Fly Ash Bricks

INTRODUCTION

Fly Ash bricks are made of fly ash, lime, gypsum and sand. These can be extensively used in all building constructional activities similar to that of common burnt clay bricks. The fly ash bricks are comparatively lighter in weight and stronger than common clay bricks. Since fly ash is being accumulated as waste material in large quantity near thermal power plants and creating serious environmental pollution problems, its utilisation as main raw material in the manufacture of bricks will not only create ample opportunities for its proper and useful disposal but also help in environmental pollution control to a greater extent in the surrounding areas of power plants. In view of superior quality and eco-friendly nature, and government support the demand for Fly Ash Bricks has picked up.

MARKET POTENTIAL

The country consumes about 180 billion tonnes bricks, exhausting approximately 340 billion tonnes of clay every year and about 5000 acres of top soil land is made unfertile for a long period. The Government is seriously concerned over soil erosion for production of massive quantities of bricks, in the background of enormous housing needs.

The excellent engineering property and durability of fly ash brick enlarges its scope for application in building construction and development of infrastructure, construction of pavements, dams, tanks, under water works, canal lining and irrigation work etc. Enormous quantities of fly ash is available in and around thermal power stations in all the states. The demand of bricks could be met by establishing small units near thermal power stations and to meet the local demand with less transportation costs.

BASIS AND PRESUMPTIONS

i.   It is assumed that the unit will operate on single shift basis for 300 working days in a year.

ii.   The salary and wages for staff and labour has been taken into consideration on the basis of prevailing market rates.

iii. To reach the full plant capacity, it requires 1 year after trial production.

iv.   Interest rate at 14% is considered in the project profile for both recurring and nonrecurring investment.

v.   Margin money will vary from 10-25% depending upon the location and scheme adopted by the entrepreneur.

vi.   Operative period of project is around 10 years considering technology obsolescence rate and period of repayment of loan.

vii. The costs of land, construction charges, machinery and equipment, raw materials, and consumables, other contingent expenses etc. indicated in the scheme are based on the prices, prevailing at the time of project preparation. Therefore, these are subject to necessary changes from time to time based on the local conditions.

IMPLEMENTATION SCHEDULE

Sl. No.	Activity	Period Starting		Period Completion
1.	Survey of collection of data in respect of demand, availability of technology, power, land and clearance from State Pollution Control Board	1day	to	2nd month
2.	Arrangement for margin money	2nd	to	3rd
3.	Preparation of project report and registration	2nd	to	3rd
4.	Finance assistance	2nd	to	4th
5.	Development of Site and construction of building	5th	to	7th
6.	Machine purchasing and installation	7th	to	8th
7.	Trial production			8th month

TECHNICAL ASPECTS

Process of Manufacture

Fly ash, lime sand and gypsum are manually fed into a pan mixer where water is added in the required proportion for intimate mixing. The proportion of the raw material is generally in the ratio 60-80% of fly ash 10-20% lime, 10% Gypsum and 10% sand, depending upon the quality of raw materials.

After mixing, the mixture is shifted to the hydraulic/mechanical presses. The bricks are carried on wooden pellets to the open area where they are dried and water cured for 21 days. The bricks are tested and sorted before despatch.

Quality Control and Standards

The Bureau of Indian Standards has formulated and published the specification for maintaining quality of product and testing purpose.

IS 12894:1990.

Production Capacity (Per year)

Quantity (Nos.) : 60 Lakhs bricks
Value   : Rs. 87,00,000.

Motive Power   30 KW.

Pollution Control

The technology adopted for making fly ash bricks is eco-friendly. It does not require steaming or auto calving as the bricks are cured by water only. Since the firing process is avoided, there are no emissions and no effluent is discharged. On the other hand, it solves the problem of fly ash disposal.

Energy Conservation

General precautions for saving electricity are required to be followed by the unit by adopting energy conservation techniques not only to conserve the power but also to save considerable expenditure in their own and also in the interest of the nation as a whole.

FINANCIAL ASPECTS

A. Fixed Capital

(i) Land and Building	(Rs.)
Land 1 Acre @ Rs. 3,20,000	3,20,000
Building Area 165 sq. mt. @ Rs. 22,00 per sq mt.	3,63,000
Working Shed 150 sq. mt. @ Rs. 1,200 per sq. mt.	1,80,000
Boundary Wall, Gate L.S.	67,000

Land and Building	(Rs.)
Fly Ash Pond and Curring Tank L.S.	1,20,000
Total	10,50,000

(ii) Machinery and Equipments

Description	Ind./ Imp.	Qty.	Price (Rs.)
Pan mixer (run by 20 HP motor)	Ind.	2	1,50,000
Hydraulic Press (30 Tonnes Cap.)	Ind.	2	3,00,000
Belt Conveyor (Run by 3 HP motor)	Ind.	1	70,000
Deep Tube Well	Ind.	1	35,000
Generator	-	1	1,25,000
Steel Plates and Extra Moulds	-	L.S.	85,000
Trollies	-	L.S.	30,000
Office, Furniture and Equipments	-	L.S.	32,000
Installation and Erection charges	-	L.S.	28,000
Total			8,55,000

(iii) Pre-operative Expenses	70,000
Total Fixed Capital (i + ii + iii)	19,75,000

B. Working Capital (Per Month)

(i) Staff and Labour (per month)

Description	Nos.	Salary	Total Salary (Rs.)
Manager	1	7000	7,000
Production Engineer	1	5500	5,500
Skilled Workers	5	3200	16,000
Un-skilled Workers	10	2800	28,000
Chowkidars	3	2200	6,600
Peons	2	2200	4,400
Cashier-Cum-Clerk	1	3500	3,500
		Total	71,000
Add Perquisites @ 15%			10,650
		Total	81,650

(ii) Raw Material (per month)

Description	Ind./Imp.	Qty. (Ton.)	Rate (P.Ton)	Value (Rs.)
Fly Ash	Ind.	1000	90.00	90,000
Lime	Ind.	250	800	2,00,000
Sand	Ind.	125	105	13,125
Gypsum	Ind.	125	900	1,12,500
			Total	4,15,625

(iii) Utilities (per month)

	(Rs.)
Power	30,000
Fuel	8,000
Total	38,000

(iv) Other Contingent Expenses (per month) (Rs.)

	(Rs.)
Postage and Stationery	1,200
Telephone	1,800
Transportation	2,500
Insurance	5,000
Repair and Maintenance	2,500
Advertisement and Publicity	2,200
Misc. Expenditure	2,500
Total	17,700
(v) Total Recurring Expenditure (per month) (i+ii+iii+iv)	5,52,975
or Say	5,53,000
(vi) Total Working Capital (for 3 months)	16,59,425

C. Total Capital Investment

Fixed Capital	Rs. 19,75,000
Working Capital	Rs. 16,59,000
Total	Rs. 36,34,000

FINANCIAL ANALYSIS

(1) Cost of Production (per year)

	(Rs.)
Total Recurring cost per year	66,36,000
Depreciation on Building @ 5%	36,500
Depreciation on Machinery and Equipment @ 10%	79,500
Depreciation on Office Equipments @ 20%	6,400
Interest on Total Capital Investment @ 14%	5,08,760
Total	72,67,160

(2) Turnover (per year)

Qty.	Rate	Value (Rs.)
60 Lakhs Bricks	1.45 per bricks	87,00,000

(3) Net Profit (per year)

= Turn Over – Production Cost

= Rs. 87,00,000 – 72,67,160

= Rs. 14,32,840

(4) Net Profit Ratio

$$= \frac{\text{Net Profit} \times 100}{\text{Total Turnover}}$$

$$= \frac{14,32,840 \times 100}{87,00,000}$$

= 16.47%

(5) Rate of Return

$$= \frac{\text{Net Profit (per year)} \times 100}{\text{Total Investment}}$$

$$= \frac{14,32,840 \times 100}{36,34,000}$$

= 39.43%

(6) Break-even Point

Fixed Cost	(Rs.)
Depreciation on building @ 5%	36,500
Depreciation on Machinery and Equipment @ 10%	79,500
Depreciation on Office Equipment @ 20%	6,400
Interest on Total Capital Investment @ 14%	5,08,760
Insurance	60,000
40% of Salary and Wages	3,91,920
40% of Other Contingent Expenses (excluding insurance)	60,960
Total	11,44,040
or Say	11,44,000

B.E.P. $= \dfrac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}}$

$= \dfrac{11,44,000 \times 100}{11,44,000 + 14,32,840}$

$= 44.4\%$

Addresses of Plant and Machinery Suppliers

1. M/s. Jindal Hydraulics
   D-203, Sector-10,
   Noida (UP)

Raw Material Suppliers

1. NTPC's and Thermal Power Plants for Fly Ash.
2. M/s. Stark and Co.
   17, Najafgarh Road,
   Near Jakhira Chowk,
   New Delhi - 110015

Technology

3. Central Building Research Institute
   Roorkee - 247 667 (U.P.)

4. National Council for Cement and Building Materials
   KM Stone,
   Delhi - Mathura Road,
   Ballabhgarh - 121 004
   Distt. Faridabad (Haryana)

5. Institute for Solid Waste Research and Ecological Balance,
   Vishakhapatnam.