EXECUTIVE SUMMARY

Environment Clearance for the proposed Integrated Cement Plant, Capacity Clinker: 540000 TPA, Portland Slag Cement: 937500 TPA, Portland Pozzolana Cement: 180000 TPA and Power Plant:20 MW along with captive railway siding near village Hansda, PO Burudih, Dist. Saraikela-Kharsawan, Jahrkhand was transferred from M/s Jupiter Cement Industries (unit of SKJ Coke Industries Ltd.) to M/s Shree Cement Ltd vide letter no. J-11011/692/2008-IA II (I) dated 31/07/2017. Further validity of EC was extended up to 29/10/2020 vide letter dated 18/10/2017

After that, the site of above proposed project has been taken-over by M/s. Shree Cement Ltd. The Business Transfer Agreement has been issued on 24/06/2016. Accordingly, EC has been transferred to M/s Shree Cement Ltd. on 31.07.2017 and validity of the same has been extended up to 29.10.2020 by MoEF&CC letter dated 18.10.2017.

Now, we are not going to install the clinker manufacturing unit and planning to install only Clinker Grinding Unit in the name of Shree Jharkhand Cement Plant (A unit of Shree Cement Ltd) with capacity 4.0 Million TPA Cement (Phase-1: 2.5 Million TPA Cement and Phase-2: 1.5 Million TPA Cement) along with Captive Power Plant of 20 MW and captive railway siding near village Hansda, PO Burudih, Dist. Saraikela-Kharsawan, Jahrkhand..

Therefore following are the capacities changes:

TABLE - 1

Sr. No	Description	Existing EC Capacity	Proposed Capacity	Remarks
1	Clinker (Million TPA)	0.54	Nil	Reduction of capacity
2	Cement (Million TPA)	1.11	4.0	Increase of capacity
3	CPP (MW)	20	20	No Change
4	DG Sets	3 MW	1250 KVA	Reduction of capacity

TABLE -2
SALIENT FEATURES OF THE PROJECT

Sr. No.	Particulars	Details
A.	Name of the Unit	**Shree Jharkhand Cement Plant (A Unit of Shree Cement Ltd.)**
	Size of the Project	Clinker Grinding Unit: 4.0 Million TPA Cement (Phase-1: 2.5 Million TPA Cement and Phase-2: 1.5 Million TPA Cement) Captive Power Plant: 20 MW Captive Railway Siding DG Set 1250 KVA
B.	Category of the Project	Proposal as per the provision of clause 7(ii) of EIA Notification 2006 and falls under S. No. '3' (Cement Plant), Project Activity '3 (b)'.
C.	Location Details	
	Location	Near village Hansda
	District	Saraikela-Kharsawan
	State	Jharkhand

Sr. No.	Particulars	Details
	Latitude& Longitude	22° 45' 15" N & 85° 51' 28"E
D.	Plant Area	No additional land will be required. Existing land of 110 Acres is sufficient.
E.	Environmental Setting Details *(with approximate aerial distance and direction from the plant site)*	
1.	Nearest Town/City	Raj Kharsawan- 5.0 km in SW direction Kharsawan- 5.0 km in NW direction
2.	Nearest Village	Hansda- 200 m in W direction Gajudih- 200 m in N direction Burudih- - 200 m in SE direction
3.	Nearest Railway Station	MahaliMarup Station 1.8 kms in E direction
4.	National Highway	Kandra-Saraikela – Chaibasa Highway- 5.5 km and and 11 km from Tata Nagar - Chaibasa Highway
5.	Nearest Airport	Ranchi Airport (~92 km in NW direction)
6.	Nearest River/Canal	Sona Nadi- 4.5 kms in N direction and SanjalNadi- 3.0 kmsin S direction.
7.	National Parks, Wild Life Sanctuaries, Reserved / Protected Forest etc. within 10km radius	No National Parks, Wild Life Sanctuaries within 10km radius PF in 6.5 kms in E Direction PF in 9.0 kms in E Direction PF in 9.8 kms in E Direction Open Jungalmainly Sal in S, N, NE &NW direction
8.	Seismic Zone	Stable Zone II
F.	Basic Requirements of the Project	
	Water Requirement	Clinker Grinding Unit: 490 KLD *Source:* Groundwater and River Sona Nadi
	Power Requirement (MW)	23 MW *Source:* JSEB/proposed CPP and D.G sets of 1250 kva for power back up
	Man Power Requirement	318 Persons
G.	Project Cost	Rs. 630 Cr.
H.	Environmental Protection Cost	Capital Cost - Rs. 30.0 Crores Recurring Cost - Rs. 1.0 Crores / annum

ENVIRONMENTAL MANAGEMENT PLAN

A comprehensive environmental management plan has been framed and will be implemented to keep the pollution levels within the prescribed limits. Following measures will be practiced.

Air Pollution Control

- Installation of Bag house with cement mill and ESP with Boiler
- Fly ash will be stored in silos.
- Clinker will be stored in clinker silos
- Gypsum, Slag, coal and limestone will be stored in covered shed.
- Better maintenance and installation of proper pollution control equipment like Bag filters will help in reducing such emissions.
- Low NOx burner and lime feeding with coal to control SO2 and NOX <100 mg/Nm from Boiler stack.

- Installation of dust-collectors at all material transfer points to control the dust emission within prescribed standards of < 30 mg/Nm^3.

About 43 Air Pollution Control Equipment (APCE) will be installed at various locations to control the emissions in cement mill circuit-1 and same 43 APCE will be installed with cement mill-2. Total 7 Air Pollution Control Equipment (APCE) will be installed with CPP as per the list given as below:

TABLE -3
AIR POLLUTION CONTROL DEVICES WITH CEMENT MILL-1 IN 1ST PHASE

Sr. No.	Location of Bag Filter	No. of Bag Filters	Capacity in m^3/hr
1	Fly ash truck unloader	1	50,000
2	Clinker truck unloder	3	25,000
3	Pond ash& Gypsum truck unloader	2	20,000
4	Coal and Slag truck unloader	4	20,000
5	Gypsum crusher ,elevator ,reversible conveyor and gantry	1	7,500
6	At TT for Belt conveyor (Pond Ash)	1	5,000
7	At TT for Belt conveyor (Gypsum)	1	5,000
8	Cement mill feed hopper Clinker	1	15,000
9	Cement mill feed hopper Gypsum/ Pondash	1	12,000
10	For weigh feeders	1	20,000
11	Cement mill bag house (VRM)	1	225000
12	Mill Reject circuit	1	15,000
13	Reject elevator	1	10,000
14	Clinker tank top & Clinker tank feed elevator TT	1	20,000
15	clinker tank extraction belt conv.	1	15,000
16	Flyash silo feed & extraction elevator boot	1	7,500
17	Flyash silo top	1	15,000
18	Flyash Mill feeding airslide	1	5,000
19	Cement Silo 1 top	1	7,500
20	Cement silo 2 top	1	7,500
21	Cement silo feeding elevator & Air Slide below bag house	1	10,000
22	Roto packer dedusting	4	40,000
23	Roto packer aux. dedusting	4	20,000
24	Packing plant feeding air slide	4	10,000
25	At TT for Belt conveyor for coal & Coal weigh feeder	1	5,000
26	Coal storage hopper with crusher	1	7,500
27	Coal storage bin for Hot air generator	1	5,000
28	Crusher Bag house	1	50,000
Total		**43**	

TABLE -4
AIR POLLUTION CONTROL DEVICES WITH CEMENT MILL-2 IN 2ND PHASE

Sr. No.	Location of Bag Filter	No. of Bag Filters	Capacity in m^3/hr
1	Fly ash truck unloader	1	25,000
2	Clinker truck unloder	3	12,500
3	Pond ash& Gypsum truck unloader	2	10,000
4	Coal and Slag truck unloader	4	10,000
5	Gypsum crusher ,elevator ,reversible conveyor and gantry	1	3,750

Sr. No.	Location of Bag Filter	No. of Bag	Capacity
6	At TT for Belt conveyor (Pond Ash)	1	2,500
7	At TT for Belt conveyor (Gypsum)	1	2,500
8	Cement mill feed hopper Clinker	1	7,500
9	Cement mill feed hopper Gypsum/ Pondash	1	6,000
10	For weigh feeders	1	10,000
11	Cement mill bag house (VRM / Ball mill with Roller Press)	1	125000
12	Mill Reject circuit	1	7,500
13	Reject elevator	1	5,000
14	Clinker tank top & Clinker tank feed elevator TT	1	10,000
15	clinker tank extraction belt conv.	1	7,500
16	Flyash silo feed & extraction elevator boot	1	3,750
17	Flyash silo top	1	7,500
18	Flyash Mill feeding airslide	1	2,500
19	Cement Silo 1 top	1	3,750
20	Cement silo 2 top	1	3,750
21	Cement silo feeding elevator & Air Slide below bag house	1	5,000
22	Roto packer dedusting	4	20,000
23	Roto packer aux. dedusting	4	10,000
24	Packing plant feeding air slide	4	5,000
25	At TT for Belt conveyor for coal & Coal weigh feeder	1	2,500
26	Coal storage hopper with crusher	1	3,750
27	Coal storage bin for Hot air generator	1	2,500
28	Coal Crusher Bag house	1	25,000
Total		**43**	

Sr. No.	Location of Bag Filter	No. of Bag Filters	Capacity m^3/hr
Captive Power Plant			
1	Coal transfer tower & Grizzle hopper	1	11660
2	Lime stone grizzle hopper	1	4400
3	Lime Stone Crusher House	1	19052
4	Coal Crusher House	1	31130
5	Between transfer tower and bunker	1	22330
6	Between transfer tower and bunker	1	12900
7	ESP with Boiler	1	199800
Total		7	

1.1.2 Water Pollution Control

- No industrial waste water will be generated from cement grinding unit.
- RO and softener plant will be installed and reject water will be used for mill spray.
- Domestic effluent will be treated in Sewage Treatment Plant and will be used for greenbelt development.
- Rain Water Harvesting will be practiced.
- No waste water will be discharged outside the plant premises.

1.1.3 Solid Waste Management

- No solid waste will be generated from the grinding unit.
- Dust collected from the dust collectors (Bag Filters) will be recycled back to the process.
- Ash generated from CPP will be used in cement manufacturing process.

- STP Sludge will be used as manure for greenbelt development / plantation.

Total Ash generated from the Captive Thermal Power Plant

Type	Unit	100% Indian Coal	100% Imported Coal
Bed ash quantity	TPD	148	133
Fly ash quantity	TPD	99	89
Total ash quantity	**TPD**	247	222

1.1.4 Hazardous Waste Management

Used oil generation will be 25 KL/Annum (approx.) which will be sold to CPCB registered recycler.

1.1.5 Noise Pollution Control

To maintain the noise level well within the prescribed limit inside the plant (85 dB (A)) and at the plant boundary (day time 75 dB (A) and Night Time 70 dB (A)), the following measures are taken:-

- In order to reduce the effect of noise pollution, earmuffs will be provided to all operators and employees working near the machinery.
- Proper maintenance, oiling and greasing of machines at regular intervals will be done to reduce generation of noise.
- Adequate silencers will be provided in all the diesel engines.
- Green Belt of appropriate width will be maintained inside the pant premises and at the plant boundary. 33% area of the project land will be developed for green belt.
- Periodical monitoring shall be done.

1.1.6 Green Belt Development/Plantation

- Greenbelt / plantation will be developed in 36.3 acres area (33% of the total plant area)
- Plantation will be done in and around the plant premises.
- 80% survival rate will be maintained with all possible efforts.
- Till August, 2018, 60% of total plantation target of 36.3 acres = 21.78 acres, Total trees: 3677 will be completed all along the plant boundary.
- Balance 40% of total plantation target of 36.3 acres= 14.5 acres, Total trees: 2452 will be completed by August, 2020.
- Local plant species will be preferred.

2.0 INTRODUCTION OF THE PROJECT/ BACKGROUND INFORMATION

(i) Identification of project and project proponent

Project Proponent

Shree Cement Limited (SCL) is an energy conscious and environment friendly sustainable business organization. SCL started its journey in the year 1979 and today, it is among India's leading cement manufacturing companies. Having witnessed an exponential growth in the last three decades, our endeavour continues to expand our capacity in the cement and power sector.

Cement Manufacturing Facilities

Presently, our cement production capacity stands at 29.3 Million tonnes. The Company's Cement and Clinker manufacturing facilities are located at Beawar & Ras in Rajasthan and Raipur in Chhattisgarh. It has split grinding units at seven locations viz. Khushkhera, Suratgarh, Jobner in Rajasthan, Roorkee in Uttarakhand, Aurangabad in Bihar, Bulandshahr in Uttar Pradesh and Panipat in Haryana.

Power Generation Facilities

Total Thermal Power Plants Capacity of the Company is 607 (including 102 MW Waste Heat Recovery Green Power Capacity which is the largest capacity of Green Power in the entire world cement industry excluding China). The power generated from these plants is primarily utilized for consumption in its own cement plants as well as to sell to the outside parties.

Products

The Company's pursues multi-brand portfolio strategy which consists of three brands viz Shree Jang Rodhak Cement, Bangur Cement and Rockstrong Cement. The Company currently has the highest market share in Rajasthan, Delhi and Haryana and distinguished positions at the top in Punjab, West Uttar Pradesh and Uttarakhand.

Corporate Sustainability

At SCL Sustainability is an integral part of our business and forms the core of our future growth strategy. We have always envisioned a growth which is inclusive and aims towards Total Prosperity of all the stakeholders. We have inculcated sustainability as business culture and all our efforts attempt to focus upon fostering innovation, ensuring prosperity, creating happiness and building trust in people.

Sustainability leads us to the enhancement of corporate values through innovation and sound business practices. This approach has helped us to proactively address challenges to our growth. Integration of sustainability in our day to day business activities helps us in identifying, analyzing, implementing control measures and in mitigating the multiple risks that we, our industry, our country and our planet faces. Sustainable business practices endorse optimal utilization of resources which enhances stakeholders' value.

Service towards the community

We believe that a company's prosperity is linked with that of its neighbouring communities. We touch the lives of the communities that surround our operations either on our own or in partnership with government bodies and the community at large. Empowering communities and working towards making a meaningful difference to them is an approach that is deeply engrained in our business. The vision is to become a catalyst of positive change in society.

Our approach towards development of the local community has been focused on the below five priority areas:

- Healthcare
- Education

- Infrastructure development
- Livelihood generation
- Women empowerment

Recognitions

- SCL ranked 2nd Best Company in the World on Carbon related matrix-2015
- First Indian Cement Company to join Cement Sustainability Initiative of WBCSD.
- First Indian Cement Company to be Member of World Economic Forum.
- First company in the World to use innovative techniques to utilize 100% Petcoke in its operations.
- First Cement Company of the World to fetch Certified Emission Reductions (CER's) on its Clean Development Mechanism project "Optimal Utilization of Clinker".
- First Indian cement company to issue Corporate Sustainability Report following the highest level "A+" for reporting triple bottom line performance
- New World Sustainability Champions by the World Economic Forum (WEF)
- CDP Climate Disclosure Leader for the year 2014
- Government of India recognized in-house R&D centre.

Awards

- 2016-17 Sustainability Disclosure Leadership Award 2016 by World CSR Congress
- 2016-17 Best Employer 2015 Award by the Employees Association of Rajasthan
- 2016-17 Excellence in Community Impact by Society of Human Resource Management, India
- 2016-17 Overall Excellence in Procurement and Outstanding Procurement Team by CPO forum India by Institute for Supply Management and Conference Asia
- 2016-17 Golden Peacock Environment Management by Institute of Directors
- 2016-17 State Level Bhamashaha Samman for Corporate Social Responsibility 2016 by Government of Rajasthan
- 2016-17 GreenCo Best Practices Award 2016 for Best Practices in Renewable Energy & GHG Emission Reduction by CII
- 2016-17 National award for Cost Management by Institute of Cost Accountants of India
- 2015-16 ABP News CSR leadership Award for Best Environment Friendly Project
- 2015-16 Green World Ambassador Award 2016 by the Green Organization London
- 2015-16 First prize in Cement Sector for Energy Conservation of Rajasthan Renewable Energy Conservation
- 2015 -16 NCCBM award for Best Improvement in Thermal Energy Performance 2013-14.
- 2015-16 NCCBM award for Best Improvement in Electrical Energy Performance 2013-14.
- 2015-16 NCCBM award for Best Quality Excellence 2013-14
- 2015-16 NCCBM award for Second Best Quality Excellence 2014-15

(ii) Brief description of nature of the project

Management is proposing to install Clinker Grinding Unit of capacity 4.0 Million TPA Cement (Phase-1: 2.5 Million TPA Cement and Phase-2: 1.5 Million TPA Cement) along with Captive Power Plant of 20 MW and captive railway siding with 1250 KVA DG set instead of proposed integrated cement plant near village Hansda, PO Burudih, Dist. Saraikela-Kharsawan, Jahrkhand.

As per EIA Notification, 2006 the project falls under S. No. '3' (Cement Plant), Project Activity '3 (b)'.

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

India has a lot of potential for development in the infrastructure and construction sector and the cement sector is expected to largely benefit from it. Some of the recent major government initiatives such as development of 98 smart cities are expected to provide a major boost to the sector.

Cement demand in India is expected to increase due to government's push for large infrastructure projects, leading to 45 million tonnes of cement needed in the next three to four years.

Demand in Target Market

Cement market for the proposed unit would be Chhattisgarh, West Bengal, Jharkhand and Odisha. This market has been identified keeping in mind the economic transportation system distance and location of other supplying clusters and existing supply from others plants of SCL.

(iv) Demand- Supply Gap

India's cement demand is expected to reach 550-600 Million Tonnes Per Annum (MTPA) by 2025. The housing sector is the biggest demand driver of cement, accounting for about 67 per cent of the total consumption in India. The other major consumers of cement include infrastructure at 13 per cent, commercial construction at 11 per cent and industrial construction at 9 percent.

To meet such rise in the demand, cement companies are expected to add 56 million tonnes (MT) of production capacity over the next three years. The cement production capacity of India may register a growth of eight per cent by next year end to 395 MT from the current level of 366 MT. It may be further increased to 421 MT by the end of 2017.At present; the country's per capita consumption stands at around 190 kg, much lower than the global average.

(v) Imports vs. Indigenous production

Gypsum and Coal are feasible to import along with local market purchase.

(vi) Export Possibility

It is expected that in the near future, export of cement does not seem to be viable. Cement market for the proposed Grinding Unit would be Chhattisgarh, West Bengal, Jharkhand and Odisha.

(vii) Domestic / Export Markets

The target market for the proposed unit would be mainly Chhattisgarh, West Bengal, Jharkhand and Odisha.

(viii) Employment Generation (Direct and Indirect) due to the project Sourcing

Total 318 person will be employed directly which includes 215 persons for cement plant and 103 persons for captive power plant.

3.0 PROJECT DESCRIPTION

(i) Type of Project including interlinked and independent projects if any

Management is proposing to install Clinker Grinding Unit of capacity 4.0 Million TPA Cement (Phase-1: 2.5 Million TPA Cement and Phase-2: 1.5 Million TPA Cement) along with Captive Power Plant of 20 MW and captive railway siding with 1250 KVA DG set instead of proposed integrated cement plant near village Hansda, PO Burudih, Dist. Saraikela-Kharsawan, Jahrkhand.

Interlinked and Independent Projects:

Interlinked Project:

Existing Cement Plants of Shree Cement Ltd. at Ras, Pali (Rajasthan), Beawar, Ajmer (Raj), Balodabazar (Chhattisgarh) and other clinker units; Environmental Clearance has already been obtained.

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

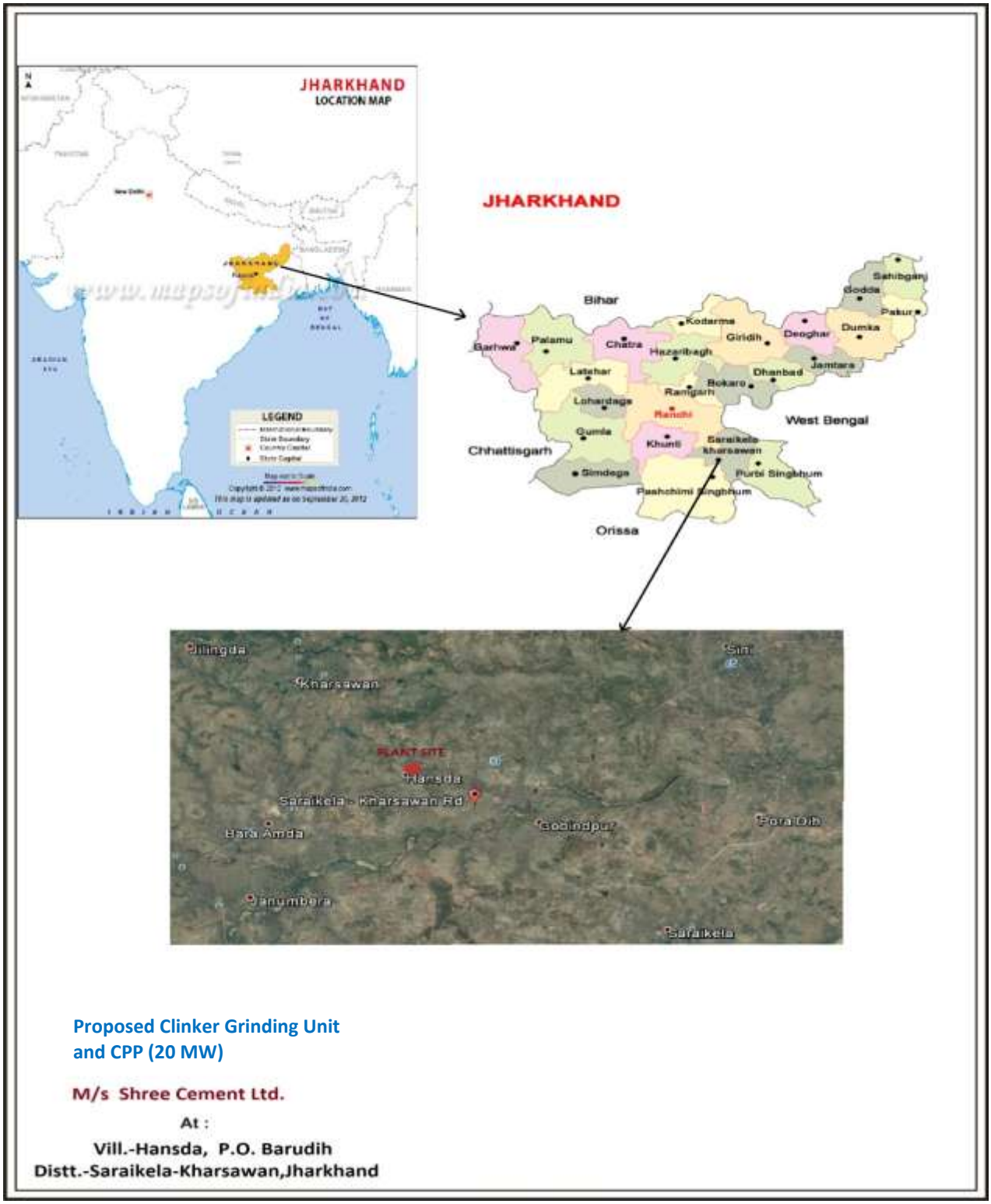

FIGURE - 1
LOCATION MAP

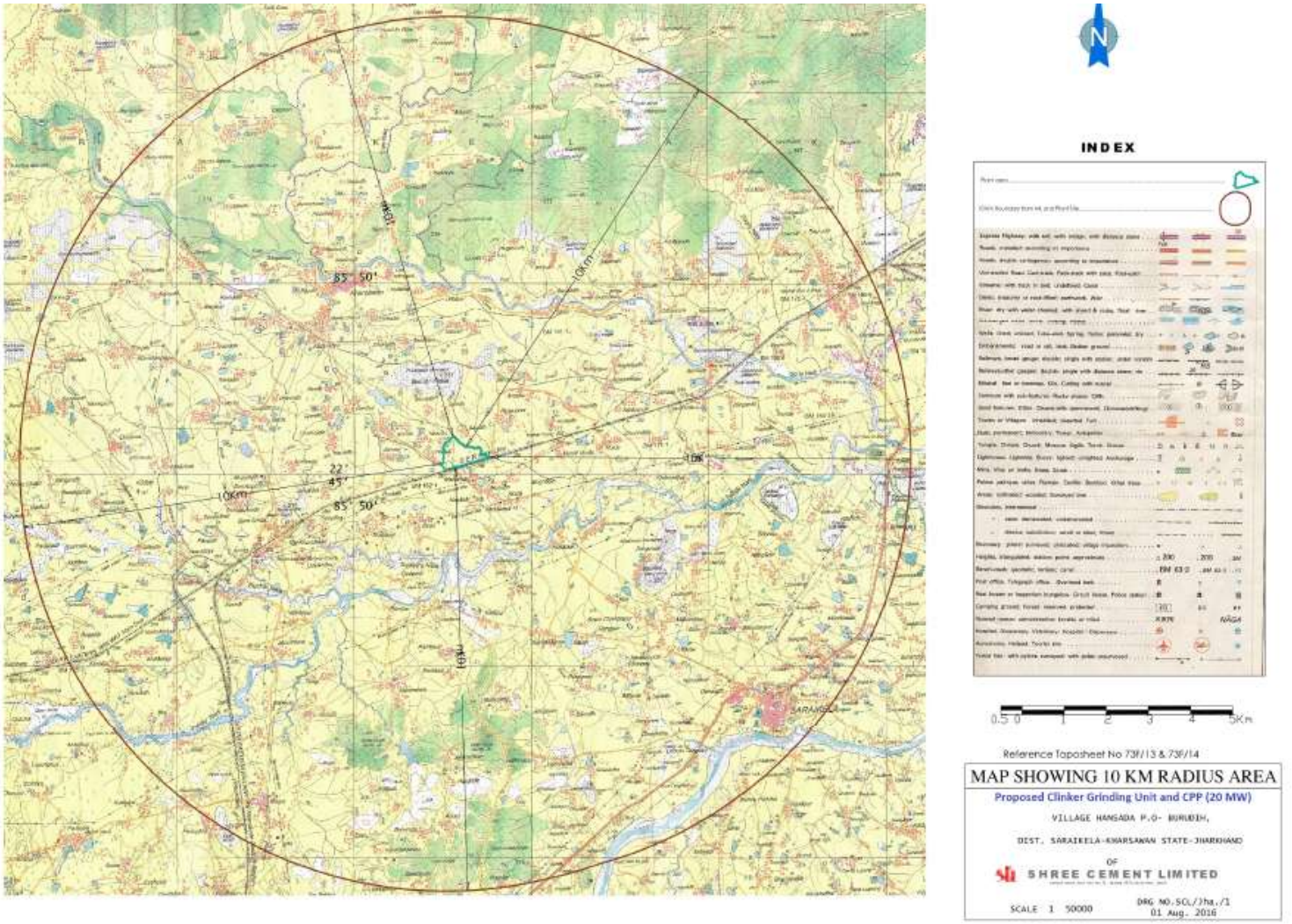

FIGURE - 2
ENVIRONMENTAL SETTING MAP

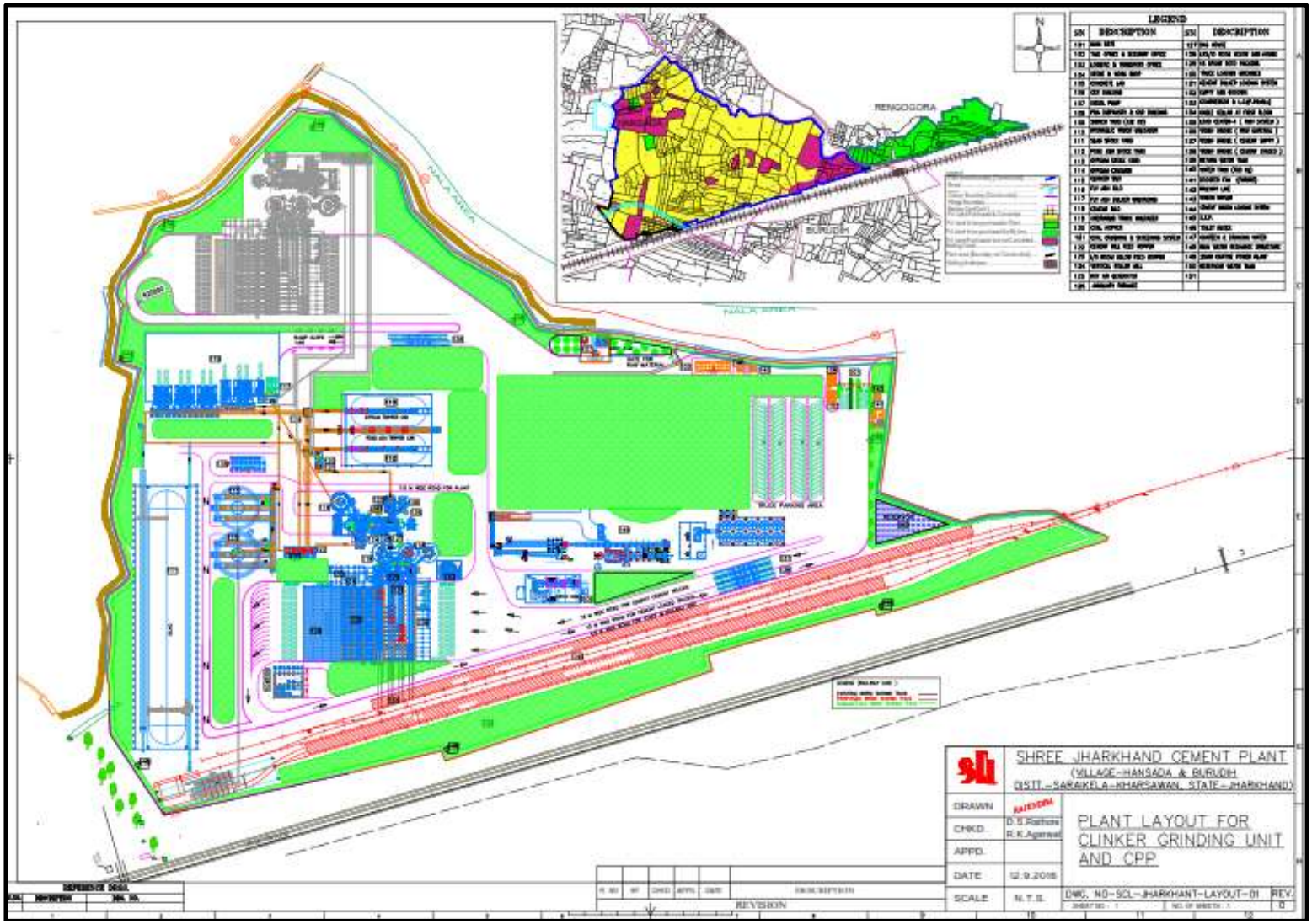

Figure – 3 Plant Layout

(iii) Details of alternative site consideration and basis of selecting the proposed site particularly the environmental considerations gone into should be highlighted.

No alternate site has been considered for the project.
The location of the project site is shown in the *Figure No. - 2*.
The co-ordinates of the proposed plant location are Latitude: 22° 45' 15" N and Longitude: 85° 51' 28" E.

The proposed location provides the following facilities to the plant:

- Availability of land, present land use / conditions & geography
- Communication facility for materials & manpower.
- Availability of resources for such project.
- Overall impact on environment and mitigation feasibility
- Socio – economic background
- Other infrastructural facilities

(iv) Size or magnitude of operation

Clinker Grinding Unit: 4.0 Million TPA Cement
(Phase-1: 2.5 Million TPA Cement and Phase-2: 1.5 Million TPA Cement)
Captive Power Plant: 20 MW
Captive Railway Siding
DG Set 1250 kva

(v) Project description with process details

The brief technical details of the cement drying & grinding system are as follows:

Project description:

Major steps involved in the process of Clinker Grinding Unit are given as below:

- Clinker storage & handling
- Fly Ash & Pond Ash storage & handling
- Gypsum storage & handling
- Coal and slag storage, handling, grinding and hot air generator
- Cement production and storage
- Cement packing and dispatch.

1. Clinker Storage &Handling

Clinker will be received at plant site by road & railway. Clinker will be received at the site will be unloaded and transported by a belt conveyor to the clinker silo. From the silo, clinker will be conveyed to the mill hopper by a combination of extraction equipment and belt conveyors. Clinker will be sourced from own and other clinker units. A railway siding will be installed within the site to receive the clinker by railway.

2. Fly Ash & Pond Ash Storage & Handling

Fly ash will be sourced from Thermal power station and will be received through closed bulkers & fed into silo through pneumatic system. However, in closed trucks will also be used to transport the dry fly ash and it will be unloaded through covered unloading hopper. Pond fly ash will be transported by trucks and stored at the site. After adequate drying, it will be used in cement manufacturing.

3. Gypsum Storage & Handling

Gypsum will be received by road through trucks and will be unloaded by truck tippler and transported to storage by a belt conveyor. Gypsum will be reclaimed by pay loader / dozer and fed to hopper for further conveying to Mill hoppers. Indian, imported, chemical and synthetic gypsum will be utilised. A railway siding will be explored near the site to receive the gypsum by railway and then it will be transported by road to the plant site.

4. Slag storage & handling

Slag will be received by road through trucks and unloaded by truck tippler and transported to storage by a belt conveyor. Slag will be reclaimed by reclaimer for further conveying to Mill hoppers by conveyors.

5. Coal Storage, Handling, Grinding and Hot Air Generator

Hot air is required for removal of moisture. This is generated from hot air generator. Coal will be used as fuel which is ground in Coal Mill/Crusher. Indian and imported coal will be utilised. Additional Hot air generator is proposed for anhydrite gypsum production.

6. Cement Production & Storage

In first phase one VRM of 2.5 Million TPA will be installed. In second phase VRM / Ball mill with roller press of capacity 1.5 Million TPA will be installed. For OPC production, clinker with gypsum will be ground in mill. In PPC production, clinker with gypsum and fly ash will be ground in mill. In PSC production, clinker with gypsum and slag will be ground in mill. For grinding the above products, hot air is required, for which the Hot Air Generator will be installed along with coal mill/Crusher.

7. Cement Packing and Dispatch

Rotary electronic packing machines are being used for packing of cement. Loading of packed bags onto the trucks is done by truck loading machines. Bags are of 50 kgs each. Loose cement would also be dispatched through closed bulkers to bulk consumers. Cement is dispatched by road. However, in future, rail network will be used for dispatch to long distance.

Captive Thermal Power Plant: 20 MW

In proposed captive thermal Power Plant, power will be generated by the utilization of thermal energy of steam in turbine that in turn rotates an alternator. The steam will be generated in the boiler by burning of various fuels. In proposed power plant Indian/imported coal will be used as the fuel & it will burn in the boiler to generate steam. The generated steam will utilize to rotate the Steam Turbine, which in turn rotates an alternator.

Indian/imported coal will be transported by truck at over power plant site than trucks will be unloaded by truck tippler in the Coal bunker. The Coal will feed to the crusher to crush it to the required size through the vibro feeder that regulates the flow. The crushed coal will fed the boiler bunkers through the conveyor belt.

After received coal in the boiler bunkers, the coal will be fed to the boiler furnace through the rotary/drag chain feeders in the controlled quantities. The coal will burn in the furnace & the resulted heat will be utilized to heat water & convert it into steam. The flue gases that will be generated on the burning of fuel will pass over the tubes of economizer & air pre-heater to utilize the heat carried by the flue gases going outside, otherwise heat will go waste. Now the flue gases pass through the ESP (Electro Static Precipitator) to chimney.

On waterside, water will be received by PTP (Pre-treatment Plant) from the existing resources. Here water will treat to get the required quality than it will be treated with lime & Dolomite in the High Rate Solid Contact Clarifier. Then clarified water will be fed to the RO plant where its properties will fine tuned to the required quality for DM system. In DM plant the required properties of water will be obtained and this DM water will feed to the boiler for the purpose of making steam. The cooling tower will feed with the RO water for its replenishment. The generated steam in boiler at required parameters will be fed to the turbine through the control valve. In turbine the thermal energy of steam will utilize to rotate it. The turbine in turn rotates an alternator (electric generator).

The generated electricity is evacuated from the alternator through the bus bar arrangement. Detail of 20 MW Proposed Captive Power plant as follows:

TABLE-5
FUEL, LIMESTONE ANALYSIS AND CALCULATION

Calculation for one unit of 20 MW			
		100% Indian Coal	**100% Imported Coal**
Description	**Unit**		
Type		**CFBC**	**CFBC**
Main Steam Pressure	kg/cm2. A	105	105
Main Steam Temperature	deg C	540±5	540±5
Main Steam Flow	(Kg/hr)	92000	92000
Fuel quantity at MCR	TPH	26.4	24.1
ASH HANDLING SYSTEM			

Fly Ash	TPH	6.2	5.5
Bed Ash	TPH	4.1	3.7
Ultimate analysis (% by weight)		**100% Indian Coal**	**100% Imported Coal**
Carbon	%	37.2	38.4
Hydrogen	%	5.9	5.9
Nitrogen	%	0.6	0.5
Oxygen	%	10.5	10.5
Sulfur	%	0.4	0.5
Moisture	%	10.4	10.4
Ash	%	35.0	33.8
Volatile Matter	%	24.2	24.2
GCV	**Kcal/kg**	**3700**	**3942**
Air required	Kg/kg of coal	8.5	8.7
Flue gas generated	kg/kg of coal	9.1	9.3
	m3/Sec	55.5	51.9
	Nm3/Sec	40.3	37.7
COAL CONS. AND ASH GENERATION			
Fuel quantity	Kg/hr	26355	24096
Total ash quantity	Kg/hr	10292	9231
Bed ash quantity	Kg/hr	4117	3693
Fly ash quantity	Kg/hr	6175	5539
Coal & Limestone Requirement			
Indian / Imported coal	TPD	633	578
Limestone	TPD	28	29
ID fan details			
ID fan flow	m3/sec	55.5	51.9
ID fan temperature	deg cent	140	140
SOx, SPM and Chimney Calculation			
Calculation for one unit of 20 MW			
Various Cases		**100% Indian Coal**	**100% Imported Coal**
Indian / Imported Coal Qty	Kg / Hr	26355	24096
Sulfur in each fuels	%	0.4	**0.5**
Total Sulfur in Fuel	%	0.4	0.7
Total Sulphur in Boiler	Kg / Hr	105.42	168.7
Sulphur capture in Boiler with Limestone	**%**	**98**	**98**
Sulfur at outlet of boiler	Kg / Hr	2	3.4
Sulfur Emission	Kg / Hr	2	3.4
So2 at Chimney	Kg / Hr	4	7
Height of Chimney (as per CPCB formula)	**Meter**	**22**	**25**

Chimney Height selected	**Meter**	**92**	
Flue gas Flow	m3/Sec	55.5	51.9
Flue gas velocity at Stack outlet	m/sec	22	22
Chimney Diameter at Exit	**m**	**1.8**	**1.7**
Flue gas flow	Nm3/Hr	145058	135782
Sox at Chimney at outlet	**mg/Nm3**	**29**	**50**
Dust load	Kg/Hr	6175	5539
Dust capture in ESP	%	99.92	99.9
Dust emission	Kg/Hr	4.9	4.4
Dust capture in FGD	%	N/A	
SPM at Chimney	**mg/Nm3**	**34**	**33**

D.G. Set (1250 KVA)

DG sets will be operated only for power back up.

EQUIPMENT DETAILS

Equipment Selection

A list of equipment and storage capacities are given below. To select a particular type of equipment or storage for the project, among others, the following issues have been considered:

- Equipment costs
- Energy consumption
- Raw material characteristics
- Sizes in which the equipment is available
- Lead times for particular types of equipment
- Operating experience with various types of equipment
- Ease of operation of equipment
- Product to be manufactured
- Site conditions
- Local skills available
- Environmental issues.

TABLE-6
MAIN MACHINERIES DETAIL & STORAGE FACILITY

Sr. No.	Description	Specification/ Capacity	
		Proposed for Kiln, Grinding Unit and CPP Integrated EC	**Revised Proposal for Grinding Unit and CPP**
A	**Plant and Machinery**		
1	Crusher	400 TPH	Nil
2	Stacker &Reclaimer	Lime stone Stacker – 200 TPH Lime stone Reclaimer – 200 TPH	Nil
3	Raw Mill (VRM)	2 X 80 TPH	Nil
4	Kiln & Cooler with 6 stage pre	1800 TPD	Nil

Sr. No.	Description	Specification/ Capacity	
		Proposed for Kiln, Grinding Unit and CPP Integrated EC	**Revised Proposal for Grinding Unit and CPP**
A	**Plant and Machinery**		
	heater		
5	Cement Mill	2 X 3168 TPD	Phase-I: 8500 TPD Phase-II: 5000 TPD
6	Coal Crusher for Hot air Generator	20 TPH	2*20 TPH
7	Packer	8 spouts x 2 Nos.	2*(16 spouts x 4 Nos)
(B)	**Storage Facilities for Clinker Grinding Unit**		
1	Limestone Stock pile	2 X 20000 MT	Nil
2	Iron ore hopper	1000 MT	Nil
3	Clinker tank (RCC)	25200 MT	2*60000MT
4	Gypsum Yard	2000 MT	2*15000 MT
5	Fly ash silo (RCC)	2*5000	2*5000 MT
7	Cement silo (RCC)	8000 MT	4*10000 MT
9	Coal Storage	2500 MT	16500 MT
10	Slag Storage Yard	16000 MT	100000 MT
11	Pond ash	Nil	15000 MT
12	HSD Tank	Nil	40 KL & 20 KL
(C)	**Hot Air Generator**	Nil	2*10 M kcal per hour
(E)	Captive Power Plant	20 MW	20 MW
(F)	**Ready Mix Concrete Plant:** for construction purpose only		

(vi) Raw materials required along with estimated quantity, likely source, marketing area of final products, mode of transportation of raw materials and finished product.

The sources for fly ash, Slag, gypsum and coal and their approximate distances from the proposed plant site are given below:

TABLE-7

RAW MATERIAL REQUIREMENTS FOR OPC, SOURCE & TRANSPORTATION

Sr. No.	Raw Material	Proportion, % by weight	Quantity (MTPA)	Source	Mode of Transportation
1	Clinker	95	3.80	Own and other plants	By Road & Rail Chhattisgarh: 550 kms (Road distance)
2	Gypsum	5	0.20	Rajasthan/Chemical /synthetic/imported Gypsum etc	By Road & Rail 1720 kms (Road distance)

TABLE – 8
RAW MATERIAL REQUIREMENTS FOR PPC, SOURCE & TRANSPORTATION

Sr. No.	Raw Material	Proportion % by weight	Quantity (MTPA)			Source	Mode of Transportation
			Phase-1 2.5 MMTPA	Phase-2 1.5 MMTPA	Total 4.0 MMTPA		
1.	Clinker	60	1.5	0.9	2.40	Own and other plants	By Road & Rail Chhattisgarh: 550 kms (Road distance)
2.	Gypsum	5	0.12	0.08	0.20	Rajasthan/Chemical /synthetic/imported gypsum & other sources etc.	By Road & Rail 1720 kms (Road distance)
3.	Fly ash	35	0.88	0.52	1.40	In house generation from power plant & other sources	By Road 50-100 Kms (Road distance)

TABLE - 9
RAW MATERIAL REQUIREMENTS FOR PSC, SOURCE & TRANSPORTATION

Sr. No.	Raw Material	Proportion % by weight	Quantity (MTPA)			Source	Mode of Transportation
			Phase-1 2.5 MMTPA	Phase-2 1.5 MMTPA	Total 4.0 MMTPA		
1.	Clinker	40	1.00	0.60	1.60	Own and other plants	By Road & Rail Chhattisgarh: 550 kms (Road distance)
2.	Gypsum	5	0.12	0.08	0.20	Rajasthan/Chemical /synthetic/imported gypsum & other sources etc.	By Road & Rail 1720 kms (Road distance)
3.	Slag	55	1.38	0.82	2.20	Integrated steel plant or from MBF's located in Jharkhand/ orissa	By Road 50-100 Kms (Road distance)

TABLE - 10
FUEL REQUIREMENT FOR GRINDING UNIT

Sr. No.	Raw Material	Proportion % by weight	Quantity (MTPA)			Source	Mode of Transportation
			Phase-1 2.5 MMTPA	Phase-2 1.5 MMTPA	Total 4.0 MMTPA		
1.	Coal	0.027	0.017	0.010	0.027	Local Market/ Indian and imported & other sources	Road & Rail 50-100 kms

Table - 11
Fuel Requirement for Captive Power Plant

Description	Unit	Indigenous	Imported	Source	Distance & Mode of Transportation
Indian / Imported coal	TPD	633	578	Local Market/ Indian and imported & other sources	Road & Rail 50-100 kms
Limestone	TPD	29	-	Source	Distance & Mode of Transportation

Marketing Area and Mode of transportation of Final Product

The main cement market for the proposed project would be Bihar, West Bengal and Jharkhand. Mode of transportation for final product will be road and railways. Initially, there is a railway line near to the site for loading and unloading activities.

(vii) Resources optimization/ recycling and reuse envisaged in the project, if any, should be briefly outlined.

- Fly ash generated as a waste from proposed CPP will be used for PPC manufacturing.
- Slag will be sources from integrated steel plant or from MBF's located in Jharkhand Orissa.
- No solid waste generation from the grinding unit. However, material collected by the dust collectors (Bag Filters) being and will automatically be recycled into the process.
- There will be no waste water generation from grinding unit.
- There will be no discharge outside the project premises.

(viii) Availability of water its source, energy /power requirement and source should be given.

The total water requirement is 490 KLD and no additional water will be required.

Water Flow Chart (Grinding Unit)

TABLE - 12
WATER REQUIREMENT

Description	Water Requirement (KLD)	
	Phase-1	Phase-2
Clinker Grinding Section	240	100
Captive Power Plant	-	100
Drinking and Domestic	40	10
Total	280	210
Grant Total	**490**	

Source: CGWA permission of 490 KLD will be obtained.

Power Requirement and Source

Total power requirement shall be around 23 MW (14 MW for phase -1 and additional 9 MW for phase-2). Source of power will be CPP and Grid. D.G sets of 1250 KVA will be installed for power back up.

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

- No waste water is being discharged outside the plant.
- No industrial waste generation in operation phase. Domestic waste water generated from office toilets and guest house will be disposed off in soak pit and septic tanks. STP would be installed after completion of project work. Treated water will be used for greenbelt development / plantation.
- RO reject water will be used for mill spray.
- No liquid and solid waste generation from cement plant.
- Used oil & grease generated from plant machinery/Gear boxes and DG set will be sold to the CPCB authorized recycler.

4.0 Site Analysis

(i) Connectivity

ACCESS

Road: The land is a 5.5 kms from to SH -40 connecting Kardra-Saraikela-Chaibasa.

Rail: The nearest railway station is Mahali Marup Station at approximately 1.8 kms in E direction.

Air: The nearest airport is at Ranchi at about 92 km.

Sea: The nearest sea port is at Kolkata, West Bengal, approximately 260 kms away.

The site is well connected with communication facilities like telephone, fax, wireless and telex and as such, no constraints are envisaged in this aspect as the Tehsil and District headquarters are near to the site.

(ii) Land Form, Land use and Land ownership

The total project area is 110 acres and is in possession of SCL.

(iii) Topography

The shear zone separates a northern terrain of highly metamorphosed rocks and southern terrain of relatively less metamorphosed rocks. Sarkar and Saha (1977) have shown that this shear zone separates two Precambrian provinces of the Indian shield: an older province in the south which stabilized after the Iron ore orogenic cycle closing about 2900 million years

ago and younger province in the north that underwent the Singhbhum orogenic cycle closing at about 850 million years ago. The rock succession of the tract in the south of the shear zone consists of a lower Archaean basement of older metamorphic group invaded by the Biotitetonalite gneiss. The iron ore group was deposited over lower Archaean basement. These rocks were folded about NNE to NNW trending fold axes and low grade metamorphism culminating in the emplacement of the Singhbhum Granite(iron ore orogeny) After a long period of erosion , rocks of Singhbhum and Gangpur group were laid down along the northern edge of the stabilized iron ore Craton. The proposed plant area is situated within the batholithic mass of Singhbhum granite. The batholiths consist of several domed up intrusive (Saha.1975) varying in composition from biotitegranidiorite to adamalite and leuco granite. The main mass of Singhbhum granite shows a distinct N-S or NNE -SSW foliation in parallelism with the foliation of the host rocks of the iron ore group.

The entire study area in and around the proposed project site is occupied by compact and hard rocks belonging to Archaean period which are devoid of any primary porosity. The ground water in such formation occurs within the secondary porosity such as joints, fractures and bedding plains.

The ground water occurrence and movement is basically controlled by the prevailing morphology and intensity of structural discontinuities. The intensity of joints, fractures, foliation planes are more along anticlinal or synclinal flexures. Therefore structure is another controlling factor for occurrence and movement of ground water over the area.

The rainfall is the main source groundwater recharge in the area. The inconsistency between fracture zone is complicated in nature. The ground water therefore moves slow and find its way through the fractures and open joints.

(iv) Existing land use pattern (agriculture, non-agriculture, forest, water bodies (including area under CRZ)), shortest distances from the periphery of the project to periphery of the forests, national park, wild life sanctuary, eco sensitive areas, water bodies (distance from the HFL of the river), CRZ. In case of notified industrial area, a copy of the Gazette notification should be given.

TABLE - 13
ENVIRONMENTAL SETTINGS OF THE AREA

1.	Nearest Town/City	Raj Kharswan- 5.0 km in SW direction Kharswan- 5.0 km in NW direction
2.	Nearest Village	Hansda- 200 m in W direction Gajudih- 200 m in N direction Burudih- - 200 m in SE direction
3.	Nearest Railway Station	MahaliMarup Station 1.8 kms in E direction
4.	National Highway	Kandra-Saraikela – Chaibasa Highway- 5.5 km and and 11 km from Tata Nagar - Chaibasa Highway
5.	Nearest Airport	Ranchi Airport (~92 km in NW direction)
6.	Nearest River/Canal	SonaNadi- 4.5 kms in N direction and SanjalNadi- 3.0 kmsin S direction.
7.	Archaeological Important Place	None within 10km radius

	within 10 km radius	
8.	National Parks, Wild Life Sanctuaries, Reserved / Protected Forest etc. within 10km radius	No National Parks, Wild Life Sanctuaries within 10km radius PF in 6.5 kms in E Direction PF in 9.0 kms in E Direction PF in 9.8 kms in E Direction Open Jungalmainly Sal in S, N, NE &NW direction
9.	Seismic Zone	Stable Zone II

(v) Existing Infrastructure

Total proposed land area is 110 Acres.
Adequate infrastructural facilities like workshop, Machinery stores, Cranes, Monorails and Pulley blocks, Security office, parking area etc. will be made available at the site.

(vi) Soil Classification

The district has mainly the Alluvium types of soil.

(vii) Climatic data from secondary sources

The area has generally moderate climate. The temperature variation is from 7.8°C to 46°C.The average annual rainfall in the area is about 1320 mm. The average humidity, during the monsoon season is about 85% – 92% and in Pre-monsoon (April-June) is about 70-80%.

(viii) Social Infrastructure available

The nearest major city are Raj Kharsawan- 5.0 km in SW direction and Kharsawan- 5.0 km in NW direction from the project site.
All required facilities such as schools, dispensaries, hospitals, places of worship, market etc are available in nearby area of the project site.

1.0 Planning Brief

(i) Planning Concept (type of industries, facilities, transportation etc.) Town and country Planning/Development authority classification.

Proposed unit is clinker grinding unit. Transportation of raw material and final product will be carried out via existing road and rail network.

(ii) Population Projection

The Hansda village comprise of 30 households having a population of 155. The average number of members per household is approximately 5. The total male population is 77, where as that of the females 78. This data gives a sex ratio of 1001 females for every 1000 males. Directly 318 people will be given employment.

(iii) Land use planning

The total project area is 110 acres private land. Land is classified as developing land which is suitable for industrialization.

33% of the total project area will be covered under green belt & plantation in order to reduce dust & noise pollution levels & to increase aesthetic beauty of the area.

(iv) Assessment of infrastructure demand (Physical &Social)

The unit is established in industrial area. All required infrastructure are developed at the site.

(v) Amenities/Facilities

SCL will develop the Amenities/Facilities in nearby area of the proposed project site as per requirements under Corporate Social Responsibilities programs.

6.0 Proposed Infrastructure

(i) Industrial Area

Following infrastructure facilities are proposed:

- **Workshop**

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

- **Machinery stores**

  A store for storing tools, spare parts, consumables, etc. Open area earmarked for storing machinery and construction materials for the proposed construction work.

- **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.

- **Dispensary**

  A small dispensary with first aid facilities in the plant premises.

- **Parking**

  Adequate parking space in the plant premises for the parking of vehicles.

(ii) Residential Area (Non processing area)

Guest house and canteen proposed at the site.

(iii) Green Belt

Greenbelt / plantation will be developed in 36.3 acres area (33% of the total plant area)

(iv) Social Infrastructure

Proposed project will result in growth of the surrounding areas by increased direct and indirect employment opportunities in the region including ancillary development and supporting infrastructure.

The installation of proposed plant will lead to the development of certain local ancillary facilities and consequent employment opportunities. Further the proposed cement project will also lead to the development of market, trade centres, activities etc.

In addition to the above, SCL has a track record of engaging the local communities and extending several social services to the nearby villages.

(v) Connectivity

Road: The land is a 5.5 kms from to SH -40 connecting Kardra-Saraikela-Chaibasa.

Rail: The nearest railway station is Mahali Marup Station at approximately 1.8 kms in E direction.

Air: The nearest airport is at Ranchi at about 92 km.

Sea: The nearest sea port is at Kolkata, West Bengal, approximately 260 kms away.

The site is well connected with communication facilities like telephone, fax, wireless and telex and as such, no constraints are envisaged in this aspect as the Tehsil and District headquarters are near to the site.

(vi) Drinking Water

RO plant will be used for drinking purpose.

(vii) Sewerage system (40 KLD)

Domestic waste water generated from office toilets and guest house is disposed off in soak pit and septic tanks. STP will be installed after completion of project work and treated water will be used for plantation. Process flow diagram of STP plant is given below:

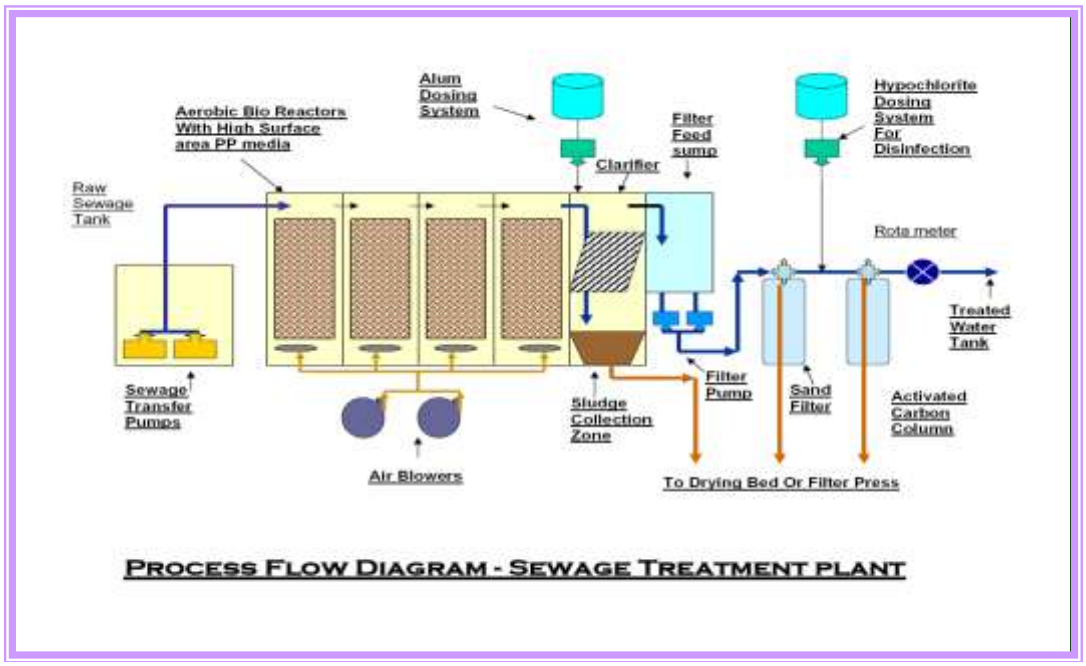

TABLE - 14
QUALITY OF STP TREATED WATER

Parameters	Quality of Raw Sewage	Quality of Treated Sewage
pH	6.0 to 8.0	6.5 to 9
BOD	300 ppm	30 ppm
COD	400 ppm	250 ppm
TSS	300 ppm	100 ppm
O & G	50 ppm	10 ppm

Process description of STP plant

Bar screen chamber followed by collection cum equalization tank followed by Fluidized Aerobic Bed Reactors (2 Nos.) will be provided with coarse air bubble diffusion system followed by Tube Settler Tank in the STP. The clear supernatant after disinfecting by chlorination will be passed through dual filter and activated Carbon filter before will be collected in the treated water tank. The sludge generated from the FAB will be passed through sludge digester and dried and the filtrate will be collected and sent back to the equalization tank and the dried cakes will be used as manure. The treated water will be used for plantation activities.

(viii) Industrial Waste management

No industrial waste water will be generated from cement grinding unit. However, waste water generated from RO and softener unit shall be reused for mill spray.

(ix) Solid waste management

No solid waste generation from the cement plant. However, material collected by the dust collectors (Bag Filters) will automatically be recycled in the process

(x) Power requirement and source

Total power requirement shall be around 23 MW (14 MW for phase -1 and additional 9 MW for phase-2). Source of power will be CPP and Grid. D.G sets of 1250 KVA will be installed for power back up.

7.0 Rehabilitation and Resettlement (R & R) Plan

(i) Policy to be adopted (Central/State)in respect of the project affected persons including home oustees, land oustees and landless labourer (brief outline to be given)

Not Applicable

8.0 Project Schedule and Cost Estimates

(i) Likely date of start of construction and likely date of completion (time schedule for the project to be given)

After getting the EC, 36 Months will be required for completion of project work.

(ii) Estimated project cost along with analysis in terms of economic viability of the project

The total capital cost of project will be Rs. 630 Crores.

Rs in Crore

Particulars	Phase-1, 2.5 MMTPA Capacity	Phase-2, 1.5 MMTPA Capacity	CPP 20 MW	Total Cost
Land & Site Development	10	0	0	10
Building & other civil structures	147	63	15	225
Plant & Machinery	167.3	71.7	65	304
Miscellaneous Fixed Assets	70.2	15.8	5	91
Total	**394.5**	**150.5**	**85**	**630**

9.0 ANALYSIS OF PROPOSAL

The state of Bihar will get revenues in terms of taxes, local people will get opportunity in terms of direct/ indirect employment, business opportunity like transport of Cement to the

market, and fly ash transport from nearby Power Plant, in short nearby people will get opportunity to improve their livelihood.

10.0 CONCLUSION

Proposed project will result in growth of the surrounding areas by increased direct and indirect employment opportunities in the region including ancillary development and supporting infrastructure. Special emphasis on Financial and Social benefits will be given to the local people including tribal population, if any, in the area. Development of social amenities will be in the form of medical facilities and education to under privileged. No adverse effect on environment is envisaged as proper mitigation measure will be taken up for the same.

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