PRE-FEASIBILITY REPORT

On

Proposed Expansion of Existing 1 X 100 TPA Sponge Iron Plant by Installing 08 MW Captive Power Plant based on 2 x 11 TPH WHRB and 30 TPH AFBC Boiler

OF

M/s. EMAAR ALLOYS PVT. LTD.

At-Tuidungri, Chandil, Saraikela Kharsawan Disrict,Jharkhand

Prepared by:-

SEPTEMBER-2015

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CHAPTER - I
EXECUTIVE SUMMARY

1	Name of the project	**Proposed expansion of existing spone iron plant by installing 08 MW Captive Power Plant based on WHRB and AFBC Boiler M/s Emaar Alloys Pvt. Ltd.**
2	Sl. No. in the schedule	3(a)
3	Registered Office	Nikant Bhuwan, Raja Apartment, 4th Floor, Room no: 23,Post Office Road(Munshi Muhalla), Mango, Jamshedpur, East Singhbhum, Jharkhand
4	Name of the promoters	Mr. Abhimanyu Kumar Singh Nikant Bhuwan, Raja Apartment, 4th Floor, Room no: 23,Post Office Road(Munshi Muhalla), Mango, Jamshedpur, East Singhbhum, Jharkhand
5	Present Business	Sponge Iron Business
6	Area of Plant	19.00 Acres
7	Topo Sheet No.	73 F/4
8	Latitude Longitude	22° 58’ 35.3’’ N 85° 58’ 18.4’’ E
9	Proposed Capacity	
	Existing	2 X 100 TPD Sponge Iron Kiln Plant- 62,000 MT/Annum DRI
	Expansion	8 MW Captive Power Plant based on WHRB and AFBC Boiler
10	Cost of Project	3625.00 Lakhs
11	Manpower Requirement	Existing – 150 Nos. Proposed – 70 Nos Total Manpower Requirement-220 Nos. (after expansion)
12	Water Requirement	Existing – 55 m^3/day Proposed – 180 m^3/day Total Water Requirement - 235 m^3/day (after expansion)
12	Power Requirement	Existing – 9.0 MW Expansion- Not Required Total Power Requirement- 9.0 MW (after expansion)
13	Nearest Railway Station/airport along with distance in kms.	Tata Nagar Railway Station- 30 km.

14	Nearest town, City, District Head quarters along with distance in kms.	Jamshedpur-30 Km
15	Village Panchayats, Zilla Paris had,Municipal corporation, Local telephone nos. to be given) body (complete postal addresses with telephone no.s to be given)	At- Village- Tuidungri Block & Tehsil- Chandil Village Panchayat-Chowka Zilla Parishad-Sareikela District- Sareikela Kharsawan, Jharkhand

1.0 Introduction

1.1 Identification of Project and Project Proponent

M/s Emaar Alloys Pvt. Ltd. has proposed to expand its existing sponge iron plant by installing 08 MW captive power plant based on WHRB and AFBC Boiler At- Tuidungri,Chowka, Sareikela Kharsawan District, Jharkhand. The Emaar Alloys Pvt. Ltd is having its Registered office Nikant Bhuwan, Raja Apartment, 4th Floor, Room no: 23,Post Office Road(Munshi Muhalla), Mango, Jamshedpur, East Singhbhum, Jharkhand.

M/s Emaar Alloys (P) Ltd: A private limited company in the business of production of Sponge Iron.

The company has been promoted by a Group of experienced businessmen who are presently engaged in production of Sponge Iron. The company is professionally managed and has successfully operated Sponge Iron Plant in the past.

Directors

1. Mr. Vikash Kumar Sinha
2. Mr. Manoj Kumar Sinha
3. Mr. Abhimanyu Kumar Singh

1.2 Employment Generation

It is estimated that the total employment generation due after proposed expansion project will be 220.

2.0 Project Description

2.1 Location

The proposed expansion project will be located At-Tuidungri, Chowka, Sareikela Kharsawan District, Jharkhand state (Ref: Topo sheet 73C/10& 73C/11). The Latitude and Longitude of the proposed site 22^0 58' 35.3"N and 85^0 58' 18.4"E respectively.

2.2 Site Selection

Site is located At-Tuidungri, Chowka, Sareikela Kharsawan District, Jharkhand state. The site has following facilities:

- Proximity to the sources of base raw material,
- Availability of common Infrastructure facilities / utilities (water / power etc.),

2.3 Technology Selection

Over the last few years, there has been a great change in the Indian Economic Scenario due to Global slowdown which affected the whole world including India. The major sector which took the toll was Steel & Power Sector where huge investments were made by both Financial Institutions & Private Equity Promoters.

To make end product economically viable in present fluctuating market the promoters of M/s Emaar Alloys have decided to go for expansion and add Captive Power plant to make its product more economical & to withstand market fluctuations. Power from proposed captive plant will be used to lower production cost of Sponge Iron & other products.

2.4 Product Profile

M/s Emaar Alloys Pvt. Ltd. has proposed to expand its existing sponge iron plant by installing 08 MW captive power plant based on WHRB and AFBC Boiler At-Village-Tuidungri, Chowka, Sareikela Kharsawan District, Jharkhand.

Table 1.0 Product Profile(Existing & Expansion)

SI. No.	Units		Product	Configuration	Capacity
	Existing	**Expansion**			
1	Sponge Iron Plant	--	DRI	2 X 100 TPD	66,000 T/Annum
2		08 MW Captive Power plant based on WHRB and AFBC Boiler	8 MW	2 X 11 TPH WHRB Boiler and 1 X 30 TPH AFBC Boiler	(467.92 Lakh Units/Annum)

2.5 Raw Material Requirement

Table 1.1 Requirement of Raw Materials(existing & Expansion)

Sl No.	Description	Quantity In TPA	Source	Mode of Transport
A. Sponge Iron Plant(Existing)				
1	Iron Ore	1,05,600	From Nearby mines	Road/Rail

2	Coal	85,800	From CCL/ Imported from Indonesia	Road/Rail
3	Dolomite	1980	Chhattisgarh	Road/Rail
B. Captive Power Plant				
1	Coal(E & F Grade)	15,250 MT	From CCL	Road/Rail
2	Dolo Char	15,250 MT	In- house	--
3	Coal Fines	7,500 MT	From CCL	Road/Rail

Water and Power Requirement

For the project the water requirement is about 180 m3/Day . This will be sufficient for the present requirement.

No additional power is required for the proposed expansion. Only construction power of not more than 0.5 MVA will be met from existing 11 KV HT line of existing plant.

2.6 Waste Generation and Management

Waste water generated from proposed power plant and others is depicted below.

Table 1.2 Waste Water Generations and Reuse

Process Unit	Waste water qty (m^3/day)	Source	Waste water characteristics	Waste water management
Captive Power Plant	18 m^3/day	Cooling	Effluent	Will be treated in Neutralizing pit and reused for greenbelt

Table 1.3 Solid Waste Generation and Management

Units	Solid Wastes	Qty In TPD	Disposal practice
WHRB & ESP (08 MW CPP)	Fly Ash	48.00	Sale to fly ash bricks / blocks manufacturers – outside party
AFBC (30 TPH)	Fly Ash and Bottom Ash	60.0	Bottom ash for road making and Fly ash sale to cement manufacturers.

3.0 Site Analysis

3.1 Connectivity

The plant is located within the existing plant premises at Tuidungri, Chowka, Jharkhand. The site is located at Tuidungri, Chowka which is well connected from National Highway No: 33. The plant site is 30 Kms away from the steel city of Jamshedpur & 1½ kms from Highway No: 33. The nearest railway station is at Tata

Nagar.

3.2 Topography and Existing Land use Pattern

The land is fallow and non cultivable land. The proposed power plant will be constructed in vacant land already in the closed premises of M/s Emaar Alloys (P) Ltd. The soil in the area is generally brownish and coarse, and has appropriate SBC for installation of an industrial unit and the existing units have been installed accordingly.

3.3 Climate Data

The climate of the Sareikela Kharsawan district is characterized by hot summer with low humidity. During the summer maximum temperature is 48^0 C. The temperature in the month of December is lowest i.e. 6^0 C. The average annual rainfall is 1534.5 mm.

4.0 Land Use Planning

No additional land is required for the proposed expansion as the proposed power plant will be constructed in vacant land already in the closed premises of M/s Emaar Alloys (P) Ltd.

5.0 Proposed Infrastructure

5.1 Industrial Area

The industrial / processing area will comprise of existing Sponge Iron Plant & proposed Captive Power Plant within the premises of M/s Emaar Alloys (P) Ltd including their respective ancillaries like Raw Material Handling unit, Cooling Towers, water tank / reservoirs, Finished Material Storage Yard, Fuel Handling plant, Air Cooled Condensers etc. The same is being shown in the Plant Layout enclosed with this report.

5.2 Green Belt

Green Belt will be developed over 33% of the plant area. Indigenous trees will be planted in three tire system. Plantation will be started along with the construction. Total area of 6.30 acres will be developed as green belt.

5.3 Utility area

Utility area has already been developed by the plant such as Canteen, Cycle / Car Parking area, Guest House, Administration Building, Stores, Storage yard (open), Labour Hut etc. There is no proposal of any residential colony as the required manpower will be sourced from local population. Few highly skilled posts may be filled from outsider for whom Guest House accommodation will be given within plant area.

6.0 Rehabilitation & Resettlements (R & R) Plan

The land 19.00 Acres has been purchased from the owners (rayats) on a mutually agreed price. Full amount has been paid and land acquired and boundary wall already constructed. At present sponge iron plant 2x100 TPD is in production.

There is no displacement of any houses, habitation or livestock. Also the land acquisition has not rendered any rayat land less or any worker on the land jobless, thus the project is not covered under R&R plan. However preference in employment will be given to land donors and laborers previously working on the land.

7.0 Project Schedule & Cost Estimates

7.1 Project Schedule

The total proposed expansion project implementation schedule is 24 months from zero date, land development. The external agencies such as consultant, machinery suppliers, contractors of civil construction and equipment will be selected carefully well in advance.

7.2 Project Cost

An indicative estimated capital cost of the proposed expansion is Rs. 3625.00. Lacs, including the pre-operative expenses, contingency and interest during construction.

8.0 Analysis of Proposal

The socio-economic benefits of the proposed expansion project are as follows:

- Improvement and construction of road network in the nearby villages.
- Extension & renovation of Local School buildings with playgrounds.
- Social awareness programme will further improve the quality of life and standard of living such as sanitation and hygiene, HIV Prevention Programme etc.
- Implementation of adult education and female education programmes in the villages surrounding the project area.
- Financial assistance to talented and poor students for higher studies.(Management/Engineering/Medical science)
- Expected to provide employment to 70 persons.

CHAPTER – 02
INTRODUCTION

2.1 Introduction

M/s Emaar Alloys Pvt. Ltd. has proposed to expand its existing sponge iron plant by installing 08 MW captive power plant based on WHRB and AFBC Boiler At- Tuidungri, Chowka, Sareikela Kharsawan District, Jharkhand. The Emaar Alloys Pvt. Ltd is having its Registered office Nikant Bhuwan, Raja Apartment, 4th Floor, Room no: 23,Post Office Road(Munshi Muhalla), Mango, Jamshedpur, East Singhbhum, Jharkhand.

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Directors

Mr. Vikash Kumar Sinha

Mr. Manoj Kumar Sinha

Mr. Abhimanyu Kumar Singh

2.3 Description of Nature of the project

M/s Emaar Alloys Pvt. Ltd. has proposed to expand its existing sponge iron plant by installing 08 MW captive power plant based on WHRB and AFBC Boiler At- Tuidungri, Chowka, Sareikela Kharsawan District, Jharkhand.

Table 2.0 Project Profile(Existing & Expansion)

SI. No.	Units		Product	Configuration	Capacity
	Existing	Expansion			
1	Sponge Iron Plant	--	DRI	2 X 100 TPD	66,000 T/Annum
2	--	08 MW Captive Power plant based on WHRB and AFBC Boiler	8 MW	2 X 11 TPH WHRB Boiler and 1 X 30 TPH AFBC Boiler	(467.92 Lakh Units/Annum)

2.4 Need of the Project and its Importance to the Country and/or Region

India's steel demand may grow 3.3 per cent this year by higher demand from construction and manufacturing sectors as per the World Steel Association (WSA). "In India, steel demand is expected to grow to 76.2 million tons in 2014, following a 1.8

per cent growth in 2013," the WSA said in its short-range outlook for 2014 and 2015 released recently.

The World Steel Association industry organization, whose members represent about 85 per cent of the world's steel production, expects the growth on an improved outlook for the construction and manufacturing sectors, although this may be constrained by high inflation and structural problems.

"Despite uncertainties relating to Global cues the steel demand is projected to grow by 4.5 per cent in 2015, supported by the expectation that structural reforms will be implemented," as per WSA.

Globally, steel use would increase by 3.1 per cent to 1,527 million tonnes in 2014, following growth of 3.6 per cent in 2013. In 2015, this would increase by 3.3 per cent to 1,576 million tonnes.

"In 2013, world steel demand grew higher than the previous forecasts due to a stronger-than-expected performance in the developed world in the second half of the year. In particular, the recovery in the US gained strength," said Hans Jurgen Kerkhoff, Chairman of the Worldsteel Economics Committee.

Despite the bottomed-out downturn in the EU, growth this year will be impacted as many emerging economies continue to struggle with structural issues and financial market volatility along with deceleration in China.

"In 2015, growth in most parts of the world will accelerate, thanks to a continuing steady recovery in the developed economies and an improvement in the situation for the emerging economies," he said.

China's steel demand will decelerate further and this will prevent the broad recovery momentum from registering a higher global growth rate for 2015, Kerkhoff said.

Steel is one of the most important products of the modern world and is of strategic importance for any industrial nation. Historically, all nations during their industrialization phase have been supported by a strong steel industry of their own. From construction, industrial machinery to consumer products, steel finds a wide variety of applications. It is also an industry with diverse technologies based on the nature and extent of use of raw materials.

The steel industry is characterized by high capital intensity, high dependence on bulk raw materials, cyclical growth trends, perpetual over-capacity and relatively low profitability. This is the reason why the problems associated with the steel industry are

generally complex requiring larger governmental and social interventions for its sustainable growth. Also, given their criticality to nation building, almost all nations with strong steel industry today had started their journey with steel industry in the state sector. Today, the industry is largely privatized and public owned with the government holding significantly reduced equity.

India is the 4th largest producer of steel in the world accounting for production of 81.54million tonnes of crude steel in 2013-14. It also holds the third position in consumption of steel.

The industry exists in different sizes and with varying degree of vertical and horizontal integration. After the liberalization of the economic policies in the

1990s coupled with deregulation of the steel industry, the structure of the industry has changed significantly. The role of the government is no longer that of a regulator, rather of a facilitator to industrial development of the industry in removing bottlenecks and making the sector globally competitive.

The National Steel Policy 2005 (NSP 2005) sought to indicate ways and means of consolidating the gains flowing out of the new economic order and to chart out a road map for sustained and efficient growth of the Indian steel industry.

However, since 2008, the global economies, including India, have experienced a significant turbulence and uncertainty. Despite some stability coming back from actions taken in response to the emerging challenges worldwide, the global economic recovery remains fragile. This has affected the growth path of the Indian steel industry in more than one ways. The world witnessed volatility in commodity prices, more particularly in the case of those related to the steel industry such as iron ore, coking coal, nickel, manganese ores, and non-coking coal. This left a profound impact on the steel industry globally since 2008 and running into 2014. Also, during this period, global steel production and consumption growth have slowed down and the world is faced with an excess capacity in crude steel making to the tune of over 550 million tonnes by now. While the Indian steel demand and production have grown steadily till 2011-12, the same also has lost pace in the past two years.

The unfolding developments mentioned above, both on the demand and supply sides have warranted a re-look at the different elements of the NSP 2005. In the new environment new investments in the industry have to be steered with appropriate policy support to ensure that production of steel matches the pace of growth in consumption every year in the decades ahead. Fresh policy initiatives are needed to ensure that the

industry follows a path that is sustainable when it comes to capacity addition, environment, raw materials sourcing, quality of steel products and the use of technology in steel making. Special attention is also required to be paid to the indigenous R and D efforts and induction of most modern technologies ensure that over time, the country's industry can reach and preferably surpass global efficiency benchmarks. Most importantly, it is incumbent on the part of the government to ensure that the industry is freed from negative externalities so that the growth of the industry is based on its absolute competitive strength and its actual performance matches its potential.

Any long term action plan for the industry in the context of developing infrastructure, provisioning for raw materials and supporting the industry with adequate policy tools to strengthen its competitive strength and face up to any external conditions will crucially depend, inter alia, on the projected growth of its market and the size of the industry. Given also the fact that the steel and its related raw materials markets are globally integrated today, the growth opportunities will also depend on how the industry shapes up in the rest of the world. Given the capital intensive and cyclical nature of the industry, there is an inherent danger of either under-investing or over-investing in it. Unrealistic optimism may lead to excessive planning and allocation of resources such land, capital, raw materials and labour which may be counterproductive both to the industry and the economy. Given the fact that all the resources will be in shortage, a larger than realistic plan will be tantamount to spreading the butter too thinly with no one really benefiting or the best options not getting the adequate support. At the same time, on the contrary, inadequate planning derived from an excessively conservative viewpoint may lead to suboptimal investment in the related areas and inappropriate planning. Therefore, the growth potential will have to be seen in a longer term perspective considering multiple scenarios of growth and choosing an optimal path.

Further, the domestic growth prospects cannot be isolated from the developments in the rest of the world. In a globally integrated economy and the steel industry in particular, the contours and direction of development of the industry will depend in a significant way on the supply position of raw materials in the world market, their cost, technology development, national policies of the governments in respect of trade and investment in raw materials, infrastructure and logistics, and, importantly, on the competitive growth of the steel industry itself elsewhere.

2.5 Steel Demand and product outlook

Despite the current concerns over growth, there is a strong view within the industry and the government that due to the intrinsic potential of steel demand growth in India, the longer term opportunities for the sector continue to be strong. Steel consumption significantly depends on the overall performance of the economy (GDP) and more specifically on investments made in fixed assets such as housing, infrastructure like railways, ports, roads, airports, etc.. While there is no absolutely reliable information on the share of steel consumption in these areas in India, most of the estimates put the figure at about 65 per cent. This is in line with global experiences. In addition, steel is consumed significantly in the production of capital goods, automobiles, etc.

The Indian economy maintained significant growth, especially from 2003-04. It is only recently that the economy has slowed down due a variety of factors including those externally derived. Despite this economic slowdown in the past two years, the overall expectations on the macro economic performance of the economy in the longer term are generally and widely seen to be strong. It is believed that the sub-optimal economic performance by India has mainly been due to factors which can be resolved rather easily. Therefore, there are no strong reasons to believe that the current low growth syndrome will continue forever. Although one does not expect a dramatic change within a short span of time for various reasons such as the existing shortages of investible capital due to low savings rates, inadequate development of quality infrastructure to support a strong manufacturing sector growth and a low domestic market base, etc., a 6.5-7 per cent annual GDP growth rate for the coming 20 years can still be a reasonable expectation assuming that the country leaves behind a status quoist position and gets into a more dynamic action mode to break the low growth syndrome. In the event of an extremely positive environment, it is also believed that the Indian economy can have a strong annual growth rate in the range of 8 -9 per cent for the period. Although there is no empirical basis to assume that such prospects exist, there are also no reasons to believe that such optimism lies in the realm of impossibility.

However, technological changes in the past decades, changing nature of international business with globalization, free flow of capital across nations and easier dissemination of knowledge and technology have changed the conditions which are to determine the actual pattern of growth for the developing and the underdeveloped economies. Therefore, today, the growth path of any economy remains hard to

predict especially if it has to take into account the potential or even unexpected structural breaks in the development path in between. The way the economies in South East Asia grew, the way China rose and why the Indian economy has not followed the path taken by any of them need to be examined in the context of assessing the growth prospects of the Indian economy and the steel industry in particular. Further, why the South East Asian economies could not maintain pace they attained in the 1980s and 1990s and why China could do so will also provide a perspective on the development strategies for developing nations. In the same vein, many economists have taken positive view of the Indian economy which maintained decent to strong growth for a long period of time, provided financial stability all through including the days of global financial crisis and the overall transparency in policy the country's government provided. The point is made here that the complexities of economic development make it difficult to assert that India or any developing nation for that matter will follow the path the developed nations have walked through in the last 50-60 years.

Empirical studies have shown that steel consumption trends in the developed nations have exhibited three distinct phases in the level and intensity of steel consumption. Such nations have started with a low base in steel consumption and then seeing exponential growth for a period and then stabilizing at a similar or lower level as the economy attains a degree of maturity in industrial growth, development of infrastructure and saturation in housing construction. In the post peak period the bulk of the steel is consumed either in the consumer goods, automobiles or replenishment of the housing and infrastructure stocks, with not much significantly added in the form of new fixed capital assets. As one moves from one stage to another lifestyle changes and the increased requirement to support the manufacturing base raises the share of the services sector where steel consumption intensity is low.

As discussed above, since there are no reasons to believe that the Indian economic growth will follow the path traversed by the developed and emerging nations at higher stages of development, to believe that Indian steel consumption will follow exactly the same path is not borne out by logic or facts. In fact, what happened in the developed west or China is not of overriding relevance in the context of India. But, what is borne out by empirical evidence is the fact that steel consumption is strongly driven by the growth of the economy and the investments in fixed assets. However, given the necessity to have a long term view from strategic considerations and planning

for the future it may be worthwhile to see how the Indian economy will be placed on its own as also in relation with other nations in the world.

2.6 Employment Generation (Direct and Indirect) Due to the Project

Basis of manpower estimate

The manpower estimates have been made taking into consideration the following aspects:

a. The proposed organization structure, production processes involved, layout, equipment with its degree of automation and mode of operation.
b. Additional manpower over and above the daily requirement at the rate of twenty-five (25) per cent is provided to cater weekly off, holidays, leave, absenteeism etc. for departments/sections working seven days a week.
c. The operation staff will be required to carry out routine checking of the plant and equipment as well as minor repairs and adjustments in addition to plant operation. Moreover, during equipment shutdown for maintenance, the operation personnel will assist the maintenance personnel in carrying out the maintenance tasks to maximize the utilization of manpower.
d. The maintenance personnel will have multi-disciplinary skills; for example, mechanic will be able to perform simple machining, welding and gas cutting. Implementation of such concept will optimize the utilization of human resources and thereby will increase labour productivity of the plant which, in turn, will reduce the cost of production.
e. Implementation of computer systems including local area network (LAN) with standard user friendly software's in the field of financial management, human resource management, personnel management, materials management, order scheduling, sales and marketing management, management information systems (MIS), production planning and control, maintenance and spares planning, etc. has been considered to increase work efficiency and to reduce manpower requirement.
f. For security services, canteen and catering services, horticulture and landscaping services, sanitary services, personnel transport, heavy maintenance and capital repairs, plant civil maintenance, general cleaning and up-keep of the plant, loading and unloading of materials, product handling, stores handling, and other miscellaneous semi-skilled and unskilled job, appropriate external agencies will be employed under management supervision.

Total manpower requirement

After commissioning of the Captive Power Plant more than 70 workers both skilled & un-skilled will be employed by the company. At present workforce of more than 150 workers are working directly or indirectly in the existing facility. The total workforce employed either directly through the company of through contractors will be around 220.The details of manpower estimate for administration or works departments are presented in Table 2.2.

Category-wise breakup of manpower

Category of personnel required in each job position for all departments is indicated in Table 2.2. The category-wise breakdown of manpower for administration and works departments of the plant is given in Table 2.2.

TABLE 2.1 Category-Wise Breakup of Manpower(Existing & Expansion)

Sl. No.	Category	Existing	Expansion	Total
1	Manager	08	04	12
2	Skilled	15	07	22
3	Semi-Skilled	38	15	53
4	Un-skilled	89	44	133
	TOTAL	**150**	**70**	**220**

Training

It is presumed that the personnel in the administration departments having requisite qualification and experience will be available from the local market and they do not normally require any specific training. It is expected that their recruitment will be progressive depending upon the requirement during the construction period and will be completed before commissioning of the plant.

For works departments, most of the key positions in operation and maintenance of the proposed plant at different categories will be manned by the qualified persons having experience in the similar field in metallurgical industries and attitude to learn new technologies. However, depending on the type of equipment/facilities along with the degree of automation contemplated, the operation and maintenance personnel of the plant so recruited will require specific need based training which is proposed to be carried out on-site by the respective equipment supplier during equipment erection, start up and commissioning of different plant units.

CHAPTER - 3

PROJECT DESCRIPTION

M/s Emaar Alloys Pvt. Ltd. has proposed to expand its existing sponge iron plant by installing 08 MW captive power plant based on WHRB and AFBC Boiler At- Tuidungri, Chowka, Sareikela Kharsawan District, Jharkhand.

3.1 Type of Project

The proposed expansion project is a expansion project envisaged to generate 08 MW power from 2 X 11 TPH Waste Heat Recovery Boiler(WHRB) on 2 X 100 TPD Kiln flue gases and 1 X 30 TPH Atmospheric Fluidised Bed Combustion Boiler(AFBC). Plant shall be based on Advanced Process technology. The plant will also be equipped with the most efficient auxiliary sub systems, material handling facilities and pollution control equipment.

3.2 Location & Accessibility

The proposed expansion Project will be located within the existing 2 X 100 TPD Sponge Iron DRI plant at Tudungri, ChowkaVillage in Sareikela Kharsawan District of Jharkhand State (Ref: Topo sheet No. 73F/4). The Latitude and Longitude of the proposed site 22^0 58' 35.3"N and 85^0 58' 18.4"E respectively.

The site is located at Tuidungri, Chowka which is well connected from National Highway No: 33. There are many steel plants in near vicinity to M/s Emaar Alloys (P) Ltd. Electricity for the plant will be sourced through JSEB. Transportation facilities to access various markets are readily available. Both skilled and un-skilled labour is available in the area. Also the location of the plant is suitable as it meets distance criteria from the various landmarks for environment related requirements.

a. **Road Connectivity:** The site is well connected with road. The project site is connected Tata – Ranchi Highway No: 33. The plant site is 30 Kms away from the steel city of Jamshedpur & 1½ kms from Highway No: 33.
b. **Rail Connectivity:** The nearest railway station is at Tata Nagar.
c. **Airport:** Nearest airport to the project site is Jamshedpur at a distance of 27.20 kms.

Fig 3.0 Plant Location

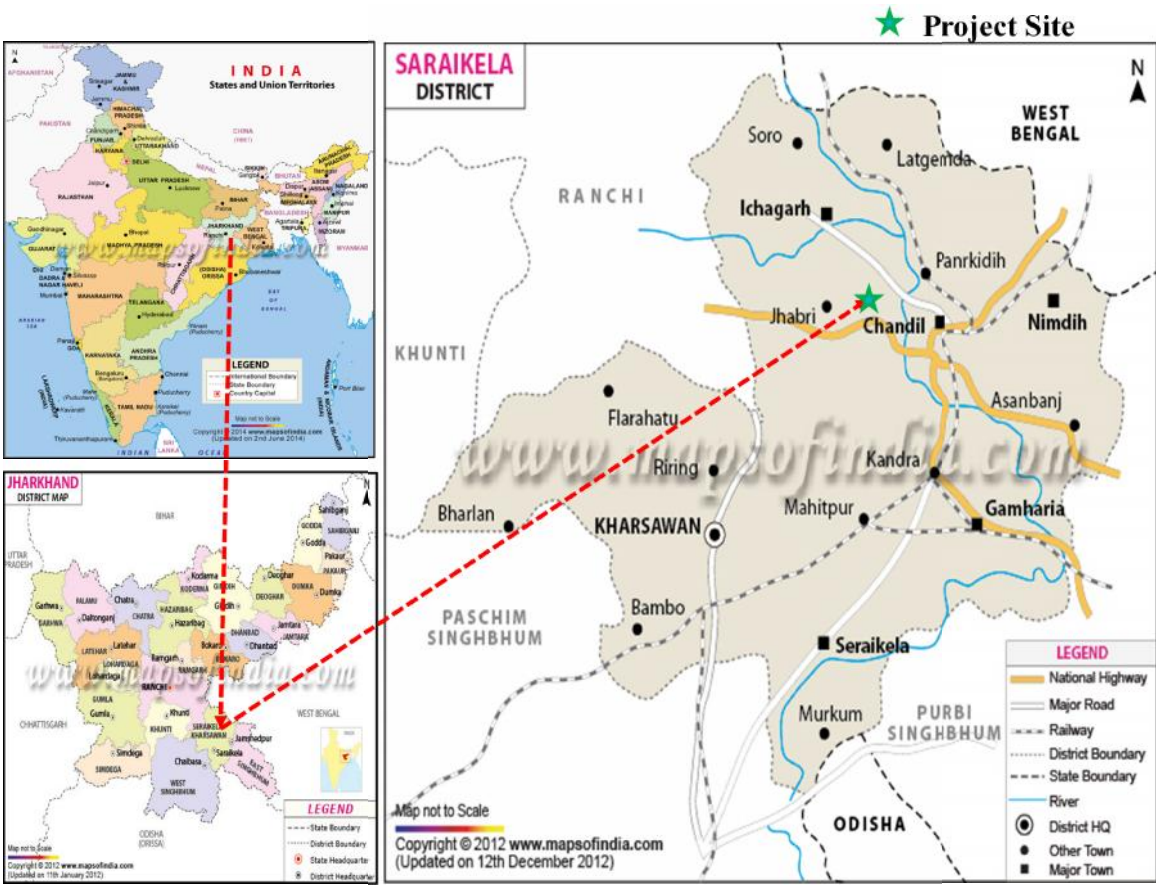
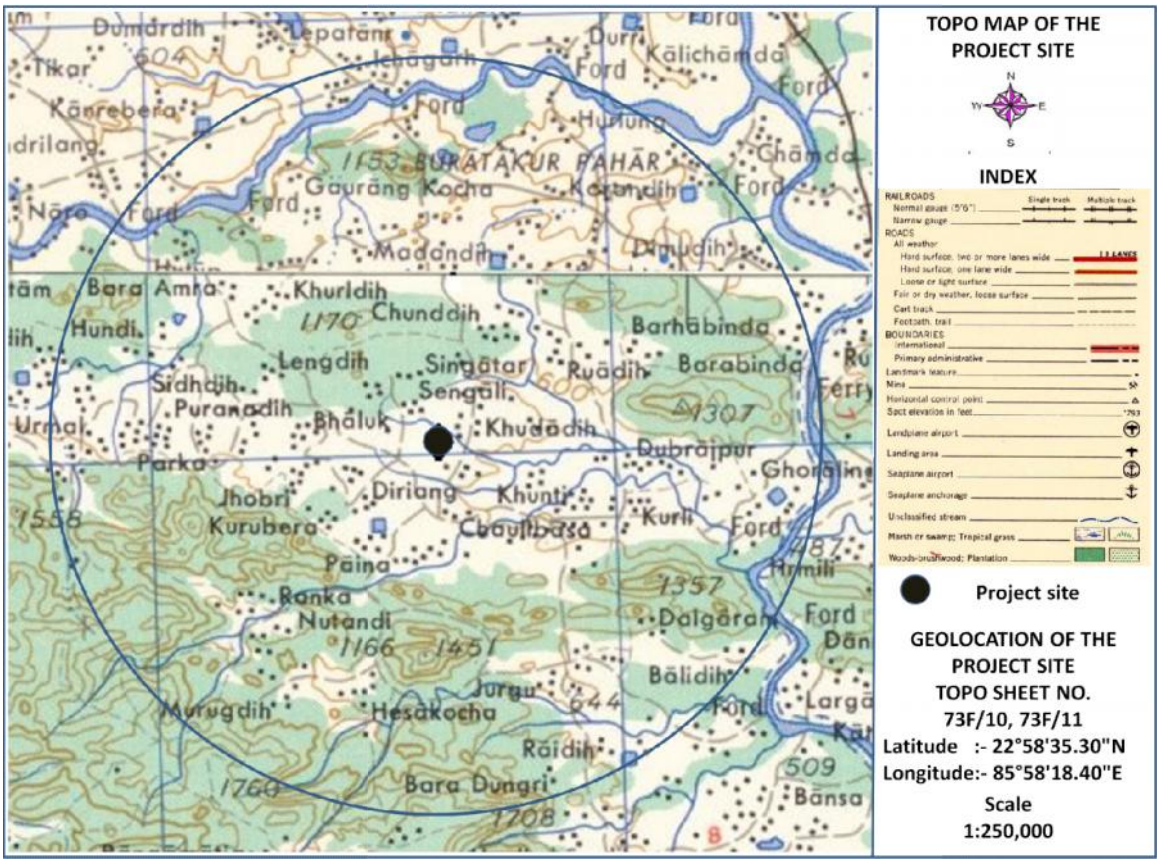


Fig 3.1 TOPO MAP (10 Km Radius)



3.3 Site Selection

The selection of project site/location has been based on the following considerations.

a. Proximity to Raw materials sources,

b. Non-presence of Eco-sensitive landmarks in the study areas,

c. Easy accessibility of rail & road infrastructure,

d. Existing topography of land with slope & drainage in the area,

e. Availability of land avoiding: Forest Land, Prime Agriculture land and Displacement & Rehabilitation or Scarce resources.

Plant layout has been developed considering the placement of technological and services units and hence there is no interference and the movement of man / material is easy and minimum.

3.4 Size or Magnitude of Operation

Table 3.0 Production capacity of the company

SI. No.	Units		Product	Configuration	Capacity
	Existing	**Expansion**			
1	Sponge Iron Plant	--	DRI	2 X 100 TPD	66,000 T/Annum
2		08 MW Captive Power plant based on WHRB and AFBC Boiler	8 MW	2 X 11 TPH WHRB Boiler and 1 X 30 TPH AFBC Boiler	467.92 Lakh Units/Annum

3.5 Project Description

3.5.1 Project Highlight

The Power Plant will have a generating capacity of 08MW. Steam required for generation of 8 MW shall be approx. 34 TPH including auxiliary consumption. On an average 4 MW will be generated from WHRB (I & II) steam & balance 4 MW from AFBC boiler. Considering steam consumption of 4.25 MT per MW, 34 TPH of steam will be required. Considering one kiln / WHRB under shutdown AFBC has been sized for 30 TPH. This will ensure availability of sufficient steam for generation of 8MW even if one kiln is under shutdown.

There shall be 2 nos. Waste Heat Recovery Boiler having 11 TPH capacities & 1x30PH AFBC Boiler. AFBC Boiler of higher capacity is being installed to ensure continuous availability of sufficient steam to operate turbine at full capacity. Steam generation from WHRB fluctuates due to variation in flue gases quantity & quality.

AFBC Boiler shall be designed for burning Mixed Fuel i.e. Coal (E & F Grade) + Coal

Fines + Dolo-char having average GCV of 2220 kcal/kg.

3.5.2 Power Generation Scheme

Thermal Cycle and Steam Parameters

1. Thermal cycle indicates the thermal processes that take place in a cyclic manner right from the combustion of gases till generation of mechanical output. Generation of electrical power by using mechanical output from the cycle however will not be included in the cycle. Any thermal cycle is designed for getting work output from heat input and vice versa for which the basic requirement is a working fluid.
2. Number of thermal cycles is proposed for power generation out of which only one cycle i.e. RANKINE CYCLE is being used for almost all thermal power plants. The variables to work with in the Rankine cycle are temperature, pressure, dryness fraction, heat quantity, quantity of work, rate of heat quantity transferred as related to the temperature at which the heat transfer takes place.
3. After selecting the cycle, next important task is the selection of proper steam parameters. The following aspects have been considered while selecting the steam parameters.
   - Efficiency of the thermal cycle
   - Capacity of the power plant
   - Specific steam consumption of the steam turbine
   - Fuel requirement to generate the steam
4. It is noted from the thermal cycle diagrams that higher steam parameters yields better efficiency and reduce the steam consumption of the turbine. Hence, less steam shall be required to generate same amount of power. This will also result in smaller boiler and turbine, lesser ash generation, lesser pollution.
5. After considering various aspects including cost economics of the power plant, it is decided to have 67 kg/cm2 (a) / 490 + 5°C as the steam parameters at the boiler outlet for 08MW power plant for higher cycle efficiency and less fuel consumption.

3.5.3 Sizing of plant and machinery

As already stated above, the power plant will mainly consist of one number Steam turbine generator set of 8000 KW generating capacity. Steam requirement for the Turbine generator set will be met through 30TPH AFBC (MCR) + 2x11TPH WHRB (MCR).

The plant apart from T.G. and Boiler units consists of various auxiliary plants and systems like Water Treatment Plant, Fuel Handling System, Air Cooled Condenser, Compressed air system, firefighting equipment, Ash handling systems, Switch gear

and Switch yard etc. Based on power generation capacity of 8000 KW various equipment will be sized in accordance with the standard engineering practices.

The power rating of the generator is 8000 KW at the generator terminals with 10% overload capacity for ½ hours within 08 hours. The speed of the generator is 1500 rpm and the generator is designed to generate electrical power at 11 KV, 50 Hz, 0.8 Power factor.

The generating voltage at generator terminals will be 11 KV. Accordingly, all other electrical equipments like power transformer, switchyard etc. shall be sized. The 08 MW Power Plant is synchronized with the grid.

The Power Plant will use start-up auxiliary power from the 33 KV grid supply. One number Diesel generator set of 1000KVA is considered to meet emergency power supply to start BFP, AOP & Barring Gear motors lighting load etc.

3.5.4 General Description

The proposed 08MW Power Plant will have 2x11TPH WHRB + 1x30 TPH AFBC and 1x08 MW STG with auxiliaries. The condenser shall be Air Cooled. Power generated at 11 KV will be utilized for captive consumption after drawal of the PP's auxiliary power requirements.

Besides the plant will have Ash handling system, Fuel Handling System, Air Cooled condenser, Pumps, Water treatment plant, Fire protection system, Air compressors, Air conditioning and Ventilation system and Electrical system.

Tube Banks will be firmly supported (fixed) on the header end, freely supported on skirt in the rear, thus permitting free expansion without additional stresses.

Chimney

Flue gas outlet from ESP will be let out to atmosphere through a Chimney. Emission from chimney shall be limited to 50mg/NM3 at 140 °C. The emitted gases will be invisible.

Ash Handling System

The ash handling system is provided for the ash collection from the following region:

- Radiation Zone Hopper
- Convection Zone hopper
- Economizer hopper
- FBC ECO Hopper
- Air Heater Hopper
- ESP Hopper

Fly ash from the boiler will be transported to the ash silo through dense phase pneumatic conveying system.

Fly ash from the Economizer and Electrostatic Precipitator Hoppers will be dry and powdery in nature. The temperature of the ash will be around 150 - 180°C maximum. Fly ash will be carried pneumatically to the fly ash silo.

3.5.5 Waste Heat Recovery boiler

Two (2) No. of waste heat recovery boiler to generate steam from the hot gases from 100 TPD sponge iron kiln, at parameters 67Kg/cm² (a) & 490±5 °C @11TPH.

- A Common Steam Distribution Header.
- Main Steam supply piping to Turbine including warm-up vent and supply to PRDS.
- Auxiliary steam supply line to gland steam pressure control station / valve of turbine.
- Auxiliary Steam Line to Ejector steam header inlet.
- Bleed Steam supply line from Turbine to Deaerator steam pressure control station.
- Boiler Feed System common for Three (3) Boilers (02 WHRB + 01 AFBC)
- Deaerator with storage tank designed for 08MW Power Plant.
- HP Chemical Dosing System common for two WHRBs.
- LP Chemical dosing System designed for 08MW Power Plant.
- All related electrical equipment, cabling, protection and instrumentation & control, for the boiler in scope, except DCS

3.5.6 AFBC Boiler

AFBC boiler will be top supported, single drum, balanced draft, natural circulation unit, with under bed firing system for Mixed Fuel. The boiler will be designed for outdoor installation. The boiler will have sub systems like pressure parts, feeding system, firing system, draft system, feed water system, ESP and chimney.

3.5.7 Fuel handling and feeding system

The fuel from the crusher house will be delivered to the fuel bunker in the Boiler house. The bunker will have a minimum of sixteen hours storage of the MCR requirement of boiler. The bunker will have suitable lining, isolation gates, manholes, vibrators etc.

The boiler will be provided with bottom hopper feeding system. Fuel is extracted from the bunker by drag chain feeders and fed into the bed by mixing nozzles and fuel nozzles. The fuel is transported pneumatically to the bed through the fuel pipes by hot air from Primary Air Fan.

Drag chain feeders will be provided with variable frequency drives. Isolation gates will be provided at Bunker outlets. Surge hoppers will be provided in between the Bunker chute outlet and drag chain feeder's inlet.

Fuel feeding system will be designed in such a way that there are no bends on the feed lines keeping minimum horizontal distance between mixing nozzle and cross, minimum vertical distance between the cross and the fuel nozzle. This avoids choking of fuel in the fuel line and improves the flow.

The design and guaranteed fuel for the plant will be mixed fuel as indicated above which shall have average **GCV of 2220 kcal/kg as DESIGN FUEL**.

3.5.8 Turbo generator System

The proposed Power Plant will have one no. 08MWturbo-generator.The turbine will be a bleed cum condensing type and run at a high speed. The generator speed will be 1500 rpm. Hence, the turbine will be connected with the generator through a reduction gear unit.

Steam is admitted into the turbine through an emergency stop valve actuated by hydraulic cylinders. The turbine speed is controlled by an electronic governing system. The bleed pressure is arrived based on the regenerative feed water requirements. Accordingly, bleed will be provided at 4.5 kg/cm²(a) for Deaerator. All the bleeds will be uncontrolled. The turbine exhaust pressure will be 0.18 kg/cm²(a) (max).

The turbine will be single cylinder, single exhaust, single bleed, condensing type. All casing will be horizontally split and the design will be such as to permit examination of the blading without disturbing shaft alignment or causing damage to the blades. The design of the casing and the supports will be such as to permit free thermal expansion in all directions.

The glands will of labyrinth type and sealed with steam. A vacuum system required by the design will be provided. All piping and components of shaft seal and vacuum system will be sized for 300 percent of the calculated leakage. Steam leaving the glands will be condensed in Gland steam condenser.

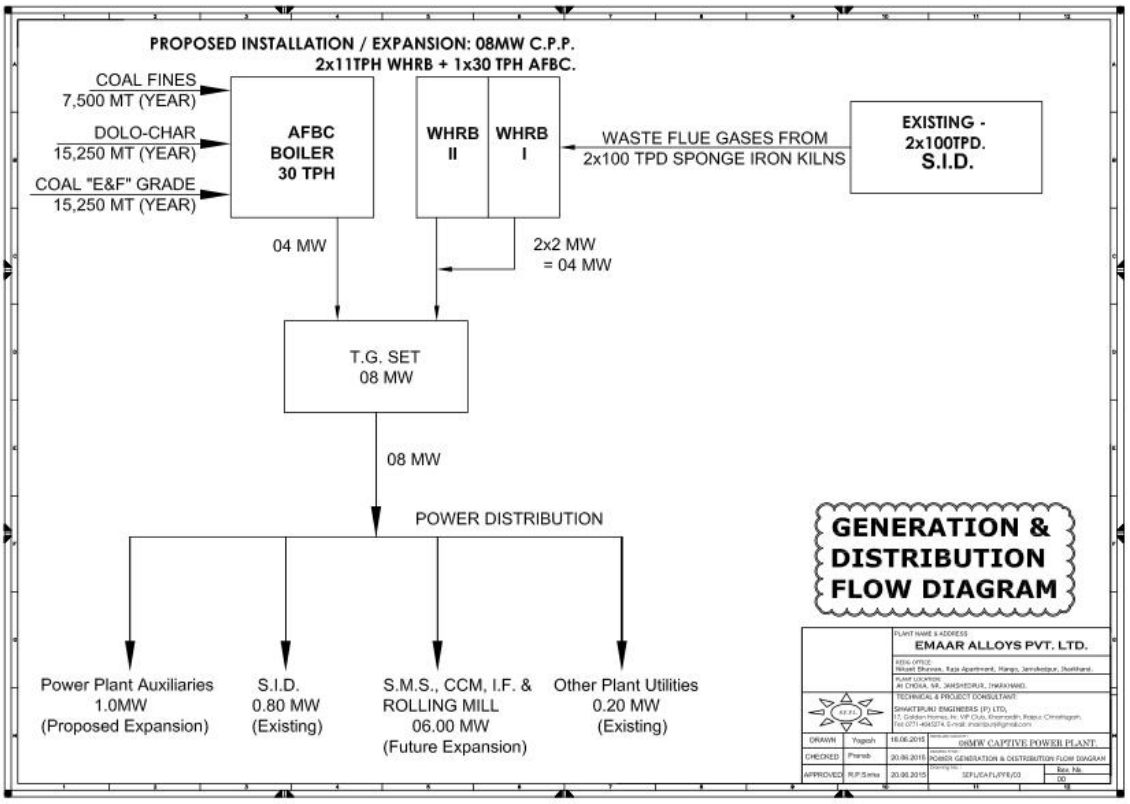
3.5.9 Air cooled condenser

The turbine exhausts steam into air Cooled Condenser. The pressure of turbine exhaust will be 0.18 ata. The corresponding temperature will be around 58°C and above. The design will be based on turbine back pressure of 0.18 ata and design

ambient of 42°C and relative humidity of 60%. The steam will be condensed by the Air circulated over the tubes.

The evacuation system consists of a starting ejector and holding ejector. The ejector creates the required vacuum in the condensing system, using the steam as the motive fluid. The steam sucked along with the air will be condensed in the ejector condenser by the incoming condensate. The condenser will be provided with a hotwell, where the condensate will be collected. The hotwell will be equipped with level control devices, to ensure positive flow to the condensate extraction pumps.

Figure3.2 Generation and distribution Flow Diagram



3.5.10 Power Generation and its Utilization

Table 3.1 Power Generation and its Utilization

No of Boilers in operation	Avg. Steam Generation	Avg. Steam Consumption	Avg. Power Generation	No.of working days	Gross Annual Generation
	(MT/ hr)	(MT/ MW)	(MW/ hr)	(days)	(lakh units)
WHRB I & II	17.00	4.25	4.0	266	255.36
AFBC	17.00	4.25	4.0	266	255.36

WHRB-I	08.50	4.25	2.0	49(315-266)	23.52
WHRB-II	08.50	4.25	6.0	49(315-266)	23.52
AFBC	25.50	4.25	6.0	64(330-266)	92.16
Annual generation @ 100% PLF					649.92

Particulars	Units	1st Year of operation		
		WHRB	AFBC	Total
Gross power from Boilers(a)	In Lakhs	302.40	347.52	649.92
P.L.F.-(b)	%	80	80	
Annual Power Generation-(a X b= C)	In Lakhs	241.92	278.01	519.93
Auxiliary power consumption –(10% of c=d)	In Lakhs	241.92	278.01	519.93
Net Power Generated = (C-D)	In Lakhs	217.72	250.20	467.920

Break-up of power generation from WHRB & AFBC

Particulars of Boilers	Generation	Net Units
a. From 30 TPH AFBC Boiler(Firing Mixed Fuel)	04 MW	217.72 Lakh Units
b. From 2 X 11 TPH WHR Boiler(Waste Gases)	04 MW	250.20 Lakh Units
Total Generation	08 MW	467.92 Lakh units

Power Utilization

The Power will be generated at 11KV which will be utilized for captive consumption within the premises.

The proposed power plant will generate power at 11 KV. The generator shall be directly connected to the 11kv switchgear. The power plant auxiliaries will be fed through 11/415V Auxiliary transformer. The boiler will discharge the flue gas to the atmosphere through the high efficiency electrostatic precipitator and the tall stack. The discharge will meet the stipulations of the pollution control authorities. The effluents and discharge water will be treated inside the plant and reused in the system. The noise level will be maintained within the stipulation of the PCB's with suitable noise abatement measures.

In addition to Boilers following Plant & equipment will be installed:

- A TG set of 08MW will be installed, operating at 65 kg/cm², 490±5°C, generating power at 11 KV voltage with all auxiliaries like – Air Cooled Condenser, oil system, steam ejector, electrical, control & Instrumentation packages etc.
- Electro-static Precipitator – One no three fields for AFBC boiler designed to restrict emission to 50mg/Nm³.
- RCC Chimney of 56.0 Meters height complying pollution control board (PCB) norm.

- Water system consisting of DM Plant, Aux. Cooling Tower, Water Storage Tank, Pumps, pipings etc as per system requirement to meet generation of 08 MW Power.
- Ash handling system including Ash silos as per requirement.
- Fuel handling system to meet requirement.
- Electrical package consisting – Transformers, PCC, MCC, 11KV Panel, HT, LT cables etc.
- Control & Instrumentation equipment consisting of DCS System.

3.5.11 Plant Layout

The layout of the plant will be developed taking into following considerations:

a. Uninterrupted flow of materials in accordance with the technological requirements.

b. Contours and gradient of the site,

c. Optimum lead for transport of materials and for services lines,

d. Predominant wind direction,

e. Logistic approach in location of technological units as well as service facilities,

f. Safely clearances & statutory provisions.

g. Close proximity to reach raw material sources.

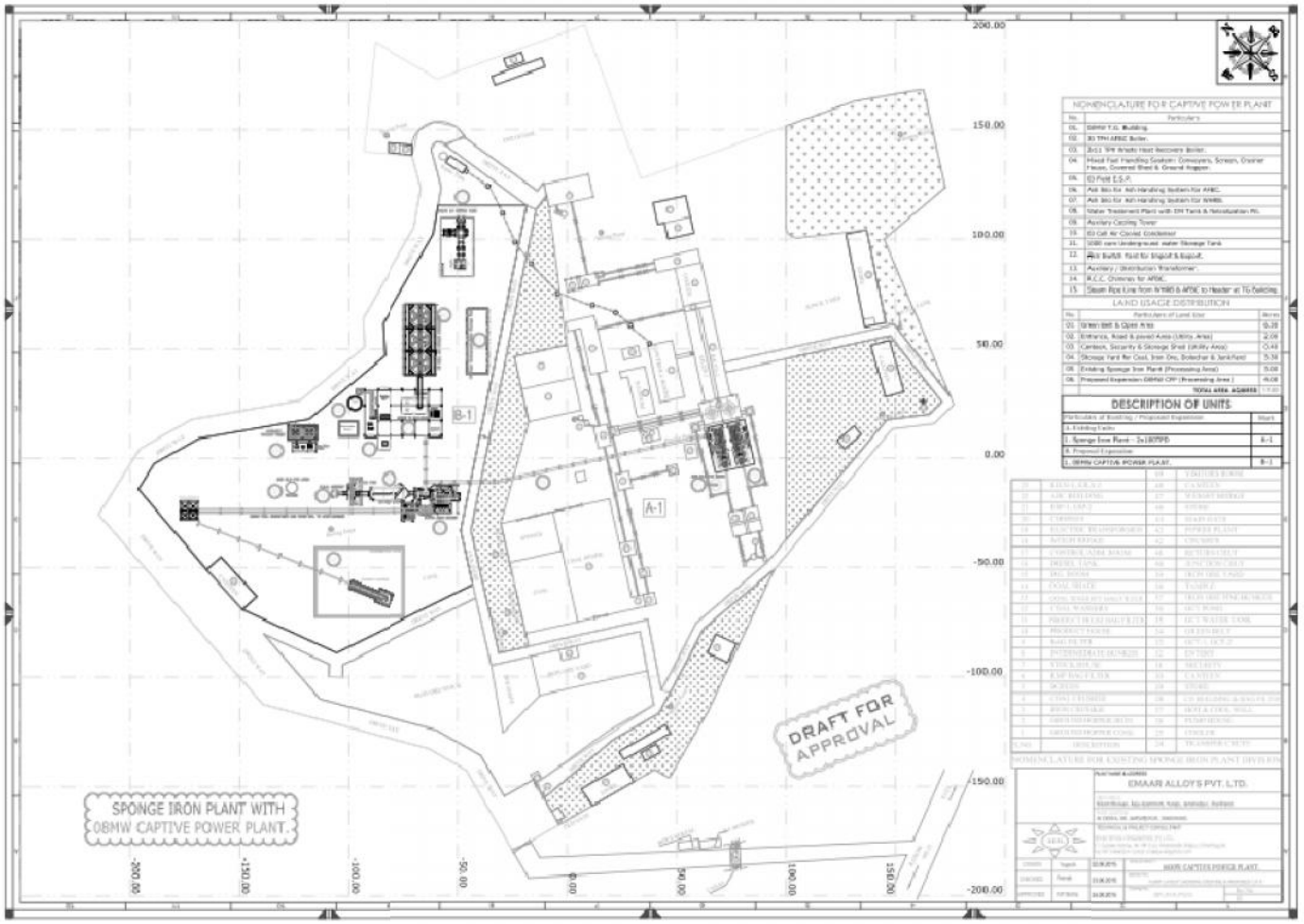
3.5.12 Heat and Mass Balance

In order to generate 8000 Units of electrical power at the generator terminals, approx. 45 TPH of steam at 65 kg/cm2 (a) / 485°C is required at the Turbine inlet. The Steam Turbine considered for the power plant is of bleed cum condensing type with one bleed for feed water heating in Deaerator.

The exhaust steam will be condensed in the Air Cooled condenser and pumped to the deaerator. In deaerator, condensate will be heated by bleed steam taken from the turbine.

The condensate after raising the temperature will be fed to the boiler economizer by boiler feed pumps.

Fig3.3 Plant Layout



3.6 Plant Auxiliary Facilities and Systems

3.6.1 Plant Water System

Water will be required in Auxiliary Cooling Tower as make up. Raw water requirement for Auxiliary Cooling Tower, DM plant, Ash conditioning system, auxiliaries cooling system, area cleaning system etc will be 180m³/day which will be met from Borewells. A water tank of 1000m³ will be constructed.

3.6.2 Compressed Air System

Instrument air is required for various pneumatically operated control valves in the boiler and TG systems. Air is required to be supplied at a pressure of 6 to 7 kg/cm² (g) at the various consumption points. Instrument air from the air compressors is proposed to be dried by refrigerant type air dryer.

Service air is required for cleaning of various areas of the plant. Accordingly, service air connections are proposed to be provided in the boiler area, TG building, workshop, DM plant etc.

Two (2) air compressors will be installed along with the drier (for instrument air) and other auxiliaries for supplying the instrument and service air requirements. Out of the two compressors one will be working and the other will be standby.

3.6.3 Air Conditioning and Ventilation System

The main control room, DCS rooms will be air conditioned using window/spilt type air conditioners. The capacity of the air conditioning units will be decided based on the area of the room and heat load dissipated in the room.

The following mechanical ventilation systems are to be provided for various buildings/rooms in the power plant:

a. Axial type power roof ventilators of adequate capacity for the TG building.
b. Centrifugal type supply air fans of adequate capacity for the switch gear room, battery room etc.
c. Suitable number of propeller type exhaust fans in the water pump house, DM Plant, filtration plant, workshop, stores and toilets.

3.6.4 Fire Protection System

Following systems of fire protection is to be provided in the power plant.

CO_2 flooding system

Portable fire extinguishers

3.6.5 Plant Electrical System

The turbine generator will generate 8000 KW at the alternator terminals at 11 KV of this auxiliary requirement of Power Plant will be stepped down to 433 V through a station auxiliary transformer. The remaining power will be fed for captive usage and surplus power will be exported to grid. Thus the system will be designed to operate in parallel with the JSEB grid at 33 KV level through 11/33 KV Generator transformer.

Power will be drawn from the grid for Power Plant start-up and also during Power Plant outage for feeding the plant.

3.6.6 Distributed Control System

A latest proven microprocessor based state-of-the-art Distributed Control System has been envisaged for the project. Control System shall be open architecture type to make the system user friendly. Adequate redundancies would be provided at all possible levels to achieve highest system availability.

3.6.7 Uninterrupted Power Supply unit (UPS)

110/230 V AC Single Phase UPS will be required for Instrumentation & Control System in general and DCS cabinet in particular. It is also required for PLC (Programmable Logic Controllers) pertaining to Solid Fuel Handling Plant, Ash handling Plant, D.M. Plant.

UPS shall comprise of 2x10KVA Rectifier – Inverter (with common Lead Acid SMF - VRLA battery) Units as well as bypass line with servo- controlled Voltage stabilizer. Facility shall be there for change over among three sources under any condition without any Power interruption.

UPS output shall have harmonics limited to 1% at 100% load and 5% at other Loads.

3.6.8 Emergency Power

1 x 1000KVA Dark Start DG set has been envisaged to provide starting power of Plant when JSEB power is not available as well as for Emergency Power to take care of safe shut down of important Boiler and Turbine auxiliaries of Plant. During total power failure, DG set will also support for Emergency lighting for personnel movement in important power plant locations.

3.6.9 Generator

The generator will be four-pole, three-phase unit, capable of generating 08MW/hr at MCR, and 105 % with valve wide open (VWO) condition, continuously

producing 10MW at 0.80 p.f. lag. 50 Hz for proposed CPP. The nominal voltage rating will be 11 kV with variations of ±10% (as per manufacturers' standard).

3.6.10 Auxiliary Transformers

One number 3.5MVA, 11KV / 433V transformer will be provided in order to meet all the power plant auxiliary loads. The transformer will be of two winding, three phase type with ON/AN Cooling. Off Circuit tap changer has been envisaged.

3.7 Plant and Machinery Source

All plant and machinery will be sourced through globally reputed and proven suppliers having vast experience of supply of various equipments required for the Industry. All equipment will incorporate the latest state of the art design and technology, eco friendly and will conform to global standards of workmanship.

Taking into account, reliability of equipment and matching capacities between the different sections of the plant, the type of equipment/ installation system and the departmental capacities at the plant, have been arrived at.

3.8 Raw Materials Requirements

Table 3.2 Requirement of Raw Materials

Sl No.	Description	Quantity In TPA	Source	Mode of Transport
A.	**Sponge Iron Plant(Existing)**			
1	Iron Ore	1,05,600	From Nearby mines	Road/Rail
2	Coal	85,800	From CCL/ Imported from Indonesia	Road/Rail
3	Dolomite	1980	Chhatttisgarh	Road/Rail
B.	**Captive Power Plant**			
1	Coal(E & F Grade)	15,250 MT	From CCL	Road/Rail
2	Dolo Char	15,250 MT	In- house	--
3	Coal Fines	7,500 MT	From CCL	Road/Rail

3.9 Water and Power Requirement

3.9.1 Water Requirement

For the project the water requirement is about 180 m³/Day . This will be sufficient for the present requirement.

Table 3.3 Water Requirement

UNIT	Installed Capacity	Make-up water m3/day
Captive Power Plant	08 MW	180.00
TOTAL		180.00

The above water requirement will be made from bore well.

3.9.2 Power Requirement

No additional power is required for the proposed expansion. Only construction power of not more than 0.5 MVA will be met from existing 11 KV HT line of existing plant.

3.10 Pollution Sources and its Control Measures

3.10.1 Air Environment

Air Pollutants are

Particulate matter i.e. Dust Particle in gases

As described above dust particles both bigger & fines will be collected in hoppers provided below the equipment. From hoppers they will be conveyed in pipes to Ash Silo by Dense Phase conveying system for disposal. Therefore, there will not be any dust nuisance in the ground/plant.

The remaining fine dust particles will be collected in three field ESP having efficiency of 99.9% from ESP, hoppers dust are transported to silo for disposal. The clean gases invisible to eyes are discharged to atmosphere through chimney. The dust load in emission shall be limited to 50 mg/Nm3 which will be spread up over a large area through chimney. Thus, the pollution is totally controlled.

Dust Particles on Ground

Coal dust present on ground will spread in stockyard due to wind & pollute Air. This will be controlled effectively by installing nos. of water sprinklers at various locations. Fine water particles will mix with dust fines & make them to settle on ground.

Gaseous Pollutants are

Gases pollutant arises primarily from the by-products of combustion process like SO2, NOx etc. which are exhausted from the chimney. Source of SO2 is Sulphur present in coal. Atmospheric Air Pollutants like SOx & Nox will be controlled within PCB norm. NOx will be controlled during process.

Control Measures-

Equipments to be installed to control Air Pollution

1. 3 field ESP of latest design
2. Chimney of Recommended height
3. Dense Phase Ash Handling System.
4. Sprinkler System to control ground Air Pollution.
5. Water Hydrant System to clean Plant Area.

Dust abatement through sprinklers will be adopted at the various drops off points. Dust extraction system will be provided at junction houses, screen houses etc as required.

Chimney height shall be sufficient to disperse the undesirable solid/ gaseous pollutants in a wider area to nullity its harmful effect.

Table 3.4 Boiler Specification

Boiler Particulars	**Proposed**
CPP Capacity	08MW
Boiler type	WHRB+AFBC
Capacity (WHRB)	2x11TPH
Capacity (AFBC)	30TPH
Fuel (WHRB)	Waste gases
Fuel (AFBC)	Mixed Fuel
Fuel to be burnt	8.5T/hr
Flue gas	40,000 M^3/hr
Sulphur in fuel	0.60%
Gas temperature	140^oC
Gas Density	0.85 Kg/m^3
SO_2 produced (Kg/hr)	102 Kg/hr

Table 3.5 Chimney Height Calculation

Q_p	[(50 x 40,000) / 10^9] MT/hr = 0.002 MT/hr
H_{min}	74 x $(0.002)^{0.27}$ = 13.82 M.
SO_2 present in flue gases by formula:	
$H_{min} = 14(Q_S)^{0.3.}$ where $Q_S = SO_2$ produced in kg/hr	
Particulars	**8 MW**
Coal burnt / hr	08.5MT
Sulphur in Coal	0.60%
Sulphur burnt	[8500 x 0.60/100] = 51.00 kg/hr
H_{min}	14 x $(102)^{0.3}$ = 56.00 M.
Since calculated height at 07 more than 02.	
Recommended Height	**56.0 m**
Selected Height	**56.0 m**

3.10.2 Water Environment – Mitigation Measures

Effluent from water treatment plant

Hydrochloric acid and sodium hydroxide will be used as regenerants in the proposed mixed bed of water treatment plant. The acid and alkali effluents generated during the process of the ion-exchanges will be drained into a epoxy lined underground neutralizing pit. Generally these effluents are self neutralizing. However provision

will be made such that the effluents will be neutralized by addition of either acid or alkali to achieve the required pH. The effluent will then be pumped into the effluent treatment ponds which form part of the power plant effluent disposal system. The neutralizing pit will be sized approximately of 15m³ capacity. The rejects from RO plant will have high TDS which will be diluted and used for cleaning purposes in the project. This water also will be used for plantation.

Steam Generator Blow down

The salient characteristics of blow down water from the point of view of pollution are the pH and temperature of water since suspended solids are negligible. The pH would be in the range of 9.8 to 10.3 and the temperature of blow down water will be about 139 °C. Since quantity of blow down is very small and hence, it will be blown down into the trench and which will carry it to the effluent pond.

Sewage from various building in the plant

Sewage from T.G. building in the power plant will be conveyed to the septic tank. The effluent from the septic tank will be disposed in soil by providing disposal trenches. There will be no ground pollution because of leaching due to this. Sludge will be removed occasionally and disposed off as land fill at suitable places.

Table 3.6 Waste Water Management

Process Unit	Waste water qty (m^3/day)	Source	Waste water characteristics	Waste water management
Captive Power Plant	18 m³/day	Cooling	Effluent	Will be treated in Neutralizing pit and reused for greenbelt

3.10.3 Solid Waste Management

Proposed expansion will generate the following solid wastes from different production processes and the respective management plans are mentioned against each heads.

Table 3.7 Solid Waste Generation and Management

Units	Solid Wastes	Qty In TPD	Disposal practice
WHRB & ESP (08 MW CPP)	Fly Ash	48.00	Sale to fly ash bricks / blocks manufacturers – outside party
AFBC (30 TPH)	Fly Ash and Bottom Ash	60.0	Bottom ash for road making and Fly ash sale to cement

			manufacturers.

There is no hazardous waste from the plant except for used oil of equipment which is saleable to the registered recyclers in the market.

3.10.4 Noise Levels

The major noise prone equipment's are product screening through crushing, milling, separators, compressors etc. The noise control will be done in four ways, namely by selecting low noise prone equipment which would have led level below 75 dB (A) at 1 meter distance;

- By selecting low noise generating equipment, which would have below 75 dB_A at 1m distance. This is taken care at the equipment design stage.
- By isolating the noise unit from the working personnel's continuous exposure by providing acoustic aids for plant personnel.
- By administrative & safety measures, providing noise level monitoring, remedial measures, providing noise safety appliances.
- The noise impact on the surrounding environment during the construction phase will be within acceptable limits. The operation of high noise generating equipment shall be restricted during the night time.
- Various measures proposed to reduce noise pollution include reduction of noise at source, provision of acoustic lagging for the equipment and suction side silencers, selection of low noise equipment and isolation of noisy equipment. The plant personnel in noisy area will be provided with high noise reduction aid such as ear muffler & also the duration of exposure of the personnel will be limited as per the norms.

Thick green belt development is planned for the attenuation of noise pollution and to maintain ambient noise quality within the statutory limit.

3.10.5 Green Belt Development

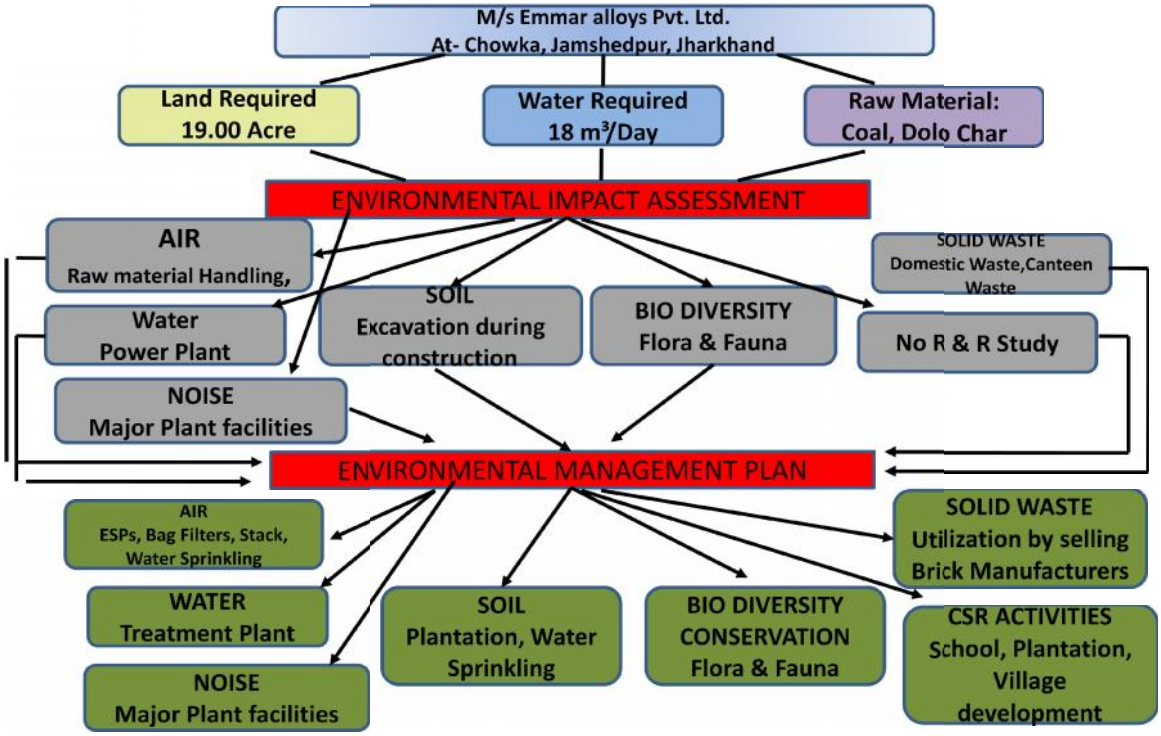
A greenbelt development plan will be prepared and implemented along with the project.The main objective of the greenbelt is to provide a barrier between the plant and the surrounding areas. The greenbelt helps to capture the fugitive emissions and to attenuate the noise generated in the plant apart from improving the aesthetics of the plant site.

The Greenbelt provided will be 33% (6.30Ac) of total area 19. Ac and will have a suitable density so as to mitigate the effects of emissions from the plant. The treated effluents from the plants will be utilized for the greenbelt development.

The landscaping of the plant will be carried out. Roads for vehicular movement will be paved and adequate mitigation measures will be provided to prevent fugitive emissions.

3.11 SCHEMATIC REPRESENTATIONS OF THE FEASIBILITY DRAWING WHICH GIVE INFORMATION OF EIA PURPOSE.

Fig 3.6 Schematic Representation



CHAPTER-04
SITE ANALYSIS

4.1 General

The proposed expansion project site is located at Vill-Tuidungri, Chowka, in Sareikela Kharsawan of Jharkhand. The site is located at Tuidungri which is well connected from National Highway No: 33. The plant site is 30 Kms away from the steel city of Jamshedpur & 1½ kms from Highway No: 33. The nearest railway station is at Tata Nagar. About 19.00 acres of existing land is available in this area of proposed expansion.

The site is located at Tuidungri which is well connected from National Highway No: 33. There are many steel plants in near vicinity to M/s Emaar Alloys (P) Ltd. Electricity for the plant will be sourced through JSEB. Transportation facilities to access various markets are readily available. Both skilled and un-skilled labour is available in the area. Also the location of the plant is suitable as it meets distance criteria from the various landmarks for environment related requirements.

4.2 Connectivity

Road

The expansion site is well connected By Tata – Ranchi Highway No: 33. The plant site is 30 Kms away from the steel city of Jamshedpur & 1½ kms from Highway No: 33.

Rail Linkage

The nearest railway station is Jamshedpur.

4.3 Topography

The proposed power plant will be constructed in vacant land already in the closed premises of M/s Emaar Alloys (P) Ltd. Mostly the land is fallow and non cultivable.

4.4 Existing Land Use Pattern

Land of the proposed expansion project is within existing plant premises and devoid of any vegetation. Plant is not coming under the dense forest category land. This area does not form part of any National Park, Wild Life Sanctuary and Natural/Biosphere reserve.

4.5 Existing Infrastructure

Land

Total Project land Area – 19.00 Acres. The land requirement for the Proposed Expansion is limited to few Acres as the facilities are being shared with existing units.

A. Power

Power Export Centre

Excess power if any will be exported to Jharkhand State Electricity Board through dedicated 33kV HT line from 33kV Switch Yard situated at M/s Emaar Alloys (P) Ltd to 33kV Switch Yard Bay of JSEB. For this Power Purchase Agreement has to be executed between M/s Emaar Alloys (P) Ltd & M/s JSEB.

Availability of Electric Power

HT Power Connection at 11kV from nearby JSEB 33kV Sub-station is available in the premises. After Captive load excess power if any will be exported to JSEB through dedicated 33kV HT Line. In case of Captive load under maintenance power may also be exported to Grid.

B. Water

Total water requirement for 08MW Power Plant based on Air Cooled Condenser shall be 180m^3/day or 7.5m^3/hr. River/other source of surface water are not located nearby. It will be uneconomical to bring from long distance also. Water will be drawn from Borewells or tanker arrangement will be done for water storage during summer season. Water storage reservoir of 1000m^3 (05 DAYS STORAGE) to be constructed.

C. Transport

The proposed site is located near the National Highway. The Major raw material i.e. Coal will be transported through Trucks. The company has Coal Linkage agreement with CCL (Central Coal Field Limited) for supply of 30,000MT per annum.

D. Communication

Communication facilities such as telephone, tale fax and internet are available in Jamshedpur.

E. Site Clearances

The land on which CPP is proposed to be installed has already been granted consent to operate Sponge Iron Plant by related authority. Fresh approval will be taken from Pollution Control Board & other related parties for Consent to Establish.

F. Infrastructure

The area is well connected with National Highway No: 33 to Tata – Ranchi. The nearest major railway station is Tatanagar. Surface and ground water is the major source of drinking water for local population. Public conveyances and communication facilities viz. Telephone etc are available on the highway.

4.6 Climate Data

Temperature

The climate of the district is characterized by hot summer with low humidity. Summer generally commences in the month of March. Temperature begins to rise rapidly attaining the maximum in the month of May. During the summer maximum temperature is 48^0 C. The weather becomes more pleasant with the advent of the monsoon in June and remains as such up to the end of October. The temperature in the month of December is lowest i.e. 06^0 C. The average annual rainfall is 1422 mm.

CHAPTER – 05
PLANNING BRIEF

5.1 Planning Concept

M/s Emaar Alloys Pvt. Ltd. has proposed to expand its existing sponge iron plant by installing 08 MW captive power plant based on WHRB and AFBC Boiler At- Tuidungri, Chowka, Sareikela Kharsawan District, Jharkhand. M/s Emmal Alloys pvt. Ltd. operating 2 X 100 TPA DRI kiln to produce Sponge Iron.

The plant is well connected by National Highway. M/s Emaar Alloys has already developed connecting roads inside plants for movement of raw material, finished product & building material since the plant is under operation.

Plant shall be provided with following facilities:

a. Administration building and technical office.

b. Construction offices, stores & Hostel facility

c. Time and security offices

d. First aid and fire fighting station

e. Canteen and welfare center

f. Toilets and change rooms

g. Car parks and cycle / scooter stands

5.2 Population Projection

With the set up of proposed expansion project infrastructure and social development will simultaneously takes place. Project will contribute for raising the population of the locality as it creates job opportunities and economic upliftment of the area. The company will provide employment to 100-200 persons during construction phase and 220 persons during the operation period of the proposed project after expansion. Plant activities will also boost the ancillary industries, business and market establishments. The whole set up will invite both skilled and unskilled from outside. This will result in increase in the population density due to industry.

5.3 Land Use Planning

Following is the break-up of the land use of the project site/area:

Table 5.0 LAND USE BREAK-UP

Sl. No.	Description	Area in acre
1.	Existing Sponge iron plant(Processing Area)	3.00
2.	Proposed Expansion 8 MW CPP(Processing Area)	4.00
3.	Entrance, Road & paved Area (Utility Area)	2.00
4.	Canteen, Security & Storge Yard(Utility Area)	0.40

5.	Storage Yard for Coal, Iron Ore, Dolochar & junk Tard	3.30
6.	Green belt & open Area	6.30
	Total	**19.00**

5.4 Amenities & Facilities

To render the necessary repair & maintenance, inventory, quality control related and administrative services for the proposed power plant associated facilities, following auxiliary facilities have been considered inside the plant boundary.

Laboratory: Taking into account the quality assurance of iron ore and coal, it is proposed to install a laboratory. The role of the laboratory is to carry out physical and chemical testing of samples. A laboratory will be set up in a building along with the plant control room located in close vicinity of the plant. Tests will be carried out in the laboratory to determine physical and chemical properties of the samples as a part of the quality control activities. The laboratory will be equipped with the sample preparation facilities and testing devices.

Repair and maintenance shop: It is proposed to set up a local repair shop equipped with facilities for machining, fabrication, assembly, electrical repairs, instrument calibration/repair etc. A mobile crane of 10 ton capacity will also be provided for dismantling and mounting of component assemblies and sub-assemblies of equipment.

Stores: A single-bay building will keep equipment spares, hardware, wearing parts and consumables. A strong room for keeping valuable item, offices for inventory control, material receipt section, toilet etc will be suitably provided.

Plant office: An office building will be constructed inside plant premises. The office building will be complete with separate toilet, conference rooms, computer room, separate executive's room and other facilities like record maintenance, printing, scanning *etc*.

Ancillary buildings:

Besides the auxiliary facilities other ancillary buildings with necessary facilities such as canteen, time office & security offices etc. will also be provided.

Canteen: A canteen building will be set up near the plant office and a suitable external agency is proposed to be engaged to service snacks and refreshments to the workers, supervisory and office staff working in the different plants/facilities and other working area.

CHAPTER – 06

PROPOSED INFRASTRUCTURE

6.1 Industrial Area

The setting up of the Main Plant Facilities, Raw Material Storage, Raw Water Storage Reservoir & Treatment, Auxilliary facilities, viz. Admn. Bldg., Tech. Bldg, Workshop, QC Lab, Switch Yard, etc. & Green belt (33%) required 6.30 Acres land, Company will use nearest road and rail facility for goods transportation and equipped with all other required facilities.

6.2 Residential Area

The area around the site is under development with reasonably good communication facilities.

Around 220 people will be engaged after proposed expansion and the area around the site is under development with reasonably good communication facilities. Other social infrastructure like housing, schooling and medical facilities have been developed in same area. Hence, no residential colony/township is envisaged for employees.

6.3 Green Belt

A greenbelt development plan will be prepared and implemented along with the project. Total green belt area shall be 33% (6.30 Ac) of total area (i.e.19.00 Ac). The main objective of the greenbelt is to provide a barrier between the plant and the surrounding areas.

Comprehensive greenbelt/plantation program will be undertaken in and around the project. The species selection will depend upon crown shape, surface of bark and leaves, flower, color, capacity of growth in the wide variations of ecological conditions etc. A mixture of soil shall be prepared by mixing commercial fertilizer, cow dung, BHC powder in the topsoil.

6.4 Social Infrastructure

EAPL will commence a lot of infrastructure developmental works in the periphery area. Some glimpses of the developmental activities are presented below:

- Improving and building road network in the adjoining villages.
- Strengthening School buildings with playgrounds.
- Social awareness programme will further improve by the local authority such as sanitation and hygiene, HIV Prevention Program.

- Through this project, adult education and female education will be provided to the illiterate adults and backward females of the villages in the project surrounding area.
- The proposed expansion project will set up training centre or tie up with Industrial Technical Institutes to educate local youth as skilled labour.

6.5 Connectivity

Proposed expansion project is well connected to NH-33 and also connected to the Tata Nagar Railway station. However the existing road network will be strengthened and new road network will be built in the adjoining villages.

6.6 Drinking Water Management

Drinking water facilities will be provided for employees as well as nearby villagers. A fresh water tank will be constructed for this drinking purpose.

A water treatment plant is envisaged for providing potable water to the colony and employees. After ensuring the drinking water standards prescribed by CPCB water will be supplied for drinking purpose.

6.6.1 Waste water treatment system

The unit will adopt zero discharge concept as per water balance given above except rainy season.

There will be no effluent generated from the plant. Water will be used in the process to maintain the moisture content of 8-10% in the raw material. Cooling water will be completely recycled in a closed loop. Effluent generated from backwash of filtration plant and clarifier underflow will be treated in settling tank and will be taken to common monitoring basin. From common monitoring basin treated effluent will be reused for ash handling, dust suppression and greenbelt development.

6.7 Sewerage System

A garland drain around the plant is envisaged to collect surface run-off during rainy season. Separate Internal drainage system will be constructed to collect domestic and industrial effluent. A common basin will be constructed for the treatment of effluents the plant. The sewage from the various plant buildings will be taken to a common STP through trenches. The treated water from the STP will be used for greenbelt development. As the sewage is taken in trenches, the soil will not get contaminated. Sludge from STP will be used as manure for greenbelt development.

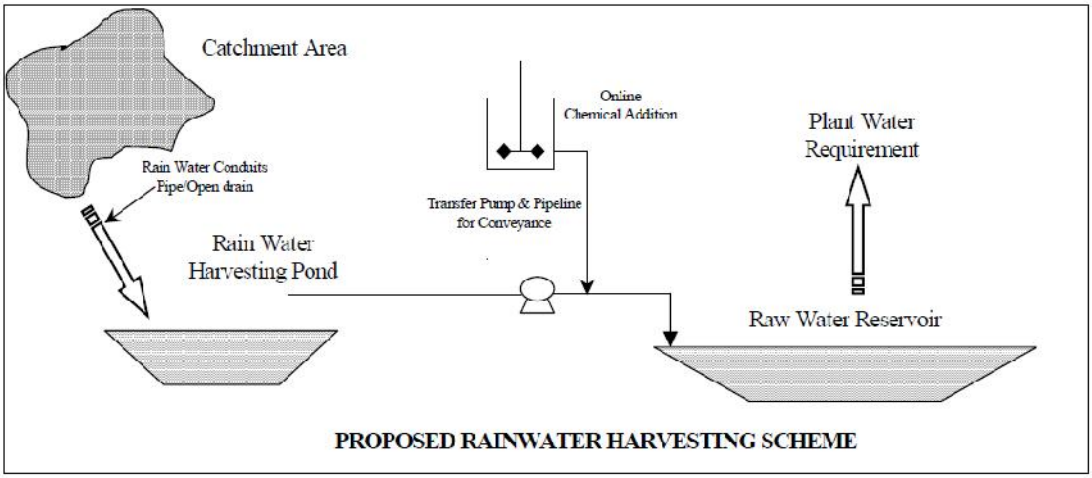
6.7.1 Waste water treatment system

Domestic effluent from canteen and plant will be treated in neutralization tank. Domestic effluent after treatment will be reused for landscaping and green belt.

6.7.2 Run-Off Management

The rain water collected from the roof of buildings will be channelized through drains around the buildings and will be recharged into the ground by providing recharging pits. Overflow, if any, will be discharged to the nearby plant drainage. Also one rain water collection pond has been considered in the layout. All the plant storm water drains will be routed to the rain water collection pond and overflow, if any, from the pond will be discharged to any existing natural outfall outside the plant area. The rain water collection pond will be unlined.

A Rain Water Harvesting Pond has been contemplated to act as collection basin for rainwater. The collected water will be 100% reused in the raw water reservoir in dry season. The pond will be located at the lowest area of the plant so that it can effectively collect all the rainwater by gravity. The Tank shall be earthen. The pond will be lined at the bottom and sides with two layers of HDPE lining of appropriate thickness to prevent percolation of the harvested rainwater in to the ground. Figure below depicts schematically the proposed rainwater harvesting scheme for the proposed plant. The



PROPOSED RAINWATER HARVESTING SCHEME

Rain Water Harvesting Pond is depicted below:

Garland drain will be provided around raw material stock pile area. The run-off collected from these areas will be treated in adequate settling pond and will be taken to rain water harvesting pond.

Suitable pump house will be installed adjacent to the rain water collection pond so that the settled water from the collection pond can be pumped and supplied to the plant for meeting some of the daily requirement.

6.8 Industrial Waste Management

Hazardous Wastes

Majority of the wastes (spend oils, lubricants and oily sludges etc.) will be preferably sold to the potential users with necessary authorization for reprocess/reuse. The non-hazardous (solid) wastes at proposed expansion project site are sludges from raw water treatment plant, biological sludge from STP; and the domestic solid waste from plant area.

The non-hazardous solid waste, i.e. after sludge drying beds, shall be used as landfill material/manure in greenbelt area or even for reclamation of low lying areas, however they will be ultimately disposed as per MoEF guidelines in consultation with JPCB.

6.9 Solid Waste Management

The solid wastes include dust from WHRB and AFBC will be sold to blocks manufacturers and cement industries.

Table 6.0 Solid Waste Generation and Management

Units	Solid Wastes	Qty In TPD	Disposal practice
WHRB & ESP (08 MW CPP)	Fly Ash	48.00	Sale to fly ash bricks / blocks manufacturers – outside party
AFBC (30 TPH)	Fly Ash and Bottom Ash	60.0	Bottom ash for road making and Fly ash sale to cement manufacturers.

CHAPTER – 07
REHABILITATION AND RESETTLEMENT (R & R) PLAN

7.1 Policy to Be Adopted For R & R Plan w.r.t Project

The proposed expansion project is going to come up within the existing plant premises of total 19.00 acres area. Total land has already been acquired. There is no existence of displaced habitants in the area. Land is also devoid of any vegetation.

Local people will be engaged for construction and operation activities and the local area have all the infrastructure facilities. The site and is well connected with NH-33, thus, no housing colony/township is envisaged.

CHAPTER – 08
PROJECT SCHEDULE & COST ESTIMATES

8.1 Project Schedule

In this industry, any one of the following three alternate modes of project execution is adopted:

- Turnkey
- Semi Turnkey
- Packaged procurement mode

Planning Of Activities

Careful planning of all the activities is one of the pre-requisite for timely completion of the expansion project. Following activities will be given special attention.

Pre Project Activities

- Management Approvals.
- Selection of location
- Land acquisitions
- Statutory Clearances
- Financial Approvals and Tie ups.
- Selection of Consultants
- Conceptual Design
- Preparation of main machinery tender
- Evaluation of tenders

Project Activities (Implementation Stage)

- Firm up basic design
- Main Machinery Order placement
- Detailed engineering of the project
- Statutory approvals of Building Plans.
- Preparation of Tender, Evaluation of tenders received and Order placement for balance machinery
- Completion of procurement activities on time
- Release of civil drawing for civil construction
- Civil construction
- Supply of mechanical & electrical equipment
- Inspection of major machinery at supplier's works

- Erection of all plant & machinery
- Commissioning of the plant

Statutory Clearances

The proposed expansion project will require various statutory approvals and clearances from various authorities of the Government. Clearances required for the proposed expansion project shall be identified in due course and necessary action will be taken to obtain the same.

Project Schedule

The schedule has been developed on the basis of the estimated quantum of work, expected delivery and installation periods of plant and equipment and the need to commission the plant facilities in the shortest possible time. The schedule envisages a total expansion project implementation period of 24 months from the date of 'Go-ahead'. Schedule commissioning of the plant can only be achieved if construction, delivery and erection periods as shown in the bar chart can be met by respective suppliers and contractors.

The 'Go-ahead' date for the project implementation has been considered as a date of 'Go-ahead' given to the Consulting Engineers for detailed engineering. The schedule has been prepared based on the assumption that the following activities will be completed prior to the date of 'Go-ahead'.

i. Freezing of adequate project details to enable preparatory site activities to commence on ' Go-ahead',
ii. Finalizing the arrangement for requisite finance as per projections matching with implementation schedule,
iii. Acquiring all relevant statutory Govt. clearance (environmental, forest, rehab illation etc)

Strategies for Timely Execution of the Project

The following strategies would be adopted for smooth functioning as well as timely execution of the project:

- The task of implementing the project in time shall be achieved by ensuring a well coordinated project implementation task force in-house and from external agencies
- A well chosen team of experienced personnel for project execution shall coordinate the implementation of the project from in-house

- Experienced engineering consultants with proven track records shall be selected for detailed engineering of the project.
- Reputed and experienced contractors with adequate resources of finance, men, material and tools and tackles, will be engaged for execution of the construction and erection work.
- Effective project monitoring including project planning schedule and monitoring shall be employed in this project. Timely execution and resources will be monitored using computer based project monitoring tools. In case of deviations in project progress, all possible corrective actions such as crashing of network etc. will be carried out.

8.2 Project Cost

An indicative estimated capital cost of the proposed expansion plant is **Rs. 3625.0 lakhs**, including the pre-operative expenses, contingency and interest during construction.

A broad break-up of the indicative estimate of the Project capital cost is provided below:

Table 8.0 Project Cost Break-Up

Sl. No.	Particulars	Amount in Lakhs
1	Land Development Cost	20.00
2	Building & Shed and civil construction	450.00
3	Plant & Machinery	2780.00
4	Electrical + Power distribution System	250.00
5	Technical & engineering Services	50.00
6	Preliminary & Pre- operative Expenses	25.00
7	Contingencies	50.00
	TOTAL	**3625.00**

CHAPTER – 09
ANALYSIS OF PROPOSAL

9.1 Financial and Social Benefits

In order to meet the power requirement and to utilize the waste gases of its existing Sponge iron Plant, M/s Emaar Alloys Pvt. Ltd. has proposed to expand its existing sponge iron plant by installing 08 MW captive power plant based on WHRB and AFBC Boiler At-Tuidungri, Chowka, Sareikela Kharsawan District, Jharkhand.

Besides there will be immense social benefits of the project, to the backward region.

9.1.1 Improvements in the Physical Infrastructure

EAPL has envisaged a lot of infrastructure developmental works in the periphery area.

- Improving and building road network in the adjoining villages.
- Strengthening School buildings with playgrounds.
- Providing the Drinking Water Facilities.

9.1.2 Improvements in the Social Infrastructure

- Employment, direct and indirect for the local predominantly tribal people.
- Social awareness programme will further improve by the local authority such as sanitation and hygiene, health, immunization etc.
- Through this project, adult education and female education will be provided to the illiterate adults and backward females of the villages in the project surrounding area. Sponsor education to Poor Students of the Proposed Area.
- The proposed expansion project will set up training centre or tie up with Industrial Technical Institutes to educate local youth as skilled labour.
- Provide & conduct the Free Eye & Health Check up Programmes.

9.1.3 Employment

It is estimated that the total requirement of manpower after proposed expansion will be 220. There will be much larger indirect employment in transport, ancillary, support facilities and growth in local trades and business. Other Benefits

- Development of the local area in terms of an enlarged market.
- Besides above, indirect benefits shall also occur to the region by way of increase in industrial production.

Thus, the proposed expansion project will usher in the social and economic upliftment of the persons living in the vicinity of the Project i.e. of society at large.

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