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PROJECT PROFILE ON
CONCRETE PRODUCTION BATCHING AND HOLLOW CONCRETE BLOCK (HCB) PRODUCTION PLANT

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KASMA ENGINEERING PRIVATE LIMITED COMPANY

PROJECT PROFILE ON CONCRETE PRODUCTION BATCHING AND HOLLOW CONCRETE BLOCK (HCB) PRODUCTION PLANT

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I. EXECUTIVE SUMMARY

Table 1: Executive summary

Project Type	Production and distribution(HCB and Ready mix concrete)
Project Owner	Kasma Engineering PLC
Nationality	Ethiopian
Project location	Addis Ababa City Administration, Akaki Kality Sub city
Project Composition	HCB production and Ready Mix Concrete Batching plant
Premises required	B/n 5000 to 6000 m^2
The total investment Capital including establishing the factory	105,187,500.00 birr
Investment Capital to be covered by the owner (30%)	31,556,250.00 birr
Investment Capital to be secured by bank loan (70%)	73,631,250.00 Birr
Net Cash flow of the project	B/n 59.67 Million Birr to 89.22 Million Birr
The plants' production capacity	1,560,000 Pcs of Hollow Block Concrete (HCBs) Concrete 98,618 m^3 per year based on 260 working days and their shifts of 8 hours per day.
Job opportunity created	Permanent employee: 108, Temporary employee: 450 Total: 558

This business plan is done by taking into consideration the current growth and expansion of KASMA Engineering Private Limited Company. The objective of the company is the Manufacture of Hollow Block Concrete (HCB) and Concrete Batching plant, in Addis Ababa. Hence Market, Technical, Organizational and Financial study was made to investigate the viability of the envisaged project.

KASMA Engineering P.L.C is intends to produce and distribute Hollow Concrete Block (HCB) and Ready Mix Concrete, these study has been developed to support the decision – making process based on a cost benefit analysis of the actual project viability. This profile includes

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marketing study, production and financial analysis, which are utilized to assist the decision-makers when determining if the business concept is viable. Ethiopia has a private sector driven Distribution of Hollow Concrete Block (HCB) and Concrete manufacturing industry.

The location of KASMA Engineering P.L.C is in Addis Ababa City Administration, Akaki Kality sub city, the basis of access to raw materials, infrastructure namely power, water, transport and telecom to easy access to international market. The most locally available raw materials for Producing Hollow Concrete Block (HCB) and Concrete are cement, sand, course aggregate, pumice etc.

Concrete Batching Plant

HCB Production Plant

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The plant at full capacity operation can produce 1,560,000 Pcs of Hollow Block Concrete (HCBs) and Concrete 98,613M3 per year based on 260 working days and their shifts of 8 hours per day.

The total investment capital including establishing the factory is Birr 105.19 million. Out of the total investment capital, the owners will cover Birr 31.56million (30 %) while the remaining balances amounting to Birr 73.63 million (70 %) will be secured from bank in the form of term loan. As indicated in the financial study, the cash flow projection of the project shows surplus from the first year on. The net cash flows of the project range from Birr 59.67Million in the first year to Birr 89.22million at the end of the 10th year of operation. At the end of the 10th year of operation period the cumulative cash balance reaches Birr 744.6 Million birr. The Benefit-cost ratio and Net present value (NPV) have been calculated at 17% discount factor (D.F) for 10 years of the project activity. Accordingly, the project has NPV of 6.14 Billion Birr at 17%D.F. and the benefit-cost ratio of 1.09 at 17% D.F. Therefore, from the aforementioned overall market technical and financial analysis we can conclude that the Hollow Block Concrete (HBCs) and Concrete manufacturing business is a viable and worthwhile.

1.0 PRODUCT SUMMARY AND APPLICATION

1.1 Concrete Production (Batching Plant)

Concrete is a composite material composed of coarse granular material (the aggregate or filler) embedded in hard matrix of material (the cement of binder) that fills the space between the aggregate particles and glue them together. In concrete the binder or matrix is a combination of cement and water; it is commonly called the "cement paste. Aggregates are essentially filler materials that can be separated into fine and coarse aggregates. In addition to aggregates and binders, there is another material called additive which may be used in concretes to improve certain of its properties. The production of concrete involves two distinct but equally important activities. One is related to material required for concrete production such as selection and proportioning of ingredients and the other is the process involved in its production such as batching, mixing, transportation, placement, compaction and curing. To produce concrete as economically as possible with appropriate workability, strength and durability so that care has to be taken during concrete production because poor quality of concrete even from well-designed mix can be happen due to lack of attention in production. A good and a bad concrete

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may be made from exactly the same ingredients if there is a difference on the quality control during production. The importance of quality of concrete is being increasingly realized to derive the optimum benefit from the materials employed. Quality control does not merely signify testing of concrete cubes at 28 days; rather it actually permeates all aspects of the choice of materials, design, and workmanship—it commences much before any concrete is available for testing at 28 days. According to EBCS 2, 1995, Quality control is defined as an action and decisions taken to ensure the compliance of works with the specification. It consists of two distinct, but interconnected parts, namely, production control and compliance control. Production control is a measure taken during production to obtain a reasonable assurance that the specifications will be satisfied which compliance control is a check is made to ensure the compliance of the product with the specification.

Raw Material storage area

1.1.1 Composition of Concrete

Concrete is basically a mixture of two components: aggregates and paste. The paste binds the aggregate into rocklike mass because of the chemical reaction between cement and water, sometimes mineral and chemical admixtures may also be included in the paste. The quality of the concrete depends upon the quality of the paste and aggregate, and the bond between them. In properly made concrete, each and every particle of aggregate is completely coated with paste and all of the spaces between aggregates are completely filled with paste.

1.2 Hollow Concrete Block (HCB) Production

Hollow concrete block is an alternative wall and floor making material in the building construction having one or more large holes with the solid material between 50 and 75 percent

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of the total volume of the block calculated from the overall dimensions [ES 596:2001]. Most hollow concrete blocks have one or more hollow cavity manufactured from a zero-slump mixture of Portland cement (and possibly other cementations materials), aggregates, pumice, water and sometimes admixtures.

Hollow Concrete Block production Machine

According to Ethiopian standards ES 596:2001 hollow concrete block shall conform four classes depends on their strength, as Class A, B, C and D and their requirements are defined below and their minimum comprehensive strength listed in Table 2.28. On the other hand

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Indian standard recommended classes of hollow concrete blocks as A, B, and C but class D manufactured as solid block used for the purpose of load bearing wall having a minimum density of 1800 kg/m3 .

Class A: used for load bearing wall construction above or below ground level in damp proof course, in exterior walls that may or may not be treated with weather- protective coating and for interior walls and density of Class A blocks must conform between the Study on the effectiveness of quality control for the production of reinforced concrete and hollow concrete blocks in range of 900 – 1200 kg/m3 on the other hand Indian standard IS: 2185 (Part I) – 1979 recommended minimum density 1500 kg/m3 .

Class B and C: are used for load bearing wall construction above ground level in damp proof course in exterior walls that are treated with suitable weather- protective coating and their density should be between 900 – 1200 kg/m3 on the other hand Indian standard IS: 2185 (Part I) – 1979 recommended minimum density within the range of 1000-1500 kg/m 3 but class C is recommended for non-load bearing wall.

Class D: are used for non-load bearing interior walls and exterior panel walls in steel or reinforced concrete framed construction when protected from weather by rendering or by some other efficient treatment and their density should be between 600 - 900 kg/m.

1.3 Key Success and Risk Factors

1.3.1. Project Environmental Degradation Effect

There is no negative environmental impact caused by the operation of the proposed factory because it is simply a mixing and operation without any sophisticated processes that produce waste.

a) Land use change

The surroundings and environment won't be harmed. Expect the working area to last for a short time, and the government is likely to address this issue quickly.

b) Noise Pollution

There is no noise pollution created by the envisaged project.

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c) Air Pollution

There is no air pollution created by the envisaged project.

d) Water and Soil Pollution

Some of the wastes expected to generate from this project includes factory waste, toilet waste and office waste are mitigated by the management of the factor.

e) Degradation of Land

There is no degradation of land created by the envisaged project.

1.3.2 Mitigation Measures

Since the proposed project is not expected to have any negative effects other than minor soil and water contamination, suitable corrective action will be implemented to prevent environmental degradation. Within the compound, wastes will be collected and dumped at the municipal disposal facility. The production remnants will be gathered and recycled. Therefore, the project won't have a bad effect on the environment.

1.4 SWOT Analysis

Table 2: SWOT analysis of the project

Strengths	Weaknesses
● The machineries are selected by skilled persons ● Machinery capacity ● Utilities are already installed ● Experience	

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Opportunities	Threats
● There are few similar company's in the Addis Ababa city ● The promoter involvement in Concrete batching plant and Hollow concrete blocks (HCBs) (Own project use) ● Efficiency of the machinery ● Open market in around Addis Ababa ● Growth of the country ● Urbanization growth ● The need for better quality	● Flow of low cost and low quality goods ● Unorganized youth laborer

2.0 MARKET ANALYSIS

2.1 The Marketing Analysis

The hollow concrete block market is projected to register a CAGR of over 5% during the forecast period.

The COVID-19 pandemic affected the hollow concrete block market as construction activities were halted. However, the sector has been recovering well since restrictions were lifted. An increase in house sales, new project launches, and increasing demand for new offices and commercial spaces have been leading the market recovery over the last three years.

● the rising demand for the hollow concrete block market due to increasing construction activities globally is expected to drive the market's growth.

● However, the fluctuating cost of raw materials to manufacture hollow concrete blocks is likely to hinder the expansion of the studied market.

2.2 Demand and Supply

The demand for concrete blocks and pipes is derived from building construction. The demand the country's requirement for concrete blocks is met through domestic production. The quantity of production of the products during the period 1998 - 2005 is shown in the following Table.

During the period under reference, the supply of concrete blocks which constitutes only domestic production ,exhibited considerable fluctuations and averaged at 10.48million.With an average increment rate of 8.1%/year.

Table 3: Supply of Concrete Blocks and Pipes ('000Pcs)

Year	Domestic Production
	Concrete& Hallow Blocks
1998	9,044
1999	9,568
2000	9,763
2001	10,039
2002	9,639
2003	9,810
2004	10,400
2005	15,639
Average	**10,488**

Source: CSA, Statistical Abstract, various years

Since the consumption of the products is associated with the construction sector, a rate of growth of 10%, which corresponds to the estimated growth rate of the sector.
Based on this fact the projected demand for the product is presented in the following table.

Table 4: Projected Demands for Concrete Blocks ('000 PCS)

Year	Projected Demand Concrete Blocks
2016	29,922.8
2017	32,915.1
2018	36,206.6
2019	39,827.2
2020	43,809.9

2.3 Market Analysis

Since Addis Ababa is endowed with under construction of Universities, hospitals, Apartments, Real state, hotels and other similar institutes, market demand for KASMA Engineering Private

Limited Company is guaranteed. Considering this, the factory will work focusing on customers in Addis Ababa.

The reason for targeting on this group of customers is that the population in the stated areas is so dense and the factory capacity. KASMA Engineering will be distributed through whole seller, retailer and end users in the selected target areas.

2.4 Industry Analysis

KASMA Engineering anticipates fierce competition from manufacturers in Addis Ababa who now supply the Concrete and Hollow concrete blocks (HCBs) industries. The factory's capacity, its contemporary equipment, its strong marketing strategy, and the owner's expertise, however, make KASMA Engineering more competitive than its rivals. Moreover, in contrast to rivals KASMA Engineering is located in a favorable area that is equipped with all necessary infrastructure, dependable water and power sources, and a backup generator. The businesses also adhere to and emphasize the cost leadership strategy.

2.5 Market Strategy

2.5.1 Product

KASMA Engineering is the brand name of our products, and we strive to please our clients. Typically, our products are stylish, high-quality, and affordable.

2.6 Promotion

KASMA Engineering uses flayers, Banners in any construction area and local media, primarily television, as its promotional methods. KASMA Engineering will advertise its goods using brochures, Face book, Telegram, and other channels.

2.7 Pricing

The market survey in the target locations reveals, as was already mentioned, that demand is exceptionally high. Due to this, KASMA Engineering will employ a cost plus pricing strategy, increasing the unit production cost by 35% to account for the cost of the concrete and Hollow Concrete Block.

2.8 Placement

KASMA Engineering will leverage enormous institutions and agencies in addition to delivering its products directly to wholesalers, retailers, and customers. Massive institutes and agents will use their own transportation services for mass distribution to whole vendors.

2.9 Plant Capacity and Production Program

2.9.1 Current Plant Capacity

We have been able to generate a total of 1,560,000 pcs of Hollow Concrete Block (HCB) and 98,613M3 of Ready Mix Concrete annually by making the most use of our restricted space resource. We have also attached the financial report summary of the year for a review. KASMA Engineering has also created job opportunity for 100 people.

2.9.2 Plant Expansion Program

Above is a description of the company's current production and situation. Its vision is not constrained by it, though. It anticipates the following two types of expansion:-

2.9.2.1 Capacity Building on the Current Products

The company makes Different of products, as was already indicated. However, accepting it would not be satisfactory to the business. By establishing a well-organized manufacturing facility with a separate and well-ventilated raw material warehouse, a larger production area that can accommodate all the machinery required to triple the current production capacity, an automatic conveyor, Batching plant, mixer and a separate final product store and canteen, a rest area for employees, and an office, the company plans to triple the production capacity of the current products fabrication. The automatic line will aid in preventing any potential contamination that may be accumulated along the process, maximizing production and reducing costs associated with discarding contaminated product. For the sake of productivity and safety, the production line for waste management should also be automated. This line needs ventilation most importantly.

2.9.2.2 Increasing Product Type

As a result of our expertise delivering our products to factories, we have come to realize that certain types of products are specifically used by most Contractions site, particularly those in Apartment real states and other constructions. The experts have been working on production

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department management in an internationally recognized specialty chemicals manufacturing firm. However, obtaining the working space is the company's largest concern.

3.0 TECHNOLOGY AND ENGINEERING

3.1 Technology

3.1.1 Production Process of Cement Concrete Hollow Blocks

The process of manufacture of cement concrete hollow blocks involves the following 5 stages;

(1)Proportioning

(2)Mixing

(3)Compacting

(4)Curing

(5)Drying

(1) Proportioning: The determination of suitable amounts of raw materials needed to produce concrete of desired quality under given conditions of mixing, placing and curing is known as proportioning. As per Indian Standard specifications, the combined aggregate content in the concrete mix used for making hollow blocks should not be more than 6 parts to 1 part by volume of Portland cement. If this ratio is taken in terms of weight basis this may average approximately at 1:7 (cement: aggregate). However, there have been instances of employing a lean mix of as high as 1:9 by manufacturers where hollow blocks are compacted by power operated vibrating machines. The water cement ratio of 0.62 by weight basis can be used for concrete hollow blocks.

(2) Mixing: the objective of thorough mixing of aggregates, cement and water is to ensure that the cement-water paste completely covers the surface of the aggregates. All the raw materials including water are collected in a concrete mixer, which is rotated for about 1 ½ minutes. The prepared mix is discharged from the mixer and consumed within 30 minutes.

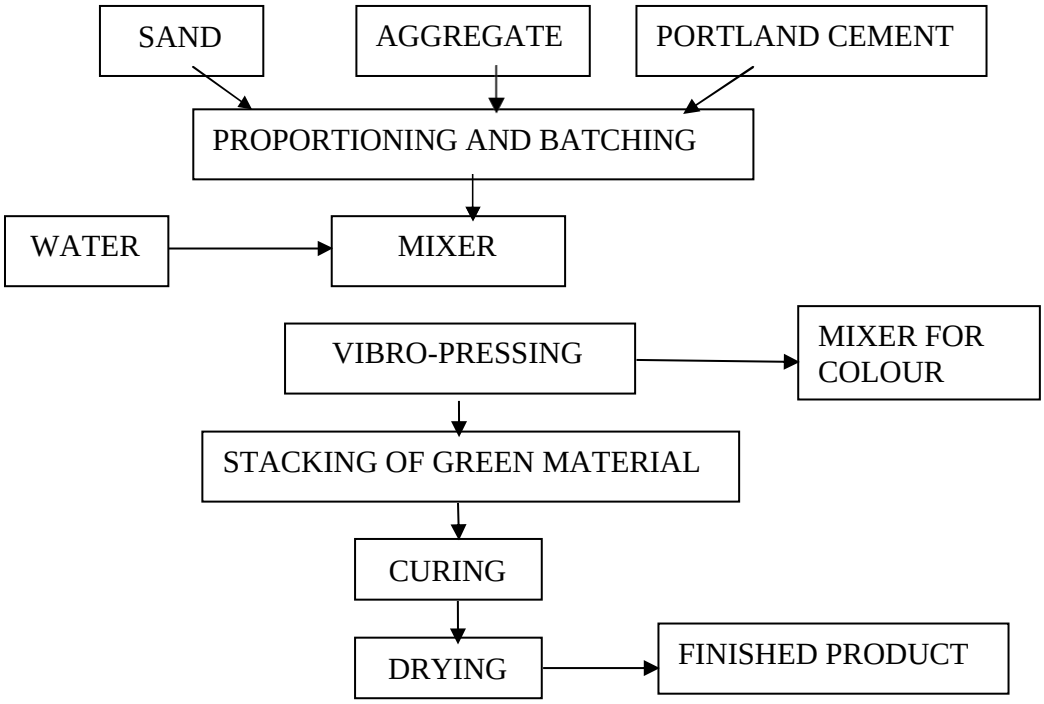
(3) Compacting: the purpose of compacting is to fill all air pockets with concrete as a whole without movement of free water through the concrete. Excessive compaction would result in formation of water pockets or layers with higher water content and poor quality of the product. Semi-automatic vibrating table type machines are widely used for making cement concrete

hollow blocks. The machine consists of an automatic vibrating unit, a lever operated up and down metallic mold box and a stripper head contained in a frame work. 5 Wooden pallets is kept on the vibrating platform of the machine. The mold box is lowered on to the pallet. Concrete mix is poured into the mold and evenly leveled. The motorized vibrating causes the concrete to settle down the mold by approximately 1 ½ to 1 ¾ inches. More of concrete is then raked across the mold level. The stripper head is placed over the mold to bear on the leveled material. Vibration causes the concrete come down to its limit position. Then the mold box is lifted by the lever. The molded hollow blocks resting on the pallet is removed and a new pallet is placed and the process repeated. The machine can accommodate interchangeable mold for producing blocks of different sizes of hollow or solid blocks.

(4) Curing: Hollow blocks removed from the mold are protected until they are sufficiently hardened to permit handling without damage. This may take about 24 hours in a shelter away from sun and winds. The hollow blocks thus hardened are cured in a curing yard to permit complete motorization for at least 21 days. When the hollow blocks are cured by immersing them in a water tank, water should be changed at least every four days. The greatest strength benefits occur during the first three days and valuable effects are secured up to 10 or 14 days. The longer the curing time permitted the better the product.

(5) Drying: Concrete shrinks slightly with loss of moisture. It is therefore essential that after curing is over, the blocks should be allowed to dry out gradually in shade so that the initial drying shrinkage of the blocks is completed before they are used in the construction work. Hollow blocks are stacked with their cavities horizontal to facilitate thorough passage of air. Generally a period of 7 to 15 days of drying will bring the blocks to the desired degree of dryness to complete their initial shrinkage. After this the blocks are ready for use in construction work.

Figure 1: Process Flow Chart of Cement Concrete Hollow Blocks



3.1.2 The Manufacturing Process of Concrete

The manufacture of concrete is fairly simple. First, the cement (usually Portland), Next, the other ingredients—aggregates (such as sand or gravel), admixtures (chemical additives), any necessary fibers, and water—are mixed together with the cement to form concrete. The concrete is then shipped to the work site and placed, compacted, and cured.

Preparing Portland cement

1). The limestone, silica, and alumina that make up Portland cement are dry ground into a very fine powder, mixed together in predetermined proportions, preheated, and claimed (heated to a high temperature that will burn off impurities without fusing the ingredients). Next the material is burned in a large rotary kiln at 2,550 degrees Fahrenheit (1,400 degrees Celsius). At this temperature, the material partially fuses into a substance known as clinker. A modern kiln can produce as much as 6,200 tons of clinker a day.

2). the clinker is then cooled and ground to a fine powder in a tube or ball mill. A ball mill is a rotating drum filled with steel balls of different sizes (depending on the desired fineness of the cement) that crush and grind the clinker. Gypsum is added during the grinding process. The final composition consists of several compounds: tricalciumsilicate, dicalciumsilicate, tricalciumaluminate, and tetracalcium alumino ferrite.

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Mixing

3). the cement is then mixed with the other ingredients: aggregates (sand, gravel, or crushed stone), admixtures, fibers, and water. Aggregates are pre-blended or added at the ready-mix concrete plant under normal operating conditions. The mixing operation uses rotation or stirring to coat the surface of the aggregate with cement paste and to blend the other ingredients uniformly. A variety of batch or continuous mixers are used.

4). Fibers, if desired, can be added by a variety of methods including direct spraying, premixing, impregnating, or hand laying-up. Silica fume is often used as a dispersing agent.

Transport to work site

5). Once the concrete mixture is ready, it is transported to the work site. There are many methods of transporting concrete, including wheelbarrows, buckets, belt conveyors, special trucks, and pumping. Pumping transports large quantities of concrete over large distances through pipelines using a system consisting of a hopper, a pump, and the pipes. Pumps come in several types—the horizontal piston pump with semi-rotary valves and small portable pumps called squeeze pumps. A vacuum provides a continuous flow of concrete, with two rotating rollers squeezing a flexible pipe to move the concrete into the delivery pipe.

Placing and compacting

6). Once at the site, the concrete must be placed and compacted. These two operations are performed almost simultaneously. Placing must be done so that segregation of the various ingredients is avoided and full compaction—with all air bubbles eliminated—can be achieved. Whether chutes or buggies are used, position is important in achieving these goals. The rates of placing and of compaction should be equal; the latter is usually accomplished using internal or external vibrators. An internal vibrator uses a poker housing a motor-driven shaft. When the poker is inserted into the concrete, controlled vibration occurs to compact the concrete. External vibrators are used for precast or thin in situ sections having a shape or thickness unsuitable for internal vibrators. These types of vibrators are rigidly clamped to the formwork, which rests on an elastic support. Both the form and the concrete are vibrated. Vibrating tables are also used, where a table produces vertical vibration by using two shafts rotating in opposite directions.

Curing

7). Once it is placed and compacted, the concrete must cured before it is finished to make sure that it doesn't dry too quickly. Concrete's strength is influenced by its moisture level during the hardening process: as the cement solidifies, the concrete shrinks. If site constraints prevent the concrete from contracting, tensile stresses will develop, weakening the concrete. To minimize this problem, concrete must be kept damp during the several days it requires to set and harden.

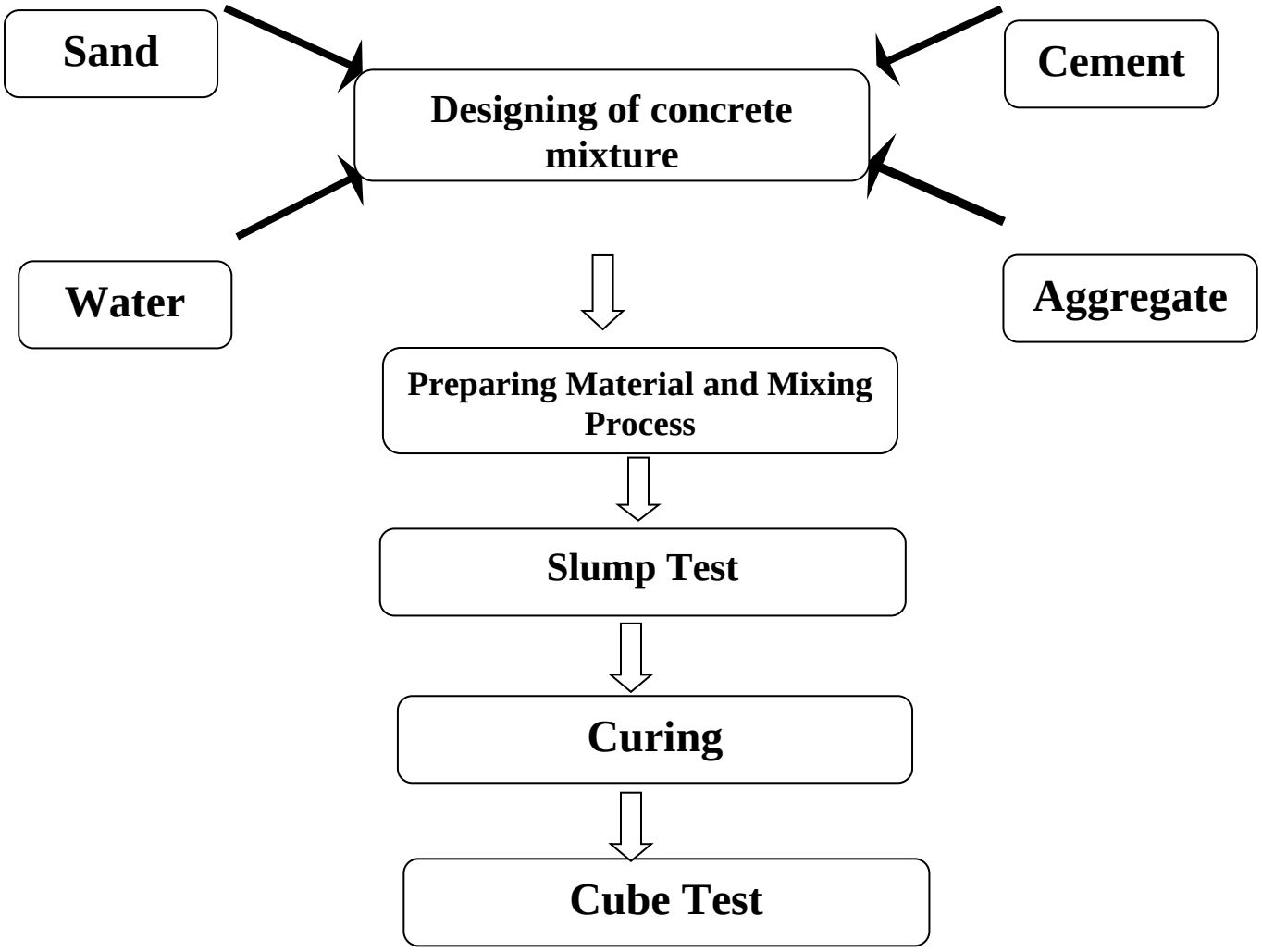

Figure 2: Process Flow Chart of Concrete

3.1.3 Bottle Neck on Implementing Technology

As mentioned above in a few places, having enough workspace is the sole issue with implementing the technology standard. The business has a strong staff, a sizable market, and capital in excess but it is prevented from growing by a lack of workspace. The overall area the company occupies is less than 4000 square meters. But for the project to reach its quality and finish the factory expansion, an area of about 5,000 square meters is required. It is quite uncomfortable for the enterprise and the neighborhood to work in a residential area. Due to a lack of appropriate storage space, the materials are deteriorating.

Figure 3: Current situation of the company

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3.2 Engineering

3.2.1 Land, Buildings and Civil Works

The required area (m2) and construction cost for the production facilities essential for the successful operation of the processing plant is shown in Table 5. A total area ready for the processing plant is 5,000m2 out of which 2,300m2 is to be covered by building, Concrete and HCB plants while uncovered area of 2,700m2 is left open for parking, storage of raw and waste materials, and future expansions. In order to estimate the land lease cost of the project profiles it is assumed that all the project will be located in different land level from level 1/1 to level 4/3, their current market lease price is from 39,073.31 birr per M 2 to 2,800.71 birr per M 2, respectively. Therefore, for the profile a land lease rate of birr 33537.01 per M 2, so 3353.7 Birr per m2 (10%) have been taken, which is between the ranges.

The cost of construction of building should be appropriate to the size and expected profitability of business, costs of building generally differs by the type of construction materials used, the type of foundation, wall height and location. The current building cost for simple storage and processing room is from 1,800.00 Birr per m2 to 25,000 Birr per m2. The total construction cost of buildings and civil works, at a rate of Birr 20,000per m2 is estimated at Birr 28.38 million. Therefore, the total cost of land lease and construction of buildings and civil works is estimated at Birr 45.15million.

Machinery Parking Area

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The proposed plant layout comprises the following buildings and structures.

Table 5: Building costs

S/No	Descriptions	Total area	Estimated cost per square meter (in Birr)	Total estimated cost (in Birr)
1	Office, living areas, toilets and laboratory buildings	300	20,000.00	6,000,000.00
2	Concrete Batching plant installation (Concrete production area)	1,000	10,000.00	10,000,000.00
3	HCB production plant installation (HCB production plant)	1,000	10,000.00	10,000,000.00
4	Guard house and fence	50	1,000.00	50,000.00
5	Machinery Parking lot	600	2,500.00	1,500,000.00
6	Raw Materials Storage area	1000	500.00	500,000.00
7	HCB product storage shades	400	500.00	200,000.00
8	Green area and for expansion	650	200.00	130,000.00
	TOTAL	**5,000**		**28,380,000.00**

Table 6: Land lease period in Addis Ababa

Sector of development activity	Period of lease	Down payment
Education, health, culture and sports	90	10%
Industry (manufacturing)	70	10%
commerce	60	10%
For urban agriculture	15	10%
For others	60	10%

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Sources: - city government of Addis Ababa land development and management bureau

Table 7: Land lease floor price in Addis Ababa

S/No	Land level	Current land lease floor price per M^2	Current lease price per M^2(Market price)
1	1/1	2,213.25	39,073.31
2	1/2	2,165.47	36,825.73
3	1/3	1,900.19	34,578.15
4	¼	1,552.93	31,119.21
5	1/5	1,531.91	29,096.45
6	2/1	1327.39	27,073.71
7	2/2	1,221.18	25,050.96
8	2/3	1,191.17	23,028.21
9	2/4	1,074.39	21,005.46
10	2/5	1,027.84	18,982.71
11	3/1	994.71	16,959.96
12	3/2	960.21	14,937.21
13	3/3	927.84	12,914.46
14	¾	904.77	10,891.71
15	3/5	873.74	8,868.96
16	4/1	814.06	6,846.21
17	4/2	786.45	4,823.46
18	4/3	748.80	2,800.71

Sources: - city government of Addis Ababa land development and management bureau

3.2.2 Machinery and Equipment

The main plant and machinery consists Production Unit, Testing Equipment, Maintenance Machinery. Major part of the machinery will be imported.

Table 8: Lists of Equipment Requirements for concrete Batching and Hollow concrete block manufacturing

S/N	Particulars	Quantity	Total Amount
	Production Unit		
1	Concrete batching 45.71m3/hrs.	1	**10,000,000.00**
2	Putzmeister Concrete Mixer with Putzmeister chassis	3	**21,000,000.00**
3	Stationary concrete pump	1	**6,000,000.00**
4	Semi wheel loader with Cummins engine, tools	1	**954,000.00**
5	Generator	2	**1,500,000.00**
6	Hollow Block Making Machine	1	**950,000.00**
7	Wooden Pallets	1	**385,000.00**
Total			**40,789,000.00**

Lists of machinery suppliers

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Hangzhou (Yuhang District)
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The selection of structure of the envisaged project is made based on the existing structure of manufacturing plants operating in the country, the capacity, complexity and technology mix of the plant. Organizational structure principles such as specialization, coordination, and departmentalization are also considered for design of structure that best suits the envisaged project.

4.0 MANPOWER REQUIREMENT AND ESTIMATED ANNUAL MANPOWER COSTS

Table 9: Annual manpower costs

S/N	Description	Number of persons	Salary in birr	
			monthly	annually
1	General manager	1	45,000.00	540,000.00
2	executive secretary	1	15,000.00	180,000.00
3	Manager- admin. and finance	1	25,000.00	300,000.00
4	assistance manager- finance	1	20,000.00	240,000.00
5	accountant	1	15,000.00	180,000.00
6	cashier	1	10,000.00	120,000.00
7	personnel and general service	1	10,000.00	120,000.00
8	guards	5	3,000.00	180,000.00
9	driver	4	10,000.00	160,000.00
10	manager-production and technical	1	20,000.00	240,000.00
11	production clerk	1	4,000.00	48,000.00
12	chief quality controller	3	12,000.00	432,000.00
13	chief miller	1	10,000.00	120,000.00
14	machine operator	3	5,000.00	180,000.00
15	assistant machine operator	3	3,000.00	108,000.00
16	senior mechanics	3	12,000.00	432,000.00
17	senior electrician	3	12,000.00	432,000.00
18	store keeper	1	10,000.00	120,000.00
19	manager- commercial	1	20,000.00	240,000.00
20	purchaser	1	10,000.00	120,000.00
21	sales- manager	1	15,000.00	180,000.00
Total		**38**		**4,672,000.00**

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5.0 FINANCIAL ANALYSIS

5.1 General

The financial analysis evaluation, under consideration has been carried out for Distribution Manufacturing cost estimates of the envisaged factory are mainly consisted of capital investment as well as operating and maintenance costs. The capital investment costs include fixed investment costs (initial fixed investment and replacement costs) and working capital, while operating and maintenance costs comprise current expenses related to material inputs, labor, utility, repair and maintenance costs, spare parts, Overheads, Sales and distribution, interest and depreciation expenses.

The financial analysis and evaluation has been conducted taking assumptions:

1. It is assumed that about 70%of the total capital investment costs including the working capital requirement could be covered through development bank loans of short and long-term credits. The remaining balance 30% will be covered by equity capital contribution of the project owner.
2. Even though the project might secure loans under different term and conditions as well as from different financial sources, for the purpose of calculation of debt service scheduling, the current development bank of Ethiopia credit terms and conditions have been used. Consequently. It is assumed that the project will secure loan facility on the basis of 11.5 % annual interest rate, and 10years' equal installments.
3. Even though the estimated project production life is more 10 years, the financial analysis has been undertaken for a period interval covering the first 10 years only, during which time most of the capital assets are assumed to be deprecated, debts recovered and pay-back period accomplished.

4. It is assumed that the project will be start up production activity at 70 % capacity. During years 2 & year 3 the projects is anticipated to gradually increase capacity utilization to reach 100% in year 4. Therefore, starting from year 4 the project will be operational at full capacity.

5. For the project under reference promotional, sales and distribution expenses have been estimated at 3% of the sales revenue.

6. Maintenance and spare parts costs are 1.5% of the fixed investment costs.

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5.2 Initial Fixed Investment Costs

Table 10: Initial Fixed investment costs

S/N	Fixed investment type	Unit of measurement	Quantity	Unit price	Total Amount	Remarks
1	Land	Square meter	5,000	3,353.70birr/ m^2	16,768,500.00	The period of land lease will be 70 years and 10% of the total lease amount will be paid in the first year
2	Buildings and civil works	Square meter	5000	Lump sum	28,380,000.00	
Sub total					**45,148,500.00**	
3	Machineries	set	2	Lump sum	40,789,000.00	
4	Transformer	set	2	Lump sum	3,000,000.00	
5	Furniture and fixture	set	1	Lump sum	250,000.00	
	SUB TOTAL				**44,039,000.00**	
	Fixed capital investment costs				89,187,500.00	
6	pre-operational expenses				5,000,000.00	
7	Working capital				11,000,000.00	
TOTAL INVESTMENT COSTS					**105,187,500.00**	

5.3 Working capital

Working capital is the financial means required for smooth operation and maintenance of a project mathematically, it is a difference between current assets and current liabilities. In the particular case of the project under consideration, the current assets comprise receivables, inventories (local and imported material inputs, spare parts, work in progress, and products ready for delivery) and cash in hand, while current liabilities comprise accounts payable to creditors.

5.4 Project Financing

Fixed capital investment costs and working capital requirements are assumed to be financed by equity capital of the owner and through loans of short and long-term credits.

As stated earlier even though the company obtains loans under different terms and condition as well as from different sources, for the purpose of calculation of debt service scheduling the current development bank of Ethiopia credit terms and conditions have been used. Accordingly it is assumed that the company will be able to obtain loan 70% of the total investment costs for construction of different buildings (about 28.38 million Birr) for purchase of machineries (about 40.8 million Birr, for working capital 11 million and for purchase of office furniture and pre operation expense which are 0.25million and 5 million respectively will be covered through bank loans that will have to be repaid back within 10 years, during which time interest will be paid on the loan. The remaining balance that of the total investment costs will be expected to be covered by equity contribution of the project promoter.

Table 11: Proposed financial Arrangement

S/N	Description	Source of Fund		Total Amount
		Equity	**Bank Loan**	
1	Land	1,376,250.00	15,392,250.00	16,768,500.00
2	Buildings and civil works	23,380,000.00	5,000,000.00	28,380,000.00
Sub total		**24,756,250.00**	**20,392,250.00**	**45,148,500.00**
3	Machineries	-	40,789,000.00	40,789,000.00
4	Transformer	-	3,000,000.00	3,000,000.00
5	Furniture and fixture	-	250,000.00	250,000.00
Sub total		**-**	44,039,000.00	**44,039,000.00**
	Fixed capital investment costs	**24,756,250.00**	**64,431,250.00**	**89,187,500.00**
6	pre-operational expenses	5,000,000.00	-	5,000,000.00
7	Working capital	1,800,000.00	9,200,000.00	11,000,000.00
Sub total		**6,800,000.00**	**9,200,000.00**	**16,000,000.00**
Total		**31,556,250.00**	**73,631,250.00**	**105,187,500.00**
	Percentage	**30%**	**70%**	**100%**

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5.5 Production costs

As it is depicted major categories of the total production costs are assembled into the following cost elements.

5.5.1 Material Inputs

Portland cement (OPC or PPC), aggregates and water are commonly raw materials used to make concrete mixture for production of hollow concrete blocks. But concrete mixture used for blocks has a higher percentage of sand and a lower percentage of gravel and water than the concrete mixtures used for general construction purposes. At full capacity operation the material inputs costs are estimated at Birr 1.36 Billion per annum.

Table 12: Raw materials input in Birr

Raw material Cost for All products per annum				
S/N	**Description**	**Material unit cost**	**production per annum**	**Total cost**
1	Hollow Concrete Block	14 birr/pc	1,560,000 pcs	21,840.000.00
2	Ready Mix Concret	10,196.26 birr/m3	124,000 m3	1,272,493,248.00
			Sub Total	**1,294,333,248.00**
			Handling loss@5%	**64,716,662.40**
			Total Material Cost	**1,359,049,910.40**

5.5.2 Utilities

In estimating costs of utility expenses for operation and maintenance of the project, Costs of fuel, oil and lubricant, electricity and water consumptions have been taken in to consideration, the rates of which have been estimated on the basis of the proposed capacity utilization program of the project and at the current official charging rates. At full capacity operation the project will have the following utility expense per annum which amounts to Birr 4.66million.

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Table 13: Utilities of the factory'000"Birr

Utility"000"Birr		Start-up			Full Capacity
Capacity utilization		70%	80%	90%	100%
Project year		1	2	3	4
Item description	Unit of measurement				
Fuel					
Gasoline for service vehicle	100km*260days*91Birr/LIT*8km/Li	207.03	236.6	266.18	295.75
Gasoline for transport truck	(200km*300days*91 Birr/LIT*5km/Li)*3	2,293.2	2,620.8	2,948.4	3,276.0
Sub-Total		2,500.23	2,857.4	3,214.58	3,571.75
Change of oil and lubricant	10% of the fuel consumption	250.02	285.74	321.18	357.18
Sub-Total		2,750.25	3,143.14	3,536.03	3,928.93
Electricity	260days*24 hrs.*600kwh* 0.69Birr/kwh	1,808	2,066	2,325	2,583
Sub- Total		1,808	2,066	2,325	2,583
Water	365days*100m^3/day* 10 Birr/m^3	255.5	292	328.5	365
Sub -Total		255.5	292	328.5	365
Telecommunication					
Telephone	5lines*500Birr/month/line + 18Birr/line/month	31.08	31.08	31.08	31.08
Mobile	5 lines*500 Birr/month/line	30	30	30	30
Internet	2,500 Birr/month	30	30	30	30
Sub-Total		**91.08**	**91.08**	**91.08**	**91.08**
TOTAL		**10,155.65**	**11,593.45**	**13,031.24**	**14,469.04**

5.5.3 Repair and Maintenance

In the expenses under this title have been considered cost estimates required for annual repair and maintenance works including spare parts expenses. These costs include the annual repair expenses of structures and civil works as well as repair and maintenance expenses of machinery and equipment including accessory and general service facilities. The repair and maintenance

and spare parts costs have been assumed to be (1.5% of fixed costs and spare part costs) i.e 1,557,812.50.

5.5.4 Salaries and Wages

The costs of salaries have been calculated in accordance with the manning list proposed under the "organization and Management" section of this study. In the estimation of salaries and wages, the official minimum wage has been taken in to account. At full capacity operation the costs of salaries and wages will amount to Birr 4.67 Million.

5.5.5 Over Heads

In the expenses under this title have been included land and building taxes, buildings, vehicles as well as machinery and equipment insurance, vehicles annual inspection; postage, telephone and e. mail, stationery and office supplies; printing and copying; audit fee; cash indemnity etc. The overhead costs and divided in to direct overheads and administration overheads.

Table 14: Overhead costs

Direct Overhead"000"Birr		**Year 1**	**Year 2**	**Year 3**	**Year 4**
Annual land lease Payment		2,775	2,775	2,775	2,775
Insurance					
Building and Civil works	0.10%	76	76	76	76
Machinery and Equipment	0.20%	83	83	83	83
Motor vehicle and Truck	1%	60	60	60	60
Vehicles annual inspection and registration	25,000 Birr per annum per vehicle	50	50	50	50
Work cloth	Two times per annum per workers at 800 Birr	78.4	78.4	78.4	78.4
Cleaning and sanitation	An estimate of 300 Birr/day	78	78	78	78
Sub Total		**3,200**	**3,200**	**3,200**	**3,200**
Administration Overhead "000' Birr					
Audit fee	40,000 Birr per annum	40	40	40	40

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Office cleaning and sanitation	2,000 Birr per month	24	24	24	24
Stationery and office supplies	2,000 Birr per month	20	20	20	20
Printing and Copy	2,000 Birr per month	24	24	24	24
Sub Total		**108**	**108**	**108**	**108**
GRAND TOTAL		**3,308**	**3,308**	**3,308**	**3,308**

5.5.6 Financial Costs

As it has been outlined earlier under" project Financing" the current Development Bank of Ethiopia credit terms and conditions for newly establishing projects have been used to compute the financial costs, estimated to be incurred in connection with that of the total investment costs assumed to be covered through loan financing. The amount of the loan capital to be obtained and the financial costs to be incurred thereof have been determined depending on the amount of fixed investment cost and pre-production expenses.

5.5.7 Depreciation

Depreciation charges should be taken in to account as part of the total production costs in order to calculate the total production costs, the net working capital and the gross or net-profit. For the given project under reference, the fixed assets and the pre-production capital expenditures have been depreciated and amortized respectively on "a straight line" depreciation method basis using the following rates of the original acquisition costs of the assets:

The rationale uses for the estimation of the depreciation and the amortization rates is based on the expected service life of the assets and repayment capacity of the project under consideration. Based on the above charging rates and consideration of the above facts, the total annual depreciation cost at full capacity operation have been estimated at Birr 9.29 million.

Table 15: Depreciation in Birr"000"

Period			**Start-up**			
Capacity utilization			70%	80%	90%	100%
Project year			1	2	3	4
Item description	Original Value					
Structure and	28,380,000.00	5% of original	1,419.00	1,419.00	1,419.00	1,419.00

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civil works		value				
Machinery and equipment	40,789,000.00	15 % of original value	6,118.35	6,118.35	6,118.35	6,118.35
Transformer	3,000,000.00	15 % of original value	450	450	450	450
Office equipment and furniture	250,000.00	20% of original value	50	50	50	50
Pre-operation expense	5,00,000.00	25% of original value	1250	1250	1250	1250
Total			**9287.35**	**9287.35**	**9287.35**	**9287.35**

5.6 Break Even Point and ROI

5.6.1 Break Even Point (BEP)

Three kinds of break-even point

A. BEP Sales Revenue (BR)

B. BEP production (Volume)

C. BEP Percentage (%)

A. Break-even point (BEP) Sales

To determine BEP Annual Sales, multiply annual sales found in income statement by the annual fixed cost, and divided by Annual sales less Annual variable cost.

$$\text{BEP (sales)} = \frac{Annual\ sales\ x\ Annual\ fixed\ costs}{Annual\ sales - Annual\ variables\ costs}$$

Annual sales = 1,008,063,784.00 Birr

$$\text{BEP (sales)} = \frac{Annual\ sales\ x\ Annual\ fixed\ costs}{Annual\ sales - Annual\ variables\ costs}$$

= (1,008,063,784 x 17, 267,350) / (1,008,063,784 – 909,887,989.85)

BEP (Sales) = 117,300,222.84 Birr

A. BEP production

To determine BEP production volume, divided BEP sales by the unit selling price (USP)

BEP production = 117,300,222.84/1,008,063.78 = 116

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B. BEP percentage $= \frac{Annual\ fixed\ costs\ x\ 100\%}{Annual\ sales - Annual\ variables\ costs}$

= (17,267,350 x 100%) / (1,008,063,784 – 909,887,989.85)
= 18%

5.6.2 Return on investment

Return on investment = Net profit /Total capital requirement

= 52,590,488.7/105,187,500.00

= 50%

The return on owners' investment (ROOI)

= Annual net profit /owners' investment

= 52,590,488.7/31,556,250

= 167%

5.7 Project Costs

Project capital investment costs are the sum of fixed capital investment (fixed investment plus pre-production capital expenses) and net working capital at full capacity, with fixed capital constituting the resources required for constructions and civil works, importation and installation of production machinery and equipment and general service facilities, whereas, the working capital corresponding to the resources needed for operation of the project totally and partially.

The total annual operating costs excluding depreciation and interest are estimated to range from 917.9 million Birr in year 1 to 1.317 billion Birr in year 4 and then after remain constant for the rest of the project life.

5.8 Project Benefits

For financial analysis and evaluation of the given project, the current material input price, and packing materials buying price and final packed Distribution transformer price at the project gate has been taken as a basis. As it has been stated earlier the project is envisaged to reach full capacity operation four years after commencement of production activities which are assumed to begin with 70% of the estimated total capacity.

At full capacity operation the project is envisaged to have the following revenue components.

Table 16: Source of revenue in Birr"000"

NO	Period			Start-up			Full Capacity	
	Capacity utilization			70%	80%	90%	100%	100%
	Project year			1	2	3	4	5
	Product type	unit	price					
1	Production of HCB and distribution	PCS	10cm-25birr 15cm-29birr 20cm-32birr	31,304,000.00	35,776,000.00	40,248,000.00	44,720,000.00	44,720,000.00
2	Production of Read-mix concrete and distribution	M3	14,150 Birr	976,759,784	1,116,296,896	1,255,834,008	1,395,371,120	1,395,371,120
Total				**1,008,063,784**	**1,152,072,896**	**1,296,082,008**	**1,440,091,120**	**1,440,091,120**

Thus, according to the computation, the net income and cash flow statements analysis revealed that at full capacity operation the project will generate a total income (gross revenue) amounting to 1.44 billion Birr per annum. The corresponding **Annex Table** of "Net Income Statement" shows a steady growth of gross profit starting from 80.9 million Birr in year 1 reaching the peak of 123 million Birr in year 10. In its 10 years of manufacturing activities, the project is expected to generate a total net profit of 744.6 million Birr and contribute 400.94 million Birr to the government treasury in form of 35% income tax.

According to the current investment Law, machinery and equipment are anticipated to be imported duty- free. The liquidity position of the project is very strong. The corresponding **Annex Table** of "Cash Flow Statement" shows the positive cumulative cash balance of Birr 744.6 million and the project will not face any cash shortage throughout its production life.

The computation of the **pay-back period** as depicted in **Annex** indicates that the project will be able to reimburse itself from its net cash-income within three years after commencement of production activities, the period which is considered to be very good for the project of this nature.

In Annex the Benefit-cost ratio and Net present value (NPV) have been calculated at 17% discount factor (D.F) for 10 years of the project activity. Accordingly, the project has NPV of 6.14 Billion Birr at 17% D.F. and the benefit-cost ratio of 1.09 at 17% D.F. these results are most appreciable, especially, when related to the external capital borrowing interest rate which ranges from 8.50% to 18.5 % for newly establishing projects.

The project under study when implemented will have BEP at about 18 % operation of the estimated full capacity. In addition to this, finally, summary of financial efficiency tests have been conducted, Accordingly, all efficiency ratios indicated positive trends and consequently, it can be inferred that the project can operate in the frame work of free market mechanism on commercially and financially viable basis and is remunerative.

ANNEX I

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1.Parameters, Technical Coefficients and Basic Assumption used in the study

1.1 Assumption used in the financial Analysis

1	**Number of working days per annum**	260	days
2	**Working hours per day**	8	hrs
3	**Number of shift**	1	
4	**Theoretical Capacity of Concrete batching plant**	96,613	m3/annum
5	**Theoretical Capacity of HCB Machine**	1,560,000	pcs/annum

1.2 Revenue calculation at full capacity

HCB Type	**Price(birr/pcs)**	**Quantity(pcs per d**	**Amount (birr/day)**
10cm	25.00	2,000.00	50,000.00
15cm	29.00	2,000.00	58,000.00
20cm	32.00	2,000.00	64,000.00
		Total revenue from HCB(Birr/ day)	**172,000.00**
		Total revenue from HCB(Birr/ year)	**44,720,000.00**
	Price(birr/m3)	**Quantity(m3 per d**	**Amount (birr/day)**
Ready-Mix Conc	379.28	14,150.00	5,366,812.00
		Total revenue from Ready-Mix Concrete(Birr/m3)	**5,366,812.00**
		Total revenue from Ready-Mix Concrete(Birr/ year)	**1,395,371,120.00**

1.3 Raw Material Cost at full capacity

Product	**Raw Material unit Cost(birr/pc)**	**Quantity(pcs/annu**	**Total Raw material Cost per annum**
Hollow Concrete B	14.00	1,560,000.00	21,840,000.00
	Raw Material unit Cost(birr/m3)	Quantity(m3/annum)	
Ready mix Concret	10,196.26	124,800.00	1,272,493,248.00
		Total Raw Material Cost(birr)	**1,294,333,248.00**

1.4

Revenue Projection										
Projection Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Capacity	**70%**	**80%**	**90%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
HCB	31,304,000.00	35,776,000.00	40,248,000.00	44,720,000.00	44,720,000.00	44,720,000.00	44,720,000.00	44,720,000.00	44,720,000.00	44,720,000.00
Ready-Mix Concrete	976,759,784.00	1,116,296,896.00	1,255,834,008.00	1,395,371,120.00	1,395,371,120.00	1,395,371,120.00	1,395,371,120.00	1,395,371,120.00	1,395,371,120.00	1,395,371,120.00
Gross income	1,008,063,784.00	1,152,072,896.00	1,296,082,008.00	1,440,091,120.00	1,440,091,120.00	1,440,091,120.00	1,440,091,120.00	1,440,091,120.00	1,440,091,120.00	1,440,091,120.00

1.5 Production Cost

Projected year	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Raw Material cost	906,033,273.60	1,035,466,598.40	1,164,899,923.20	1,294,333,248.00	1,294,333,248.00	1,294,333,248.00	1,294,333,248.00	1,294,333,248.00	1,294,333,248.00	1,294,333,248.00
Utilities	2,750,247.50	3,143,140.00	3,536,032.50	3,928,925.00	3,928,925.00	3,928,925.00	3,928,925.00	3,928,925.00	3,928,925.00	3,928,925.00
Repair and Maintenance	1,104,468.75	1,262,250.00	1,577,812.50	1,577,812.50	1,577,812.50	1,577,812.50	1,577,812.50	1,577,812.50	1,577,812.50	1,577,812.50
Salaries and Wages	4,672,000.00	4,672,000.00	4,672,000.00	4,672,000.00	4,672,000.00	4,672,000.00	4,672,000.00	4,672,000.00	4,672,000.00	4,672,000.00
Overhead cost	3,308,000.00	3,308,000.00	3,308,000.00	3,308,000.00	3,308,000.00	3,308,000.00	3,308,000.00	3,308,000.00	3,308,000.00	3,308,000.00
Depreciation	9,287,350.00	9,287,350.00	9,287,350.00	9,287,350.00	9,287,350.00	9,287,350.00	9,287,350.00	9,287,350.00	9,287,350.00	9,287,350.00
Total	**927,155,339.85**	**1,057,139,338.40**	**1,187,281,118.20**	**1,317,107,335.50**	**1,317,107,335.50**	**1,317,107,335.50**	**1,317,107,335.50**	**1,317,107,335.50**	**1,317,107,335.50**	**1,317,107,335.50**

1.6 Profit/Loss statement

Description	Projection years									
	1	2	3	4	5	6	7	8	9	10
Revenue	1,008,063,784.00	1,152,072,896.00	1,296,082,008.00	1,440,091,120.00	1,440,091,120.00	1,440,091,120.00	1,440,091,120.00	1,440,091,120.00	1,440,091,120.00	1,440,091,120.00
production cost	927,155,339.85	1,057,139,338.40	1,187,281,118.20	1,317,107,335.50	1,317,107,335.50	1,317,107,335.50	1,317,107,335.50	1,317,107,335.50	1,317,107,335.50	1,317,107,335.50
Profit before Tax	80,908,444.15	94,933,557.60	108,800,889.80	122,983,784.50	122,983,784.50	122,983,784.50	122,983,784.50	122,983,784.50	122,983,784.50	122,983,784.50
Net profit(after 35% tax)	**52,590,488.70**	**61,706,812.44**	**70,720,578.37**	**79,939,459.92**	**79,939,459.92**	**79,939,459.92**	**79,939,459.92**	**79,939,459.92**	**79,939,459.92**	**79,939,459.92**

1.7 Cash flow statement

Description	Projection years										
	0	1	2	3	4	5	6	7	8	9	10
Cash inflow											
Equity	31,556,250.00										
Loan	73,631,250.00										
Net profit(after 35% tax)		52,590,488.70	61,706,812.44	70,720,578.37	79,939,459.92	79,939,459.92	79,939,459.92	79,939,459.92	79,939,459.92	79,939,459.92	79,939,459.92
Depreciation		9,287,350.00	9,287,350.00	9,287,350.00	9,287,350.00	9,287,350.00	9,287,350.00	9,287,350.00	9,287,350.00	9,287,350.00	9,287,350.00
Total Inflow	**105,187,500.00**	**61,877,838.70**	**70,994,162.44**	**80,007,928.37**	**89,226,809.92**	**89,226,809.92**	**89,226,809.92**	**89,226,809.92**	**89,226,809.92**	**89,226,809.92**	**89,226,809.92**
Cash outflow											
Fixed asset	**89,187,500.00**										
Pre-operating expense	**5,000,000.00**										
Working capital	**11,000,000.00**	**2,200,000.00**	**2,200,000.00**	**2,200,000.00**	**2,200,000.00**	**2,200,000.00**					
Loan repayment			**9,203,906.25**	**9,203,906.25**	**9,203,906.25**	**9,203,906.25**	**9,203,906.25**	**9,203,906.25**	**9,203,906.25**	**9,203,906.25**	
Total Cash outflow	**105,187,500.00**	**2,200,000.00**	**11,403,906.25**	**11,403,906.25**	**11,403,906.25**	**11,403,906.25**	**9,203,906.25**	**9,203,906.25**	**9,203,906.25**	**9,203,906.25**	**-**
Net Cash outflow	**-**	**59,677,838.70**	**59,590,256.19**	**68,604,022.12**	**77,822,903.67**	**77,822,903.67**	**80,022,903.67**	**80,022,903.67**	**80,022,903.67**	**80,022,903.67**	**89,226,809.92**
Cumulative Cash outflow	**-**	**59,677,838.70**	**119,268,094.89**	**187,872,117.01**	**265,695,020.68**	**343,517,924.36**	**423,540,828.03**	**503,563,731.71**	**583,586,635.38**	**663,609,539.06**	**752,836,348.98**