM PRODUCTION	274193	280502	286811	293120	299429	305740	312049	315204	315204	315204
PAID IN EQUITY	0	0	0	0	0	0	0	0	0	0
LOAN BORROWING(LONG TERM-1)	0	0	0	0	0	0	0	0	0	0
LOAN BORROWING(LONG TERM-2)	0	0	0	0	0	0	0	0	0	0
LOAN BORROWING(SHORT TERM)	-18411	-30262	-22345	-23855	-26458	-29373	-32635	-36424	-40794	-45690
TOTAL SOURCE OF CASH	1092731	1313577	1545394	1789983	2080182	2377640	2681320	2987890	3294007	3599598
INVESTMENT	0	0	0	0	0	0	0	0	0	0
PRE-OPERATION EXPENCES	0	0	0	0	0	0	0	0	0	0
WORKING CAPITAL INCREASE	0	0	0	0	0	0	0	0	0	0
INCOME TAX REPAYMENT	50035	53956	57876	60369	62668	64968	67267	68416	68416	68416
LOAN REPAYMENT(LONG TERM-1)	41581	41581	41581	0	0	0	0	0	0	0
LOAN REPAYMENT(LONG TERM-2)	0	0	0	0	0	0	0	0	0	0
LOAN REPAYMENT(SHORT TERM)	-315	-315	-320	0	0	0	0	0	0	0
INTEREST (LONG TERM-1)	9147	4573	0	0	0	0	0	0	0	0
INTEREST (LONG TERM-2)	0	0	0	0	0	0	0	0	0	0
INTEREST (SHORT TERM)	-11019	-13190	-15585	-18228	-21091	-24266	-27790	-31707	-36077	-40973
TAX FOR PROFIT DISTRIBUTED	0	0	0	0	0	0	0	0	0	0
DIVIDENDS	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATION FOR CASH	39394	32649	25676	-18228	-21091	-24266	-27790	-31707	-36077	-40973
NET CASH INCREASE	234799	247853	261135	311348	320520	330006	339839	346311	351281	356177
BALANCE AT END OF YEAR	1053337	1280928	1519718	1807211	2101273	2401906	2709110	3019597	3330084	3640571
SALVAGE VALUE	0	0	0	0	0	0	0	0	0	0
CASH FLOW (ROE)	234799	247853	261135	311348	320520	330006	339839	346311	351281	356177
CASH FLOW (ROI1)	274193	280502	286811	293120	299429	305740	312049	315204	315204	315204
CASH FLOW (ROIAT)	234158	226546	228935	232751	236761	240772	244782	246788	246788	246788
CUMULATIVE CASH FLOW(ROIAT)	1112361	1338907	1567842	1800593	2037354	2278126	2522908	2769696	3016484	3263272

Base Case II

	CASH FLOW STATEMENT (3/3)		
PROJECT YEAR	18	19	20
STARTING BALANCE AT BEGINNING OF YEAR	3640571	3951058	4261545
EARNINGS	267663	267663	267663
DEPRECIATION	47541	47541	47541
AMORTIZATION	0	0	0
LES-INCREASE-IN-ACCOUNT-RECV	0	0	0
TOTAL FROM PRODUCTION	315204	315204	315204
PAID IN EQUITY	0	0	0
LOAN-BORROWING(LONG-TERM-1)	0	0	0
LOAN-BORROWING(LONG TERM-2)	0	0	0
LOAN-BORROWING(SHORT TERM)	-51172	-57313	-64191
TOTAL-SOURCES-OF-CASH	3904603	4208949	4512558
INVESTMENT	0	0	0
PRE-OPERATION EXPENCES	0	0	0
WORKING-CAPITAL-INCREASE	0	0	0
INCOME TAX REPAYMENT	68416	68416	68416
LOAN REPAYMENT(LONG TERM-1)	0	0	0
LOAN-REPAYMENT(LONG-TERM-2)	0	0	0
LOAN REPAYMENT(SHORT TERM)	0	0	0
INTEREST (LONG TERM-1)	0	0	0
INTEREST (LONG-TERM-2)	0	0	0
INTEREST (SHORT TERM)	-46455	-52596	-59474
TAX FOR PROFIT DISTRIBUTED	0	0	0
DIVIDENDS	0	0	0
TOTAL APPLICATION FOR CASH	-46455	-52596	-59474
NET CASH INCREASE	361639	367800	374678
BALANCE-AT-END-OF-YEAR	3951058	4261545	452032
SALVAGE VALUE	0	0	0
CASH FLOW (ROE)	361639	367800	374678
CASH-FLOW-ROE(1)	315204	315204	315204
CASH FLOW (ROIAT)	246788	246788	246788
CUMULATIVE CASH FLOW(ROIAT)	3510060	3756848	4003636



Base Case I (After Renovation)

PROJECT YEAR	PROFIT AND LOSS STATEMENT (1/3)									
	-3	-2	-1	2	3	4	5	6	7	
SALES VOLUME (TON/YEAR)	0	0	0	689096	648434	657229	686024	704820	723615	733012
RATIO OF DOMESTIC SALES (%)	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SALES REVENUE	0	0	0	670987	680855	700590	730325	740061	759795	769662
EXCISE DUTY	0	0	0	0	0	0	0	0	0	0
SALES TAX	0	0	0	60998	61895	63690	65484	67278	69072	69969
NET SALES REVENUE	0	0	0	609989	618960	636900	654841	672783	690723	699699
COST AND EXPENSE										
DIRECT COST										
RAW MATERIAL	0	0	0	64496	66355	68225	70094	71963	72898	72898
CONSUMABLES	0	0	0	16718	16964	17456	17947	18439	18931	19177
FUEL	0	0	0	97184	98614	101472	104330	107189	110047	111476
ELECTRIC POWER	0	0	0	94180	95565	98335	101105	103875	106645	108030
REPAIR EXPENSES	0	0	0	12141	12319	12677	13034	13391	13748	13926
WAGES	0	0	0	75595	75693	77887	80061	82275	84469	85566
TOTAL OF DIRECT COST	0	0	0	358371	363641	374182	384722	395263	405803	411073
FIXED COST										
SALARIES AND WAGES	0	0	0	9761	9761	9761	9761	9761	9761	9761
ADMINISTRATIVE EXPENSES	0	0	0	8280	8280	8280	8280	8280	8280	8280
MISCELLANEOUS EXPENSES	0	0	0	0	0	0	0	0	0	0
DEPRECIATION	0	0	0	115010	115010	115010	115010	115010	115010	115010
AMORTIZATION	0	0	0	515	515	515	515	515	515	515
TOTAL OF FIXED COST	0	0	0	133566	133566	133566	133566	133566	133566	133566
EARNINGS	0	0	0	118952	121253	129152	136953	143954	151854	155054
FINANCIAL CHARGE										
INTEREST LONG TERM (1)	0	0	0	41165	36591	32017	27443	22869	18295	13721
INTEREST LONG TERM (2)	0	0	0	29304	21903	14602	7301	0	0	0
INTEREST SHORT TERM	0	0	0	618	556	494	433	371	309	247
TOTAL	0	0	0	70887	59050	47113	35177	23240	18604	13968
TOTAL OF PRODUCTION COST	0	0	0	562224	556257	524861	533465	552069	552973	558607
NET EARNINGS BEFORE TAX	0	0	0	47065	62703	82039	101376	120714	132750	141086
INCOME TAX	0	0	0	16472	21946	28713	35481	42249	46462	49380
NET EARNINGS AFTER TAX	0	0	0	30593	40757	53326	65895	78465	86288	91706

Base Case I (After Renovation)

PROJECT YEAR	8	9	10	11	12	13	14	15	16	17
SALES VOLUME (TON/YEAR)	751808	770603	780000	798796	817591	836386	855181	873976	892772	911567
RATIO OF DOMESTIC SALES (X)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SALES REVENUE	789398	809133	819000	838735	858470	878205	897940	917674	937410	957145
EXCISE DUTY	0	0	0	0	0	0	0	0	0	0
SALES TAX	71763	73557	74454	76248	78042	79836	81630	83424	85219	87013
NET SALES REVENUE	717635	735576	744546	762487	780428	798369	816310	834250	852191	870132
COST AND EXPENSE										
DIRECT COST										
RAW MATERIAL	74767	76636	77579	79440	81309	83178	85047	86916	88786	90655
CONSUMABLES	19668	20160	20406	20898	21389	21881	22373	22864	23356	23848
FUEL	114335	117193	118622	121481	124339	127197	130056	132914	135773	138631
ELECTRIC POWER	110800	113570	114955	117725	120495	123265	126035	128805	131575	134345
REPAIR EXPENSES	14284	14641	14819	15176	15533	15890	16248	16605	16962	17319
PAVS	87760	89954	91051	93245	95439	97633	99827	102021	104215	106409
TOTAL OF DIRECT COST	421614	432154	437423	447965	458504	469044	479586	490125	500667	511207
FIXED COST										
SALARIES AND WAGES	9761	9761	9761	9761	9761	9761	9761	9761	9761	9761
ADMINISTRATIVE EXPENSES	8280	8280	8280	8280	8280	8280	8280	8280	8280	8280
MISCELLANEOUS EXPENSES	0	0	0	0	0	0	0	0	0	0
DEPRECIATION	115010	115010	115010	115010	115010	115010	115010	115010	115010	115010
AMORTIZATION	515	515	519	0	0	0	0	0	0	0
TOTAL OF FIXED COST	133566	133566	133570	133051	133051	133051	133051	133051	133051	133051
EARNINGS	162455	169856	173553	181471	188873	196274	203673	211074	218473	225874
FINANCIAL CHARGE										
INTEREST LONG TERM (1)	9147	4573	0	0	0	0	0	0	0	0
INTEREST LONG TERM (2)	0	0	0	0	0	0	0	0	0	0
INTEREST SHORT TERM	185	124	62	0	0	0	0	0	0	0
TOTAL	9332	4697	62	0	0	0	0	0	0	0
TOTAL OF PRODUCTION COST	564512	570417	571055	581016	591555	602095	612637	623176	633718	644258
NET EARNINGS BEFORE TAX	153123	165159	173491	181471	188873	196274	203673	211074	218473	225874
INCOME TAX	53593	57805	50721	63314	66105	68695	71285	73875	76465	79055
NET EARNINGS AFTER TAX	99530	107354	112770	117957	122768	127579	132388	137199	142008	146819

Base Case I (After Renovation)

PROFIT AND LOSS STATEMENT (3/3)

	18	19	20
PROJECT YEAR	930362	939760	933760
SALES VOLUME (TON/YEAR)	100.00	100.00	100.00
RATIO OF DOMESTIC SALES (%)	976880	986748	986748
SALES REVENUE	0	0	0
EXCISE DUTY	88807	89704	89704
SALES TAX	888073	897044	897044
NET SALES REVENUE	92524	93459	93459
COST AND EXPENSE	24340	24586	24586
DIRECT COST	141489	142919	142919
RAW MATERIAL	137115	138500	138500
CONSUMABLES	17676	17855	17855
FUEL	189603	189700	189700
ELECTRIC POWER	521747	527019	527019
REPAIR EXPENSES	9761	9761	9761
BAGS	8280	8280	8280
TOTAL OF DIRECT COST	0	0	0
FIXED COST	115010	115010	115010
SALARIES AND WAGES	0	0	0
ADMINISTRATIVE EXPENSES	115010	115010	115010
MISCELLANEOUS EXPENSES	0	0	0
DEPRECIATION	133051	133051	133051
AMORTIZATION	236974	236974	236974
TOTAL OF FIXED COST	0	0	0
EARNINGS	0	0	0
INTEREST LONG TERM (1)	0	0	0
INTEREST LONG TERM (2)	0	0	0
INTEREST SHORT TERM	0	0	0
TOTAL	0	0	0
TOTAL OF PRODUCTION COST	654798	660070	660070
NET EARNINGS BEFORE TAX	233275	236974	236974
INCOME TAX	81646	82940	82940
NET EARNINGS AFTER TAX	151629	154034	154034

Base Case I (After Renovation)

PROJECT YEAR	CASH FLOW STATEMENT (1/3)								
	-3	-2	-1	2	3	4	5	6	7
BALANCE AT BEGINNING OF YEAR	0	0	0	59652	134942	229568	343531	476832	683011
EARNINGS	0	0	0	118052	121753	136553	149954	151354	155854
DEPRECIATION	0	0	0	115010	115010	115010	115010	115010	115010
AMORTIZATION	0	0	0	515	515	515	515	515	515
LES INCREASE IN ACCOUNT KEQU	0	0	0	0	0	0	0	0	0
TOTAL FROM PRODUCTION	0	0	0	233577	244677	252078	259473	266879	270579
PAID IN EQUITY	0	0	0	0	0	0	0	0	0
LOAN BORROWING (LONG TERM-1)	0	91004	324012	0	0	0	0	0	0
LOAN BORROWING (LONG TERM-2)	0	66579	237633	0	0	0	0	0	0
LOAN BORROWING (SHORT TERM)	0	0	5154	0	0	0	0	0	0
TOTAL SOURCE OF CASH	0	157583	567599	233577	296930	481646	603010	743711	953590
INVESTMENT	0	145904	501696	0	0	0	0	0	0
PRE-OPERATION EXPENSES	0	0	0	0	0	0	0	0	0
WORKING CAPITAL INCREASE	0	0	5154	0	0	0	0	0	0
INCOME TAX REPAYMENT	0	0	0	16472	21946	28713	35481	42249	49380
LOAN REPAYMENT (LONG TERM-1)	0	0	0	41581	41581	41581	41581	41581	41581
LOAN REPAYMENT (LONG TERM-2)	0	0	0	60842	60842	60842	60842	60842	60842
LOAN REPAYMENT (SHORT TERM)	0	0	0	515	515	515	515	515	515
INTEREST (LONG TERM-1)	0	1364	40204	41165	36521	32017	27443	22853	18295
INTEREST (LONG TERM-2)	0	10315	20545	23204	21903	14602	7301	0	0
INTEREST (SHORT TERM)	0	0	0	618	556	494	433	371	309
TAX FOR PROFIT DISTRIBUTED	0	0	0	0	0	0	0	0	0
DIVIDENDS	0	0	0	0	0	0	0	0	0
TOTAL APPLICATION FOR CASH	0	157583	567599	173925	161988	150951	138115	126178	60700
NET CASH INCREASE	0	0	0	59652	75290	94626	113963	133301	206179
BALANCE AT END OF YEAR	0	0	0	59652	134942	229568	343531	476832	683011
SALVAGE VALUE	0	0	0	0	0	0	0	0	0
CASH FLOW (NOE)	0	0	0	59652	75290	94626	113963	133301	206179
CASH FLOW (ROIBT)	0	-145904	-501696	233577	237278	244677	252078	259479	266879
CASH FLOW (ROIAT)	0	-145904	-501696	217105	215332	215904	216597	217230	220417
CUMULATIVE CASH FLOW (ROIAT)	0	-145904	-647600	-430495	-215163	801	217398	434628	655045

Base Case I (After Renovation)

PROJECT YEAR	8	CASH	9	FLOW	10	STATEMENT (2/3)	11	12	13	14	15	16	17
BALANCE AT BEGINNING OF YEAR	897526	112478	1362666	1609586	1906067	2209950	2521234	2839917	3166001	3499484	3840368	4179352	4518236
EARNINGS	162455	169856	173553	181471	188873	196274	203673	211074	218473	225874	233274	240673	248074
DEPRECIATION	115010	115010	115010	115010	115010	115010	115010	115010	115010	115010	115010	115010	115010
AMORTIZATION	515	515	519	519	519	519	519	519	519	519	519	519	519
LES INCREASE IN ACCOUNT REC'D	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL FROM PRODUCTION	277980	285381	290982	296481	303883	311284	318683	326084	333483	340884	348283	355683	363084
PAID IN EQUITY	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BORROWING(LONG TERM-1)	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BORROWING(LONG TERM-2)	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN BORROWING(SHORT TERM)	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL SOURCE OF CASH	1175306	1409459	1651748	1906067	2209950	2521234	2839917	3166001	3499484	3840368	4179352	4518236	4857120
INVESTMENT	0	0	0	0	0	0	0	0	0	0	0	0	0
PRE-OPERATION EXPENSES	0	0	0	0	0	0	0	0	0	0	0	0	0
WORKING CAPITAL INCREASE	0	0	0	0	0	0	0	0	0	0	0	0	0
INCOME TAX PAYMENT	53593	57805	60721	63514	66105	68695	71285	73875	76465	79055	81645	84235	86825
LOAN REPAYMENT(LONG TERM-1)	41581	41581	41581	41581	41581	41581	41581	41581	41581	41581	41581	41581	41581
LOAN REPAYMENT(LONG TERM-2)	0	0	0	0	0	0	0	0	0	0	0	0	0
LOAN REPAYMENT(SHORT TERM)	515	515	519	519	519	519	519	519	519	519	519	519	519
INTEREST (LONG TERM-1)	9147	4573	0	0	0	0	0	0	0	0	0	0	0
INTEREST (LONG TERM-2)	0	0	0	0	0	0	0	0	0	0	0	0	0
INTEREST (SHORT TERM)	185	124	62	0	0	0	0	0	0	0	0	0	0
TAX FOR PROFIT DISTRIBUTION	0	0	0	0	0	0	0	0	0	0	0	0	0
DIVIDENDS	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATION FOR CASH	51428	46799	42162	37525	32888	28251	23614	19077	14540	10003	5466	919	4752
NET CASH INCREASE	226552	238588	246920	256481	266042	275603	285164	294725	304286	313847	323408	332969	342530
BALANCE AT END OF YEAR	1124078	1362666	1609586	1906067	2209950	2521234	2839917	3166001	3499484	3840368	4179352	4518236	4857120
SALVAGE VALUE	0	0	0	0	0	0	0	0	0	0	0	0	0
CASH FLOW (NOE)	226552	238588	246920	256481	266042	275603	285164	294725	304286	313847	323408	332969	342530
CASH FLOW (NOBT)	277980	285381	290982	296481	303883	311284	318683	326084	333483	340884	348283	355683	363084
CASH FLOW (NOIAT)	224387	227576	230765	233954	237143	240332	243521	246710	249899	253088	256277	259466	262655
CUMULATIVE CASH FLOW(NOIAT)	1100631	1322207	1556568	1799555	2027313	2269990	2517300	2769509	3026527	3288356	3555385	3827214	4103043



Base Case I (After Renovation)

PROJECT YEAR	CASH FLOW STATEMENT (3/3)		
	18	19	20
BALANCE AT BEGINNING OF YEAR	3840368	4188653	4540637
EARNINGS	233275	236974	236974
DEPRECIATION	115010	115010	115010
AMORTIZATION	0	0	0
LES INCREASE IN ACCOUNT RECV	0	0	0
TOTAL FROM PRODUCTION	348285	351984	351984
PAID IN EQUITY	0	0	0
LOAN BORROWING(LONG TERM-1)	0	0	0
LOAN BORROWING(LONG TERM-2)	0	0	0
LOAN BORROWING(SHORT TERM)	0	0	0
TOTAL SOURCE OF CASH	4188653	4540637	4892621
INVESTMENT	0	0	0
PRE-OPERATION EXPENCES	0	0	0
WORKING CAPITAL INCREASE	0	0	0
INCOME TAX REPAYMENT	81646	82940	82940
LOAN REPAYMENT(LONG TERM-1)	0	0	0
LOAN REPAYMENT(LONG TERM-2)	0	0	0
LOAN REPAYMENT(SHORT TERM)	0	0	0
INTEREST (LONG TERM-1)	0	0	0
INTEREST (LONG TERM-2)	0	0	0
INTEREST (SHORT TERM)	0	0	0
TAX FOR PROFIT DISTRIBUTED	0	0	0
DIVIDENDS	0	0	0
TOTAL APPLICATION FOR CASH	0	0	0
NET CASH INCREASE	348285	351984	351984
BALANCE AT END OF YEAR	4188653	4540637	4892621
SALVAGE VALUE	0	0	0
CASH FLOW (ROE)	348285	351984	351984
CASH FLOW (ROIAT)	348285	351984	351984
CASH FLOW (ROIAT)	266639	269044	269044
CUMULATIVE CASH FLOW(ROIAT)	355495	382439	4093083

Base Case I (After Renovation)

		BALANCE SHEET (1/3)									
PROJECT YEAR		-3	-2	-1	1	2	3	4	5	6	7
ASSETS											
CURRENT ASSETS		0	0	0	59652	134942	229568	343531	476832	683011	897526
CASH IN HAND		0	0	0	0	0	0	0	0	0	0
ACCOUNTS RECEIVABLE		0	0	0	0	0	0	0	0	0	0
INVENTORY		0	0	935	935	935	935	935	935	935	935
RAW MATERIAL		0	0	1530	1530	1530	1530	1530	1530	1530	1530
WORK-IN-PROCESS		0	0	1530	1530	1530	1530	1530	1530	1530	1530
FINISHED GOODS		0	0	1530	1530	1530	1530	1530	1530	1530	1530
STOKES AND SPARES		0	0	1159	1159	1159	1159	1159	1159	1159	1159
LESS: AMORTIZATION		0	0	0	-515	-1030	-1545	-2060	-2575	-3090	-3605
TOTAL OF CURRENT ASSETS		0	0	5154	64291	139066	233177	346625	479411	685075	899075
FIXED ASSETS		0	145904	647600	647600	647600	647600	647600	647600	647600	647600
INVESTMENT		0	145904	647600	647600	647600	647600	647600	647600	647600	647600
PRE-OPERATION EXPENSES		0	0	0	0	0	0	0	0	0	0
TOTAL		0	145904	647600	647600	647600	647600	647600	647600	647600	647600
DEFERRED ASSETS		0	11679	72428	72428	72428	72428	72428	72428	72428	72428
LESS: DEPRECIATION		0	0	0	-115010	-230020	-345030	-460040	-575050	-690060	-805070
TOTAL OF FIXED ASSETS		0	11679	72428	609218	494208	379298	259588	149778	29968	0
TOTAL ASSETS		0	157583	720228	669309	629074	608175	606613	624389	715043	899075
LIABILITIES AND EQUITY											
CURRENT LIABILITIES		0	0	0	0	0	0	0	0	0	0
ACCOUNT PAYABLE		0	0	0	0	0	0	0	0	0	0
SHORT TERM LOAN		0	0	3154	4039	4124	3609	3094	2579	2064	1549
TOTAL		0	0	3154	4039	4124	3609	3094	2579	2064	1549
LONG TERM LOAN(1)		0	91004	415016	374235	332654	291073	249492	207911	166330	124749
LONG TERM LOAN(2)		0	66379	304212	243370	182528	121686	60844	2	2	2
EQUITY		0	0	0	0	0	0	0	0	0	0
PAID IN CAPITAL		0	0	0	0	0	0	0	0	0	0
RETAINED EARNINGS		0	0	0	47655	109768	191807	293182	413897	546647	772775
TOTAL		0	0	0	47655	109768	191807	293182	413897	546647	772775
TOTAL OF LIABILITIES		0	157383	725182	669309	629074	608175	606613	624389	715043	899075
AND EQUITY											

Base Case I (After Renovation)

	8	9	10	11	12	13	14	15	16	17
BALANCE SHEET (2/3)										
PROJECT YEAR										
ASSETS										
CURRENT ASSETS										
CASH IN HAND	1124078	1363666	1609586	1906067	2209950	2521234	2839917	3166001	3499484	3840368
ACCOUNTS RECEIVABLE	0	0	0	0	0	0	0	0	0	0
INVENTORY										
RAW MATERIAL	935	935	935	935	935	935	935	935	935	935
WORK-IN-PROCESS	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530
FINISHED GOODS	1530	1530	1530	1530	1530	1530	1530	1530	1530	1530
STORES AND SPARES	1159	1159	1159	1159	1159	1159	1159	1159	1159	1159
LESS: AMORTIZATION	-4120	-4635	-5154	-5154	-5154	-5154	-5154	-5154	-5154	-5154
TOTAL OF CURRENT ASSETS	1125112	1363185	1609586	1906067	2209950	2521234	2839917	3166001	3499484	3840368
FIXED ASSETS										
INVESTMENT	647600	647600	647600	647600	647600	647600	647600	647600	647600	647600
PRE-OPERATION EXPENSES	0	0	0	0	0	0	0	0	0	0
TOTAL	647600	647600	647600	647600	647600	647600	647600	647600	647600	647600
DEFERRED ASSETS	72428	72428	72428	72428	72428	72428	72428	72428	72428	72428
LESS: DEPRECIATION	-805070	-805070	-805070	-805070	-805070	-805070	-805070	-805070	-805070	-805070
TOTAL OF FIXED ASSETS	0	0	0	0	0	0	0	0	0	0
TOTAL ASSETS	1125112	1363185	1609586	1906067	2209950	2521234	2839917	3166001	3499484	3840368
LIABILITIES AND EQUITY										
CURRENT LIABILITIES										
ACCOUNT PAYABLE	0	0	0	0	0	0	0	0	0	0
SHORT TERM LOAN	1034	519	0	0	0	0	0	0	0	0
TOTAL	1034	519	0	0	0	0	0	0	0	0
LONG TERM LOAN(1)	83168	41587	6	5	6	5	6	6	6	6
LONG TERM LOAN(2)	2	2	2	2	2	2	2	2	2	2
EQUITY										
PAID IN CAPITAL	0	0	0	0	0	0	0	0	0	0
RETAINED EARNINGS	1040908	1321077	1609578	1906059	2209942	2521226	2839909	3165993	3499476	3840360
TOTAL	1040908	1321077	1609578	1906059	2209942	2521226	2839909	3165993	3499476	3840360
TOTAL OF LIABILITIES AND EQUITY	1125112	1363185	1609586	1906067	2209950	2521234	2839917	3166001	3499484	3840368

Base Case I (After Renovation)

BALANCE SHEET (3/3)

PROJECT YEAR	18	19	20
ASSETS			
CURRENT ASSETS			
CASH IN HAND	4188653	4540637	4892621
ACCOUNTS RECEIVABLE	0	0	0
INVENTORY			
RAW MATERIAL	935	935	935
WORK-IN-PROCESS	1530	1530	1530
FINISHED GOODS	1530	1530	1530
STORES AND SPARES	1159	1159	1159
LESS: AMORTIZATION	-5154	-5154	-5154
TOTAL OF CURRENT ASSETS	4188653	4540637	4892621
FIXED ASSETS			
INVESTMENT	647600	647600	647600
PRE-OPERATION EXPENSES	0	0	0
TOTAL	647600	647600	647600
DEFERRED ASSETS	72428	72428	72428
LESS: DEPRECIATION	-805070	-805070	-805070
TOTAL OF FIXED ASSETS	0	0	0
TOTAL ASSETS	4188653	4540637	4892621
LIABILITIES AND EQUITY			
CURRENT LIABILITIES			
ACCOUNT PAYABLE	0	0	0
SHORT TERM LOAN	0	0	0
TOTAL	0	0	0
LONG TERM LOAN(1)	6	6	6
LONG TERM LOAN(2)	2	2	2
EQUITY			
PAID IN CAPITAL	0	0	0
RETAINED EARNINGS	4188645	4540629	4892613
TOTAL	4188645	4540629	4892613
TOTAL OF LIABILITIES	4188653	4540637	4892621



Base Case II(After Renovation)

PROJECT YEAR	PROFIT AND LOSS STATEMENT (1/3)									
	-3	-2	-1	1	2	3	4	5	6	7
SALES-VOLUME (TON/YEAR)	0	0	0	637791	655028	672266	689504	698122	715960	732598
RATIO OF DOMESTIC SALES (%)	0.00	0.00	0.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SALES REVENUE	0	0	0	674464	692692	710921	729150	738264	756493	774722
EXCISE DUTY	0	0	0	0	0	0	0	0	0	0
SALES TAX	0	0	0	61314	62972	64629	66286	67114	68772	70429
NET SALES REVENUE	0	0	0	613150	629720	646292	662864	671150	687721	704293
COST AND EXPENSE										
DIRECT COST										
RAW MATERIAL	0	0	0	61862	63534	65206	66878	67714	69386	71058
CONSUMABLES	0	0	0	17355	17825	18294	18763	18997	19466	19935
FUEL	0	0	0	108760	108618	111476	114335	115764	118622	121481
ELECTRIC POWER	0	0	0	98491	101152	103814	106476	107807	110469	113131
REPAIR EXPENSES	0	0	0	12118	12445	12773	13100	13264	13592	13919
BAGS	0	0	0	74450	76462	78475	80487	81493	83505	85517
TOTAL OF DIRECT COST	0	0	0	370036	380036	390038	400039	405039	415040	435041
FIXED COST										
SALARIES AND WAGES	0	0	0	9761	9761	9761	9761	9761	9761	9761
ADMINISTRATIVE EXPENSES	0	0	0	8280	8280	8280	8280	8280	8280	8280
MISCELLANEOUS EXPENSES	0	0	0	0	0	0	0	0	0	0
DEPRECIATION	0	0	0	115010	115010	115010	115010	115010	115010	115010
AMORTIZATION	0	0	0	489	489	489	489	489	489	489
TOTAL OF FIXED COST	0	0	0	133540	133540	133540	133540	133540	133540	133540
EARNINGS	0	0	0	109574	116144	122714	129285	132571	139141	145712
FINANCIAL CHARGE										
INTEREST LONG TERM (1)	0	0	0	41165	36591	32017	27443	22869	18295	13721
INTEREST LONG TERM (2)	0	0	0	29204	21903	14602	7301	0	0	0
INTEREST SHORT TERM	0	0	0	587	528	463	411	352	293	234
TOTAL	0	0	0	70956	59022	47088	39153	23221	18588	13955
TOTAL OF PRODUCTION COST	0	0	0	574592	572598	570666	568734	561800	567168	573936
NET EARNINGS BEFORE TAX	0	0	0	38618	57122	75626	94130	109350	120553	131757
INCOME TAX	0	0	0	13516	19992	26469	32945	38272	42193	46114
NET EARNINGS AFTER TAX	0	0	0	25102	37130	49157	61185	71078	78360	85643

Base Case II(After Renovation)

PROJECT YEAR	8	9	10	11	12	13	14	15	16	17
PROFIT AND LOSS STATEMENT (2/3)										
SALES VOLUME (TON/YEAR)	749835	767073	784310	801948	818786	836023	853261	861880	861880	861880
RATIO OF DOMESTIC SALES (X)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
SALES REVENUE	792950	811179	829407	847637	865866	884094	902323	911438	911438	911438
EXCISE DUTY	0	0	0	0	0	0	0	0	0	0
SALES TAX	72086	73743	75400	77057	78715	80372	82029	82858	82858	82858
NET SALES REVENUE	720864	737436	754007	770580	787151	803722	820294	828580	828580	828580
COST-AND-EXPENSE										
DIRECT COST										
RAW MATERIAL	72730	74402	76074	77746	79418	81090	82762	83598	83598	83598
CONSUMABLES	20404	20874	21343	21812	22281	22750	23219	23454	23454	23454
FUEL	124339	127197	130056	132914	135773	138631	141489	142919	142919	142919
ELECTRIC POWER	115793	118455	121117	123779	126441	129103	131765	133096	133096	133096
REPAIR EXPENSES	14247	14574	14902	15229	15557	15884	16212	16376	16376	16376
BAGS	87529	89542	91554	93566	95578	97590	99602	100609	100609	100609
TOTAL OF DIRECT COST	435042	445044	455046	465046	475048	485048	495049	500052	500052	500052
FIXED COST										
SALARIES AND WAGES	9761	9761	9761	9761	9761	9761	9761	9761	9761	9761
ADMINISTRATIVE EXPENSES	8280	8280	8280	8280	8280	8280	8280	8280	8280	8280
MISCELLANEOUS EXPENSES	0	0	0	0	0	0	0	0	0	0
DEPRECIATION	115010	115010	115010	115010	115010	115010	115010	115010	115010	115010
AMORTIZATION	489	489	491	0	0	0	0	0	0	0
TOTAL OF FIXED COST	133540	133540	133542	133051	133051	133051	133051	133051	133051	133051
EARNINGS	152282	158852	165419	172483	179052	185623	192194	195477	195477	195477
FINANCIAL CHARGE										
INTEREST LONG TERM (1)	9147	4573	0	0	0	0	0	0	0	0
INTEREST LONG TERM (2)	0	0	0	0	0	0	0	0	0	0
INTEREST SHORT TERM	176	117	38	0	0	0	0	0	0	0
TOTAL	9323	4690	38	0	0	0	0	0	0	0
TOTAL OF PRODUCTION COST	577905	583274	588646	595097	601609	608099	621100	633103	633103	633103
NET EARNINGS BEFORE TAX	142959	154163	165361	172483	179052	185623	192194	195477	195477	195477
INCOME TAX	50035	53956	57876	60369	62668	64968	67267	68416	68416	68416
NET EARNINGS AFTER TAX	92924	100206	107485	112114	116384	120655	124927	127061	127061	127061

Base Case II(After Renovation)

PROFIT AND LOSS STATEMENT (3/3)

PROJECT YEAR	18	19	20
SALES VOLUME (TON/YEAR)	861880	861880	861880
RATIO OF DOMESTIC SALES (%)	100.00	100.00	100.00
SALES REVENUE	911438	911438	911438
EXCISE DUTY	0	0	0
SALES TAX	82858	82858	82858
NET SALES REVENUE	828580	828580	828580
COST AND EXPENSE			
DIRECT COST			
RAW MATERIAL	83598	83598	83598
CONSUMABLES	23454	23454	23454
FUEL	142919	142919	142919
ELECTRIC POWER	133096	133096	133096
REPAIR EXPENSES	16376	16376	16376
RAGS	100609	100609	100609
TOTAL OF DIRECT COST	500052	500052	500052
FIXED COST			
SALARIES AND WAGES	9761	9761	9761
ADMINISTRATIVE EXPENSES	8280	8280	8280
MISCELLANEOUS EXPENSES	0	0	0
DEPRECIATION	115010	115010	115010
AMORTIZATION	0	0	0
TOTAL OF FIXED COST	133051	133051	133051
EARNINGS	195477	195477	195477
INTEREST LONG TERM (1)	0	0	0
INTEREST LONG TERM (2)	0	0	0
INTEREST SHORT TERM	0	0	0
TOTAL	0	0	0
TOTAL OF PRODUCTION COST	633103	633103	633103
NET EARNINGS BEFORE TAX	195477	195477	195477
INCOME TAX	68416	68416	68416
NET EARNINGS AFTER TAX	127061	127061	127061



Base Case II(After Renovation)

PROJECT YEAR	-3	-2	-1	1	2	3	4	5	6	7
BALANCE AT BEGINNING OF YEAR	0	0	0	0	51205	120914	209127	315844	437781	591763
EARNINGS	0	0	0	109574	116144	122714	129285	132571	139141	145712
DEPRECIATION	0	0	0	115010	115010	115010	115010	115010	115010	115010
AMORTIZATION	0	0	0	489	489	489	489	489	489	489
LES INCREASE IN ACCOUNT RECV	0	0	0	0	0	0	0	0	0	0
TOTAL FROM PRODUCTION	0	0	0	225073	231643	238213	244784	248070	254640	261211
PAID IN EQUITY	0	0	0	0	0	0	0	0	0	0
LOAN BORROWING(LONG TERM-1)	0	91004	324812	0	0	0	0	0	0	0
LOAN BORROWING(LONG TERM-2)	0	66579	237633	0	0	0	0	0	0	0
LOAN BORROWING(SHORT TERM)	0	0	4892	0	0	0	0	0	0	0
TOTAL SOURCE OF CASH	0	157503	567337	225073	283848	359127	453911	563914	692421	892974
INVESTMENT	0	145904	501696	0	0	0	0	0	0	0
PRE-OPERATION EXPENSES	0	0	0	0	0	0	0	0	0	0
WORKING CAPITAL INCREASE	0	0	4892	0	0	0	0	0	0	0
INCOME TAX REPAYMENT	0	0	0	13516	19992	26469	32945	38272	42193	46114
LOAN REPAYMENT(LONG TERM-1)	0	0	0	41581	41581	41581	41581	41581	41581	41581
LOAN REPAYMENT(LONG TERM-2)	0	0	0	60842	60842	60842	60842	60842	60842	60842
LOAN REPAYMENT(SHORT TERM)	0	0	0	489	489	489	489	489	489	489
INTEREST (LONG TERM-1)	0	1364	40304	41165	36591	32017	27443	22869	18295	13721
INTEREST (LONG TERM-2)	0	10815	20545	29204	21903	14602	7301	0	0	0
INTEREST (SHORT TERM)	0	0	0	587	538	459	411	352	293	234
TAX FOR PROFIT DISTRIBUTED	0	0	0	0	0	0	0	0	0	0
DIVIDENDS	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATION FOR CASH	0	157503	567337	173868	161934	150000	138067	126133	60658	56025
NET CASH INCREASE	0	0	0	51305	69709	89213	106717	121937	193982	205186
BALANCE AT END OF YEAR	0	0	0	51205	120914	209127	315844	437781	631763	836949
SALVAGE VALUE	0	0	0	0	0	0	0	0	0	0
CASH FLOW (ROE)	0	0	0	51305	69709	89213	106717	121937	193982	205186
CASH FLOW (ROI5T)	0	-145904	-501696	335073	231643	238213	244784	248070	254640	261211
CASH FLOW (ROIAT)	0	-145904	-501696	211557	311651	211744	211839	209798	212447	215097
CUMULATIVE CASH FLOW(ROIAT)	0	-145904	-647600	-436043	-224392	-12648	199191	408989	621436	836533

Base Case II(After Renovation)

PROJECT YEAR	8	9	10	11	12	13	14	15	16	17
	CASH FLOW STATEMENT (2/3)									
VARANCE AT BEGINNING OF YEAR	836949	1053337	1280928	1519718	1807211	2101273	2401906	2709110	3019597	3330084
EARNINGS	152282	158852	165419	172483	179052	185623	192194	195477	195477	195477
DEPRECIATION	115010	115010	115010	115010	115010	115010	115010	115010	115010	115010
AMORTIZATION	489	489	491	0	0	0	0	0	0	0
LES INCREASE IN ACCOUNT RECV	0	0	0	0	0	0	0	0	0	0
TOTAL FROM PRODUCTION	267781	274351	280920	287493	294062	300633	307204	310487	310487	310487
PAID IN EQUITY	0	0	0	0	0	0	0	0	0	0
LOAN BORROWING(LONG TERM-1)	0	0	0	0	0	0	0	0	0	0
LOAN BORROWING(LONG TERM-2)	0	0	0	0	0	0	0	0	0	0
LOAN BORROWING(SHORT TERM)	0	0	0	0	0	0	0	0	0	0
TOTAL SOURCE OF CASH	1104730	1327688	1561848	1807211	2101273	2401906	2709110	3019597	3330084	3640571
INVESTMENT	0	0	0	0	0	0	0	0	0	0
PPE-OPERATION EXPENSES	0	0	0	0	0	0	0	0	0	0
WORKING CAPITAL INCREASE	0	0	0	0	0	0	0	0	0	0
INCOME TAX REPAYMENT	50035	53956	57876	60369	62668	64968	67367	68416	68416	68416
LOAN REPAYMENT(LONG TERM-1)	41581	41581	41581	0	0	0	0	0	0	0
LOAN REPAYMENT(LONG TERM-2)	0	0	0	0	0	0	0	0	0	0
LOAN REPAYMENT(SHORT TERM)	489	489	491	0	0	0	0	0	0	0
INTEREST (LONG TERM-1)	9147	4573	0	0	0	0	0	0	0	0
INTEREST (LONG TERM-2)	0	0	0	0	0	0	0	0	0	0
INTEREST (SHORT TERM)	176	117	58	0	0	0	0	0	0	0
TAX FOR PROFIT DISTRIBUTED	0	0	0	0	0	0	0	0	0	0
DIVIDENDS	0	0	0	0	0	0	0	0	0	0
TOTAL APPLICATION FOR CASH	51393	46760	42130	0	0	0	0	0	0	0
NET CASH INCREASE	216388	227591	238790	287493	294062	300633	307204	310487	310487	310487
BALANCE AT END OF YEAR	1053337	1280928	1519718	1807211	2101273	2401906	2709110	3019597	3330084	3640571
SALVAGE VALUE	0	0	0	0	0	0	0	0	0	0
CASH FLOW (ROE)	216388	227591	238790	287493	294062	300633	307204	310487	310487	310487
CASH FLOW (ROIPI)	267781	274351	280920	287493	294062	300633	307204	310487	310487	310487
CASH FLOW (ROIAT)	217746	220395	223044	227124	231394	235665	239937	242071	242071	242071
CUMULATIVE CASH FLOW(ROIAT)	1054279	1274674	1497718	1724842	1956236	2191901	2431838	2673909	2915980	3158051

Base Case II(After Renovation)

PROJECT YEAR	18	19	20
CASH FLOW STATEMENT (3/3)			
BALANCE AT BEGINNING OF YEAR	3640571	3951058	4261545
EARNINGS	195477	195477	195477
DEPRECIATION	115010	115010	115010
AMORTIZATION	0	0	0
LES. INCREASE IN ACCOUNT RECV	0	0	0
TOTAL FROM PRODUCTION	310487	310487	310487
PAID IN EQUITY	0	0	0
LOAN BORROWING(LONG TERM-1)	0	0	0
LOAN BORROWING(LONG TERM-2)	0	0	0
LOAN BORROWING(SHORT TERM)	0	0	0
TOTAL SOURCE OF CASH	3951058	4261545	4572032
INVESTMENT	0	0	0
PRE-OPERATION EXPENSES	0	0	0
WORKING CAPITAL INCREASE	0	0	0
INCOME TAX REPAYMENT	68416	68416	68416
LOAN REPAYMENT(LONG TERM-1)	0	0	0
LOAN REPAYMENT(LONG TERM-2)	0	0	0
LOAN REPAYMENT(SHORT TERM)	0	0	0
INTEREST (LONG TERM-1)	0	0	0
INTEREST (LONG TERM-2)	0	0	0
INTEREST (SHORT TERM)	0	0	0
TAX FOR PROFIT DISTRIBUTED	0	0	0
DIVIDENDS	0	0	0
TOTAL APPLICATION FOR CASH	0	0	0
NET CASH INCREASE	310487	310487	310487
BALANCE AT END OF YEAR	3951058	4261545	4572032
SALVAGE VALUE	0	0	0
CASH FLOW (ROE)	310487	310487	310487
CASH FLOW (ROIAT)	310487	310487	310487
CASH FLOW (ROIAT)	242071	242071	242071
CUMULATIVE CASH FLOW(ROIAT)	3400122	3642193	3884254

Base Case II(After Renovation)

	BALANCE SHEET (1/3)									
PROJECT YEAR	-3	-2	-1	1	2	3	4	5	6	7
ASSETS										
CURRENT-ASSETS	0	0	0	51205	120914	209127	315844	497781	631763	836949
CASH IN HAND	0	0	0	0	0	0	0	0	0	0
ACCOUNTS RECEIVABLE	0	0	0	0	0	0	0	0	0	0
INVENTORY	0	0	0	836	836	836	836	836	836	836
RAW-MATERIAL	0	0	1497	1497	1497	1497	1497	1497	1497	1497
WORK-IN-PROCESS	0	0	1497	1497	1497	1497	1497	1497	1497	1497
FINISHED GOODS	0	0	1497	1497	1497	1497	1497	1497	1497	1497
STOCKS-AND-SPARES	0	0	1062	1062	1062	1062	1062	1062	1062	1062
LESS: AMORTIZATION	0	0	0	-489	-978	-1467	-1956	-2445	-2934	-3423
TOTAL OF CURRENT ASSETS	0	0	4892	55608	124828	212552	318780	440228	633721	838418
FIXED ASSETS	0	145904	647600	647600	647600	647600	647600	647600	647600	647600
INVESTMENT	0	145904	647600	647600	647600	647600	647600	647600	647600	647600
PRE-OPERATION EXPENSES	0	0	0	0	0	0	0	0	0	0
TOTAL	0	145904	647600	647600	647600	647600	647600	647600	647600	647600
DEFERRED ASSETS	0	11679	72428	72428	72428	72428	72428	72428	72428	72428
LESS: DEPRECIATION	0	0	0	-115010	-230020	-345030	-460040	-575050	-690060	-805070
TOTAL-OF-FIXED-ASSETS	0	157583	724028	609018	490008	379998	259988	144978	29968	0
TOTAL ASSETS	0	157583	724920	660626	614836	587550	578768	585206	663689	838418
LIABILITIES AND EQUITY										
CURRENT-LIABILITIES	0	0	0	0	0	0	0	0	0	0
ACCOUNT PAYABLE	0	0	0	0	0	0	0	0	0	0
SHORT TERM LOAN	0	0	4892	4403	3914	3425	2936	2447	1958	1469
TOTAL	0	0	4892	4403	3914	3425	2936	2447	1958	1469
LONG TERM LOAN(1)	0	91004	415816	374235	332654	291073	249492	207911	166930	124749
LONG TERM LOAN(2)	0	66579	304212	243370	183528	121686	60844	2	2	2
EQUITY	0	0	0	0	0	0	0	0	0	0
PAID-IN-CAPITAL	0	0	0	38618	95740	171366	265496	374846	495399	712198
RETAINED EARNINGS	0	0	0	38618	95740	171366	265496	374846	495399	712198
TOTAL	0	0	0	38618	95740	171366	265496	374846	495399	712198
TOTAL-OF-LIABILITIES	0	157583	724920	660626	614836	587550	578768	585206	663689	838418
AND EQUITY										

Base Case II(After Renovation)

BALANCE SHEET (2/3)

PROJECT YEAR	8	9	10	11	12	13	14	15	16	17
ASSETS										
CURRENT-ASSETS										
CASH IN HAND	1053337	1380928	1519718	1807211	2101273	2401906	2709110	3019597	3330084	3640571
ACCOUNTS RECEIVABLE	0	0	0	0	0	0	0	0	0	0
INVENTORY										
RAW-MATERIAL	836	836	836	836	836	836	836	836	836	836
WORK-IN-PROCESS	1497	1497	1497	1497	1497	1497	1497	1497	1497	1497
FINISHED GOODS	1497	1497	1497	1497	1497	1497	1497	1497	1497	1497
STORES-AND-SPARES	1062	1062	1062	1062	1062	1062	1062	1062	1062	1062
LESS: AMORTIZATION	-3912	-4401	-4892	-4892	-4892	-4892	-4892	-4892	-4892	-4892
TOTAL OF CURRENT ASSETS	1054317	1281419	1519718	1807211	2101273	2401906	2709110	3019597	3330084	3640571
FIXED ASSETS										
INVESTMENT	647600	647600	647600	647600	647600	647600	647600	647600	647600	647600
PRE-OPERATION EXPENSES	0	0	0	0	0	0	0	0	0	0
TOTAL	647600	647600	647600	647600	647600	647600	647600	647600	647600	647600
DEFERRED ASSETS	72428	72428	72428	72428	72428	72428	72428	72428	72428	72428
LESS: DEPRECIATION	-805070	-805070	-805070	-805070	-805070	-805070	-805070	-805070	-805070	-805070
TOTAL-OF-FIXED-ASSETS	0	0	0	0	0	0	0	0	0	0
TOTAL ASSETS	1054317	1281419	1519718	1807211	2101273	2401906	2709110	3019597	3330084	3640571
LIABILITIES AND EQUITY										
CURRENT-LIABILITIES										
ACCOUNT PAYABLE	0	0	0	0	0	0	0	0	0	0
SHORT TERM LOAN	980	491	0	0	0	0	0	0	0	0
TOTAL	980	491	0	0	0	0	0	0	0	0
LONG TERM LOAN(1)	83168	41587	6	6	6	6	6	6	6	6
LONG TERM LOAN(2)	2	2	2	2	2	2	2	2	2	2
EQUITY										
PAID-IN-CAPITAL	0	0	0	0	0	0	0	0	0	0
RETAINED EARNINGS	970167	1239339	1519710	1807203	2101265	2401898	2709102	3019589	3330076	3640563
TOTAL	970167	1239339	1519710	1807203	2101265	2401898	2709102	3019589	3330076	3640563
TOTAL-OF-LIABILITIES-AND EQUITY	1054317	1281419	1519718	1807211	2101273	2401906	2709110	3019597	3330084	3640571

Base Case II(After Renovation)

BALANCE SHEET (3/3)

PROJECT YEAR 18 19 20

ASSETS  
CURRENT-ASSETS  
CASH IN HAND 3951058 4261545 4572032

ACCOUNTS RECEIVABLE 0 0 0

INVENTORY  
RAW-MATERIAL 836 836 836

WORK-IN-PROCESS 1497 1497 1497

FINISHED GOODS 1497 1497 1497

STORES AND SPARES 1062 1062 1062

LESS: AMORTIZATION 4892 4892 4892

TOTAL OF CURRENT ASSETS 3951058 4261545 4572032

FIXED ASSETS  
INVESTMENT 647600 647600 647600

PRE-OPERATION EXPENSES 0 0 0

TOTAL 647600 647600 647600

DEFERRED ASSETS 72428 72428 72428

LESS: DEPRECIATION 805070 805070 805070

TOTAL OF FIXED ASSETS 0 0 0

TOTAL ASSETS 3951058 4261545 4572032

LIABILITIES AND EQUITY

CURRENT-LIABILITIES  
ACCOUNT PAYABLE 0 0 0

SHORT TERM LOAN 0 0 0

TOTAL 0 0 0

LONG TERM LOAN(1) 6 6 6

LONG TERM LOAN(2) 2 2 2

EQUITY  
PAID-IN-CAPITAL 0 0 0

RETAINED EARNINGS 3951050 4261537 4572024

TOTAL 3951050 4261537 4572024

TOTAL OF LIABILITIES 3951058 4261545 4572032



## XI-2 Economic Evaluation

Detailed financial analysis of the renovation has been made in XI-2. In this article, the renovation is further evaluated from economic point of view, so that the feature of the renovation can be visualized more clearly. The implementation of the renovation will remarkably decrease fuel consumption through the conversion of production system from wet process to dry process and reduce electric unit cost through the conversion of electrical source. Relevant economic costs and benefits of the renovation are evaluated quantitatively and qualitatively comparing those before the renovation.

### (1) Improvement of international payments

#### (i) Reduction of foreign currency payment

The production costs that are remarkably reduced through the implementation of the renovation are fuel cost and electrical cost. The latter, however, does not contribute to the saving of foreign currency because it is due to the conversion of electrical source.

Therefore the reduction of fuel cost remarkably contributes to the improvement of international payments.

Provided that all the coal is to be imported, reduction of annual foreign currency payment in case of 100% operation is calculated as follows:

Fuel cost before renovation	Pesos 259,146,000/year
Fuel cost after renovation	Pesos 142,919,000/year
Reduction of payment	Pesos 116,227,000/year

Since the above mentioned amount includes import tax and inland transportation cost which correspond to about 33% of total amount. Therefore the net reduction



of foreign currency payment is calculated as follows:

Net reduction of foreign currency payment  
Pesos 77,000,000/year

(ii) Increase of foreign currency payment

A part of the capital requirement for the renovation is furnished in foreign currency.

Foreign currency portion: Pesos 415,818,000

According to loan condition the repayment period is 10 years and interest rate is 11% /year.

Therefore average foreign currency payment is calculated as follows:

Principal	Pesos 41,581,800/year
Interest (average)	Pesos 22,870,000/year
Total	Pesos 64,451,850/year

(iii) Foreign currency savings

The amount of foreign currency savings is calculated as follows:

Total savings for 20 years after the renovation

Case I	Pesos 658,000,000
Case II	Pesos 747,000,000

Annual savings from 21st year after the renovation

Case I	Pesos 77,000,000/year
Case II	Pesos 77,000,000/year

Note: (1) Average operation ratio during 20 years after the renovation is:

Case I : 84.6%

Case II : 90.4%

(2) Payment of foreign currency including that of interest is completed in 10th year after the renovation.

(2) Ensurance of local employment

In case the renovation is implemented, the management condition of ICC is much improved and its cement plant is operated steadily for long years.

Accordingly the employment of Antipolo area with regards to the personnel related to ICC can be ensured for long period.

(3) Economic internal rate of return (EIRR)

At first the economic benefit and economic cost are quantitatively calculated both in case the renovation is implemented and in case not implemented and then EIRR is calculated based on that results.

The economic profit of the renovation is generated by the cement produced. That is: the economic profit is expressed by the difference between the economic value of cement produced and the economic cost necessary for the production.

(i) Premise for calculation of EIRR

(a) Case

Case I	Production ratio of OPC to PC	50:50
Case II	Production ratio of OPC to PC	80:20

(b) Conversion factor

The following figures which were learnt from the offices concerned in Philippines were used as the conversion factors.

Standard conversion factor	0.86
Factor for skilled labor	1.00
Factor for unskilled labor	0.80

(c) Capital requirement for renovation

Refer to X-2 and XI-1-3.

(d) Production and sales price of cement

Refer to XI-1-4.

(e) Production cost

Refer to XI-1-5.

(f) Other conditions

Refer to XI-1-1.

(ii) Economic capital requirement for renovation

The capital requirement for renovation used for financial analysis is shown in Table 11-2-1.

Table 11-2-1 Financial Capital Requirement (1,000 Pesos)

Year	Foreign Currency Portion	Local Currency Portion					Total
		Material	Labour		Expenses	Sub-total	
			Skilled	Un-skilled			
-2	69,201	36,114	16,346	11,612	12,631	76,703	145,904
-1	305,049	91,166	38,813	32,346	34,322	196,647	501,696
Total	374,250	127,280	55,159	43,958	46,953	273,350	647,600

Based on the above Table the economic capital requirement is calculated using the conversion factors and shown in Table 11-2-2.

Table 11-2-2 Economic Capital Requirement (1,000 Pesos)

Year	Foreign Currency Portion	Local Currency Portion					Total
		Material	Labour		Expenses	Sub-total	
			Skilled	Un-skilled			
	C.F.						
	1.00	0.86	1.00	0.80	0.86	-	-
-2	69,201	31,058	16,346	9,290	10,863	67,557	136,758
-1	305,049	78,403	38,813	25,877	29,517	172,610	477,659
Total	374,250	109,461	55,159	35,167	40,380	240,167	614,417

(iii) Economic production cost

Based on the production cost for financial analysis the economic production cost is calculated and show in Table 11-2-3 (Case I) and Table 11-2-4 (Case II).

Table 11-2-3 Economic Production Cost (Case 1) (1,000 Pesos/Year)

	C.F.	Before Renovation		After Renovation	
		Financial	Economic	Financial	Economic
[Direct cost]					
Raw material	0.86	99,948	85,948	93,459	80,375
Fuel *	0.77	259,146	199,542	142,919	110,048
Grinding media	1.0	12,921	12,921	12,921	12,921
Fire brick	1.0	23,400	23,400	11,700	11,700
Lube. oil	0.86	9,398	8,082	9,398	8,082
Electricity	0.86	315,821	271,606	138,500	119,110
Paper bag	0.86	97,953	84,240	97,953	84,240
Repair expenses	0.86	17,855	15,355	17,855	15,355
Export promotion	0.86	11,747	10,102	11,747	10,102
Sub total		848,181	711,196	536,452	451,933
[Fixed cost]					
Salaries & wages	**	9,492	9,212	9,761	9,473
Depreciation	0	67,469	0	115,010	0
Amortization	0	836	0	515	0
Interest	0	702	0	47,282	0
Administrative exp.	0.86	8,280	7,121	8,280	7,121
Sub total		86,779	16,333	180,848	16,594
Total		934,960	727,529	717,300	468,527

Note. 1 \* Conversion factor of fuel.  
The breakdown of the cost of 66,601 ton of coal used by ICC in 1985 is shown in Table 11-2-5.

Table 11-2-4 Economic Product Cost (Case II)  
(1,000 Pesos/Year)

	C.F.	Before Renovation		After Renovation	
		Financial	Economic	Financial	Economic
[ Direct cost]					
Raw material	0.86	89,999	77,399	83,598	71,894
Fuel	0.77	259,146	199,542	142,919	110,048
Grinding media	1.0	12,713	12,713	3,200	3,200
Fire brick	1.0	23,400	23,400	11,635	11,635
Lube. oil	0.86	8,619	7,412	8,619	7,412
Electricity	0.86	304,663	262,010	133,096	114,462
Paper bag	0.86	89,835	77,258	89,835	77,258
Repair expenses	0.86	16,376	14,083	16,376	14,083
Export promotion	0.86	10,774	9,266	10,744	9,266
Sub total		815,525	683,083	500,052	419,258
[ Fixed cost]					
Salaries & wages		9,492	9,212	9,761	9,473
Depreciation	0	67,469	0	115,010	0
Amortization	0	804	0	489	0
Interest	0	4,540	0	35,400	0
Administrative exp.	0.86	8,280	7,121	8,280	7,121
Sub total		90,585	16,333	168,940	16,594
Total		906,110	699,416	668,992	435,852

(iv) Sales revenue

(a) Economic price of cement

The cement produced in the Philippines is exported at present and its quality is equal to that of other cement exporting countries. Since no cement is imported now, CIF price of cement cannot be obtained. Further the domestic cement price is almost the same as the international cement price. Considering the factors mentioned above the conversion factor of cement is deemed to be 1.0.

In economic price the sales tax that is included in the financial cement price is to be zero.

The economic ex-factory cement price and the average economic cement price of Case I and Case II are shown in Table 11-2-6 and Table 11-2-7 respectively.

Table 11-2-6 Economic Price of Cement

Peso/bag

C.F.	Financial Price			Economic Price		
	Unit Price	Sales Tax	Total	Unit Price	Sales Tax	Total
	-	-	-	1.0	0	-
OPC	38.64	3.86	42.5	38.6	0	38.64
PC	37.73	3.77	41.5	37.73	0	37.73



Table 11-2-7 Average Economic Price of Cement

	PC/PC	Economic Price	
		Peso/bag	Peso/ton
Case I	50/50	38,185	954,625
Case II	80/20	38,458	961,450

(b) Economic sales revenue of cement

The economic sales revenue is calculated using the economic cement price stated in (a) and shown in Table 11-2-8.

(v) Economic internal rate of return

Based on the matters stated in (i) (iv) the economic benefit before renovation and that after renovation are calculated and using the deference between them the economic internal rate of return is calculated and shown in Table 11-2-9.

Table 11-2-8 Economic Sales Revenue

Year	Case I			Case II		
	Operation Ratio	Production	Sales Revenue	Operation Ratio	Production	Sales Revenue
	%	1,000 ton/y	1,000 P/y	%	1,000 ton/y	1,000 P/y
1	68	639,036	610,039	74	637,791	613,204
2	69	648,434	619,011	76	655,028	629,776
3	71	667,229	636,953	78	672,266	646,350
4	73	686,024	654,895	80	689,504	662,923
5	75	704,820	672,838	81	698,122	671,209
6	77	723,615	690,780	83	715,360	687,782
7	78	733,012	699,751	85	732,598	704,356
8	80	751,808	717,694	87	749,835	720,928
9	82	770,603	735,636	89	767,073	737,502
10	83	780,000	744,608	91	784,310	754,074
11	85	798,796	762,550	93	801,548	770,648
12	87	817,591	780,492	95	818,786	787,221
13	89	836,386	798,434	97	836,023	803,794
14	91	855,181	816,377	99	853,261	820,367
15	93	873,976	834,319	100	861,880	828,654
16	95	892,772	832,214	100	861,880	828,654
17	97	911,567	870,204	100	861,880	828,654
18	99	930,362	888,146	100	861,880	828,654
19	100	939,760	897,118	100	861,880	828,654
20	100	939,760	897,118	100	861,880	828,654

The process of calculation for Case I is shown in Table 11-2-10 ~ 11-2-12 and for Case II in Table 11-2-13 ~ 11-2-15 respectively.

Table 11-2-9 Economic Internal Rate of Return

	Case I	Case II
EIRR	28.9	31.8
FIRROI (before tax)	33.3	35.5
FIRROI (after tax)	28.8	31.6

#### Consideration

1. Judging from EIRR, the economic profitability of both Cases I and II are high.
2. What greatly contribute to this profitability are reduction of fuel cost and electric cost.
3. In both Cases I and II, EIRR is almost equal to FIRROI (after tax) and somewhat lower than FIRROI (before tax) but show the same trend.

Table 11-2-10 Economic Internal Rate of Return (Case 1)

(Before Renovation)

(1,000 Pesos)

Year	Pro- duction 1,000 Ton	Renovation capital requirement	Direct cost	Fixed cost	Sales revenue	Salvage value	Net benefit
-2	-	-			-		-
-1	-	-			-		-
1	639,036		483,613	16,333	610,039		110,093
2	648,434		490,725	"	619,011		111,953
3	667,229		504,949	"	636,953		115,671
4	686,024		519,173	"	654,895		119,389
5	704,820		533,397	"	672,838		123,108
6	723,615		547,621	"	690,780		126,826
7	773,012		554,733	"	699,751		128,685
8	751,808		568,957	"	717,694		132,404
9	770,603		583,181	"	735,636		136,122
10	780,000		590,293	"	744,608		137,982
11	798,796		604,517	"	762,550		141,700
12	817,591		618,741	"	780,492		145,418
13	836,386		632,964	"	798,434		149,137
14	855,181		647,188	"	816,377		152,856
15	873,976		661,412	"	834,319		156,574
16	892,772		675,636	"	852,214		160,245
17	911,567		689,860	"	870,204		164,011
18	930,362		704,084	"	888,146		167,729
19	939,760		711,196	"	897,118		169,589
20	"		"	"	"	7,012	176,601

Table 11-2-11 Economic Internal Rate of Return (Case I)  
(After Renovation) (1,000 Pesos)

Year	Pro- duction 1,000 Ton	Renovation capital re- quirement	Direct cost	Fixed cost	Sales revenue	Salvage value	Net benefit
-2	-	(136,758)			-		(136,758)
-1	-	(477,659)			-		(477,659)
1	639,036		307,314	16,594	610,039		286,131
2	648,434		311,834	"	619,011		290,583
3	667,229		320,872	"	636,953		299,487
4	686,024		329,911	"	654,895		308,390
5	704,820		338,950	"	672,838		317,294
6	723,615		347,988	"	690,780		326,198
7	773,012		352,508	"	699,751		330,649
8	751,808		361,546	"	717,694		339,554
9	770,603		370,585	"	735,636		348,457
10	780,000		375,104	"	744,608		352,910
11	798,796		384,143	"	762,550		361,813
12	817,591		393,182	"	780,492		370,716
13	836,386		402,220	"	798,434		379,620
14	855,181		411,259	"	816,377		388,524
15	873,976		420,298	"	834,319		397,427
16	892,772		429,336	"	852,214		406,284
17	911,567		438,375	"	870,204		415,235
18	930,362		447,414	"	888,146		424,138
19	939,760		451,933	"	897,118		428,591
20	"		"	"	"	4,326	432,917

Table 11-2-12 Economic Internal Rate of Return (Case I)

Year	Benefit difference*	Discount rate	
		28%	29%
-2	[ 136,758]	[ 106,849]	[ 106,015]
-1	[ 477,659]	[ 291,563]	[ 287,025]
1	176,038	83,935	81,999
2	178,630	66,540	64,503
3	183,816	53,490	51,450
4	189,001	42,979	41,013
5	190,468	33,827	32,037
6	199,372	27,673	25,998
7	201,964	21,893	20,419
8	207,150	17,546	16,232
9	212,335	14,050	12,897
10	214,928	11,125	10,121
11	220,113	8,888	8,034
12	225,298	7,108	6,376
13	230,483	5,681	5,057
14	235,666	4,539	4,006
15	240,853	3,625	3,174
16	246,039	2,891	2,515
17	251,224	2,306	1,990
18	256,409	1,838	1,574
19	259,002	1,453	1,233
20	256,316	1,228	946
		+14,203	-1,466

EIRR = 28.9%

Note: \* Benefit difference between before and after renovation.

Table 11-2-13 Economic Internal Rate of Return (Case II)  
(before Renovation) (1,000 Pesos)

Year	Pro- duction 1,000 Ton	Renovation capital re- quirement	Direct cost	Fixed cost	Sales revenue	Salvage value	Net benefit
-2	-	-			-		-
-1	-	-			-		-
1	637,791		505,481	16,333	613,204		91,390
2	655,028		519,143	"	629,776		94,300
3	672,266		532,805	"	646,350		97,212
4	689,504		546,466	"	662,923		100,124
5	698,122		553,297	"	671,209		101,579
6	715,360		566,959	"	687,782		104,490
7	732,598		580,621	"	704,356		107,402
8	749,835		594,282	"	720,928		110,313
9	767,073		607,044	"	737,502		113,225
10	784,310		621,606	"	754,074		116,135
11	801,548		635,267	"	770,648		119,048
12	818,786		648,929	"	787,221		121,959
13	836,023		662,591	"	803,794		124,870
14	853,261		676,252	"	820,367		127,782
15	861,880		683,083	"	828,654		129,238
16	"		"	"	"		"
17	"		"	"	"		"
18	"		"	"	"		"
19	"		"	"	"		"
20	"		"	"	"	6,682	135,920

Table 11-2-14 Economic Internal Rate of Return (Case II)

(after Renovation)

(1,000 Pesos)

Year	Pro- duction 1,000 Ton	Renovation capital re- quirement	Direct cost	Fixed cost	Sales revenue	Salvage value	Net benefit
-2	-	(136,758)			-		(136,758)
-1	-	(477,659)			-		(477,659)
1	637,791		310,251	16,594	613,304		286,359
2	655,028		318,636	"	629,776		294,546
3	672,266		327,021	"	646,350		302,735
4	689,504		335,406	"	662,923		310,923
5	698,122		339,599	"	671,209		315,016
6	715,360		347,984	"	687,782		323,204
7	732,598		356,369	"	704,356		331,393
8	749,835		364,754	"	720,928		339,580
9	767,073		373,140	"	737,502		347,768
10	784,310		381,525	"	754,074		355,955
11	801,548		389,910	"	770,648		364,144
12	818,786		398,295	"	787,221		372,332
13	836,023		406,680	"	803,794		380,520
14	853,261		415,065	"	820,367		388,708
15	861,880		419,258	"	828,654		392,802
16	"		"	"	"		"
17	"		"	"	"		"
18	"		"	"	"		"
19	"		"	"	"		"
20	"		"	"	"	4,049	396,851



Table 11-2-15 Economic Internal Rate of Return (Case II)

Year	Benefit difference	Discount rate	
		31%	32%
-2	[ 136,758]	[ 104,401]	[ 103,608]
-1	[ 477,659]	[ 278,332]	[ 274,129]
1	194,969	86,722	84,773
2	200,246	68,004	65,961
3	205,523	53,272	51,278
4	210,799	41,717	39,841
5	213,437	32,229	30,564
6	218,714	25,218	23,730
7	223,991	19,711	18,410
8	229,267	15,404	14,276
9	234,543	12,030	11,063
10	239,820	9,389	8,571
11	245,096	7,326	6,635
12	250,373	5,711	5,135
13	255,650	4,453	3,973
14	260,926	3,468	3,071
15	263,564	2,675	2,348
16	"	2,043	1,782
17	"	1,558	1,349
18	"	1,189	1,023
19	"	0,912	0,775
20	270,246	0,711	0,600
		+11,009	-2,579

EIRR=31.8%





## SECTION XII CONCLUSION AND RECOMMENDATION

### XII-1 Conclusion

Since Antipolo plant of ICC is consuming much fuel due to its wet process and paying higher unit electricity cost because the electricity is supplied by MERALCO.

As these two items are greatly suppressing its financial situation, the renovation plan mainly consisting of the conversion from wet process kiln to dry process NSP kiln and the conversion of electricity source is considered as a countermeasure.

After examination of the plant, this renovation project is judged to be feasible both in technically and economically under the premise stated in I-1.

- (1) Policy of the Government of the Republic of the Philippines with respect to the cement industries in the Philippines as well as the rehabilitation and modernization of ICC.

The Government of the Philippines is adopting price policy, market policy, and export policy towards the cement industries and assisting the improvement of production technology and quality.

The Government intends to cooperate the renovation of ICC in case the cement demand is recovered and the investment to this project is judged to be effective.

Remark: Policy of the Government described above is what was expressed during the field survey in January 1986.

(2) Present situations and future prospects of supply and demand

Average production of past 11 years is 4,100,000 ton/year which corresponds to about 70% of the total production capacity of the country, 6,000,000 ton/year.

Demand forecasts of cement were made by the trend analysis, correlation analysis, estimation based on similar cases and the forecast prepared in the Philippines.

Among the estimations mentioned above, the forecast calculated by correlation analysis with population has been adopted as the basis of this study due to the reasons described as follows.

- The population is highest in correlativity with cement consumption.
- The above forecast is on the conservative side when making an estimation.

(3) The environment of Antipolo

Antipolo area is situated in the vicinity of Metro Manila which is a big cement consuming city and surrounded by deposits of main cement raw materials.

It is quite favourably located as a cement plant site.

(4) Management of ICC

Although controls of plant such as plant operation and maintenance are to be improved in various points, the management of plant of a whole is conducted normally.

However fuel cost and electricity cost are so high that they suppress the financial situation greatly.

(5) Facilities of ICC

According to ICC's data, the main raw materials seems to be satisfied both in quality and in quantity.

The plant facilities are considered to operate at their rated capacity if maintained well, although some problems are pointed out.

(6) Process of ICC

ICC's present process is wet long kiln system which consumes more fuel than other processes.

No technical problem exists in converting the process from wet long kiln system to dry NSP kiln system.

(7) Study on electric power source to the Antipolo plant of ICC

The unit electricity sales charge for industry of MERALCO from which ICC is supplied the electricity is largely higher than that of NPC.

Therefore by converting the electric power source from MERALCO to NPC, remarkable decrease in production cost can be achieved with a small investment.

(8) Management after rehabilitation and modernization of ICC

The control for new machinery and equipment to be installed through the renovation should be conducted steadily.

While some parts of various controls which have been imperfect or inadequate should be improved.

(9) Formulation of rehabilitation and modernization program of ICC

The renovation plan was made centering around the process conversion to dry process NSP system and the conversion of electricity power source.

The total capital requirement of the renovation is Pesos 725,182,000, and is mainly financed by long term loan.

The period necessary for the renovation is:

- 10 months of preparation period for selecting a consultant and a contractor and
- 24 months of construction works, and so
- total 34 months

(10) Evaluation

(i) Financial analysis

The profitability of the renovation is shown in Table 12-1-1.

Table 12-1-1 FIRROI of Basic Cases

	(%)	
	Case I	Case II
FIRROI (before tax)	33.3	35.5
FIRROI (after tax)	28.8	31.6

Note: These figures were calculated based on cash flow difference between those before and after the implementation of renovation.

(ii) Economic evaluation

EIRR of this renovation of Case I and Case II are 28.9% and 31.8% respectively which show high economic viability.