STONE CHIPS

INTRODUCTION:

Stone chips, termed at “Metal” in construction parlance, constitute one of the main construction materials along with bricks, sand, cement and steel. In the north-eastern region, where places are widely dispersed and there are communication bottlenecks, availability of construction materials is not adequate at all the places. In many areas, stone chips have to be brought over long distances, resulting in high construction costs. Dispersed stone crushing units are therefore a necessity in all the north-eastern states.

MARKET POTENTIAL:

At present there are about 15 to 20 stone crushing units in and around Guwahati and a few units around other urban centers such as Tinsukia, Dibrugarh, Shillong, Imphal and Agartala. In a state like Arunachal Pradesh, which is the largest in terms of land area, there are hardly 10 units. Nagaland and Mizoram also have few units. Same units can make stone grit and chips, but currently chips are more in demand. The demand for stone chips is directly linked with the volume of construction activity. Stone chips are used in concreting, along with cement and sand and in road pavement work. It is estimated that for 1000 cu.m of metaling, 750 cu.m of stone chips will be required. Assuming that a tiny unit would cater to local demands within a 25 km radius, it may be expected to serve metal requirements for 100 km of road work per year and 2000 cu.m of concrete per year. On this basis the demand potential for a tiny unit is placed at 31,500 cu.m per year. Assuming that 50% of the demand would be met by the existing units there would be scope for 1 – 2 units in the local area of radius 25 km.

PLANT CAPACITY:

The capacity of a stone crusher unit depends on the feed size of stone, the desired product size and the size of crusher used. Besides on a 16” x 9” Jaw crusher which is a popular size and 7” feed size of stone, the capacity of a typical unit would be 8,400 tonne per year as follows:

Hourly production capacity	:	3.50 tonne.
Effective working hours	:	8 hours.
No.of shift per day	:	1 shift
No.of work-day per annum	:	300 days.
Annual production capacity	:	8400 tonne
Capacity utilization	:	70%
Annual production	:	5880 tonne

RAW MATERIALS:

Stone boulders are the only raw material required for the plant. Assuming an average yield of 90% of stone chips, the annual requirement of boulders is estimated at 6540 tonne at 70% capacity utilization.

PROCESS:

Big stone boulders are first broken to smaller size manually, and then fed to the stone crusher. The crusher can accept stone size of 175mm. Stone crushing is two-stage process. In the first stage 175mm stone is crushed to about 50mm. Thereafter, the crusher is fitted with a conversion kit to enable granulation of 5 to 20mm. The crushed material is screened by rotary screen.

MACHINERY:

The major equipment required in a stone crushing plant are given below:

(A. I No. Jaw crusher and granulator of size 16” to 10” having 15 HP motor along with rotary screen.
(B. Conversion kit for converting crushed stone granules (size 16”x6”).
(C. Grizzly for screening of big materials.
(D. Set of hoppers for manual breaking.
(E. Rotary screen complete with all fittings.

(F. 2 Nos. trollies for carrying crushed material.

(G. 2 Nos. bunkers for storage.
(H. Other essential accessories – 1 set.
(I. Air compressor
(J. Rock drilling machine and jack hammers.
(K. Drill rods, houses etc.
(L. Hand tools like shovel, spade, chisels, hammers etc.

Stone crusher are available in two major types namely (a) stationary (b) portable or mobile. Stationary crushers are usually located at quarry heads. Portable crushers are mainly used at construction sites. This profile is based on a stationary crusher.

INFRASTRUCTURE:

The main infrastructure requirements are –

Land & building	:	0.5 acre.
Simple shed	:	3 x 2m (wooden/steel poles with GCI Sheet roof)
Power:	:	1.5 KW
Water:	:	2000 ltrs/day.

LOCATION:

Stone crushing units should be ideally located near large construction sites. Keeping in view the large projects and industrial areas that are likely to be developed in future, the following locations are suggested.

Assam	:	Bongaigaon, Mangaldoi, Numaligarh, Sibsagar.
Meghalaya	:	Byrnihat, Tura, Jowai.
Arunachal Pradesh	:	Pasighat, Banderdewa, Deomale
Nagaland	:	Medzephera, Phek
Manipur	:	Churachandpur, Ukhrul
Mizoram	:	Kolasib, Vairangte.
Sikkim	:	Gangtok & other Dist. H.Q.

TOTAL CAPITAL REQUIREMENT:

The total capital requirement including fixed capital and working capital is estimated at Rs 13.03 lakh as follows. Of this, the project cost comprising fixed capital and margin money on working capital is Rs 10.82 lakh.

			(Rs. lakhs)
A	Fixed Capital:		
	Land (0.5 acre)		On rent
	Plant & Machinery		8.00
	Misc. Fixed Assets		0.80
	Preliminary & Pre-operative expenses		0.60
		Total (A)	9.40
B.	Working Capital:		
	Raw materials	10 days	0.22
	Packing material	½ months	0.69
	Working expenses	1 month	0.69
	Receivables	1 month	2.03
		Total (B)	3.63
		Grant Total (A+B)	13.03 lakh

Note: Working capital may be financed as –
Bank Finance: R.s. 2.21 lakh
Margin Money: Rs. 1.42 lakh
Total : Rs. 3.63 lakh

MEANS OF FINANCE:

Promoter's contribution (35%)		Rs 3.79 lakh
Term Loan(65%)		Rs 7.03 lakh
	Total	Rs 10.82 lakh

OPERATING EXPENSES

The annual operating expenses are estimated at Rs 20.88 lakh as given below:

	(Rs. lakh)
Raw materials and consumables –	
6540 tonne boulder @ Rs 100/tonne	6.54
Utilities	1.50
Wages & salaries	6.75
Rent	1.08
Other overheads	0.60
Selling expenses @ 10%	2.44
Interest on term loan @12%	0.84
Interest on bank finance @15% for working capital	0.33
Depreciation	0.80
Total	Rs. 20.88 lakh

SALES REALIZATION:

In the output 90% will be chips and balance 10% will be sand. Accordingly, for a throughout of 6540 tonnes of boulders, production of chips will be 5886 tonnes and sand will be 654 tonnes.

The annual sales realization is estimated at Rs 24.39 lakhs as under:

5886 tonnes of stone chips @ Rs 400/tonne		:	Rs 23.54 lakh
654 tonnes of sand @ Rs 130/tonne		:	Rs 0.85 lakh
	Total	:	Rs 24.39 lakh

PROFITABILITY:

Based on the sales realization and the operating expenses, the profit at 70% capacity would be Rs 3.51 lakh per year. This works out to a return on investment of 27%. The plant would break even at about 52% of the rated capacity.

HIGHLIGHTS:

The major highlights of the projects are as follows:

Total Capital requirement	:	Rs 13.03 lakh
Promoter's contribution	:	Rs 3.79 lakh
Annual Sales realization	:	Rs 24.39 lakh
Annual operating expenses	:	Rs 20.88 lakh
Annual Profit (Pre-tax)	:	Rs 3.51 lakh
Pre-tax return on sales	:	14%
Break-Even Point	:	52%
Number of persons employed	:	20 Nos.

MACHINARY SUPPLIER:

1. M/s Hindustan Agrico,
   Pratapnagar, I.T.I., Udaipur – 313 001

2. M/s Thapar Auto Trading Works,
   B- 32, Phase-II,Mayapuri, New Delhi – 110 064