Pre-Feasibility Report

By

Balaji Power [Ferro Division]

[Establishment of Ferro Alloys Unit (4 x 12 MVA ; FeSi–37,300 TPA / FeMn-1,34,400 TPA / SiMn-76,800 TPA / FeCr-80,000 TPA / Pig Iron – 1,34,400 TPA / Titanium Slag – 72,000 TPA, Mn Ore Sinter Plant – 1,20,000 TPA, AOD Converter – 36,000 TPA and Briquetting Plant – 500 Kg/Hr.]

at

Belsonda Village, Mahasamund Tehsil & District,

Chhattisgarh

Table of Contents

Chapter –1:EXECUTIVE SUMMARY

1.1 SALIENT FEATURES OF THE PROJECT

Balaji Power [Ferro Divisioin] is proposing to establish a Ferro Alloys unit, Mn ore Sinter Plant, AOD Converter and Briquetting Plant at Khasra no. 1181/2, 1182, 1184, 1185, 1216, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246/1, 1247/1, 1247/2, 1248, 1249, 1250, 1252, 1253, 1255, 1257, 1258, 1259/1, 1259/2 at Belsonda Village, Mahasamund Tehsil & District, Chhattisgarh. Following is Plant configuration and Production Capacity:

Table No. 1.1 :Plant configuration and production capacity

S.No.	Units (Products)	Plant Configuration (Production Capacity)
1.	Ferro Alloys Unit (FeSi / FeMn / SiMn / FeCr / Pig Iron / Titanium Slag)	2 x 12 MVA (FeSi – 18,600 TPA / FeMn-67,200 TPA / SiMn-38,400 TPA / FeCr-40,000 TPA / Pig Iron – 67,200 TPA)
2.	Mn ore Sinter Plant	1,20,000 TPA
3.	AOD Converter	36,000 TPA
4.	Briquetting Plant	500 kg/Hr

Total land identified for the proposed project is 7.94 Ha. (19.64 Acres) and same is in possession of management.

Estimated Project Cost for the proposed project is Rs. 240 Crores.

Water required for proposed project (for process and domestic) is 600 KLD & will be sourced from Mahanadi River, at distance of 1.5 Kms. from the project site. Permission will be obtained from Water Resources Department, Government of Chhattisgarh after receipt of TOR letter.

1.2 PROJECT PROPONENT

Hira Ferro Alloys Limited is the company registered under Companies Act, 1956 having present ferro alloys production capacity of Ferro Alloys: 50000 metric tonnes per annum or pig iron 70000 metric tonnes per annum along with captive power plant of 20 MW in the name of Hira Ferro Alloys Limited (Unit-II) along with ferro alloys production capacity of 10500 metric tonnes per annum in the name of Hira Ferro Alloys Limited (Unit-I) at Urla Industrial Area Raipur.

The company is also having 8.5 MW biomass based renewable energy power plant in the name of Balaji Power (A unit of Hira Ferro Alloys Limited) at Village Belsonda, District Mahasamund and 1.5 MW Wind mill in the state of Karnataka. The company's turnover during last financial year 2019-20 was of Rs.301 Crores.

Hira Ferro Alloys Limited is a company of Hira Group which is one of the leading business conglomerates in the state of Chhattisgarh. The group is one of the largest group of Chhattisgarh with predominant interest in power generation, sponge iron, steel making, steel rolled products, ferro alloys and coal and iron ore mining and cement manufacture. The group turnover in 2019-20 was around Rs.4200 crores. The Group has vast experience in the projects of Ferro Alloys & Steel making among other products.

Hira Group of companies operate in eight business sectors viz. **Sponge (DRI), Steel, Power, Ferro alloys, Cement, Real Estate, Pellets & Mining**. The Group Combines unparalleled experience, across all related products through extensive research for cost effective production.

The Group efficiently collaborates with the customer's needs and expectations to help them become high-performance businesses and governments. The group is well established in India and is expanding operations in International market.

The group has always thrived for growth and innovation hence the success saga is still going very strong since its inception. In the journey so far, the group has believed in returning wealth to the society by serving through various philanthropic activities around its different industrial units. Empowering the society through Education, Enriching the Environment, Developing Infrastructures, spreading hygienic norms through Sports and Re-Creations and Corporate Governance have been the groups priorities.

After decades of operations, Hira Group has emerged as a synonym of trust & commitment in Indian Steel Scenario. Moving ahead, the group is focusing on new technologies and innovation to lead its business in domestic and international market, while balancing the interests of shareholders, employees and the society.

Chapter – 2: INTRODUCTION OF THE PROJECT / BACKGROUND INFORMATION

2.1 IDENTIFICATION OF PROJECT AND PROJECT PROPONENT

HIRA FERRO ALLOYS LIMITED, a Unit of Hira Group was incorporated on 14.10.1990 with the main Vision of "*Be one of the world's leading providers of Ferro Alloy by creating value for each of our stakeholders. By constant research, innovation and development bring a better product for the customer. We will accomplish our Vision through our commitment to strategic growth, outstanding service, and environmental care."* And Mission of *"Our Mission is to utilize the available raw materials at optimum efficiency by innovation and technology. Delivering the best product without disturbing the environment. Maximum utilization of our by products and industrial waste."*The present Board of Directors of the Company are:

Shri Biswajit Choudhari, Chairman and Independent Director

Shri Biswajit Choudhari, B.Tech (Hons), aged 65 years, Chairman and Non-Executive Independent Director has over 44 years of experience in Engineering, Banking, Finance and Management. Shri Biswajit Choudhari graduated as a Mechanical Engineer from IIT, Kharagpur in 1963 is also a Fellow Member of Institute of Cost and Works Accountants of India (ICWAI) and Indian Institute of Banking and Finance.

He acted as Director and Member of various Boards and Councils viz., National Insurance Company, National Institute of Bank Management, Indian Institute of Bankers, Indian Institute of Social Welfare and Business Management, Institute of Banking Personnel Selection, Calcutta Stock Exchange, Usha Martin Limited, EID Parry (India) Limited, Mundra Port & SEZ Limited etc.

In the year 1992, he has been appointed by Government of India as Executive Director for revival of UCO Bank. Subsequently in the year 1996, he was appointed as Chairman and Managing Director of United Bank of India when the bank was incurring losses in the last four consecutive years. After his joining as CMD in the year 1996, the United Bank of India started earning net profits during his tenure as CMD of the bank.

Shri Narayan Prasad Agrawal, Managing Director

Shri Narayan Prasad Agrawal, Managing Director, aged 53 years is a commerce graduate and has been an active part of his family business. He has been taking charge of the financial, commercial and administrative aspects of the company very efficiently.

Always standing parallel to the Hira foundation, a charitable trust by the group, he has put in unrelenting efforts for the fulfillment of its motives. He was the Chairman of CII of Chhattisgarh region for the year 2010-11. He has 25 years of hard work and experiences have made him guide the company towards its tremendous success.

Shri Bhrigu Nath Ojha, Independent Director

Shri Bhrigu Nath Ojha, Non-Executive Independent Director, aged 67 years, is Bachelor of Electrical Engineering from BIT Sindri. He has vast experience of over 40 years in the power sector. He started his career as Executive Engineer in the year 1966 in Damodar Valley Corporation. He joined NTPC as Manager in the year 1980 and has been gradually promoted to Director (Operations). He served NTPC in various capacities till 2003.

He has outstanding experience in building, developing, managing and directing power organizations to success and is fully capable of leading and representing large organizations and undertaking high level roles and successfully dealing in matters related to the power industry, government issues, commerce and media.

Ms. Bhavana G Desai, Woman Independent Director

Ms. Bhavna G. Desai aged 57 year, is a Bachelor in Commerce from Bombay University having over two decades of experience in shares and security market activities. She was associated as a partner with a firm M/s G. B. Desai which is engaged in the business of dealing with securities and presently, associated with our group companies i.e.Godawari Power and Ispat Limited, Godawari Green Energy Limited and Ardent Steel Limited in the capacity of Independent Women Director.

Shri Arbind Kumar Dubey, Executive Director

Shri Arbind Kumar Dubey, Executive Director, aged 49 is a Commerce Graduate and associated with the Company and Group companies in various capacities since last two decades. He has vast experience in the General Administration. Presently he is looking day to day operation of the Company.

Shri Yarra Chandra Rao, Non-Executive Director

Shri Yarra Chandra Rao, Non-Executive Director aged 46 years, Shri Yarra Chandra Rao has been managing all the secretarial and legal compliances with ease and efficiency. Associated with the company since 1996, he was appointed as Director in April 1999. He is a fellow member of the Institute of Company Secretaries of India and an Associate Member of the Institute of Cost and Works Accountants of India (ICWAI). Being a Law Graduate from the University of Calcutta, he possesses flair in handling all the legal matters with proficiency.

He started his career with M/s. Orient Paper and Industries Limited, one of the Birla Group of Companies. He has been also associated with M/s. Paradeep Phosphates Limited (a Joint Venture with the Government of Nauru) as Company Secretary for four years. He is responsible for all the legal cases relating to Central Excise, Secretarial Matters and Other Statutes. He has worked with all his heart and soul to see the company where it is today. He is presently working as a President (Legal) and Compliance Officer of Godawari Power AndIspat Limited.

Shri Ajya Dubey, Non Executive Director

Shri Ajay Dubey, Non Executive Director of the Company aged 57 years has been associated with the group for the last 3 decades in various capacities and presently he is looking after entire plant operations of Ferro Alloys division of Alok Ferro Alloys Limited, one of the group company.

2.2 BRIEF DESCRIPTION OF THE NATURE OF THE PROJECT

It is proposed to setup a Steel Plant with the following facilities:

- Establishment of Ferro Alloys by installing 4 x 12 MVA to manufacture FeSi–37,300 TPA / FeMn-1,34,400 TPA / SiMn-76,800 TPA / FeCr-80,000 TPA / Pig Iron – 1,34,400 TPA / Titanium Slag – 72,000 TPA.
- Establishment of Mn Ore Sinter Plant to manufacture Sinter 1,20,000 TPA.
- Establishment of AOD Converter of capacity 36,000 TPA
- Establishment of Briquetting Unit to manufacture Briquettes 500 Kg/ Hr.

Total land identified for the proposed project is 7.94 Ha. (19.64 Acres) and same is in possession of management.

2.2 NEED FOR THE PROJECT AND ITS IMPORTANCE TO THE COUNTRY AND OR REGION

India's economic growth is contingent upon the growth of the Indian steel industry. Consumption of steel is taken to be an indicator of economic development. While steel continues to have a stronghold in traditional sectors such as construction, housing and ground transportation, special steels are increasingly used in engineering industries such as power generation, petrochemicals and fertilizers. India occupies a central position on the global steel map, with the establishment of new state-of-the-art steel mills, acquisition of global scale capacities by players, continuous modernization and up gradation of older plants, improving energy efficiency and backward integration into global raw material sources. Steel production in India has increased by a compounded annual growth rate (CAGR) of 8 percent over the period 2002-03 to 2006-07. Going forward, growth in India is projected to be higher than the world average, as the per capita consumption of steel in India, at around 52 kg, is well below the world average (170 kg) and that of developed countries (400 kg). Indian demand is projected to rise to 300 million tonnes by 2025. Given the strong demand scenario, most global steel players are in a massive capacity expansion mode, either through brownfield or Greenfield route. Steel production capacity in India is expected to touch 170 million tonnes by 2020. While Greenfield projects are slated to add 30 million tonnes, brownfield expansions are estimated to add 50 million tonnes to the existing capacity of 90 million tonnes. Steel is manufactured as a globally tradable product with no major trade barriers across national boundaries to be seen currently. There is also no inherent resource related constraints which may significantly affect production of the same or its capacity creation to respond to demand increases in the global market. Even the government policy restrictions have been negligible worldwide and even if there are any the same to respond to specific conditions in the market and have always been temporary. Therefore, the industry in general and at a global level is unlikely to throw up substantive competition issues in any national policy framework. Further, there are no natural monopoly characteristics in steel. Therefore, one may not expect complex competition issues as those witnessed in industries like telecom, electricity, natural gas, oil, etc.

2.3 DEMAND AND SUPPLY GAP

Demand for steel is high and as soon as they are processed they will be supplied to nearby industries.

2.4 EXPORT POSSIBILITY

As the Indian steel industry has entered into a new development stage from 2007-08, riding high on the resurgent economy and rising demand for steel. Rapid rise in production has resulted in India becoming the 4thlargest producer of crude steel and the largest producer of sponge iron or DRI in the world. As the demand is more the export possibility of Sponge Iron will also be more. As the demand is more the export possibility will also be more.

2.5 DOMESTIC/EXPORT MARKETS

While the demand for steel will continue to grow in traditional sectors such as infrastructure, construction, housing automotive, steel tubes and pipes, consumer durables, packaging, and ground transportation, specialized steel will be increasingly used in hi-tech engineering industries such as power generation, petrochemicals, fertilizers, etc. The new airports and railway metro projects will require a large amount of steel. Hence the domestic and export markets for steel sector will rise.

2.6 EMPLOYMENT GENERATION (DIRECT AND INDIRECT) DUE TO THE PROJECT

The local areas will be benefited by way of generation of employment opportunities, increased demand for local products and services. There will be an overall improvement in the income level of the local people.

The proposed project will generate direct employment 150 nos. which will be employed officials, staff, skilled, semi -skilled labour & 250 nos. indirectly employed in contract works & transport.

Top priority will be given to locals for Semi-Skilled and Unskilled jobs. With the development of this Plant there will be lot of scope for more ancillary development, which in turn will benefit the nation.

Chapter – 3 : PROJECT DESCRIPTION

3.1 TYPE OF PROJECT INCLUDING INTERLINKED AND INTERDEPENDENT PROJECTS

3.1.1 TYPE OF THE PROJECT

It is proposed to setup a Steel Plant with the following facilities:

- Establishment of Ferro Alloys by installing 4 x 12 MVA to manufacture FeSi–37,300 TPA / FeMn-1,34,400 TPA / SiMn-76,800 TPA / FeCr-80,000 TPA / Pig Iron – 1,34,400 TPA / Titanium Slag – 72,000 TPA.
- Establishment of Mn Ore Sinter Plant to manufacture Sinter 1,20,000 TPA.
- Establishment of AOD Converter of capacity 36,000 TPA
- Establishment of Briquetting Unit to manufacture Briquettes 500 Kg/ Hr.

Ministry of Environment, Forest & Climate Change (MoEF&CC) has made prior Environmental Clearance (EC) for certain developmental projects mandatory through its notification issued on 14thSeptember 2006 and its subsequent amendments.

As per the EIA notification dated 14thSeptember, 2006 & its subsequent amendments, all Primary metallurgical processing industries are listed under S.No. 3(a), under Category 'A'.

3.1.2 INTERLINKED PROJECT

No interlinked project is envisaged.

3.2 LOCATION OF THE PROJECT

The proposed project site is located at Belsonda Village, Mahasamund Tehsil & District, Chhattisgarh.

Total land identified for the proposed project is 7.94 Ha. (19.64 Acres) and same is in possession of management.

Khasra no. 1181/2, 1182, 1184, 1185, 1216, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246/1, 1247/1, 1247/2, 1248, 1249, 1250, 1252, 1253, 1255, 1257, 1258, 1259/1, 1259/2.

The project site falls in Survey of India Topo sheet no. 64K/4.

Table No. 3.2 :Coordinates of the project site

S.No.	Point	Coordinates	
1.	Point # 1	21.155278 N	82.029926 E
2.	Point # 2	21.154832 N	82.030463 E
3.	Point # 3	21.154504 N	82.030350 E
4.	Point # 4	21.154210 N	82.030702 E
5.	Point # 5	21.154218 N	82.030892 E
6.	Point # 6	21.153819 N	82.031568 E
7.	Point # 7	21.153331 N	82.031731 E
8.	Point # 8	21.153192 N	82.031537 E
9.	Point # 9	21.153213 N	82.031311 E
10.	Point # 10	21.153133 N	82.031135 E
11.	Point # 11	21.153137 N	82.030923 E
12.	Point # 12	21.153124 N	82.030752 E
13.	Point # 13	21.152948 N	82.030779 E
14.	Point # 14	21.152611 N	82.031054 E
15.	Point # 15	21.152388 N	82.030955 E
16.	Point # 16	21.152334 N	82.030978 E
17.	Point # 17	21.152127 N	82.030941 E
18.	Point # 18	21.152132 N	82.030553 E
19.	Point # 19	21.151639 N	82.030454 E
20.	Point # 20	21.151547 N	82.030341 E
21.	Point # 21	21.151559 N	82.030175 E
22.	Point # 22	21.151278 N	82.029895 E
23.	Point # 23	Not provided	Not provided
24.	Point # 24	21.151795 N	82.029566 E
25.	Point # 25	21.151829 N	82.029322 E
26.	Point # 26	21.151770 N	82.029128 E
27.	Point # 27	21.151652 N	82.028524 E

28.	Point # 28	21.151467 N	82.028578 E
29.	Point # 29	21.151403 N	82.028464 E
30.	Point # 30	21.151315 N	82.028108 E
31.	Point # 31	21.151088 N	82.027877 E
32.	Point #32	21.150991 N	82.027612 E
33.	Point #33	21.150777 N	82.027707 E
34.	Point #34	21.150676 N	82.027310 E
35.	Point #35	21.151172 N	82.027233 E
36.	Point #36	21.151156 N	82.026949 E
37.	Point #37	21.151559 N	82.026945 E
38.	Point #38	21.152190 N	82.026841 E
39.	Point #39	21.152270 N	82.027098 E
40.	Point #40	21.152443 N	82.027080 E
41.	Point #41	21.152397 N	82.027414 E
42.	Point #42	21.152590 N	82.027387 E
43.	Point #43	21.152586 N	82.027432 E
44.	Point #44	21.152695 N	82.027486 E
45.	Point #45	21.152826 N	82.027676 E
46.	Point #46	21.152830 N	82.027856 E
47.	Point #47	21.152960 N	82.028000 E
48.	Point #48	21.152901 N	82.028131 E
49.	Point #49	21.153183 N	82.028307 E
50.	Point #50	21.153263 N	82.028172 E
51.	Point #51	21.153726 N	82.028379 E
52.	Point #52	21.153785 N	82.028451 E
53.	Point #53	21.153907 N	82.028573 E
54.	Point #54	21.154210 N	82.028997 E
55.	Point #55	21.154239 N	82.029232 E
56.	Point #56	21.154534 N	82.029507 E

57.	Point #57	21.154706 N	82.029304 E
58.	Point #58	21.154875 N	82.029570 E
59.	Point #59	21.154984 N	82.029606 E
60.	Point #60	21.155009 N	82.029705 E
61.	Point #61	21.155262 N	82.029823 E
62.	Point #62	21.155270 N	82.029877 E

Figure : 1.0 – General Location of Plant

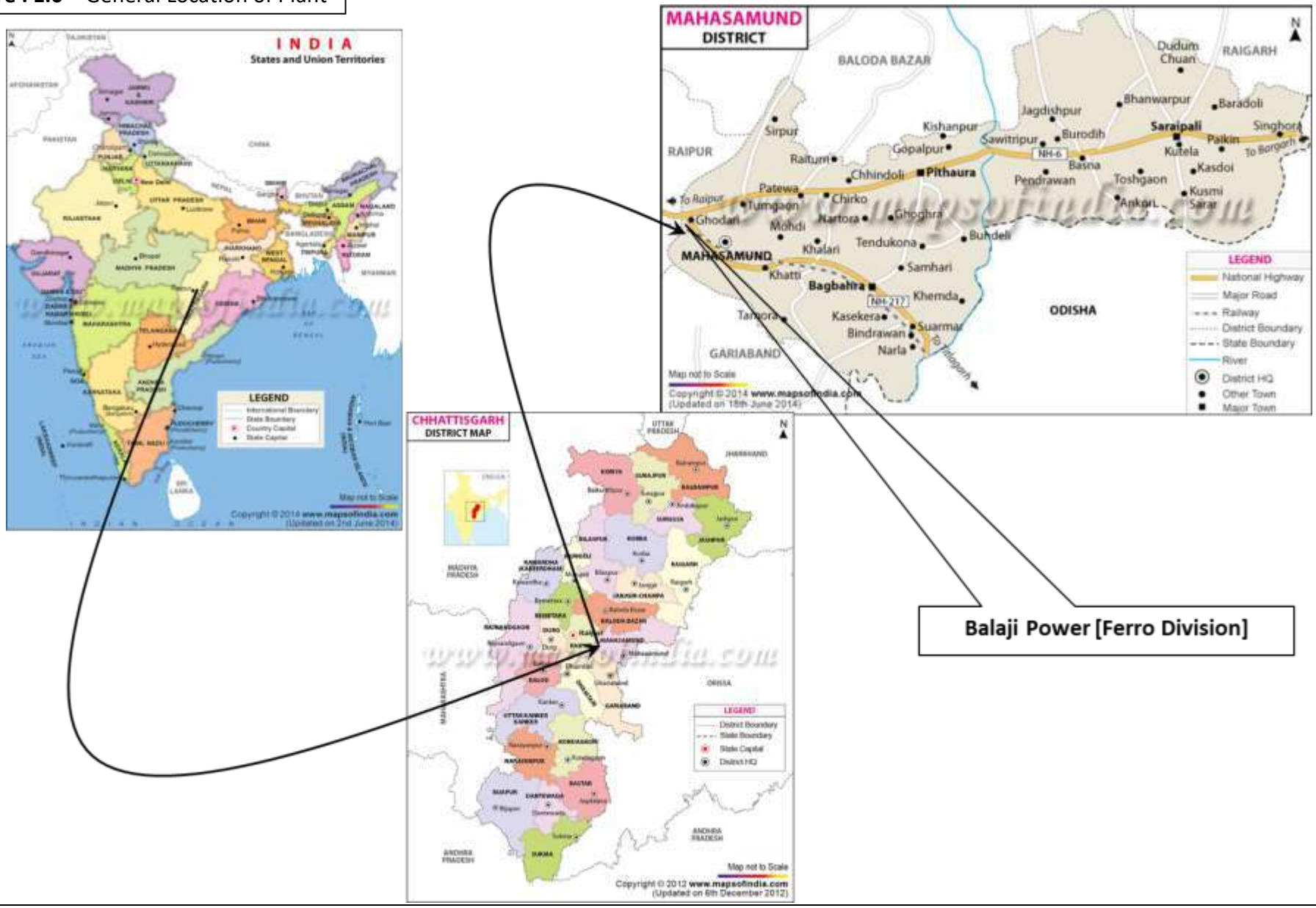


Figure :2.0 – Topo map (10 Kms.)

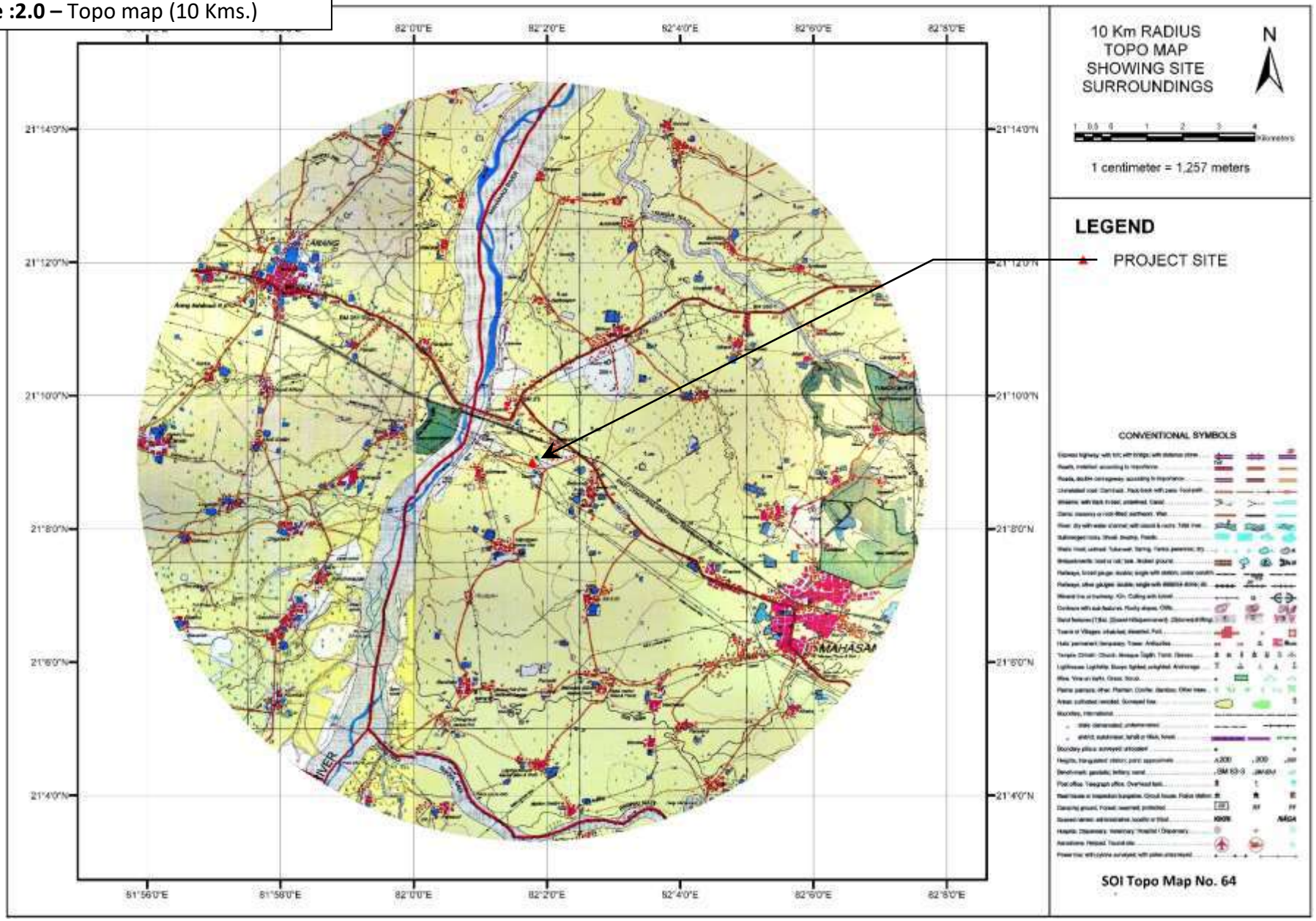
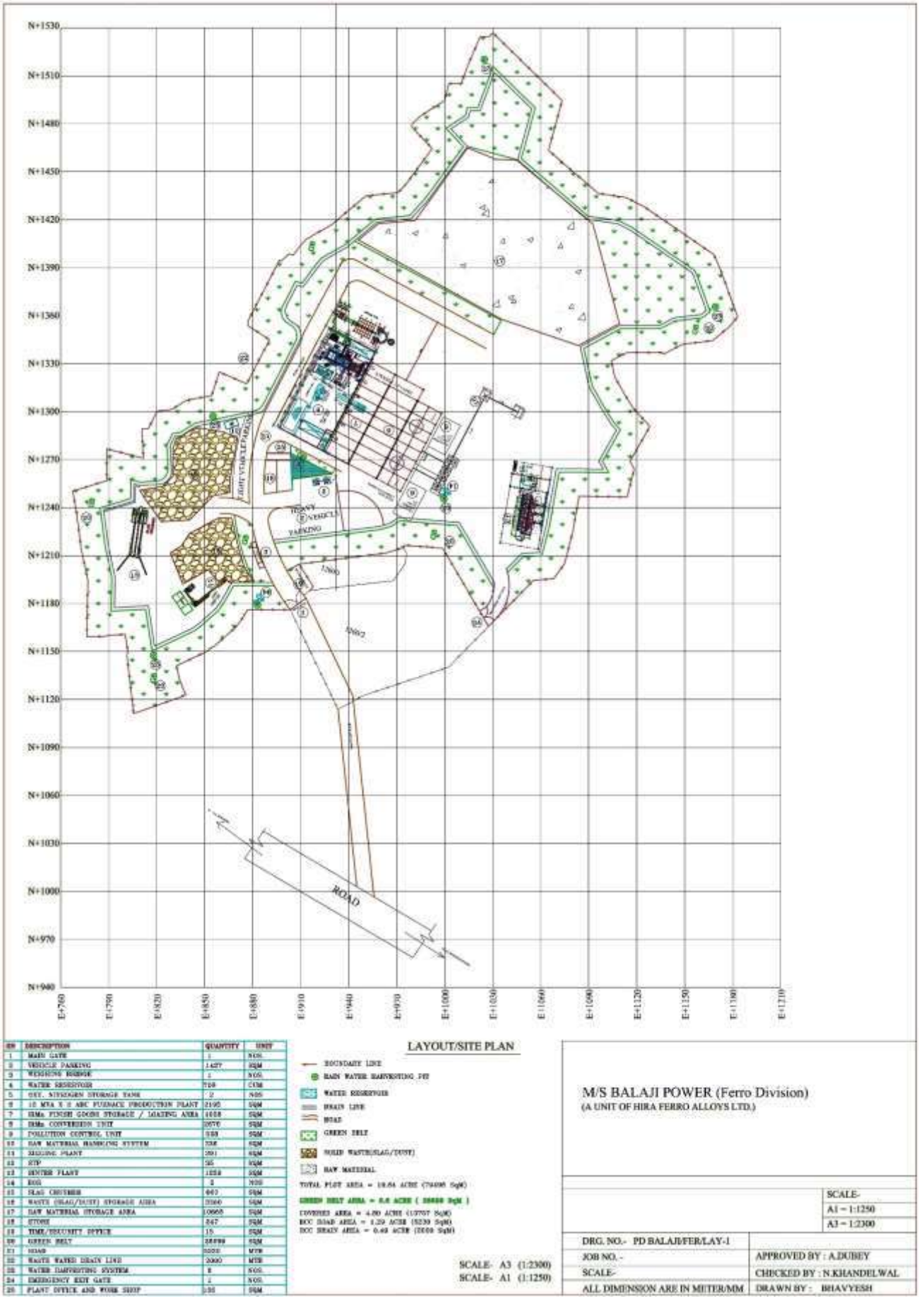


Figure :3.0 – Plant Layout



3.3 DETAILS OF THE ALTERNATE SITES

3 nos. of sites have been considered for the present proposal and following is analysis of the considered site.

Table No. 3.3.1 :Details of Alternate Sites

S.No.	Parameters	SITE #1	SITE # 2	SITE # 3
1.	Location	Bemcha Village Simga Tehsil	Belsonda Village, Mahasamund Tehsil	Laphin Khurd Village, Rajim Tehsil
2.	Extent of land identified	6.91 Ha.	7.94 Ha.	8.33 Ha.
3.	Geographical Coordinates	21° 9'57.74"N 82° 6'39.37"E	21° 9'8.86"N 82° 1'45.06"E	21° 4'4.46"N 82° 1'23.32"E
4.	Type of Land (Present land use)	Agricultural Land	Agricultural Land	Agricultural Land
5.	Areas falling under the critically polluted areas (within 10 Kms. Radius)	Nil	Nil	Nil
6.	National Parks / Wild life Sanctuaries / Bird Sanctuaries / Tiger reserve / Elephant corridors / Migratory routes for Birds (within 10 Kms. of the project site)	Nil	Nil	Nil
7.	Forests	Tumgaon R.F (0.21 Kms.)	Tumgaon R.F (8.5 Kms.)	Nil
8.	Water Bodies	Kurar Nadi (2.7 Kms.)	Mahanadi River (1.25 Kms.)	Sukha River (0.5 Kms.)
9.	Source of Surface water	Kurar Nadi (2.7 Kms.)	Mahanadi River (1.25 Kms.)	Sukha River (0.5 Kms.)
10.	Distance of nearest Habitation	Bemcha Village (0.55 Kms.)	Belsonda Village (0.3 Kms.)	Laphin Khurd Village (0.55 Kms.)
11.	Road Connectivity	NH # 6 (2.9 Kms.)	NH # 217 (0.50 Kms.)	NH # 217 (7.6 Kms.)
12.	Rail Connectivity	Mahasamund RS (5.5 Kms.)	Belsonda RS (0.45 Kms.)	Belsonda RS (9.5 Kms.)
	Main Reason for Seleciton / Rejection	*Not selected because:* • *Land is proximate to Reserve Forest.*	***Selected because*** • ***Site is well connected with NH # 16 (0.5 Kms.)***	*Not selected because:* • *Land is proximate to river* • *Land is proximate to agricul.*

Table No. 3.3.2: Proposed methodoloy for Alternate Site analysis

S.No	Environmental Parameter	Maximum Weightage allocated	Site #1 Bemcha Village Simga Tehsil	Site # 2 Belsonda Village, Mahasamund Tehsil	Site # 3 Laphin Khurd Village, Rajim Tehsil
1.	**land(20)**	**20**			
	A).Type of Land(15)				
	· Barren land(15)				
	· Unirrigated for 1>10 years(8)				
	· Agriculture land				
	Ø Single crop(7)		7	7	
	Ø Double crop(3)			s	3
	· Govt. Land / Industrial Land(15)				
	· Forest Land(4)				
	· Wet Land / Mud Flap(0)				
	B)Shape of the Land(2)	**2**			
	Square /Rectangle(2)				2
	Irrugular shape(1)		1	1	
	C) Land Contaning trees				
	Tree cutting (3)	**3**			
	0-10(3)		3	3	
	11-100(2)				2
	Above 100(1)				
2.	**National Park/Sanctuary within 10 Km. radius (10)**	**10**			
	· Nil(10)		10	10	10
	· Exist(2)				
3.	**Forest(5)**	**5**			
	· No Forest within 1 km. radius(5)			5	5
	· Dense scrub within 1 km. radius(4)				
	· PF within 1 km. radius(3)				
	· RF within 1 km. radius(2)		2		
4.	**CPA / SPA(10)**	**10**			
	· Nil within 10 Km. radius(10)		10	10	10
	· Exist in 5-10 Km. radius(4)				
	· Exist in 0 – 5 Km radius(2)				
5.	**Water Bodies(10)**	**10**			
	· Rivers(5)				
	Ø No river within 0.5 Km. radius(5)		5	5	

S.No	Environmental Parameter	Maximum Weightage allocated	Site #1 Bemcha Village Simga Tehsil	Site # 2 Belsonda Village, Mahasamund Tehsil	Site # 3 Laphin Khurd Village, Rajim Tehsil
	Ø River exist within 0.5 km. raidus(2)				2
	· Canals(2)				
	Ø No Canal within 0.5 Km. radius(2)		2	2	2
	Ø Canal exist within 0.5 km. radius(1)				
	· Streams **/** Nallas passing through site(3)				
	Ø No Streams /Nallas passing through site(3)		3	3	3
	Ø Streams/Nallas pass through the site(1)				
6.	**Source of water for project(10)**	**10**			
	· Ground water(4)				
	· Surface water(10)		10	10	10
7.	**Distance of habitation(10)**	**10**			
	· Habitation in the site (2)				
	· 0.01 - 0.50 Kms. (5)		5		
	· 0.51 - 1.0 Kms.(7)			7	7
	· 1.01 – 1.50 kms.(9)				
	· Beyond 1.50 Kms.(10)				
8.	**Road connectivity(15)**	**15**			
	· Approach road(5)				
	Ø Single lane(1)		1	1	1
	Ø 2-lane & above(5)				
	· Site abutting NH/SH(15)				
	· Distance of NH/SH				
	Ø 0- 5 Kms.(15 to 10)			14	
	Ø 5-10 Kms.(10 to 5)		5		7
	Ø Beyond 10 Kms.(3)				
9.	**Railway facility(10)**	**10**			
	· Self Railway siding(10)				
	· Distance of railway facility				
	Ø 1 - 5 Kms.(8)			8	
	Ø 5 – 10 Kms.(6)		6		
	Ø 10 – 15 Kms.(4)				4
	Ø 15-20 Kms.(2)				
	Ø Beyond 20 Kms.(1)				
		100	**70**	**86**	**68**

Based on the above, Site 2, at Belsonda Village, Mahasamund Tehsil is selected for proposed project.

3.4 SIZE OR MAGNITUDE OF OPERATION

Following is the plant configuration and production capacity of proposed project:

Table No. 3.4 :Plant configuration and production capacity

S.No.	Units (Products)	Plant Configuration (Production Capacity)
1.	Ferro Alloys Unit (FeSi / FeMn / SiMn / FeCr / Pig Iron / Titanium Slag)	4 x 12 MVA (FeSi–37,300 TPA / FeMn-1,34,400 TPA / SiMn-76,800 TPA / FeCr-80,000 TPA / Pig Iron – 1,34,400 TPA / Titanium Slag – 72,000 TPA)
2.	Mn ore Sinter Plant	1,20,000 TPA
3.	AOD Converter	36,000 TPA
4.	Briquetting Plant	500 kg/Hr

3.5 MANUFACTURING PROCESS

3.5.1 SUBMERGED ARC FURNACE UNIT

Ferro Alloys will be smelted at about 1350 – 1500^{0}C. This will be achieved by a Closed Submerged Electric Arc Furnace. The three carbon Electrodes, partially submerged in the charge, are supported on hydraulic cylinders for upward and down ward movements to maintain the desired electrical conditions.

The body of the furnace is cylindrical in shape, and is lined with firebricks, silicon carbide bricks and carbon tamping paste. Three tap – holes are provided at 120 degree apart for drawing out both the molten alloy and Slag. During the repair works one of the tap – holes the other will function as stand by.

The weighed raw materials will be thoroughly mixed in the proper proportion before charging into the furnace, through Skip, Telfer hoist and charging chutes. The charge will be pushed near to electrodes on Furnace top by a Charging Stoker.

As the charge enters the smelting zone, the alloy formed by chemical reactions of the oxides and the reductants, will be heavy, gradually settles at the bottom. At regular intervals the furnace will be tapped. The tap hole will be opened by Oxygen lacing pipe and after tapping is completed, it will be closed by clay plugs.

The liquid Silico manganese and Slag will be collected in a Ladle and Slag will be over flowed to sand beds. The metal being retained in the ladle having a Nozzle at bottom which allows metal

flows on to C.I. Pans. After solidification the cakes will be broken manually to required lump size.

SILICO MANGANESE & FERRO MANGANESE PROCESS

Manganese ore is in the form of MnO, SiO_2, FeO, Al_2O_3, MgO and other Oxides. MnO is reduced to Mn and FeO is reduced to Fe taking Carbon from Coke / Coal and the product is produced as Si Mn/Fe Mn. The other oxides are simultaneously removed as Slag along with metal. The Slag and Metal are separated by virtue of its self-differential gravities after collecting in the ladle. The ladle will have a nozzle in the bottom portion through which the metal flows in to C.I. Pans.

Chemical Composition of Si Mn

S.No.	Constituent	Percentage
1.	Mn	60 – 65%
2.	Si	+ 15%
3.	C	2%
4.	S & P	0.03% Max

Chemical Composition of Fe Mn

S.No.	Constituent	Percentage
1.	Mn	70 - 75%
2.	Si	+ 1.5%
3.	C	7 - 8 %
4.	S	0.05% Max
5.	P	0.4 %

FERRO SILICON PROCESS

Ferro Silicon is a Slagless process. Quartz is the main raw material which contains 99%of SiO_2. Charcoal and a small percentage of Coal is used as reductants. Mill Scale / Iron Ore is added to obtain Ferro Silicon. FeO is reduced to Fe and SiO_2 is reduced to Si Combining with Carbon and produced as Fe Si.

Chemical Composition of Fe Si

S.No.	Constituent	Percentage
1.	Si	70 - 75%
2.	C	7 – 8 %
3.	S	0.05 %
4.	P	0.4% Max

FERRO CHROME PROCESS

Chrome Ore is in the form of Cr2 O3, Fe2O3, SiO2, Al2O3, CaO and MgO. These oxides react with carbon in the coke and reduced to Fe, Cr, Si, C etc. Other oxides i.e Al2O3, SiO2, CaO, MgO are removed in the form of Slag.

Chemical Composition of Fe Cr

S.No.	Constituent	Percentage
1.	Cr	60 – 65 %
2.	C	1 - 8 %
3.	Si	1 - 3 %
4.	S	0.04 %
5.	P	0.04%
6.	Cu	0.5 %

THE PROCESS:

Ferro Alloys will be smelted at about 1350 – 1500^0C temperature. This will be achieved by a conventional, Closed Submerged Electric Arc Furnace. The three carbon Electrodes, partially submerged in the charge, are supported on hydraulic cylinders for upward and down ward movements to maintain the desired electrical conditions.

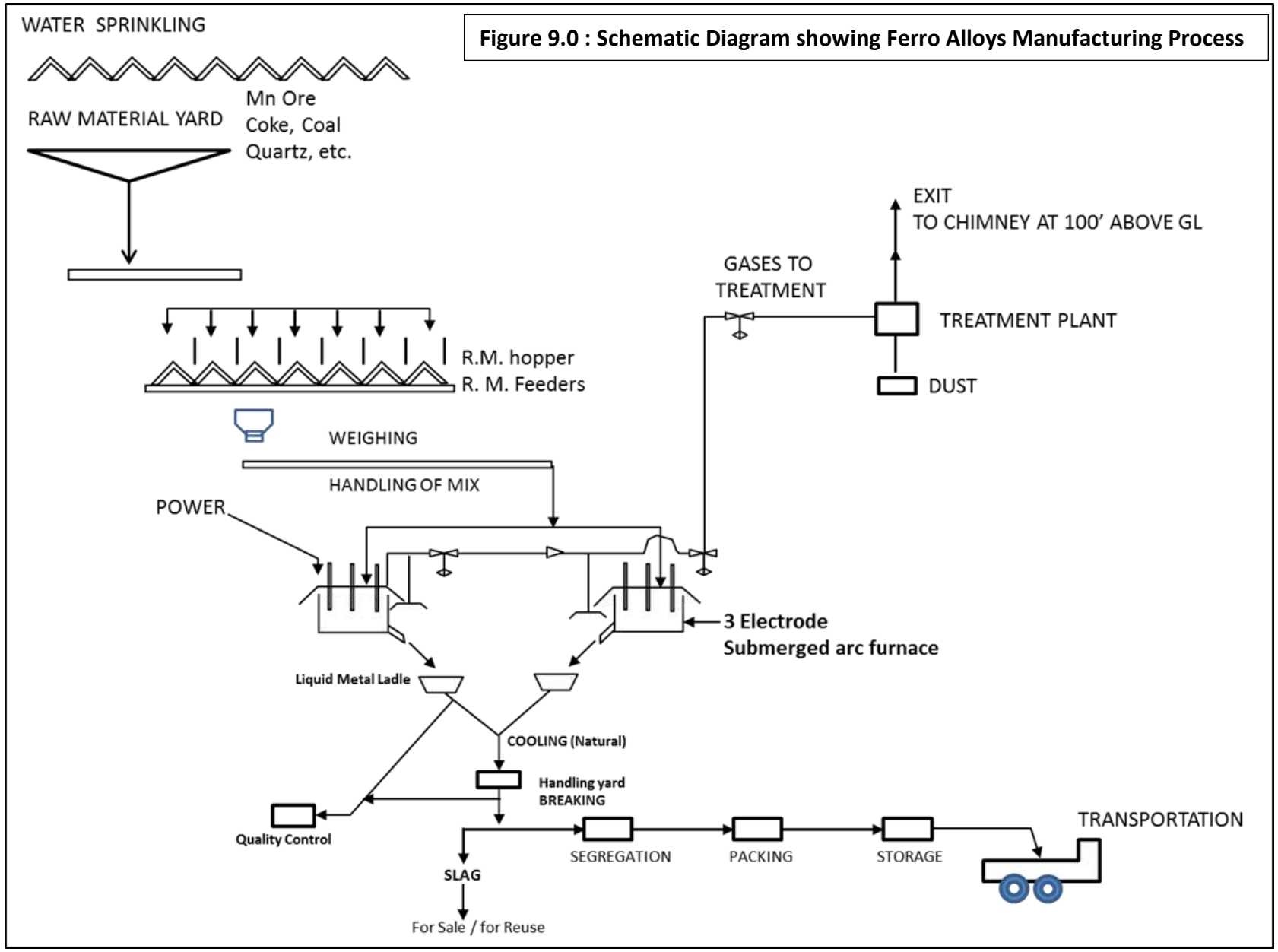
The body of the furnace is cylindrical in shape, and is lined with firebricks, silicon carbide bricks and carbon tamping paste. Three tap – holes are provided at 120 degree apart for drawing out both the molten alloy and Slag. During the repair works one of the tap – holes the other will function as stand by.

The weighed raw materials will be thoroughly mixed in the proper proportion before charging into the furnace, through Skip, Telfer hoist and charging chutes. The charge will be pushed near to electrodes on Furnace top by a Charging Stoker.

As the charge enters the smelting zone, the alloy formed by chemical reactions of the oxides and the reductants, will be heavy, gradually settles at the bottom. At regular intervals, the furnace will be tapped. The tap hole will be opened by Oxygen lacing pipe and after tapping is completed, it will be closed by clay plugs.

The liquid Silico manganese and Slag will be collected in a Ladle and Slag will be over flowed to sand beds. The metal being retained in the ladle having a Nozzle at bottom which allows metal flows on to C.I. Pans. After solidification, the cakes will be broken manually to required lump size.

Figure 9.0 : Schematic Diagram showing Ferro Alloys Manufacturing Process



PROCESS OF FERRO CHROME RECOVERY (ZIGGING PLANT)

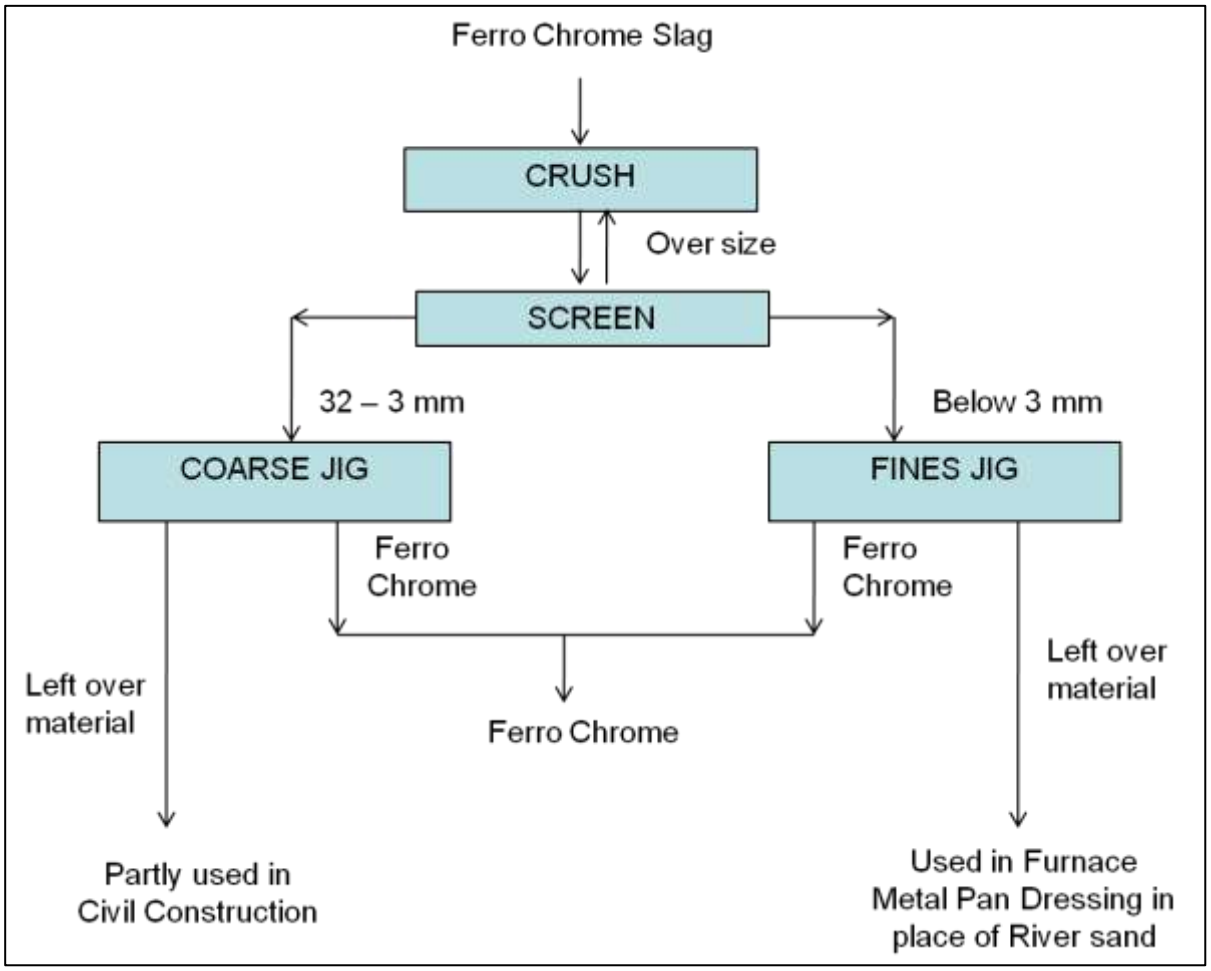
Ferro chrome recovery process involves the following steps

i. Crushing & screening: In this slag is crushed to smaller size particles as close as possible

ii. Coarse jigging: In this particles having coarse fraction (approximately -32 to -3mm) is separated through two stage air pulsated jig for recovery of metal.

iii. Fine jigging: In this particles of fine fraction (-3mm) is separated through diaphragm pulsed (through the bed' jigs for recovery of metal.)

iv. The recovered metal will be reused in the process.



MANUFACTURING PROCESS OF TITANIUM SLAG & PIG IRON

Initial product from the complex is Titanium Slag (@72,000 TPA) and pig iron (@1,34,400 TPA). Titanium Di-oxide - TiO_2 (@30,000 TPA) is produced from Titanium slag. It is one of most important Pigment materials. Titanium Di-oxide has the highest refractive Index among the known materials and hence it imparts best pigment properties such as hiding power, opacity etc. Titanium Di-oxide is the whitest of the white pigments.

Titanium Di-oxide is produced and marketed in two grades, these are ANATASE & RUTILE. RUTILE has closed packed structure whereas ANATASE has more open structure. Rutile has higher density, higher refractive index, and better resistance to chalking & higher hardness. Their relevant properties are highlighted in Table below; shows that the Rutile grade is superior in many respects.

The process description for Titanium Slag comprises the following steps:

i) Receipt of raw materials like Ilmenite and Anthracite coal/ coke and theirstorage.
ii) Batching of raw materials and feeding to electric smelting furnace withtapping of slag and Pig Iron metal at regular intervals.
iii) Gas Purification System for exhaust gases from smelting furnace.
iv) After tapping, cooling will be done by water spray for disintegration.
v) Crushing/ Screening of Titanium Slag to required size fraction.
vi) Packing & despatch of Titanium Slag.
vii) Production of Pig Iron.

Out sourced Ilmenite and Metallurgical Coke/ Antracite Coal shall be transported to stock yard for storage. The raw material stocked (Ilmenite, Coke/ Coal, etc) shall be loaded into silo of the proportion room by loader. There are four bunkers in proportion room. Proportioning will adopt magnetic vibrant-feeder, weighing bunker, electric scale etc. The well proportioned material will be transferred to the mixer formixing and then sent to the intermediate bunkers by belt conveyor.

Smelting and Casting Section:

Feeding belt conveyer or trestle dolly will transfer the blended material from the intermediate bunkers into the furnace top bunkers. The materials will be transferred through reversible shuttle distributor or loop type distribution device into the discharging pipe and from the discharging pipe getting into the electric furnace for smelting.

Smelted iron liquid flows into the hot metal ladle from the tapping hole. The hot metal ladle will be lifted to the casting mould by crane for casting. Natural cooled pig-iron billet can be crushed into required size by crusher. Hot slag will be put into slag ladle, and then the slag ladle will be lifted to the slag pan by crane for cooling.

Cooling of High Titanium Slag:

Acid titanium slag needs to be cooled for more than 4 hours by springing water in the slag pot to guarantee enough hardness of slag. Then crane is used to hoist the slag to the cooling districts to separate the slag from slag pot. If the slag cannot beseparated from the pot, water is applied to the slag again to separate them. Theslag, after this separation, still needs watering until completely cooled without any hot liquid inside of the slag.

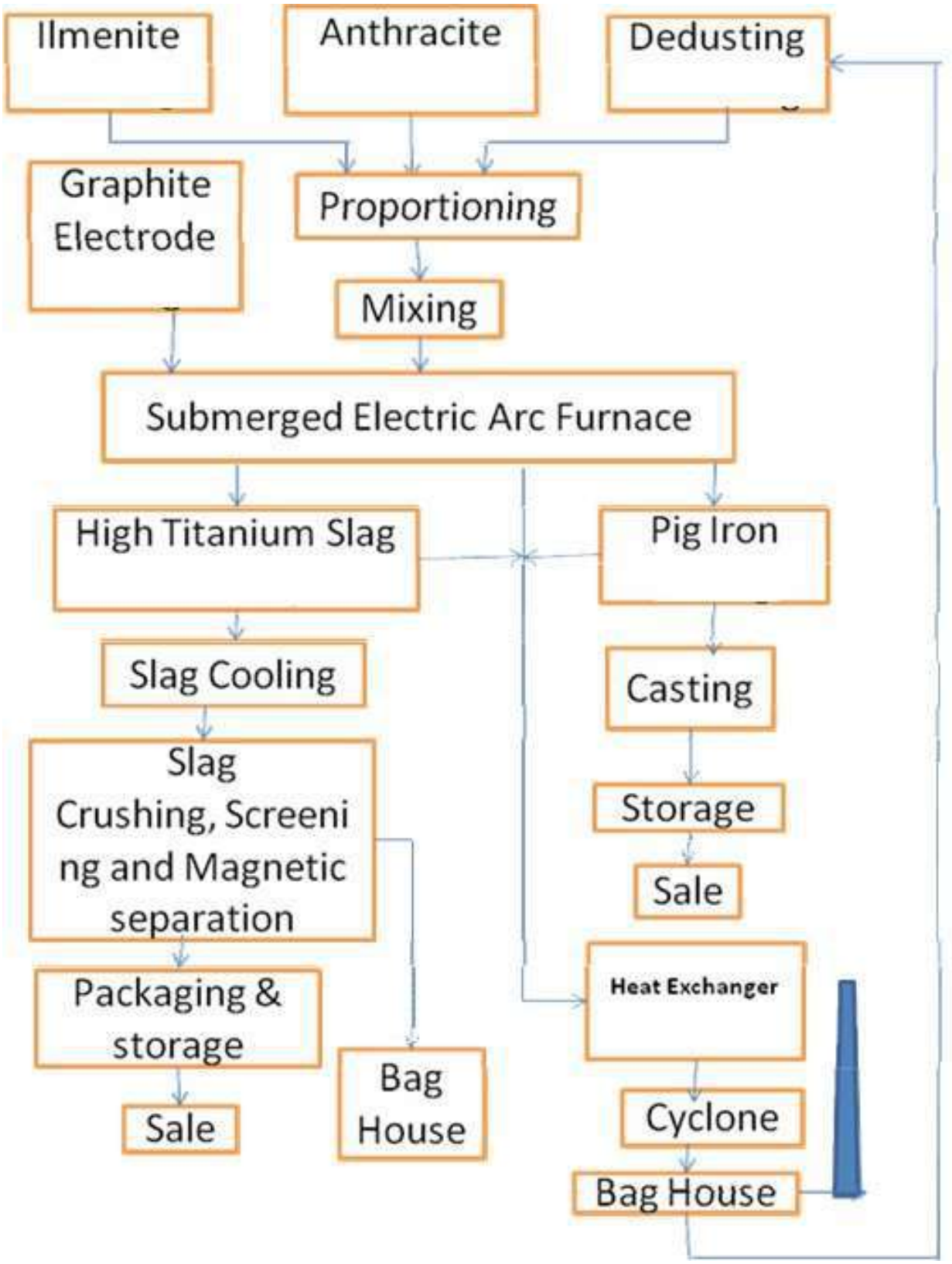
The magnetic disk is used to penetrate the iron ball to the upper air and then aimed at the cooled slag block to smash it. After the slag block is opened, watering is continued to cool it to make the slag size up to the crushing requirement. When the titanium slag size is up to the requirement (<300mm), use 5+5T overhead travelling crane to grab the slag to designated area. Use electric chuck to penetrate the bigiron blocks among titanium slag

i. The loader is used to put the cooled titanium slag into the slag pond of crusher room and then the 5 ton grab bucket puts the titanium slag into bucket of jaw crusher to get into main crushing process.
ii. Titanium slag is charged uniformly to jaw type crusher for crushing them into lessthan 50mm size and then they are conveyed to hammer type crusher for final crushing into 3mm. Magnetic iron remover erected above the belt conveyerremoves iron entrained in titanium slag.
iii. Titanium slag, thus obtained after final crushing, will be conveyed to screen roomfor screening. The titanium slag with qualified size after screening is carried to the finish products warehouse for storage by belt conveyor. The big block titanium slag is returned to the hammer type crusher to be crushed again until itis up to the qualified.

Storage and Package of Finished Slag:

There will be set up for one product silo for storage of titanium slag. Thetitanium slag with qualified size after screening is carried to the product silo for storage by belt conveyor.

The titanium slag stored in the product silo is packed by automatic packer andthen stacked and stored for transportation to outside for selling.



3.5.2 SINTER PLANT

Sintering is a technology for agglomeration of iron ore fines into useful blast furnace burden material. This technology was developed for the treatment of the waste fines in the early 20th century. Since then sinter has become the widely accepted and preferred blast furnace burden material. Presently more than 70% of hot metal in the world and about 50% in India is produced through sinter. The major advantages of using sinter in B.F. are:

- Use of iron ore fines, coke breeze, metallurgical waste, lime, dolomite for hot metal production.
- Better reducibility and other high temperature properties
- Increased blast furnace productivity
- Improved quality of hot metal
- Reduction in coke rate in B.F.

The raw materials used are; iron ore fines (-10mm), coke breeze (-3 mm), limestone & dolomite fines (-3 mm) and other metallurgical wastes.

The proportioned raw materials are mixed and moistened in a mixing drum. The mix is loaded on sinter machine through a feeder on to a moving grate (pellet) and then the mix is rolled through segregation plate so that coarse materials settle at the bottom and the fines on to the top.

The top surface of the mix is ignited through stationary burners at 1200 °C. As the pallets move forward, the air is sucked through wind boxes situated under the grate. A high temperature combustion zone is created in the charge-bed due to combustion of solid fuel of the mix and regeneration of heat of incandescent sinter and outgoing gases. Due to forward movement of the pallet, the sintering process travels down.

Sinter is produced as a combined result of locally limited melting, grain boundary diffusion and recrystallisation of iron oxide.

On completion of sintering process, finished sintering cake is crushed and cooled. The cooled sinter is screened, and + 6 mm fraction is dispatched to blast furnace and – 6 mm fraction is recirculated as return sinter.

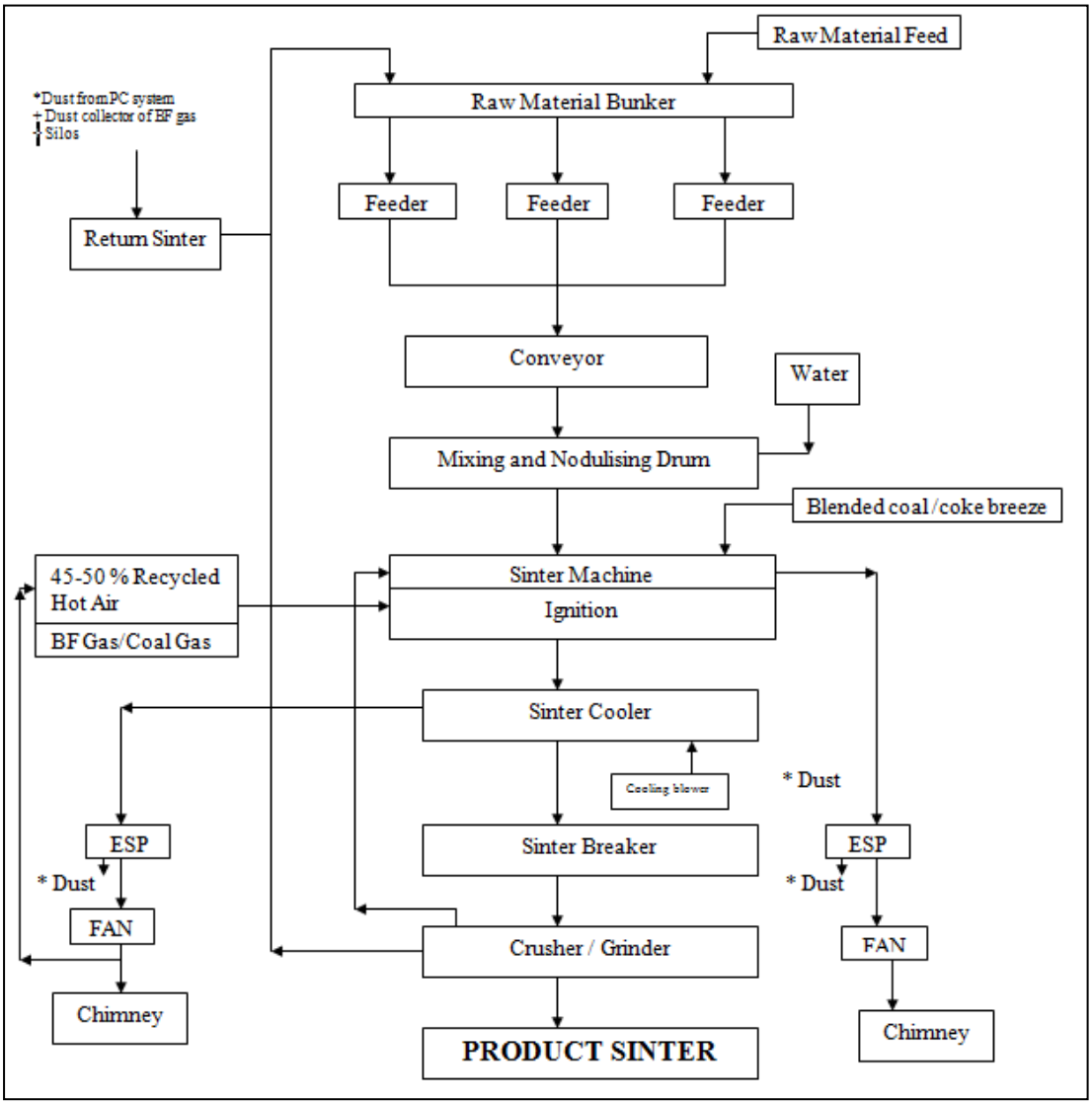
Design and operating parameters

S.No.	Item Description	Unit	Value
1	No. of sinter machine x area	No. x m^2	1 x 50
2	Specific Productivity	$t/m^2/h$	1.345
3	Annual gross sinter production	t/y	2,59,200
4	Size of finished sinter	mm	5-50
5	Annual working regime	d/y	330
6	No. of working hours/day	h/day	24
7	Gaseous energy consumption for ignition (BF gas with CV: 770 kcal/ Nm^3)	kcal/t	27,000
8	Coke breeze consumption	kg/t of skip sinter	60
9	Under-grate suction	mm WC	1,500
10	Sinter m/c bed height (including 30 – 50 mm hearth layer)	mm	500
11	Cooler type	mm	Circularcooler
12	Temperature of cooled sinter	^oC	Below100
13	Dust content in exhaust gases at stack	mg/Nm^3	Below50

Specific consumption of raw materials (net and dry)

Raw Materials	kg/t of Sinter
Iron ore fines	895
Limestone	71
Dolomite	78
Coke breeze	60
Burnt Lime Powder	25
Mill scale	65
Flue dust	80
Sinter plant return	92
Return fines from BF	90

PROCESS FLOW CHART OF SINTER PLANT

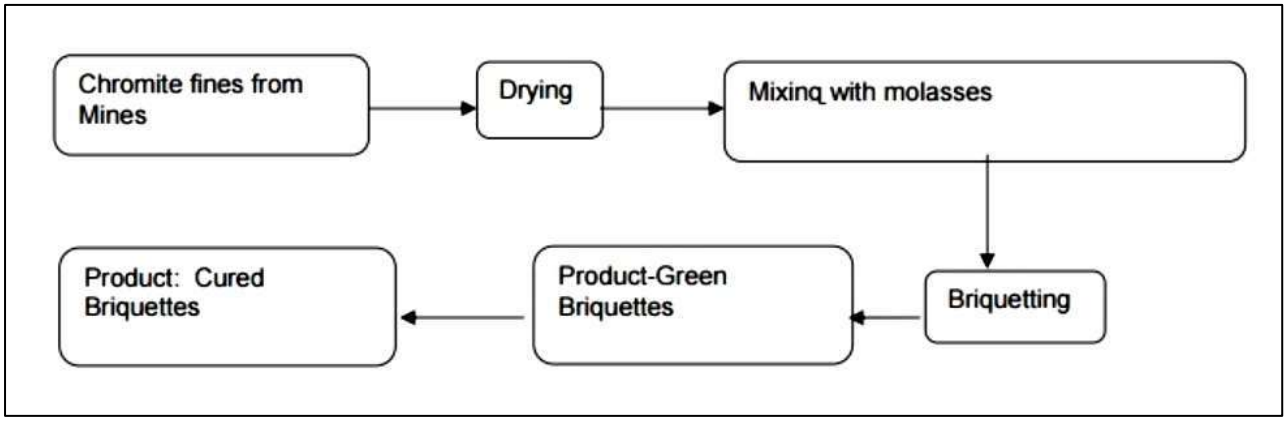


3.5.3 BRIQUETTING UNIT

Chromites ore Fines and concentrates cannot be charged directlyinto the smelting furnace, especially closed top submerged arcfurnace for reason of safety and bad performances. The fines aretherefore agglomerated for improving the smelting condition.Various processes are available for agglomeration- sinter pellet,briquettes and chrome ore sinter, the first two process being mostwidely used. As explained in Figure below, the chrome ore fines received from mines are first dried in dryer. The dry ore is mixedwith molasses, and the green mix is then fed to the briquettingpresses. The presses compact the mixture at high pressure to formgreen briquettes. The green briquettes are stored in the storageyard for curing. After

curing at ambient temperature for 24- 48 hrs,the briquettes become stronger and are fed into Submerged ArcFurnaces.

Figure 2.11 : Schematic Diagram showing Process of Ferro ChromeBriquettes



3.6 RAW MATERIAL REQUIREMENT

The following will be the raw material requirement for the proposed project:

Table No. 3.6 : Raw Material Requirement, Source & Mode of Transport

S.No.	Raw Material	Quantity (TPA)	Sources	Distance from site (in Kms.	Mode of Transport
1.	**For Ferro Alloys (4 x 12 MVA)**				
1 (i)	*For Ferro Silicon – 37,300 TPA*				
a)	Quartz	56,696	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
b)	Mill Scale	8,766	Inhouse Generation	---	By road (through covered trucks)
c)	M.S. Scrap	1,306	Inhouse Generation	---	By road (through covered trucks)
d)	LAM Coke	20,888	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
e)	Electrode paste	746	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Briquetted Bag filter dust	1,417	Own generation	---	---
1 (ii)	*For Ferro Manganese – 1,34,400 TPA*				
a)	Manganese Ore	305,760	MOIL / OMC	~ 500 Kms.	By Rail & Road

					(through covered trucks)
b)	LAM coke	49,056	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Dolomite	22,848	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	MS Scrap / Mill scales	20,160	Inhouse Generation	---	By road (through covered trucks)
e)	Electrode Paste	1,747	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Briquetted Bag filter dust	6,720	Own generation	---	---
1 (iii)	*For Silico Manganese – 76,800 TPA*				
a)	Manganese Ore	125,184	MOIL / OMC	~ 500 Kms.	By Rail & Road (through covered trucks)
b)	FeMn. Slag	81,258	In house generation	---	----
c)	LAM Coke	28,800	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	Dolomite	17,280	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
e)	Electrode paste	1,536	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Quartz	18,432	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
g)	Briquetted Bag filter dust	1,152	Own generation	---	---
1 (iv)	*For Ferro Chrome – 40,000 TPA*				
a)	Chrome Ore	160,000	Sukinda, Odisha Import, South Africa	~ 500 Kms. ~ 600 Kms. (from Vizag Port)	By road (through covered trucks) From Port By Road (through covered Trucks)
b)	LAM Coke	26,400	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Quartz	14,000	Chhattisgarh /	~ 500 Kms.	By road

			Andhra Pradesh		(through covered trucks)
d)	MS Scrap / Mill Scale	12,000	Inhouse Generation	---	By road (through covered trucks)
e)	Magnetite / Bauxite	13,520	Chhattisgarh / Maharashtra	~ 500 Kms.	By road (through covered trucks)
f)	Electrode Paste	2,400	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
g)	Briquetted Bag filter dust	5,120	Own generation	---	---
1 (v)	*For Pig Iron – 67,200 TPA*				
a)	HG Iron ore	198,240	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
b)	LAM Coke	65,184	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
c)	Lime stone	16,800	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	Quartz	8,064	Chhattisgarh / Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
e)	Electrode Paste	2,688	Maharashtra / West Bengal	~ 300 Kms.	By road (through covered trucks)
f)	Briquetted Bag filter dust	4,032	Own generation	---	---
1 (vi)	*For Titanium Slag (72,000 TPA)*				
a)	Ilmenite	1,44,000	IREL, Orissa	~ 500 Kms.	By Rail & Road (through covered trucks)
b)	Anthracite Coal/ coke	25,200	Imported / Open Market	~ 300 Kms.	By road (through covered trucks)
c)	Graphite	1800	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
2.	**Sinter Plant – 60,000**				
a)	Iron ore fines	48,000	Chhattisgarh / Andhra Pradesh	~ 100 Kms.	By road (through covered trucks)
b)	Mill Scales	300	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)

c)	Fluxes	3,000	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
d)	Coke Fines	5,100	Andhra Pradesh	~ 500 Kms.	By road (through covered trucks)
e)	Dust from DRI, Pellet plant etc	6,000	Chhattisgarh	~ 100 Kms.	By road (through covered trucks)
f)	Sinter Returns	7,200			By road (through covered trucks)

3.6.1 MODE OF TRANSPORT OF RAW MATERIAL AND FINISHED PRODUCTS

- Major raw materials will be transported through railway rakes up to the nearest railway station (i.e.Belsonda RS – 2.1 Kms. – By road) and then to the site through road by covered trucks.
- All the trucks used for the transport of raw materials, products and wastes will be completely covered with tarpaulin and ensured no spillage during transportation.
- No. of trucks required for proposed project will be 40 trucks /day.
- Internal roads in the proposed project will be made pucca.
- All the raw material required for the proposed steel plant will be stored on pucca platform above ground level.
- All the raw material yards are equipped with water sprinkling system, so as to avoid fugitive emission during the material handling.

3.6.2 MARKET OF FINAL PRODUCTS

Final product i.e. FeSi–37,300 TPA / FeMn-1,34,400 TPA / SiMn-76,800 TPA / FeCr-80,000 TPA / Pig Iron – 1,34,400 TPA / Titanium Slag – 72,000 TPA, Sinter – 60,000 will be sold local market & may also be exported.

3.7 WATER REQUIREMENT AND ITS SOURCE

- Water required for the proposed project will be 600 KLD. This includes make up water for Submerged Arc Furnace Unit, Sinter Plant, Briqutteting Unit & Domestic.
- Water required for proposed project will be sourced from Mahanadi River, flowing at distance of 1.5 Kms. from the project site.

- Water drawl permission from Water Resource Department, Chhattisgarh will be obtained after receipt of TOR letter for proposed project.

Table No. 3.7 :WATER REQUIREMENT BREAKUP

S.No.	Unit	Quantity in KLD
1.	Ferro Alloys Unit	570
2.	Sinter Plant	10
3.	Briqueting Unit	10
4.	Domestic	10
	Total	**600**

3.8 WASTEWATER GENERATION & ITS MANAGEMENT

- There will be no effluent discharge from the Submerged Arc Furnace unit, Sinter Plant & Briqutteting Unit as closed circuit cooling system will be adopted.
- Sanitary waste water will be treated in STP and treated water will be utilized for Greenbelt development.
- Garland drains will be provided around all the raw material stacking areas.
- Zero effluent discharge will be maintained in the proposed project.

Table No. 3.8 :WASTEWATERGENERATION AND ITS BREAKUP

S.No.	Source	Generation (KLD)
1.	Submerged Arc Furnace Plant	---
2.	Sinter Plant	---
3.	Sanitary Wastewater	8
	Total	**8**

3.9 POWER REQUIREMENT AND ITS SOURCE

Power required for the proposed project will be 49 MW and same will be sourced from sister concern power plant situated adjacenet to the project site.

Table No. 3.9 :POWER REQUIREMENT AND ITS BREAKUP

S.No.	Plant	Power Consumption	Power Requirement (in MW)
1.	Submerged Arc Furnace Unit	9000 Kwh/ton	48.0
2.	Sinter Plant	---	0.5
3.	Briquetting Unit	---	0.5
Total			**49.0**

3.10 SOLID WASTE GENERATION & ITS MANAGEMENT

Following solid waste / by product will be generated from plant:

Table No. 3.10: SOLID WASTE GENERATION AND IT BREAK UP

S.No.	Waste / By product	Quantity (TPA)	Proposed method of disposal
1.	Slag from FeMn	81,258	Will be reused in manufacture of SiMn as it contains high SiO_2 and Silicon.
2.	Slag from FeSi	8982	Will be given to Cast iron foundries
3.	Slag from SiMn	68,411	will be used for Road construction / will be given toslag cement manufacturing
4.	Slag from FeCr	46,463	Will be processed in Zigging plant for Chrome recovery. After Chrome recovery, the left-over slag will be analysed for Chrome content through TCLP test, if the Chrome content in the slag is within the permissible limits, then it will be utilised for Road laying /brick manufacturing. If Chrome content exceeds the permissible limits, it will be sent to nearest TSDF.
5.	Slag from Pig Iron	57,792	Will be given slag based Cement plant

3.11 AIR EMISSION& ITS MANAGEMENT

Following are Air Emission Control Systems are proposed in the present proposal:

Table No. 3.11: AIR EMISSION CONTROL SYSTEMS

S.No.	Source	Control Equipment	Emission at the outlet
1.	Submerged Electric Arc Furnaces	4th Hole Fume Extraction system with PTFE membrane bag filters	< 30 mg/Nm^3
2.	Mn ore Sinter Plant	4th Hole Fume Extraction system with PTFE membrane bag filters	< 30 mg/Nm^3

3.12 SCHEMATIC REPRESENTATION OF THE FEASIBILITY DRAWINGS WHICH GIVE INFORMATION OF EIA PURPOSE

As per the Ministry of Environment, Forest & Climate Change (MoEF&CC), New Delhi, EIA notification dated 14th September, 2006 & its subsequent amendments, all Primary metallurgical processing industries (Ferro Alloys) are falling under Sl. No. 3 (a), classified as Category 'A' for the grant of Environmental Clearance at Central Level.

As per the provision of the EIA notification 2006 & it subsequent amendment, it is necessary to get Environmental Clearance by applying to MoEF&CC along with the Environmental Impacts Assessment Study Report for the proposedproject prior to commissioning of the

project activities. Therefore the EIA is required to conduct to comply with provisions of EIA notification 2006 & it subsequent amendment made for Sl. No. 3 (a) "A" of schedule –I of the notification.

Chapter – 4 : SITE ANALYSIS

4.1 CONNECTIVITY

The proposed site is well connected with Road network. The following table gives brief regarding connectivity of the proposed site:

Component		Description
Road	:	Site is connected to NH # 217 – 1.4 Kms. (By Road) & NH # 6–3.2 Kms (By Road)
Rail	:	Site is connected to Belsonda RS – 2.1 Kms. (By road)
Air	:	Raipur Airport – 28.0 Kms. (Aerial)

4.2 LAND FORM, LAND USE & LAND OWNERSHIP

Land Form

Total land identified for the proposed project is 7.94 Ha. (19.64 Acres). Land is Private Land (Unirrigated Agriculture land).

No major plantation is present on the proposed land, only sparsely seen shrubs and bushes will be cleared.

Land use

Total land identified for the proposed project is 7.94 Ha. (19.64 Acres) and same will be converted for Industrial Purpose.

Land Ownership

Total land identified for the proposed project is 7.94 Ha. (19.64 Acres) and same is in possession of management.

4.3 TOPOGRAPHY

Proposed land is more or less flat without many undulations. The site is slightly slope towardsWestern side. Due to the proposed project, there will be some topographical change will occur due the excavations, construction activities pertaining to project. The Topographical map is shown Figure No. 2

4.4 EXISTING LAND USE PATTERN

Total land identified for the proposed project is 7.94 Ha. (19.64 Acres). Land is Private Land (Unirrigated Agriculture land).

Forest:

Tumgaon RF (8.3 Kms. – E Direction) & Sorid RF (8.9 Kms. – EES Direction) are present within 10 Km. radius of the project site.

Water Bodies:

Mahanadi river (1.4 Kms.), Kodar river (7.0 Kms.) and Sukhi river (8.3 Kms.) are present within 10 Km. radius of the project site..

There no National Parks, Wildlife Sanctuary, Eco-sensitive area within the study area.

4.5 EXISTING INFRASTRUCTURE

Infrastructure like Internal Roads, Storage area, Parking areas etc. will be provided in the proposed project.

For establishment and successful operation of plant, it is imperative to ensure availability of the following infrastructure:

- Availability of raw material and its proximity to the plant to reduce cost of transportation.
- Road / Rail head connection so that the raw materials and products can be easily and economically transported.
- Availability of water.
- Permanent and reliable source of power.
- Adequate land for the plant, storage of raw material and products & disposal of waste material.

Chapter – 5 : PLANNING BRIEF

5.1 PLANNING CONCEPT

Balaji Power [Ferro Divisioin] is proposing to establish a Ferro Alloys unit, Sinter Plant and Briquetting Plant at Khasra no. 1181/2, 1182, 1184, 1185, 1216, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246/1, 1247/1, 1247/2, 1248, 1249, 1250, 1252, 1253, 1255, 1257, 1258, 1259/1, 1259/2 at Belsonda Village, Mahasamund Tehsil & District, Chhattisgarh. Following is Plant configuration and Production Capacity:

Table No. 5.1 :Plant configuration and production capacity

S.No.	Units (Products)	Plant Configuration (Production Capacity)
1.	Ferro Alloys Unit (FeSi / FeMn / SiMn / FeCr / Pig Iron / Titanium Slag)	4 x 12 MVA (FeSi–37,300 TPA / FeMn-1,34,400 TPA / SiMn-76,800 TPA / FeCr-80,000 TPA / Pig Iron – 1,34,400 TPA / Titanium Slag – 72,000 TPA)
2.	Mn ore Sinter Plant	1,20,000 TPA
3.	AOD Converter	36,000 TPA
4.	Briquetting Plant	500 kg/Hr

Total land identified for the proposed project is 7.94 Ha. (19.64 Acres) and same is in possession of management.

5.2 POPULATION PROJECTION

An official Census 2011 detail of Mahasamund, a district of Chhattisgarh has been released by Directorate of Census Operations in Chhattisgarh. Enumeration of key persons was also done by census officials in Bastar District of Chhattisgarh.

According to the 2021 census Mahasamund district has a population of 10,32,754, roughly equal to the nation of Cyprus or the US state of Rhode Island. This gives it a ranking of 438rd in India (out of a total of 640). The district has a population density of 270 inhabitants per square kilometre (560/sq mi). Its population growth rate over the decade 2011–2021 was 21.25%. Mahasamund has a sex ratio of 1018 females for every 1000 males, and a literacy rate of 71.54%.

Most of the employment will be generated from the local areas only. There will not be much population projection due to the proposed project.

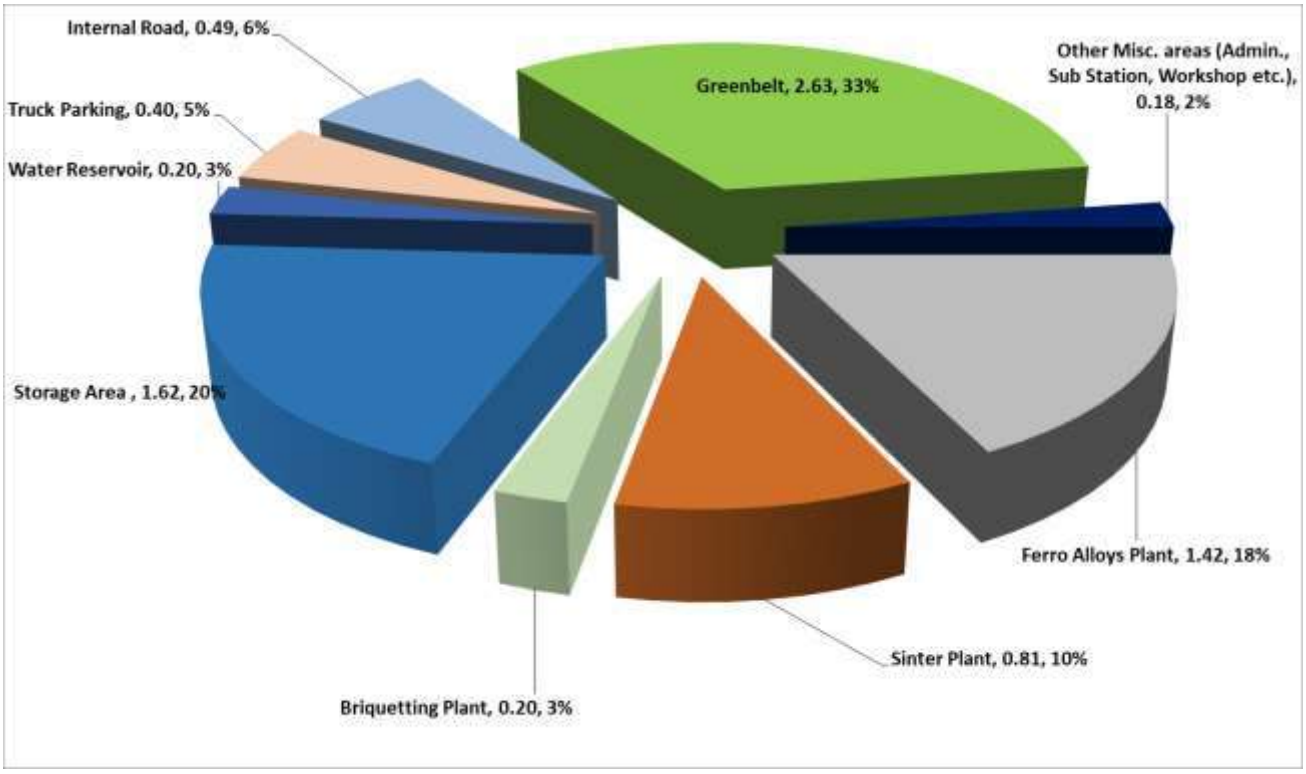
5.3 LAND USE PLANNING

7.94 Ha. (19.64 Acres) of land is envisaged for the proposed project. The following is land use planning / statement of the plant area:

Table No. 5.2 : Land Use Statement

S.No.	Land Use for	Area (in Ha.)	Area (in Acres)
1.	Submerged Arc Furnace Unit	1.42	3.50
2.	Sinter Plant	0.81	2.00
3.	Briquetting Plant	0.20	0.50
4.	Storage Area	1.62	4.00
5.	Water Reservoir	0.20	0.50
6.	Truck Parking	0.40	1.00
7.	Internal Road	0.49	1.20
8.	Greenbelt	2.63	6.50
9.	Other Misc. areas (Admin., Sub Station, Workshop etc.)	0.18	0.44
	Total	**7.95**	**19.64**

Figure 10 : Pie diagram showing Land use statement



5.4 ASSESSMENT OF INFRASTRUCTURE DEMAND (PHYSICAL & SOCIAL)

Infrastructure like Toilets, Rest Rooms, Car and Truck parking, Time & security, Fire Fighting facilities etc. will be provided in the proposed project. The Compnaywill assess the demand of infrastructure (Physical & Social) in the nearby are of the project site and development activities will be carried out uner corporate social responsibilities program from time to time.

5.5 AMENITIES / FACILITIES

Facilities like canteen, rest room will be provided as basic facilities to workers. No other additional facilities are proposed.

Chapter – 6 : PROPOSED INFRASTRUCTURE

6.1 INDUSTRIAL AREA (PROCESSING AREA)

The main plant area comprises of Submerged Arc Furnace Unit, Sinter Plant, Jigging Plant Plant, Raw material storage and product storage etc.

6.2 RESIDENTIAL AREA (NON PROCESSING AREA)

No Township / Colony is proposed, however facilities like Admin building, canteen, rest room and indoor games facilities will be provided in the proposed project.

6.3 GREEN BELT

The plantation and green belt development will also be taken care in the plant and the space reserved for plantation will be 33% of the total plant areai.e. 2.3Ha. (6.50 Acres). Balaji Power [Ferro Division] Ltd will take-up extensive green belt development by planting about 2500 trees per Ha. It has beenproposed to develop 15-20 meters wide green belt along the periphery inside the factory premises.

6.4 SOCIAL INFRASTRUCTURE

Proposed project will result in growth of the surrounding areas by increasing direct and indirect employment opportunities, which in turn will be develop their livelihood. Social infrastructure will be developed as per the local needs through CSR funds and funds as fixed by the statutory authorities as per the per MoEF&CC notification.

6.5 CONNECTIVITY

The proposed site is well connected with Road network. The following table gives brief regarding connectivity of the proposed site:

Component		Description
Road	:	Site is connected to NH # 217 – 1.4 Kms. (By Road) &NH# 6–3.2 Kms (By Road)
Rail	:	Site is connected to Belsonda RS – 2.1 Kms. (By road)
Air	:	Raipur Airport – 28.0 Kms. (Aerial)

6.6 DRINKING WATER MANAGEMENT

Proposed domestic water requirement is 10 KLD and same will be sourced from surface water.

6.7 SEWARAGE SYSTEM

Toilet facilities will be provided. It is proposed to collect sewerage through sewerage network from the plant and will lead to the Sewerage Treatment Plant (STP). The treatment plant will consist of screen, grit separator, Equalization tank, primary clarifier, Aeration tank, secondary clarifier, sludge recirculation pump house, etc. The treated sewage will comply with the stipulated standards and will be utilized for greenbelt development.In the proposed project, STP of Capacity –8.0 KLD will be established to treateDomestic waste water.

6.8 INDUSTRIAL WASTEWATER MANAGEMENT

- There will be no effluent dischargefrom theFerro Alloys unit, Sinter Plant & Briqutteting Unit as closed circuit cooling system will be adopted.
- Sanitary waste water will be treated in STP and treated water will be utilized for Greenbelt development.
- Garland drains will be provided around all the raw material stacking areas.
- Zero effluent discharge will be maintained in the proposed project.

6.9 SOLID WASTE MANAGEMENT

Following solid waste / by product will be generated from plant:

Table No. 6.1: SOLID WASTE GENERATION AND ITS MANAGEMENT

S.No.	Waste / By product	Quantity (TPA)	Proposed method of disposal
1.	Slag from FeMn	81,258	Will be reused in manufacture of SiMn as it contains high SiO_2 and Silicon.
2.	Slag from FeSi	8,982	Will be given to Cast iron foundries
3.	Slag from SiMn	68,411	will be used for Road construction / will be given toslag cement manufacturing
4.	Slag from FeCr	46,463	Will be processed in Zigging plant for Chrome recovery. After Chrome recovery, the left-over slag will be analysed for Chrome content through TCLP test, if the Chrome content in the slag is within the permissible limits, then it will be utilised for Road laying /brick manufacturing. If Chrome content exceeds the permissible limits, it will be sent to nearest TSDF.
5.	Slag from Pig Iron	57,792	Will be given slag based Cement plant

6.10 POWER REQUIREMENT & SUPPLY / SOURCE

Power required for the proposed project will be 49.0 MW and same will be sourced from sister concern power plant situated adjacenet to the project site.

Table No. 6.2 :POWER REQUIREMENT AND ITS BREAKUP

S.No.	Plant	Power Consumption	Power Requirement (in MW)
1.	Submerged Arc Furnace Unit	9000 kwh/ton	48.0
2.	Sinter Plant	60 kwh/ton	0.5
3.	Briquetting Unit	---	0.5
Total			**49.0**

Chapter – 7: REHABILITATION & RESETTLEMENT (R & R) PLAN

- Total land identified for the proposed project is 7.94 Ha. (19.64 Acres) and same is in possession of management.
- No rehabilitation and resettlementis required as the proposed project site is not having any habitations.

Chapter – 8 : PROJECT SCHEDULE & COST ESTIMATES

8.1 PROJECT SCHEDULE

Proposed projectwill be implemented in 3–4 Years from the date of receipt of Environmental Clearance from the MoEF&CC, New Delhi & Consent from CECB.

8.2 ESTIMATED PROJECT COST

Estimated Cost for proposed project is Rs. 240 Crores.

Chapter – 9 : ANALYSIS OF PROPOSAL

9.1 FINANCIAL AND SOCIAL BENEFITS

With the implementation of the proposed project, the socio-economic status of the local people will improve substantially. The land rates in the area will improve in the nearby areas due to the proposed activity. This will help in upliftment of the social status of the people in the area. Educational institutions will also come-up and will lead to improvement of educational status of the people in the area. Primary health centre will also be developed by us and the medical facilities will certainly improve due to the proposed project.

9.2 SOCIO-ECONOMIC DEVELOPMENTAL ACTIVITIES

Balaji Power [Ferro Division] will be actively contributing to improve the Socio-economic conditions of the area by providing assistance for local persons preferable from the nearby villages. The continuing commitment by business to behave ethically and contribute to economic development while improve the quality of life of workforce and their families as well as that of the local community and society at large.

As per MoEF&CC Office Memorandum vide F.No.22-65/2017-IA.III dt. 30thSeptember 2020, budgetary allocation for commitment made by Project Proponent to address the concern raised during public hearing, issues raised from Social Impact Assessment (SIA), which is part of Environment Management Plan (EMP) will be made.