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INDUSTRIAL STUDIES AND DEVELOPMENT CENTRE

DAR-ES-SALAAM

02513

FEASIBILITY REPORT

ON

FOUNDRY (CAST IRON) PROJECT

IN

T A N Z A N I A

Pp.

Dar es Salaam, October 2, 1970.

MRA/RR/CBS/SK/587/3412

2501

CONTENTS

INTRODUCTION

INDCENTRE was requested by a private investor for preparing a feasibility report on the manufacture of cast iron soil pipe, pipe fittings and manhole frames/covers.

Cast Iron pipe, pipe fittings and manhole frames/covers are used in buildings, water supply systems and sewage disposal systems, and 100% of the country's requirements are being met by imports. With the rate of development in the country there will be a continued demand for these items.

Establishment of a Foundry Project in Tanzania is imperative, not only for meeting the demands of cast iron pipe, fittings etc. but also for the development of engineering and machine building industry for achieving self-reliance and import substitution.

This report has been prepared with a view of ascertaining the economic viability of establishing a Foundry for the production of cast iron soil pipe, pipe fittings and manhole frames/covers to start with, and to go in for the manufacture of cast iron machine and vehicle components, maleable castings etc. in future.

Dar es Salaam, October 2, 1970

M. Raza Ali
Industrial Engineer

CHAPTER 1

SUMMARY AND CONCLUSIONS

1.1. **Plant Capacity:** 4300 tons of castings per year (working on single shift basis) installed capacity.

1.2 **Total Investment:** Shs.6.636 million including Shs.0.976 million for working capital.

1.3 **Foreign Exchange Requirements:-**

Non Recurring: 3.64 million for Machinery & Equipment

Recurring : 0.996 million for raw material, tools, spares and shop supplies.

1.4 **FEASIBILITY:-**

a) Calculations show that the Internal Rate of Return for the project is 14.57%, which is higher than the cost of capital which is 11.7%, as such the project is financially feasible.

b) The project can break even if it is worked at about 50% of the installed capacity, which is also indicative of the project being feasible.

1.5 **CONTRIBUTION TO NATIONAL ECONOMY**

a) Value added as % of turnover : 54.09%

b) Foreign exchange Saving :

Foreign exchange required for import of 4030 tons of pipe, pipe fittings and manhole frames/covers	Shs. 3,425,630 (CIF)	p.a.
Total estimated import content for local production of 4030 tons of above items	Shs. 1,980,454	p.a.
Foreign Exchange Saving	Shs. 1,505,176	p.a.

c) Employment : 88 persons

d) Contribution to National Exchequer :-

Corporation tax payable by the project	Shs. 598,319	p.a.
Income Tax payable by employees (20% of pay Roll)	Shs. 121,620	p.a.
Total Tax	Shs. 719,939	p.a.
Loss of custom duty due to import substitution	Shs. 513,845	p.a.
Net gain to Exchequer	Shs. 206,094	p.a.

CHAPTER - 2

MARKET CONSIDERATIONS AND PLANT CAPACITY

Cast Iron pipe, pipe fittings and manhole frames/covers are imported in Tanzania and other member countries of E.A.C., as there is no sizeable Foundry in E.A.C. countries. These items are imported from West and East European countries. Peoples' Republic of China, Japan, India and Israil.

While import statistics for cast iron pipe are available for the past several years, statistics for manhole frames/covars are only available for the year 1968 and 1969. On the other hand separate import statistics for cast iron pipe fittings are not available, as these have bean groupad with Iron and Steel pipe fittings.

IMPORT OF CAST IRON PIPE AND MANHOLE COVERS IN E.A.C.

	KENYA		UGANDA		TANZANIA		TOTAL FOR E.A.C.	
	Weight Tons	Value T.£	Weight Tons	Value T.£	Weight Tons	Value T.£	Weight Tons	Value T.£
CAST IRON PIPE:-								
1965	51.21	2,796	383.00	25,429	2451.12	153,617	2885.33	181,842
1966	1589.64	173,932	571.16	42,356	1810.76	119,117	3971.56	335,405
1967	450.54	30,436	340.49	21,508	768.26	52,729	1559.29	104,673
1968	900	50,695	437	30,247	7485	245,225	8822	326.167
1969	348	18,385	494	26,107	5435	200,440	6277	244,932
ANNUAL AVERAGE OVER 5 YEARS	667.88 Tons	-	445.13 Tons	-	3590.03 Tons	-	4703.04 Tons	-
C.I. MANHOLE COVERS								
1968	175.134	5,635	258.482	13,450	434.911	22,720	868.527	41,805
1969	357.366	16,057	245.893	10,270	543.973	26,827	1147.232	53,154
ANNUAL AVERAGE OVER 2 YEARS	266.25 Tons	-	252.19 Tons	-	489.442 Tons	-	1007.882 Tons	-

Examination of the statistics show that the imports during the past 5 years have been fluctuating, as such it appaars reasonable to take the average of the five years, as annual damand. It will also be seen that the average annual combined demand of Kenya and Uganda for cast iron pipe is about ½ that of Tanzania and in case of Manhole frames/covers the combined demands of Kenya and Uganda is very near the same as that of Tanzania.

In view of this situation and the uncertainity of Kenya and Uganda buying Tanzanian products, it is considered safer to select production capacity of the proposed plant of a size that is adequate to meet Tanzanian demands with one shift operation, which will enable to meet export requirements by working on two shift basis during selected period for meeting additional demands.

Import statistics do not indicate seperate figures for Cast Iron pressure pipes and for soil pipes. It is however considered that soil pipe requirements could reasonably be between 70 and 75% of the total pipe requirements. As such the proposed foundry should have a capacity of 72.5% of pipe requirements of Tanzania, to start with, and in future by adding centrifugal costing machine, it will be possible to produce pressure pipes also.

Since seperate figures for cast iron pipe fittings are not available, a ratio of pipes to pipe fittings of 1:2 (by number) has been assumed, which appears to be reasonable.

The statistics do not indicate weight or number of pipe and pipe fittings imported by diameters and lengths. It has however been confirmed that most popular size of soil pipes and pipe fittings are of 4 inch diameter, of bell and spigot type, and the bulk requirements are of 6 feet pipe lenghths.

Manhole frames/covers of the following sizes are in demand:-

1. 12" x 12" - 20 lbs
2. 15" x 15" - 30 lbs
3. 18" x 18" - 42 lbs } These two sizes are most in demand.
4. 18" x 24" - 56 lbs }
5. 32" diameter Round.

From the above considerations, the annual Tanzania demand works out as follows:-

Cast Iron Soil Pipe	(3590.03 x 0.725) -	2602.77	Tons
	Say	2600	Tons
Pipe Fittings :	(average weight of 4" x 6' pipe - 56 lbs) (average weight of pipe fitting - 15 lbs)	930	Tons
Manhole frames/covers	... ...	500	Tons
	Total Annual tonnage of finished castings)	4030	Tons

Plant Capacity

From the consideration of balanced set of equipment of standard specifications, the proposed plant will have a single shift annual capacity of 4300 tons finished castings. The surplus capacity of 270 tons per annum could be utilized for producing machine and vehicle component (castings) for other engineering industries. For the purpose of exports to Kenya , Uganda and other neighbouring countries, the plant could be operated for more than one shift.

PRICES

The following prices of cast iron soil pipe, pipe fittings and manhole frames/covers have been ascertained from local impoerts:-

Item	CIF Price per Ton Shs.	Selling Price per Ton Shs.
Cast Iron Pipe 4" dia x 6' lengths	800	960
Pipe Fittings 4" dia	941	1176
Manhole Frames/Covers	941	1176

CHAPTER 3

COST CALCULATIONS AND PROFITABILITY ANALYSIS

3.1 ANNUAL SINGLE SHIFT PRODUCTION

Cast Iron pipe	2,600 Tons
Cast Iron pipe fittings	930 "
Cast Iron Manhole frames and covers	500 "
Total	4,030 Tons per annum

3.2 LAND AND BUILDING

	T.Shillings
Land 80 x 160 meters (263 x 526 ft.) = 3.18 acres	77,110
Factory Building including office, stores, canteen etc. 132'x 20' is 26,400 sq.ft. @ Shs.35/- per sq.ft.	924,000
Fencing, roads, water tower, drainage, mono rail for metal pouring area, electric wiring etc.	500,000
	1,424,000
Professional fee @ 3%	42,720
Total cost of Buildings and site works	1,466,720
Total cost of land, buildings and site works	1,543,830

3.3 MACHINERY AND EQUIPMENT

Machinery and Equipment as per Annexure 1 (CIF)	3,585,500
Hand tools	50,000
	3,535,500
Clearing and local handling @ 2%	72,710
Installation and Erection expenses @ 10% of equipment cost	358,550
	4,066,760
Furniture and office equipment	200,000
Transport vehicles	150,000
Total Machinery and Equipment	4,416,760

3.4 TOTAL COST OF FIXED ASSETS — 5,960,590

3.5 TOTAL CAPITAL COST

Fixed Assets	5,960,590
Initial expenses (Company formation, Supervision during construction etc.)	100,000
Total	6,060,590

3.6 RAW MATERIAL (per annum)

Annual Production (Saleable castings)		4,030	Tons
Metal losses in foundry 20%		806	"
Total Mixture proposed: Pig iron		4,836	"
	Say	4,840	"
Total Mixture proposed: Pig iron 10%		484	"
Steel scrap 40%		1,930	"
Cast Iron scrap 50%		2,420	"
		4,840	

Since iron and steel scrap is not readily available in sufficient quantity, and from the consideration that the NDC's proposed steel Mill at Tanga will be using all the available iron and steel scrap, it is considered advisable to import iron and steel scrap for foundrys use.

Procurement Schedule and Cost of Raw Material:-

Item	DURING 1st PRODUCTION YEAR			DURING FOLLOWING YEARS		
	QTY Tons	Rate/ ton Shs.	Cost Shs.	QTY Tons	Rate/ ton Shs.	Cost Shs.
Pig Iron (imported)	484	420	203,280	484	420	203,280
Steel Scrap (")	1936	200	387,200	1936	200	387,200
Cast Iron Scrap (imported)	1210	200	242,000			
Foundry's own return cast iron scrap (gates, risers and rejects)	1210			2420		
Total Cost CIF	4840		832,480	4840		590,480
Clearing and local Handling @ 2%			16,750			11,810
Total Cost of Raw Material			848,230			602,290

3.7 FUEL (per annum)

Including wasteage in heading and bed coke requirement, coke (fuel) to iron ratio of 1:6.5 will be reasonable. On this basis, annual requirements of coke will be 4,840 tons = 744.615 tons per annum or say 745 tons per annum.

Coke 745 tons @ Shs.321/- per ton	Shs.	239,145
Clearing and local handling @ 2%	"	4,784
Total cost of Fuel	Shs.	243,929 p.a.

3.8 DIRECT LABOUR (per annum)

(with 90% attendence - 56 x .9 = 62)

Skilled workers	20 @	Shs.550/- p.m.	Shs.	132,000
Semi-skilled workers	21 @	Shs.350/- p.m.	"	88,200
Unskilled workers	21 @	Shs.225/- p.m.	"	56,700
		Total	Shs.	276,900 p.a.

3.9 **OVERHEADS** (per annum)

				T. Shillings	
Management and Administrative pay roll:-					
General Manager (Tech.)	1	@	Shs. 5,000/- p.m.	60,000	p.a.
Administration & Personnel Officer	1	@	" 2,500/- p.m.	30,000	"
Sales & Stores Officer	1	@	" 2,500/- p.m.	30,000	"
Accountant	1	@	" 3,000/- p.m.	36,000	"
Foreman (Melt & pour)	1	@	" 1,500/- p.m.	18,000	"
Foreman (Mould & Core)	1	@	" 1,500/- p.m.	18,000	"
Foreman (Sand preparing)	1	@	" 1,500/- p.m.	18,000	"
Laboratory Analyst	1	@	" 1,500/- p.m.	18,000	"
Maintenance Mechanic	1	@	" 1,500/- p.m.	18,000	"
Accounts clerks	2	@	" 600/- p.m.	14,400	"
Sales & Stores clerks	2	@	" 600/- p.m.	14,400	"
Store keepers	2	@	" 600/- p.m.	14,400	"
Stenographer	1	@	" 700/- p.m.	8,400	"
Typist	1	@	" 600/- p.m.	7,200	"
Drivers	2	@	" 400/- p.m.	9,600	"
Guards	3	@	" 300/- p.m.	7,200	"
Messengers	2	@	" 200/- p.m.	4,800	"
Cleaners	2	@	" 200/- p.m.	4,800	"
					331,200
Consumeable material, furnace lining, alloying compounds, and tools, sand, bentonite etc.					165,000
Electricity (500 KVA connected load @ 80% load factor, 300 KW per hour consumption, with tariff No.4 - high tension supply)					123,264
Water (1,320,000 gallons per year)					8,400
Vehicle & Travel expenses					50,000
Staff costs					100,000
General Factory expenses					100,000
General Office expenses					50,000
				Total	927,871
				Say	928,000

3.10 **DEPRECIATION** (per annum)

Buildings @ 4% p.a.	58,659
Machinery and Equipment (4,016,710) @ 12½% p.a.	502,090
Furniture, office equipment and vehicles @ 20% p.a.	70,000
Total	630,749
Say	631,000

3.11 **WORKING CAPITAL** (for 3 months)

		T.Shillings
Direct Labour		69,225
Raw Material		212,308
Fuel (coke)		60,982
Overheads		232,000
	Total	574,515

3.12 **TOTAL INVESTMENT**

Fixed Assets		5,960,590
Initial Expenses		100,000
Working Capital		574,515
	Total	6,635,105
		6,636,000

3.13 **CAPITALISATION** (suggested)

Equity	4,424,000
Loan @ 8½% interest per annum	2,212,000

3.14 **SCHEDULE OF REPAYMENT OF LOAN**

Year	Principal Amount Outstanding	Installment Payable	Interest @ 8½% Payable	Total Amount Payable
1	2,212,000	442,400	188,020	630,420
2	1,769,600	442,400	150,416	592,816
3	1,327,200	442,400	112,812	555,212
4	884,800	442,400	75,208	517,608
5	442,400	442,400	37,604	480,004
Total		2,212,000	564,060	2,776,060

3.15 **ANNUAL COST OF PRODUCTION**

T.Shillings

	DURING 1st year	DURING Following Years
Raw Material	849,230	602,290
Fuel	243,929	243,929
Direct Labour	276,900	276,900
Overheads	928,000	928,000
Depreciation	630,764	630,764
Interest on Loan @ 8½% p.a.	188,020	188,020
Total Cost of Production	[illegible]	[illegible]

3.16 **ANNUAL SALES REVENUE**

a. Selling Price Prevailent in Dar es Salaam:-

T.Shillings

Item	CIF Per Ton	Clearing and Local Handling	Dealers Margin	Selling Price Per Ton
Cast Iron Pipe	800	16	144	960
Cast Iron Pipe Fittings	941	19	216	1176
Cast Iron Manhole frames and covers	941	19	216	1176

b. Annual Sales Revenue:-

T.Shillings

Item	Quantity Per Annum Shs.	Selling Price Shs. Per Ton	Total Sales Revenue Shs.
Cast Iron Pipe	2,600	960	2,496,000
Cast Iron Pipe Fittings	930	1,176	1,093,680
Cast Iron Manhole frames and covers	500	1,176	588,000
Total	4,030		4,177,680

3.17 **PROFIT AND LOSS**

	during 1st year (75% saleable)	DURING following years
Sales Revenue	3,133,260	4,177,680
Cost of Production	3,116,843	2,869,903
Gross Income	16,417	1,307,777
Tax @ 40%	6,567	523,111
Net Income after Tax	9,850	784,666

3.18 **BREAK-EVEN POINT**

Annual Production - 4,030 Tons

	T.Shillings
a. Variable Costs	
Raw Material (second year on wards)	602,290
Fuel	243,929
Direct Labour	276,900
Water	8,400
Electricity	123,264
Consumable tools and supplies	165,000
Total	1,419,783

b. **Fixed Costs**

	T.Shillings
Management and Administrative Expenses	331,200
Staff Costs	100,000
Vehicle Expenses	50,000
General Factory Expenses	100,000
General Office Expenses	50,000
Depreciation	631,000
Interest	188,020
Total	1,450,220

c. **Total Revenue** 4,177,680

Variable Cost per ton = $\frac{1,419,783}{4,030}$ = 352.303

Revenue per ton = $\frac{4,177,680}{4,030}$ = 1,036.65

n x (revenue per ton) = (Fixed Costs) + (Variable Cost per ton) x n

1036.65 x n = (1,450,220) + (352.303) x n

n x (1036.65-352.303) = 1,450,200

n x 684.347 = 1,450,200

$n = \frac{1,450,200}{684,347}$

n = 2,119.1004 Tons

Break Even Point for the proposed foundry = 2,119 Tons

i.e. 49.27%

Say 50% of capacity

3.19 **PROJECTED PROFIT AND LOSS STATEMENT** (T.Shillings)

Years	1	2	3	4	5	6	7	8
Sales Revenue	3,133,260	4,177,680	4,177,680	4,177,680	4,177,680	4,177,680	4,177,680	4,177,680
Cost of Production	2,928,823	2,681,883	2,681,883	2,681,883	2,681,883	2,681,883	2,681,883	2,681,883
Gross Income	204,437	1,495,797	1,495,797	1,495,797	1,495,797	1,495,797	1,495,797	1,495,797
Interest Payable	188,020	150,416	112,812	75,208	37,604			
Income before Tax	16,417	1,345,381	1,382,985	1,420,589	1,458,193	1,495,797	1,495,797	1,495,797
Tax @ 40%	6,567	538,152	553,194	568,236	583,277	598,319	598,319	598,319
Net Profit after Tax	9,850	807,229	829,791	852,353	874,916	897,478	897,478	897,478
Net Profit as % of Totoal Investment	1.484%	12.164%	12.504%	12.844%	13.184%	13.524%	13.524%	13.524%

3.20 PROJECTED CASH FLOW (T.Shillings)

CASH INFLOW

Years	0	1	2	3	4	5	6	7	8
Profit after Tax		9,850	807,229	829,791	852,353	874,916	897,478	897,478	897,478
Depreciation		631,000	631,000	631,000	631,000	631,000	631,000	631,000	631,000
Total Cash Inflow		640,850	1,438,229	1,460,791	1,483,353	1,505,916	1,528,478	1,528,478	1,528,478

CASH OUTFLOW

Capital Cost	6,060,590								
Working Capital		574,515							
Loan Repayment		442,400	442,400	442,400	442.400	442,400			
Net Cash Balance	(6,060,590)	(376,065)	995,829	1,018,391	1,040,953	1,063,516	1,528,478	1,528,478	1,528,478
Accumulated Cash		(6,436,655)	(5,440,826)	(4,422,435)	(3,381,482)	(2,317,966)	(789,488)	738,990	1,528,478

3.21 **DISCOUNTED CASH FLOW ANALYSIS** (T.Shillings)

CASH INFLOW

Years	0	1	2	3	4	5	6	7	8
Profit After Tax		9,850	807,229	829,791	852,353	874,916	897,478	897,478	897,478
Depreciation		631,000	631,000	631,000	631,000	631,000	631,000	631,000	631,000
Salvage value of Building									997,368
Recovery of Working Capital									574,515
Total Cash Inflow		640,850	1,438,229	1,460,791	1,483,353	1,505,916	1,528,478	1,528,478	3,100,361

CASH OUTFLOW

Capital Cost	6,060,590								
Working Capital		574,515							
Total Cash Outflow	6,060,590	574,515							

NET CASH FLOW

	(6,060,590)	66,335	1,438,229	1,460,791	1,483,353	1,505,916	1,528,478	1,528,478	3,100,361

3.82 DISCOUNTED CASH FLOW ANALYSIS (continued)

Year	Net Cash Flow	Discounted @ 14% Factor	Discounted @ 14% Present Value	Discounted @ 15% Factor	Discounted @ 15% Present Value
0	(6,060,590)	1.000	(6,060,590)	1.000	(6,060,590)
1	66,336	.877	58,177	.870	57,712
2	1,438,229	.769	1,105,998	.756	1,087,301
3	1,460,791	.675	986,034	.658	961,200
4	1,483,353	.592	878,145	.572	848,478
5	1,505,916	.519	781,570	.497	748,440
6	1,528,478	.456	696,986	.432	660,302
7	1,528,478	.400	611,391	.376	574,708
8	3,100,361	.351	1,088,227	.327	1,013,818
			6,206,528		
			(6,060,590)		(6,060,590)
			145,938		5,951,959
					108,631

I.R.R. = 14 + $\frac{145,938}{145,938 + 108,631}$ % = 14 + $\frac{145,938}{254,569}$ = 14 +0.573%

INTERNAL RATE OF RETURN = 14.573%

PAY BACK PERIOD = 6.862 YEARS

3.83 WEIGHTED AVERAGE COST OF CAPITAL

Equity	4,424,000 x 15%		= 66,360,000
Loan	2,212,000	(0.6 x 8.5% = 5.1%)	= 11,281,800
	6,636,000		77,641,800

Average cost of capital = $\frac{77,641,800}{6,636,000}$ %

= 11.700%

CHAPTER 4

PROJECTS CONTRIBUTION TO NATIONAL ECONOMY

4.1 Value Added

		T.Shillings
a. Sales Turnover		4,177,680
b. Import Content:-		
Raw Material	100%	590,480
Fuel	100%	239,145
Electricity	60%	73,959
Consumable materials, supplies and tools	100%	165,000
Water	50%	4,200
Vehicle & Travel Expenses	50%	25,000
Staff Costs	100%	100,000
General Factory Expenses	50%	50,000
General Office Expenses	50%	25,000
Depreciation of Buildings	50%	29,335
Depreciation of Machinery & Equipment	100%	552,095
Management and Administrative Expenses	20%	66,240
Total Import Content		1,920,454

(a-b) = (4,177,680 - 1,920,454)

= 2,257,226

Value Added as % of Sales Turnover = $\frac{2,257,226 \times 100}{4,177,680}$

= 54.031%

4.2 Foreign Exchange Saving (per annum)

	T.Shillings
Foreign Exchange required for importing finished goods	3,425,630
Total Import Content of Local production cost	1,920,454
Foreign Exchange Saving	1,505,176

4.3 Employment

88 persons

4.4. Contribution to National Exchequer (per annum)

a. Corporation Tax	Shs.	598,319
b. Income Tax from employees (20% of Pay Roll)	"	121,620
c. Total Tax Collection	"	719,939
d. Loss of Custom Duty	"	513,845
e. Net gain to National Exchequer	Shs.	206,094 p.a.

4.5 Other Benefits

Establishment of Foundry Industry will help in the development of Engineering and Machine Building industry in Tanzania for achieving self reliance and import substitution. By operating the proposed Foundry for more than a shift, the capacity could be increased to be utilized for exporting to neighbouring countries for earning

ANNEXURE - 1

LIST OF MAJOR MACHINERY & EQUIPMENT.

Item No.	Description	Quantity	Unit Price Tz. Shs.	Amount Tz. Shs. CIF Dar es Salaam
1.	Cast Iron Foundry. As per our proposed layout No. Co-82093			
1.	Jolt Squeeze Stripper Moulding Machine, Model "FD-4" Complete with standard accessories and spare parts.	4 sets	22,640	90,560
2.	Monorail for box handling. Complete with 500 kgs electric trolly hoist, 200 I-beam of 4,500 m/mL and necessary stands.	4 sets	13,870	55,480
3.	Box Closing Monorail. Complete with 500 kgs electric trolly hoist, 200 I-beam of 5,000 m/mL and necessary stands.	2 sets	13,870	27,740
4.	Roller Conveyor 60ϕ x 600b x 150p x 11,000L x 6 sets 60ϕ x 600b x 150p x 2,000L x 2 sets 57ϕ x 600b x 150P x 25,000L x 1 set 57ϕ x 600b x 150P x 2,000R(45°) Cone Roller x 1 set	1 set		66,000
5.	Mold Traverser, Model "TRA" Size of Bogie: 600 x 800 Roller: 60ϕ x 600b x 150P x 800L Rail: 4,000L x 2 sets Hand operating type.	2 sets	5,970	11,940
6.	Box Releasing Monorail Hoist. 1-ton capacity electric trolly hoist. 200-I-beam x 13,500m/mL whitstands.	1 set		19,560
7.	Shakeout Machine, Model "SHO-3" Complete with standard accessories. Drive Motor: 2.2KW x 4P	1 set		15,120
8.	Dusthood, Model "DH-38" Size of Hood: 1,000 x 1,500m/m	1 set		6,240
9.	Propeller Fan, Model "PR-5" Air Volume : 330 m³/min. Air Pressure : 38 mmAq. Fan Motor : 3.7KW x 4P	1 set		3,540

.../2.

Item No.	Description	Quantity	Unit Price	Amount
10.	Double Belt type Hydraulic Stationery Sand Slinger, Model "DBS-25D" Complete with standard accessories and spare parts. Total Electric Consumption: 23.45KW	1 set	T. [illegible]	97,600
11.	Roller Conveyor 90ϕ x 300b x 300p x double row x 10,000m/m L Heavy duty type.	1 set		30,440
12.	Shakeout Machine, Model "SHO-10" Complete with standard accessories.	1 set		36,760
13.	Dusthood, Model "DH-10" Size of Hood: 2,200 x 2,500m/m	1 set		12,240
14.	Propeller Fan, Model "PR-15" Air Volume : 600 m^3/min. Air Pressure : 54 mmAq. Fan Motor : 11KW x 4P	1 set		7,060
15.	Oscillating Conveyor, Model "OC-5-7,000" Width of Trough : 500 m/m Length of Trough : 7,000 m/m Drive motor : 3.7KW x 4P Complete with standard accessories.	1 set		17,760
16.	Oscillating Conveyor, Model "OC-5-10,000" Width of Trough : 500 m/m Length of Trough : 10,000 m/m Patially double-trough. Drive motor : 3.7KW x 4P Complete with standard accessories.	1 set		22,000
17.	Oscillating Conveyor, Model "OC-5-10,000" Width of Trough : 500 m/m Length of Trough : 10,000 m/m Grate & double trough at one end. Drive motor : 2.2KW x 4P Complete standard accessories.	1 set		22,000
18.	Belt Conveyor, Model "BC-4A-2,000" Width of Belt: 400 m/m C.C. distance of pulleys: 2,000 m/m Heat resistant rubber belt and a Permanent magnetic separator are furnished. Drive motor 0.75KW x 4P x 1/30	1 set		15,120

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Item No.	Description	Quantity	Unit Price	Amount
			T. ㎞	T. ㎞
19.	Bucket Elevator, Model "BE-20A-11,850" Transporting capacity: 20 tons/hr Total height: 11,850 m/m (Above F.L.: 8,750, Below F.L.: 3,100 m/m) With reverse stopper, one-siding stopper & Platform. Drive motor: 3.7KW x 4^P x 1/15	1 set		26,460
20.	Rotary Breaker Screen, Model "RCS-10A" Size of Drum: 900ϕ x 2,000L 20ϕ perforated. Drive motor: 1.5KW x 4^P x 1/30	1 set		21,000
21.	Sand Storage, Model "SS-35" Capacity for reclaimed sand: 30 m^3 Capacity for new sand: 5 m^3 With upper & lower level switches for reclaimed sand storage and lower level switch for new sand storage.	1 set		50,600
22.	Belt Feeder, Model "BC-4A-3,500" Width of Belt: 400 m/m C.C. distance between pulleys: 3,500 m/mL Drive motor: 1.5KW x 4P x 1/59 Complete with standard accessories.	2 sets	10,900	21,800
23.	Bucket Elevator, Model "BE-20A-13,500" Transporting capacity: 20 tons/hr Total height: 13,500 m/m (Above F.L.: 10,400 m/m, Below F.L.: 3,100 m/m) With reverse stopper, one-siding stopper and platform. Drive motor: 3.7KW x 4P x 1/15	1 set		87,060
24.	Binder Conveying Device, Model "FLO-3A" Pressure Tank Capacity: 0.3 m^3 Hand operated changeover fitting and about 30,000 m/mL of 2" gas pipe.	1 set		16,760
25.	Binder Hopper, Model "SH" Capacity. 1 m^3 x 2 Complete with level switches and bag filters.	1 set		11,080

Item No.	Description	Quantity	Unit Price	Amount
			T. Shs.	T. Shs.
26.	Screw Conveyor, Model "SCC-160 3,200" Diameter of Screw: 160 m/mϕ Length of screw: 3,200 m/mL Drive motor: 0.75KW x 4P x 1/59 Complete with standard accessories.	2 sets	8,900	17,800
27.	Sinto-Simpson Mix-Muller, Model "MS-20-D" Complete with standard accessories and spare parts. Drive motor: 30KW x 6P	1 set		142,640
28.	Belt Conveyor, Model "BC-5-6,500" Width of Belt: 500 m/m C.C. distance: 6,500 m/m Complete with standard accessories. Drive Motor: 1.5KW x 4P x 1/30	1 set		17,160
29.	Sinto-Simpson Coolerator, Model "CRF-4VA" Interior dimensions of casing: 250^{b} x 2,900 m/mL Drive motor: 2.2KW x 4P	1 set		9,920
30.	Overhead Belt Conveyor, Model "BCH-4-35,000" Width of belt: 400 m/m C.C. distance: 35,000 m/m Complete with 5 p'cs of automatic scraper, 4 units of 0.25 m^3 hopper with swing chute, stands, platform and end chute. Partially inclined type with V-section. Drive motor: 3.7KW x 4P x 1/30	1 set		85,440
31.	Sand Bin, Model "BIN-2" Complete with frame. Volume: 2 m^3 Revolving rate of bin: 3 r.p.m. Drive motor: 1.5KW	1 set		36,180
32.	Pouring Device. Consists of: 2 sets of geared Crane Ladle, Model "GCL-05" & 3 sets of Trolly Ladle with Lift, Model "DL-150"	1 set		18,580

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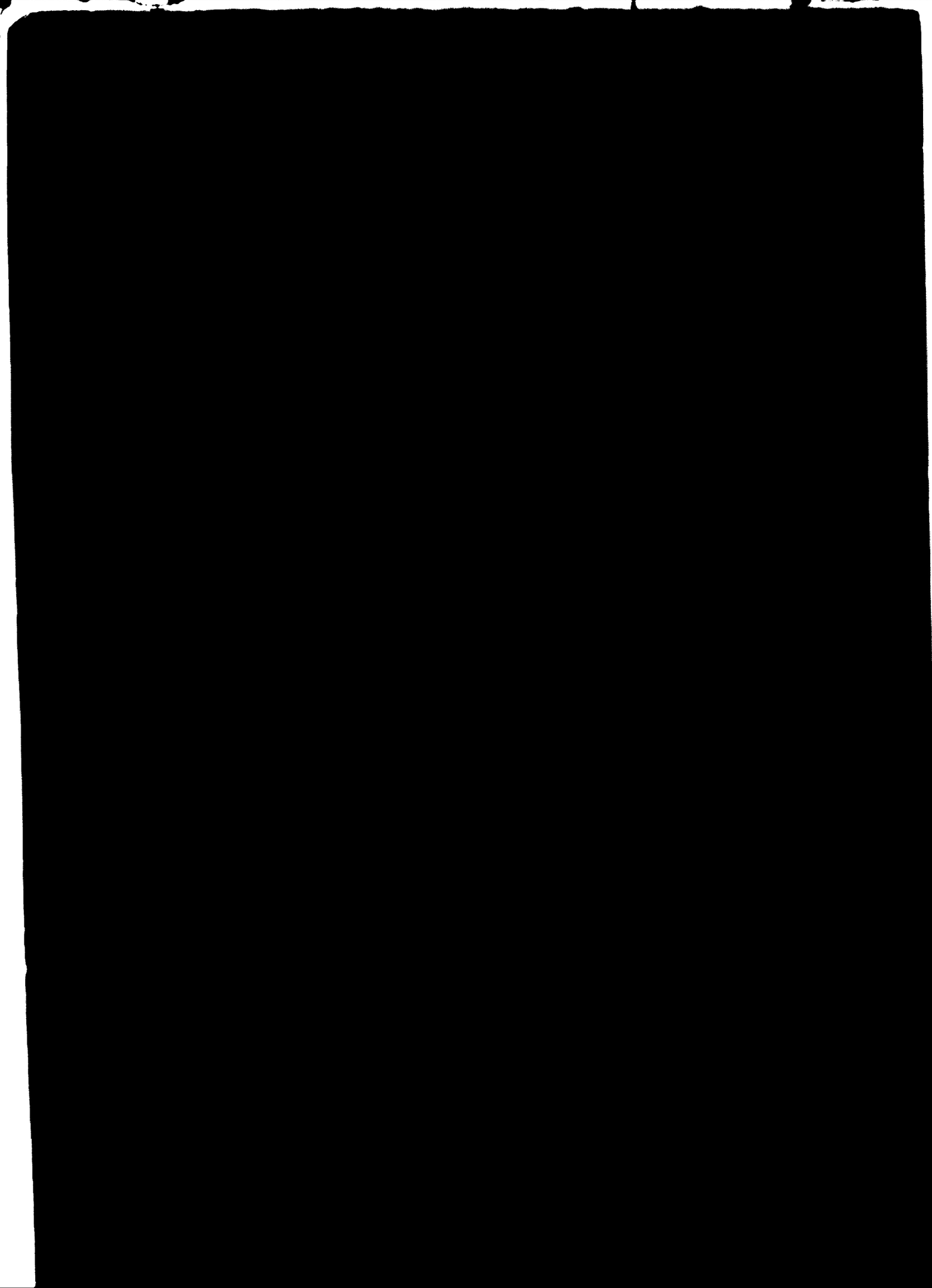
Item No.	Description	Quantity	Unit Price T. Shs.	Amount T. Shs.
33.	Bubble Filter, Model "BDC-30S" Complete with standard accessories. Fan motor: 22KW x 4P Sludge conveyor motor: 0.4KW cycle reduction motor.	1 set		60,000
34.	Operation Panel Totally enclosed box type. Sinto standard.	1 set		52,920
35.	Cupola Furnaces 3 Ton capacity Complete with loading hoist blower and electric motors and starters.	2 sets	285,000	570,000
36.	Core Making Equipment	1 set		74,000
37.	Moulding Pattern Plates	6 sets for sand slinger, 22 sets for Moulding Machines		151,000
38.	Moulding Flasks	40 sets for sand slinger, 80 sets for Moulding Machines		370,000
39.	Sand Testing Equipment	1 set		122,000
40.	Fettling Equipment (Pneumatic grinders, swing grinder, chipping hammer, shot blast etc).			162,000
41.	Maintenance Equipment (lathe, Drilling & shapping machines), set of hand tools etc.			170,000
42.	Air compressor 50HP			54,000
43.	Material Handling Equipment Fork lift, Crane Hoist etc.			366,000
44.	500 KVA - substation (Tansformer & control pannel)			280,000
45.	Pumping Equipment			18,000
		Total C.I.F. T. Shs.		- 3,385,500



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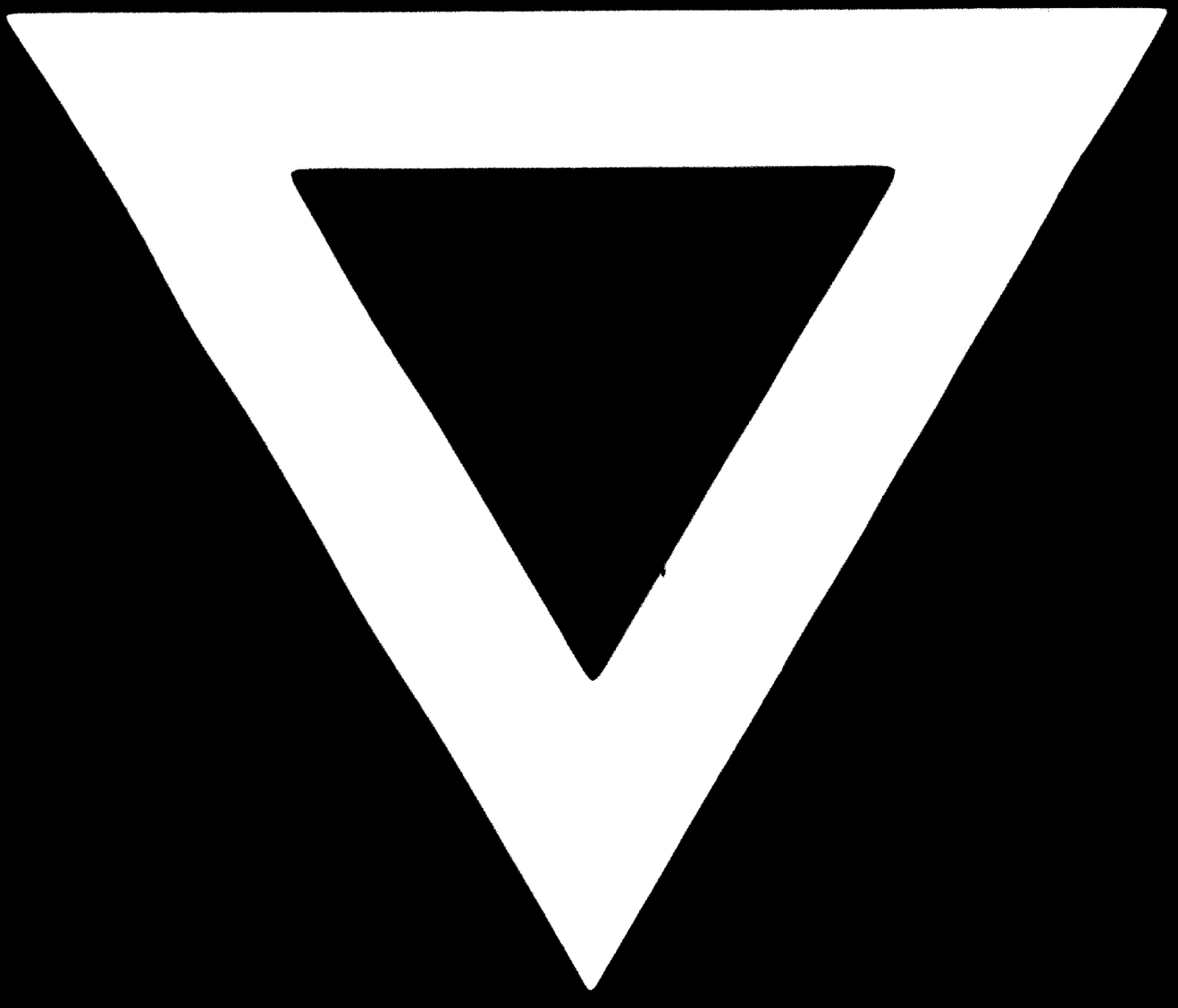

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