SANGHI INDUSTRIES LIMITED

PRE FEASIBILITY REPORT

For

EXPANSION OF CEMENT PLANT

With

INCREASE OF PRODUCTION

CLINKER FROM 3.5 MTPA TO 7.5 MTPA

CEMENT FROM 4.0 MTPA TO 8.6 MTPA

AT SANGHIPURAM KUTCH,GUJARAT

MAY, 2017

Table of Contents

1.0 Preamble

Sanghi Industries Limited is the flagship company of The Ravi Sanghi Group dealing in the production and distribution of Cement under the Brand Name "Sanghi Cement". Sanghi Cement was commissioned in 2002 with one of the world's largest single stream Cement Plant located at Sanghipuram in the Abdasa Taluka of Kutch District of Gujarat State. This plant is fully automatic with state-of-the-art technology from Fuller International, USA and having present capacity of 4.0 MTPA. The company produces superior quality 53 Grade OPC, PPC and PSC Cement and have revolutionized the way cement is produced and sold in India. The company has several firsts to its credit :

- First plant in India to install cross belt analyzer for micro analysis of Limestone to ensure consistent superior quality of cement.
- First plant in the country to have 100% robotic control systems to ensure consistently superior strength and quality of operations.
- Only Indian Cement Company to achieve Export House status in the first eight months of commencement of operations.
- Cement grade high quality captive limestone mines with mining through latest eco-friendly and state-of-the-art surface miners.
- First company in India to have full fledged infrastructure, from day one, such as 100% captive power plant, own jetty to cater the needs of sea route transportation, desalination plant and road network.
- The only FIVE STAR certified organisation in Indian Cement Industry conforming

Quality Management System (ISO:9001:2000)
Environmental Management System (ISO:14001:2004)
Health & Safety Management System (OHSAS:18001:2007)
Testing & Calibration Management System (ISO:17025:2005)
Social Accountability Management System (SA:8000:2001)

The original design capacity of the main plant was 7,500 tpd clinker. SIL further installed third preheater string, with which the existing line capacity became 10,000 tpd clinker. However, SIL produces about 9,500 tpd clinker on a sustained basis supporting 4.0 MTPA cement production capacity. Design engineering for the plant was done by Fuller. The plant consists of a dry process kiln with twin string, 6 stage preheater (PH) with separate line precalciner (SLC) in one string and an in-line precalciner (ILC) in the other string and separate third string.

Sil now intends to expand its capacity by installing a new clinkerisation line of 4.0 MTPA alongside the existing line and clinker grinding units to 4.6 MTPA taking total capacity to 8.6 MTPA. Along with grinding 2.3 MTPA near to existing clinker plant and 2.3 MTPA at existing grinding unit.

Table 1.1

Salient Features of the Project

S. NO.	PARTICULARS	DETAILS
1.	Nature & Size of the Project	Proposed expansion in capacity with increase of production of Clinker capacity from 3.5 mtpa to 7.5 mtpa and Cement from 4.0 mtpa to 8.6 mtpa at Sanghipuram, Tehsil Abdasa, district Kutch, Gujarat by M/s. Sanghi Industries Ltd.
2.	Category of the Project	As per EIA Notification dated 14th September, 2006, as subsequent amendment the project falls under Category "A", Project or Activity '3(b)'.
3.	Location details	
	Village	Motiber and Akiri
	Tehsil	Abdasa
	District	Kutch
	State	Gujarat
4.	Geographical Location:	**Latitude** **Longitude** 23°29'33.52"N 68°35'4.04"E 23°29'32.30"N 68°34'35.35"E 23°29'44.66"N 68°34'34.69"E 23°29'45.24"N 68°35'4.33"E
	Plot/Survey/Khasra No.	Survey No:- 96,97,99,100,123,124-Motiber Village & Survey No.-64,65-Village Hothiyay
	Toposheet No.	41 A/10 and 41 A/11
5.	Plant Area	Existing – 70 ha Expansion – 30.56 ha within the existing plant area.
6.	Water Requirement	Existing requirement – 1500 m^3/day Additional for Expansion Project- 1500 m^3/day **Source:** The water requirement shall be met from the existing desalination plant mines and Rain water storage at mined out pits with in captive limestone mines..
7.	Power Requirement	Expansion Project- 56 MW **Source:** CPP , 15 MW WHRS/Grid
8.	Man Power Requirement	Existing requirement -384 persons Additional requirement for Expansion Project -350 persons **Source:** Unskilled/semi skilled manpower will be sourced from the local area and skilled manpower will be sourced from outside/local.
9.	**Project Cost**	
	Total Cost of the Expansion Project	₹ 1050 Crore ₹ An amount of 60% of the project work including ordering of plant and machinery has been done. Construction activities have started and the same have been stopped due to want of the revalidation/extension of environment clearance.
	Cost for Environment protection Measures	• Capital Cost- ₹50 crore • Recurring cost- ₹10 Crore/annum.

2.0 ENVIRONMENT MANAGEMENT PLAN

(i) Air Pollution Control

- All major sources of air pollution are being/ will be provided with Pulse Jet BH/ Bag filters/ESP / water spraying to keep emissions below permissible limits for the PM emissions.
- Clinker will be stored in clinker silos.
- Fly ash will be stored in covered yard/silos & handled pneumatically in cement mills.
- Regular water sprinkling on haulage road and transportation of material will be done by covered container.
- Proper maintenance of vehicles will be done regularly.
- Green belt will be developed along the plant premises as dust preventive barrier.
- Periodic air quality monitoring will be carried out as per CPCB / SPCB norms.

(ii) Water Pollution Control

- No industrial waste water will be generated from the Cement Plant.
- Domestic waste water from colony & plant will be treated in the STPs & treated water will be utilized for green belt development and dust suppression.
- Rain water harvesting will be practised at plant and colony area.

(iii) Noise Pollution Control

- Proper maintenance, oiling and greasing of machines at regular intervals will be done to reduce generation of noise.
- Properly insulated enclosures will be provided to staff working close to the high noise sources.
- Personal Protective Equipment like earplugs and ear defenders will be provided to the workers exposed to high noise level.
- Green Belt of appropriate width inside the plant premises and at the plant boundary will be developed.
- Regular monitoring of noise level will be carried out.

(iv) Solid /Hazardous Waste Management

- Kiln process dust will be generated from the cement manufacturing process. Same will be partly reused and partly dumped into the dumping area designated in plant area and green belt will be developed on such land fill site.

- Dust collected from various air pollution control equipment will be recycled completely in process.
- Fly ash will be utilized in cement manufacturing.
- Used oil & grease will be generated from plant machinery/Gear boxes and DG set as hazardous waste which will utilized in kiln as AFR.

(vi) Green Belt Development/Plantation

- In addition to plant area i.e. 100 ha, 40 ha is considered for green belt.
- Parks and Garden in the plant and colony premises have been constructed.
- Green belt development along with the road & plant boundary has been done which will attenuate noise level, arrest dust and improve the environment in surrounding.
- Local species will be planted after consultation with local forest department.

3.0 PROJECT AT GLANCE

(i)Identification of project and project proponent

Sanghi Industries Limited (SIL) operates an integrated cement plant of capacity 3.5 MTPA clinker and 4.0 MTPA cement at Sanghipuram, tehsil Abdasa, district Kutch, Gujarat.SIL proposes expansion of clinker and cement capacity by setting up a brown field cement plant of capacity 4.0 MTPA clinker and 2.3 MTPA cement within the premises of the existing plant at Sanghipuram. SIL also proposes to set up a Grinding facility of capacity 2.3 MTPA cement at existing Grinding unit.

(iii) Need for the project and its importance to the country and or region

Cement is an essential ingredient for the modern building construction. The new generation cement plant in India now employs the latest technology for better efficiency, energy conservation, pollution control and economics of large capacity production. The improved market conditions witnessed recently, after a grip of recession over a long period, are expected to continue due to high priority being given by the Government to housing and infrastructure and also in view of the massive investment proposed in industry and rural sectors. Therefore, there is an urgent need to increase the production capacity in the country in spite of severe resource constraints. There is a large demand for cement on the coastal areas where there is deficit in cement supplies. The expansion project shall plan to supply cement to coastal locations through coastal shipping.

Hence, the proposal of expansion in Cement Plant by M/s. Sanghi Industries Limited will cater the increased demand of cement in the country and region.

(iv) Demand- Supply Gap

The likely demand supply gap has been calculated based on the estimated future most likely demand as well as the expected growth of cement capacity in the state. Future supply has been estimated based on the assumption that in the year of commissioning a plant is capable of supplying only 50% of its installed capacity and it starts supplying 100% from the next year onwards. The demand supply gap is given in the table that follows:

(v) Export Possibility –

The total effective capacity as per estimates is 389 million tonne per annum for FY 16.Estimated domestic dispatches by Indian cement plants (including that from mini cement plants) are around 289 million tonee in FY 16. Apart from this, India is estimated to export around8 to 10 mio t of cement and clinker during FY 16.

(vi) Domestic Markets –

Demand in target cement target in proposed unit will be mainly Gujarat, Rajasthan, Kerala, and Maharashtra

(vii) Employment Generation (Direct and Indirect) due to the project

Direct and indirect employment will be generated due to the project. During construction phase, direct permanent employment opportunity to approximately 350 persons is estimated. The total manpower requirement for the proposed expansion project will be 734 persons as per following details.

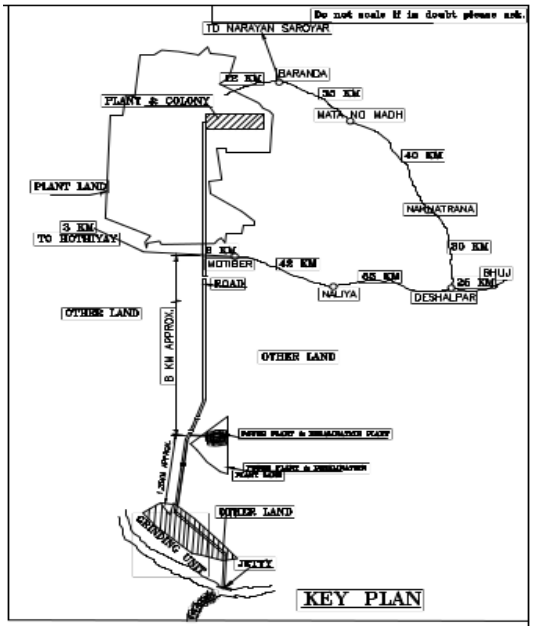
Particulars	Existing	Proposed	Total after Expansion
Skilled	278	254	532
Semi – Skilled	66	60	126
Unskilled	40	36	76
Total	**384**	**350**	**734**

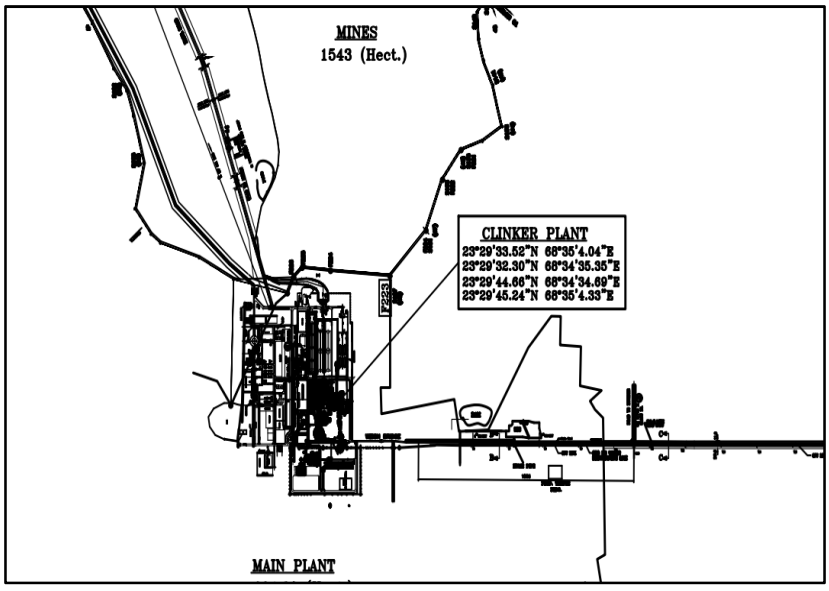
4.0 PROJECT DESCRIPTION

(i) Type of Project

M/s. Sanghi Industries Ltd. has proposed for expansion in clinker production capacity from 3.5 MTPA to 7.5 MTPA and cement production capacity from 4.0 MTPA to 8.6 MTPA at Village-Motiber, Tehsil-Abdasa, District-Kutch (Gujarat).

(ii) Location (map showing general location, specific location, and project boundary & project site layout) with coordinates





iii) Project Description with Process Details

a) Raw material storage and Main machinery description

Description	Main Plant
Belt conveyor for LS transportation from mines area to stockpile	1800 tph x 01 no. (existing)
LS pre-blending stockpile	2 x 40,000 t, Linear Stockpile with stacker cap. 1800 tph and reclaimer cap. 1,200 tph. (New)
Corrective Storage	Existing storage (4 x 10,000 t) with stacker capacity upgraded to 600 tph and a new reclaimer 300 tph is envisaged.
Raw Material Grinding	900 tph. Vertical Roller Mill with integral high efficiency separator and external recirculation. Mill venting by "Bag House".
Raw Meal Homogenizing Silo	1 x 30,000 t. Continuous blending cum storage. Silo feed by bucket elevator. 2 nos. Kiln feed system (extraction from kiln feed bin onwards; one as standby). Feeding to preheater shall be with bucket elevator. Solid flow meter for weighment of kiln feed. (New)
Clinkerisation	10,000 tpd,, Scalable up to 12000 tpd, 6 stage (double string) preheater with in-line calciner. Kiln, Modular Frame Cooler. Cooler de-dusting with EP. Fuel dosing gravimetric system. (New)
Coal Mill	1 x 95 tph. Vertical Roller Mill with integral high efficiency separator. Coal Mill venting by "Bag Filter".
Coal Handling and Storage	4 x 6,000 t (existing). Linear storage with existing Stacker and Reclaimer
Additive Handling & Storage	Storage Hall with stacker and reclaimer and having storage provisions as follows: <u>For Cement Mill Feeding</u> 1 x 5,000 t – Gypsum (New) ,1 x 5,000 t - Wet Fly ash (New) Fly ash storage. 10,000 t silo at Grinding Unit cement storage silos <u>to be considered for flyash storage.</u>
Cement Grinding	VRM (1 x 335 tph) in main plant and Ball mill with HRP (1 x 335 tph) at Grinding unit
Cement Storage	1 x 20,000 t. Silo at main plant and 1 x 20,000 t. Silo at grinding unit(existing)
Packing and Loading	4 x 180 tph packing plant, twin discharge packer and with 4 semi-automatic truck loaders.
Mechanical Conveying system for ship loading	1500 tph belt conveyor with 2 x 750 tph ship loaders at jetty (New).

b) Details of Design & Engineering, Ordering, received material and Construction

PLANT AND MACHINERY ORDERING AND SUPPLY

PYRO Pyro equipment ordered and major equipment received on site supplied by M/s FLS Pvt ltd.-2008, Re-ordered in 2014

GRINDING MILL Raw meal and Coal grinding mills ordered.-M/s Loesche-2008 ,Re-ordered in 2015

ELECTRICAL AND INSTRUMENTATION -Major motors Ordered to M/s NHI,China.2008

POLLUTION CONTROL EQUIPMENT M/s Thermax Cooler ESP and Pre Lignite ESP,M/s FLS-Bag house-2008

CONSTRUCTION

Civil works Civil contract awarded to M/s Simplex-Civil contract awarded to M/s Simplex

Mechanical fabrication and erection Mechanical contract awarded to M/s HAPBCO.

Cement mill-Cement Capacity enhanced to 4MTPA

Packer-Packer 4,5 up gradation from 8 spout to 12 spout to capacity 180 TPH each thus Packing capacity enhanced to 5MTPA Installation of cement packer of capacity 120 TPH At Dharamtar, Packing capacity enhanced to 6 MTPA

Enhancement of Kiln raw mill bag house To achieve < 30mg/Nm3 emission

WHRS-Installation of Waste heat recovery system capacity 15 MW supplied by M/s Crun,China

ALTERNATE FUEL Installation of Alternate of fuel System -10 TPH Alternate fuel feeding capacity has been installed to use plastic waste Clinker plant with this in to a Co-Processing unit with induction of AFR

ORDERING

UNDER ORDERING

Stacker & reclaimer package-Offer received, Order and Supply in 1.5 years and installation in next 1.5 years

Air pollution control equipments (re-ordering)-Offer received, Order and Supply in 1.5 years and installation in next 1.5 years

Material handling. (Belt Conveyors)-Clinker grinding, Nuisance bag filter (re-ordering), Refractory and castable &,insulation. And Crane and hoists

An amount of 60% of the project work including ordering of plant and machinery has been done. Construction activities have started and the same have been stopped due to want of the revalidation/extension of environment clearance.

c)Manufacturing Process:

Limestone Handling and Transportation to stockpile : Limestone shall be mined by surface miners, loaded onto dumpers, transported and unloaded into Limestone dump hopper in the mines. The material shall be transported from mines to plant by an Over Land Belt Conveyor (OLBC) of 1,800 tph capacity common for both the existing plant and the proposed expansion.

Limestone Pre-blending Stockpile : Two nos. stockpiles have been proposed for storage and homogenization of Limestone. The storage capacity for the stockpile has been considered as 2.5 days for a 10,000 tpd clinker plant. The Limestone received from the Mines shall be stacked with the help of a stacker. For reclaiming, one bridge type reclaimer has been considered.

Fuel crushing, storage and transport : It is proposed to use various fuels such as imported coal from South Africa & Indonesia, imported Petcoke and locally available Lignite depending upon cost competitiveness. SIL also uses alternate fuels like Plastic Waste and Coal Tar, cotton waste etc.

Vertical roller mill for Coal and Raw Meal Grinding : The proposed VRM designed for high drying and grinding efficiency. Exit gas from mill shall be conveyed by mill induced draft fan to the bag house type filter. Cleaned gas from bag house filter will be conveyed by bag house filter fan to the stack.

Preheater, Precalciner, Kiln, Cooler : A dry-process kiln installation with 6 stage preheater has been envisaged.

De-dusting of Kiln : Kiln and raw mill exit gases shall be cleaned in common bag house type filter. Kiln/ raw mill bag house de-dusting filter shall be of modern design equipped with high temperature textile filter bags (preferably glass-fibre laminated membrane bags). The bag house de-dusting system shall be designed for maximum dust content in cleaned exit gas of <30 mg/Nm 3 .

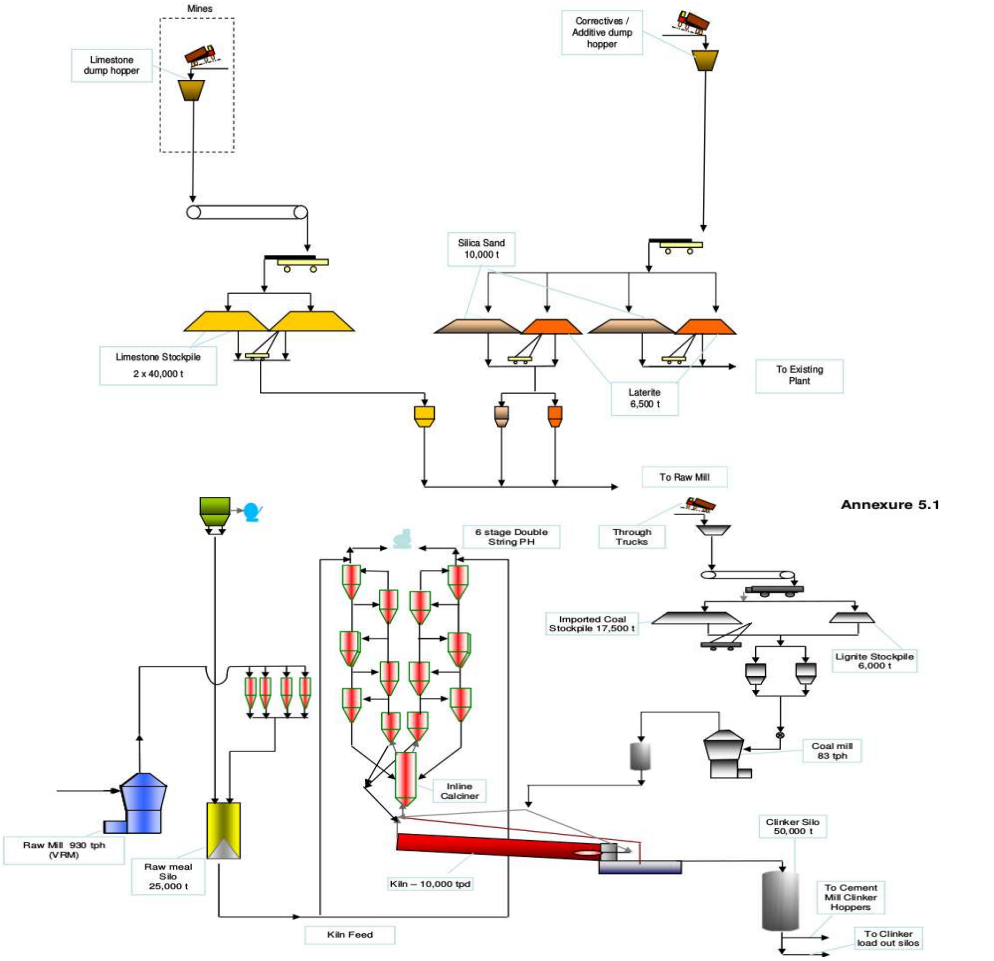
Cement Grinding System : In the proposed expansion, it is envisaged that 100% OPC shall be produced at IU and 100% PPC shall be produced at GU.

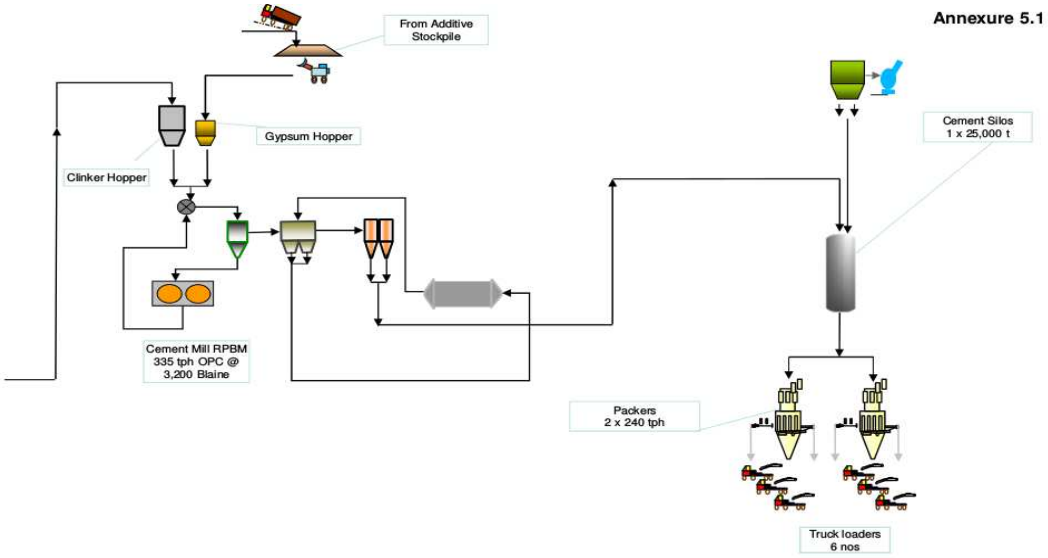
Mill De-dusting : The solution envisaged for de-dusting of roller press circuit gases is with a Bag filter. The solution envisaged for de-dusting of ball mill gases is with a Bag filter. The separator circuit shall also be de-dusted by means of bag filter. Bag filter will be designed to meet the requirements of prevalent environmental norms.

Cement Packing and Dispatch :

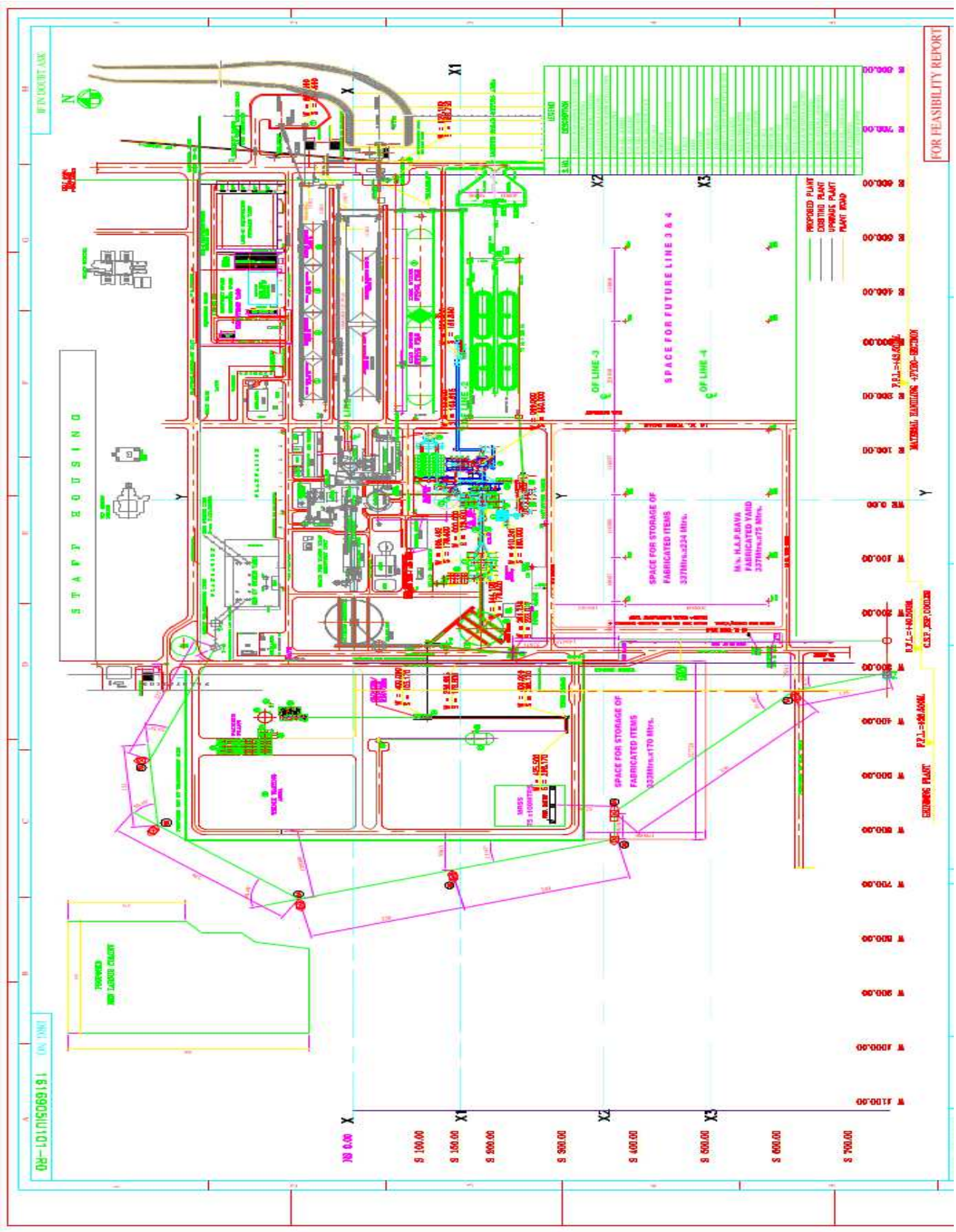
Four nos. 16 spout packers have with Truck loaders have been considered

d) CEMENT MANUFACTURING PROCESS DESCRIPTION-Process Flow Chart





e) Plant Layout :Clinker plant with Grinding unit near Main Plant



f) Raw Material Requirement and Sources.

RAW MATERIAL REQUIRMENT EXPANSION		
RAW MATERIAL	**REQUIRED FOR EXPANSION**	**AFTER EXPANSION**
	MTPA	**MTPA**
Limestone	5.40	10.00
Laterite	0.32	0.60
Pozzolana Clay	0.76	1.27
Gypsum	0.26	0.46
Fly Ash	0.85	1.16
Coal/lignite/Petcoke	0.90	1.70

The details of raw material required for the proposed expansion are given below:

S.N.	Material		Source Category	Source Locality	Distance from plant (Km)	Remarks
01	Limestone		Captive	Jadua, Kachchh, Gujarat	4.5	Cross country belt conveyor
02	Pozzolana Clay		Captive	Hothiyay, Kachchh, Gujarat	4	Transport On Contract
03	Silica Sand		Captive	Motiber, Abdasa, Kachchh	5	
04	Laterite		Captive	Naredo, Lakhpat, Kachchh	14	
05	Gypsum	Marine	Purchase	Jakhau, Abdasa	50	All the gypsum are mixed together and used at the plant
		Phospho		GSFC, Bharuch, Gujarat	480	
		Chemical		Ashapura, Bhuj, Gujarat	150	
		Mineral		Imported(Iran)	Through Jetty	
05	Fly Ash		Purchase	Local market ,CPP	165	
06	Lignite		Purchase	Panandhro, Kachchh,Gujarat	40	
07	Coal		Purchase	Open market	Through Jetty	
08	Pond Ash		Purchase	Bhuj	155	
09	Pet coke		Purchase	Imported/Local	Through Jetty/400	

h) Marketing Area and Mode of transportation of Final Product

States of interest for Sanghi Industries Limited - SIL's project are:

1. Gujarat- By Road and Sea
2. Madhya Pradesh-By Road and Rail transport
3. Maharashtra-by Sea and Road transport
4. Kerala-By Sea and Road transport

(iv) Resources optimization/ recycling and reuse envisaged in the project,

- No waste water will be generated from the Cement manufacturing process & "Zero Discharge" will be maintained at all the point.
- Domestic effluents generated from Colony & Plant are being/will be treated through existing STPs having adequate capacity (2 x 250 m^3/day) and treated water will be used for Cement plant cooling purpose and Green belt development.
- Kiln process dust will be generated from the cement manufacturing process. Same will be partly reused and partly dumped into the dumping area designated in plant area and green belt will be developed on such land fill site. .
- There will be no liquid discharge outside the project premises.

(v) Availability of water it's source, energy /power requirement and source

a) Water Requirement and Source

Total water requirement after the proposed expansion project (Existing + Expansion) will be 3000m^3/day**.** Source of Water will be from existing desalination plant. The Company has developed mined out limestone pits as rain water storage and the water from the same shall also be used to meet the water requirement.

b) **Power Requirement and Source**

Power requirement for proposed expansion project will be56 MW, which will be sourced from Captive Power Plant and WHRS / Grid

(vi) Quantity of waste to be generated (liquid and solid) and scheme for their management/disposal

- There will be no waste water generation from the proposed expansion.
- Domestic waste water from colony & plant is being /will be treated in the STPs (2 X 250 m^3/day) & treated waste water will be utilized for green belt development and dust suppression. Root Zone Treatment plant is in operation.
- No effluent will be discharged outside the project premises.
- No solid waste will be discharged from the plant. However, material collected by the air pollution control equipment (Bag house & Bag filters) will be totally recycled back to the process.

5.0 SITE ANALYSIS

(i) Connectivity

The proposed site at Sanghipuram can be reached by travelling on NH - 8A from Naliya to Vagot, at Vagot take a detour on Sanghipuram - Vagot road and travel up to Sanghipuram.

The proposed site is within the premises of existing plant boundary.

Nearest railway station is Bhuj railway station at a distance of ~ 150 km and Nearest Airport is Bhuj Airport at a distance of 155 km from the plant site. All the communication facilities such as telephone, telefax and internet are available in the vicinity of plant site.

(ii) Land from Land use and Land ownership

Proposed expansion total Project Area of 35.0 ha will be done within the existing plant premises. Hence the land ownership will be considered as Industrial type. The plant area Break-up is given as follows:

Plant Area Break-Up-kindly provide

Unit	Existing Area (in ha)	Proposed Area (in ha)	Total after proposed expansion
Cement Plant	70	30	100
Captive Power Plant	10		10
Colony	32	0	32
Green belt	25	15	40

(iii) Topography

The topography of the land proposed for the proposed plant is largely flat and free from major undulations.

A lump sum provision for site preparation, grading and levelling has been considered in the investment cost estimate.

(iv) Proposed cement plant Line II will be established on the vacant land of 30.56 ha already in possession of SIL acquired during the establishment of the cement plant line-1.The proposed land is adjoining to the existing Line I and under industrial use.

Environmental Settings of the Area

S. No.	Particulars	Details
1.	Nearest Village	Village Motiber (~2 km in ENE direction)
2.	Nearest Town / City	➢ Nearest Town - Naliya (~ 40 Km) ➢ Nearest City – Bhuj (~ 150 Km)
3.	Nearest National/State Highway	➢ NH-8A (~ 150 km)
4.	Nearest Railway Station	Bhuj Railway Station (~150 km.)
5.	Nearest Airport	Bhuj Airport (~ 150km.)
6.	Plant Area (Land use)	Total Project Area – 30.56 ha
7.	Archaeological Important Place	None in 10 km radius
8.	Ecological Sensitive Areas (National Park, Wild Life Sanctuary, Biosphere reserves, Tiger Reserve, Elephant Reserve etc.)	Project is outside of eco sensitive zone notification dated 12 may 2012 of NSS
9.	Seismic Zone	V

(v) Existing Infrastructure

Workshop

A common mechanical and electrical workshop is located to take care of the regular maintenance/ repair jobs in the plant.

Machinery stores

A store building needed for storing tools, spare parts, consumables, etc. Open area for storing machinery and construction materials for the proposed plant.

Cranes, Monorails and Pulley blocks

Adequate sized maintenance cranes/ hoists, monorails and pulley blocks at all suitable locations at the plant for ease of maintenance and operation.

Time and Security office

At the entrance of the main plant, a time office and a security office has been provided.

Hospital

A hospital has been provided in the Colony.

Weighbridge

Electronic weighbridges are envisaged to take care of the incoming and outgoing materials in the existing plant premises.

Bags godown

Space has been provided in the packing plant area for the storage of bags.

Parking

Adequate parking space has been/will be provided in the plant premises for the parking of vehicles.

Roads

All internal roads are of concrete roads. External roads to Highway and to jetty are built and maintained by the Company.

Captive Jetty

Company has built captive jetty meant for exports and coastal sea transport of cement/clinker.

Residential Area (Non processing area)

Residential colony for staff has been developed within the plant premises along with all the required social amenities except for a dormitory to house essential skilled workmen.

(vi) Social Infrastructure available

SIL has developed banking facility, parks, recreation centre, shopping complex ,temple, post office, Hospital and school etc. as part of social infrastructure.