Shyam Steel Manufacturing Limited

[Expansion of Steel Plant – DRI Kilns (Sponge Iron from 2,25,000 TPA to 7,86,000 TPA), Induction Furnaces along with CCM & LRF (MS Ingots / Billets/ Hot Charging from 2,34,300 TPA to 6,95,800 TPA), Rolling Mill (Hot Rolled TMT / Structural / Cold Rolled Bars/Wire Rod - 2,90,000 TPA to 7,19,000 TPA), 2 x 9 MVA Ferro Alloys, 1 x 30 T Electric Arc Furnace, WHRB based Power Plant from 10 MW to 46 MW, FBC based Power Plant from 7 MW to 25 MW, New 1.2 MTPA of I/O Beneficiation plant, New 0.8 MTPA of I/O Pellet Plant]

Category – A Project

at

J.L.No. 11, Jemua Mouza, Mejia Block,
Bankura District, West Bengal-722143

Pre-Feasibility Report

May 2021

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Chapter –1:EXECUTIVE SUMMARY

1.1 SALIENT FEATURES OF THE PROJECT

Shyam Steel Manufacturing Ltd. is an existing plant located J.L.No. 11, Jemua Mouza, Mejia Block, Bankura District, West Bengal-722143.

Chronology of permission obtained:

- Existing plant has obtained Environment Clerance from MoEF&CC vide F.No.J-11011/724/2007 – IA II (I) dated 4th August 2008. Accordingly obtained Consent to Establishment and Consent to Operate from the WBPCB for few units and same are under operation.
- Subsequently another EC has been obtained from MoEF&CC vide F.No.J-11011/724/2007 – IA II (I) dated 24th May 2019 for expansion of steel plant.
- Later obtained NIPL Certificate (for capacities of EC dt. 4th August 2008) vide dt. vide letter no. 406-2N-29/2019 (E)-PT-II dt. 26th April 2021 from West Bengal Pollution Control Board (WBPCB) for increase in production capacity of Sponge Iron, Induction Furances & Rolling Mill.

Now, the present expansion proposal, which will be taken up partly in existing plant and the partly in the land adjacent to the existing plant premises, is as follows:

- Establishment of New Iron ore Beneficiation plant & Pellet Plant as part of backward integration.
- Reduction in FBC Power plant capacity from 25 to 18 MW as per EC permission accorded by MoEF&CC vide dated 24th May 2019.
- DRI, SMS, Rolling Mill units have not been implemented. Now it has been proposed to install 4 x 425 TPD of DRI Kilns instead of 3 x 350 TPD of DRI Kilns as permitted in EC dt. 24th May 2019.
- Installation of 3 x 15T & 5 x 17T Induction Furnaces along with CCM & LRF instead of 8 x 15 T Induction Furnaces as permitted in EC dated 24th May 2019.
- Change in Rolling Mill configuration to 1 x 1,000 TPD & 1 x 300 TPD instead of 2 x 650 TPD as permitted in EC dated 24th May 2019.

The following are the cpapcities of of products as per EC permission accorded on 24th May 2019 & the present proposal:

Table No. 1.1 :Plant configuration and production capacity

S. No.	Unit (Product)	Existing Operating plant	Capacity for which EC obtained in 24th May, 2019	Present Proposal	Final Configuration after Present Proposal
		[1]	[2]	[3]	[4] = [1] + [3]
1.	Iron Ore Beneficiation plant (concentrated Iron ore)	---	---	1.2 MTPA	1.2 MTPA
2.	Iron Ore Pellet Plant (I/o Pellets)	---	---	0.8 MTPA	0.8 MTPA
3.	DRI Kilns (Sponge Iron)	2,25,000 TPA	3,46,500 TPA (3 x 350 TPD)	5,61,000 TPA (**4 x 425 TPD will be installed instead of 3 x 350 TPD**)	7,86,000 TPA
4.	Induction Furnace with CCM & LRF (MS Ingots / Billets / Hot Billets)	2,34,300 TPA	3,96,000 TPA (8 x 15T)	4,61,500 TPA (**3 x 15T & 5 x 17T with 5 x 15T LRF will be installed instead of 8 x 15 T)**	6,95,800 TPA
5.	Electric Arc Furnace	Nil	1,98,000 TPA (1 x 30 T)	1,98,000 TPA (1 x 30 T) **[Retained EC permitted capacity]**	1,98,000 TPA (1 x 30 T)
6.	Rolling Mill (Hot Rolled TMT / Structural / Cold Rolled Bars / Wire Rod) (80 % Hot charging with Hot Billets and remaining 20% through 2X20TPH RHF)	2,90,000 TPA	4,29,000 TPA (2 x 650 TPD)	4,29,000 TPA (**Change in configuration of EC permitted capacity to 1 x 1000 TPD + 1 x 300 TPD**)	7,19,000 TPA
7.	Ferro Alloy Plant (FeSi/FeMn/SiMn/FeCr)	2 x 9 MVA (FeMn 32,400 TPA / SiMn 32,400 TPA / FeCr – 27,000 TPA / FeSi – 15,600 TPA)	2 x 9 MVA (FeMn 32,400 TPA / SiMn 32,400 TPA / FeCr – 27,000 TPA / FeSi – 15,600 TPA)	2 x 9 MVA (FeMn 32,400 TPA / SiMn 32,400 TPA / FeCr – 27,000 TPA / FeSi – 15,600 TPA)	4 x 9 MVA (FeMn 64,800 TPA / SiMn 64,800 TPA / FeCr – 54,000 TPA / FeSi – 31,200 TPA)

S. No.	Unit (Product)	Existing Operating plant	Capacity for which EC obtained in 24th May, 2019	Present Proposal	Final Configuration after Present Proposal
		[1]	[2]	[3]	[4] = [1] + [3]
				[Retained EC permitted capacity]	
8.	Power Plant (WHRB)	10 MW	24 MW	Increase in WHRB Power from 24 MW **to 36 MW (4 x 9 MW)**	46 MW
9.	Power Plant (FBC)	7 MW	25 MW (1 x 25 MW)	**Reduction in Power Plant from 25 MW to 18 MW**	25 MW
10.	Oxygen Plant	Nil	4,000 TPA	4,000 TPA **[Retained EC permitted capacity]**	4,000 TPA
11.	Cement Plant	75,000 TPA	Nil	---	75,000 TPA
12.	Coal / Coke / Chrome fines Briquette	Nil	1,00,000 TPA	1,00,000 TPA **[Retained EC permitted capacity]**	1,00,000 TPA

The Estimated Capital Investment for the proposed expansion project is Rs. 1,410 Crores.

Water required for existing plant is 1050 KLD. Water for existing plant is being sourced from Damodar river. Water required for the proposed expansion project will be 3420 KLD and same will also be sourced from Damodar river. Water drawl permission has already been obtained from Damodar Valley Corporation (DVC) for 1.3 MGD. The water requirement including the proposed expansion will be within this permitted quantity. Hence no seprate water drawl permission will be required for the proposed expansion.

Power required for propsed expansion will be 105.5 MW and will be met partly from proposed 54 MW captive power plant and remaining 51.5 MW from Damodar Valley Corporation (DVC).

The expansion project creates direct employment to about 1,800 persons (skilled, semiskilled & unskilled) once the expansion comes to the operational stage and indirect employment of about 700 persons.

Chapter – 2: INTRODUCTION OF THE PROJECT / BACKGROUND INFORMATION

2.1 IDENTIFICATION OF PROJECT AND PROJECT PROPONENT

Established in 1953, Shyam Steel Group is one of the leading TMT Bar Producers in India, manufacturing TMT Rebar, Billets and Sponge Iron. Guided by a philosophy to produce safe and sustainable steel, it is a pioneer in quality production of steel.

Shyam Steel has established itself as one of the leading TMT Bar manufacturers in the country. Its founder, Sri Shriram Beriwal had dreamt of building a legacy in the manufacturing industry in the country. In 1953 he laid the foundation of Shyam Steel with a small factory in Howrah. Later, he was joined by his younger brother Shyam Sunder Beriwal. Their leadership contributed to Shyam Steel's world-class technology, quality control and complete professionalism, which enables the company to meet the stringent requirements of its reputed customers both in India and abroad. Operating for over six decades and now an INR 30 billion group, Shyam Steel has emerged as a large, growing, competitive and multi-product steel organization by delivering quality material through innovation, excellence, and dedication.

Shyam Steel is operated through its Steel Manufacturing Plants located in West Bengal. The products of the company are manufactured at its integrated steel plant in Durgapur & Mejia and marketed under the brand Shyam Steel's flagship product – Shyam TMT Rebars are earthquake proof and corrosion resistant. Shyam TMT Rebar has a wide market presence across various infrastructure segments such as urban development, irrigation and it also used in various projects for rail, roads, bridges, ports, airports, defence and energy.

Shyam steel is among the first companies to invest in the most upgraded and advanced international technology of Electric Arc Furnace. Our dedicated pursuit of the latest technology and intensive in-house R&D over the years has made us one of the most cost-efficient producers of steel in India.

The company is associated with the largest institutional projects in India. Our quality steel products are used for large government entities including public sector undertakings such as National Highway Authority of India (NHAI), railways, military engineering services, Nuclear Power Corporation of India (NPCI) and various state governments.

Shyam Steel's superior design, engineering and quality manufacturing process provide the ideal **strength** and **flexibility** to the TMT steel bars that is required in today's construction industry.

2.2 BRIEF DESCRIPTION OF THE NATURE OF THE PROJECT

It has been proposed to expand the existing steel plant at J.L.No. 11, Jemua Mouza, Mejia Block, Bankura District, West Bengal. The following are the details of expansion project:

- Establishment of New Iron ore Beneficiation plant & Pellet Plant as part of backward integration.
- Reduction in FBC Power plant capacity from 25 to 18 MW as per EC permission accorded by MoEF&CC vide dated 24th May 2019.
- DRI, SMS, Rolling Mill units have not been implemented. Now it has been proposed to install 4 x 425 TPD of DRI Kilns instead of 3 x 350 TPD of DRI Kilns as permitted in EC dt. 24th May 2019.
- Installation of 3 x 15T & 5 x 17T Induction Furnaces along with CCM & LRF instead of 8 x 15 T Induction Furnaces as permitted in EC dated 24th May 2019.
- Change in Rolling Mill configuration to 1 x 1 000 TPD & 1 x 300 TPD instead of 2 x 650 TPD as permitted in EC dated 24th May 2019.

Existing plant is located in 66.1 Ha./ 163.3 Acres of land.

Proposed expansion will be taken up partly in the Existing plant (i.e. 66.1 Ha./ 163.3 Acres) and partly in the land adjacent to the existing plant (i.e. 25.24 Ha./ 62.34 Acres) and agreement of sale have been done for the additional land.

Total land after proposed expansion will be 91.34 Ha./ 225.64 Acres.

2.3 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.

2.4 DEMAND AND SUPPLY GAP

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

2.5 EXPORT POSSIBILITY

As the Indian steel industry has entered into a new development stage, riding high on the resurgent economy and rising demand for steel. Rapid rise in production has resulted in India becoming the 4th largest 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.

2.6 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.

2.7 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 1,800 nos. which will be employed officials, staff, skilled, semi -skilled labour & 700 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 THE PROJECT INCLUDING INTERLINKED PROJECT

3.1.1 TYPE OF THE PROJECT

It has been proposed to expand the existing steel plant at J.L.No. 11, Jemua Mouza, Mejia Block, Bankura District, West Bengal. The following are the details of expansion project:

- Establishment of New Iron ore Beneficiation plant & Pellet Plant as part of backward integration.
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- Installation of 3 x 15T & 5 x 17T Induction Furnaces along with CCM & LRFs instead of 8 x 15 T Induction Furnaces as permitted in EC dated 24th May 2019.
- Change in Rolling Mill configuration to 1 x 1 000 TPD & 1 x 300 TPD instead of 2 x 650 TPD as permitted in EC dated 24th May 2019.

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

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

3.1.2 INTERLINKED PROJECTS

No interlinked project envisaged.

3.2 LOCATION OF THE PROJECT

SSML is an existing plant is located at J.L.No. 11, Jemua Mouza, Mejia Block, Bankura District, West Bengal. Existing plant is located in 66.1 Ha./ 163.3 Acres of land.

Proposed expansion will be taken up partly in the Existing plant (i.e. 66.1 Ha./ 163.3 Acres) and partly in the land adjacent to the existing plant (i.e. 25.24 Ha./ 62.34 Acres) and agreement of sale have been done for the additional land.

Total land after proposed expansion will be 91.34 Ha./ 225.64 Acres.

The project site falls in Survey of India Topo sheet no. 73 I/14, 73 M/2 & 73 M/3.

Mouza Numbers (Plot Nos.) of total land area are enclosed as Annexure – 1.

Table No. 3.1 :Coordinates of the project site

Point	Coordinates
Point # 1	23°34'5.43"N 87° 5'42.40"E
Point # 2	23°33'50.57"N 87° 5'35.69"E
Point # 3	23°33'42.29"N 87° 5'20.44"E
Point # 4	23°33'33.53"N 87° 4'51.96"E
Point # 5	23°33'42.34"N 87° 4'53.35"E
Point # 6	23°33'42.98"N 87° 4'45.38"E
Point # 7	23°33'56.37"N 87° 4'45.60"E
Point # 8	23°34'7.38"N 87° 4'52.87"E
Point # 9	23°34'3.60"N 87° 5'6.58"E
Point # 10	23°34'7.01"N 87° 5'22.52"E

Figure : 1.0 – General Location of Plant

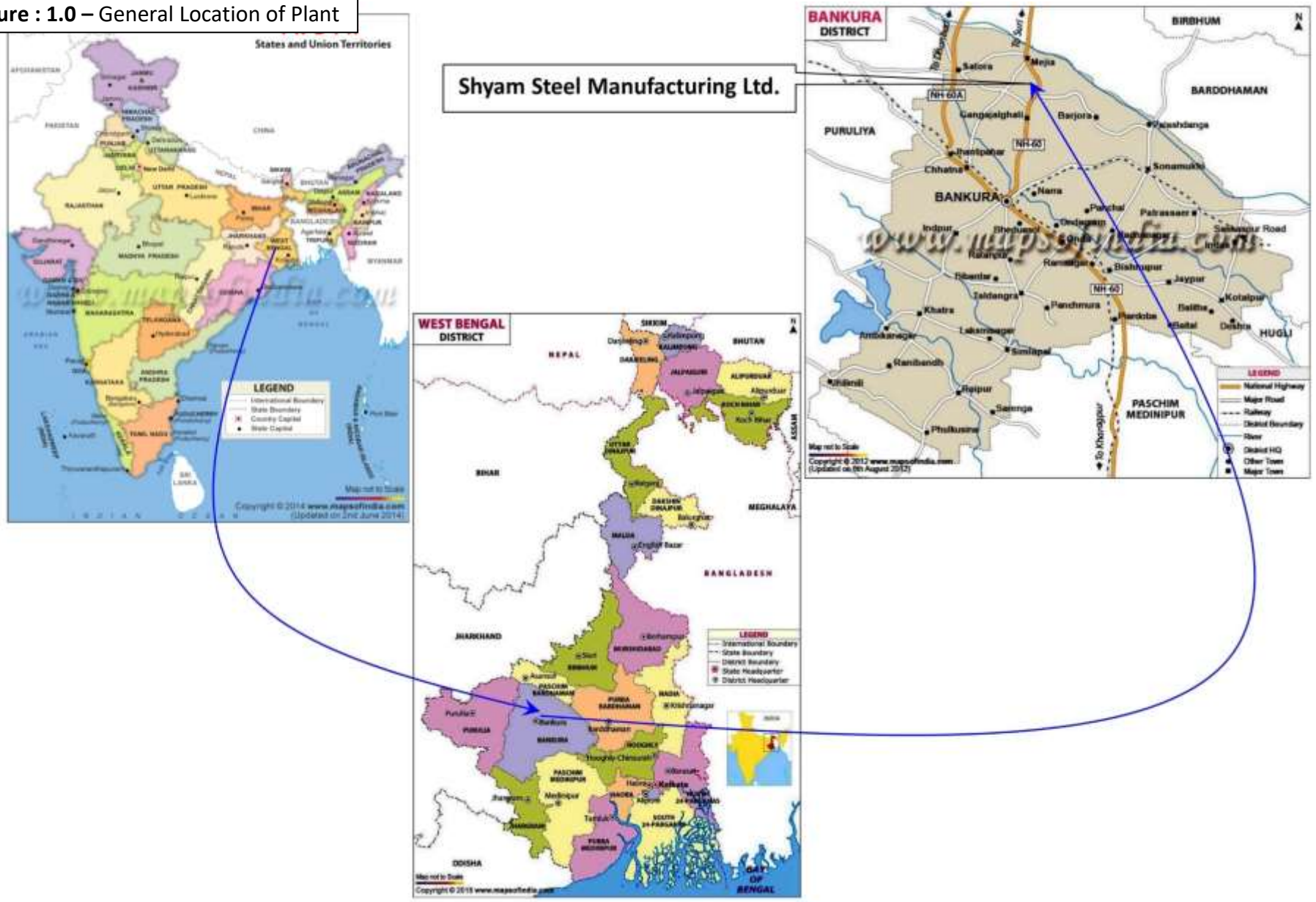


Figure : 2.0 – Topo map (10 Kms.)

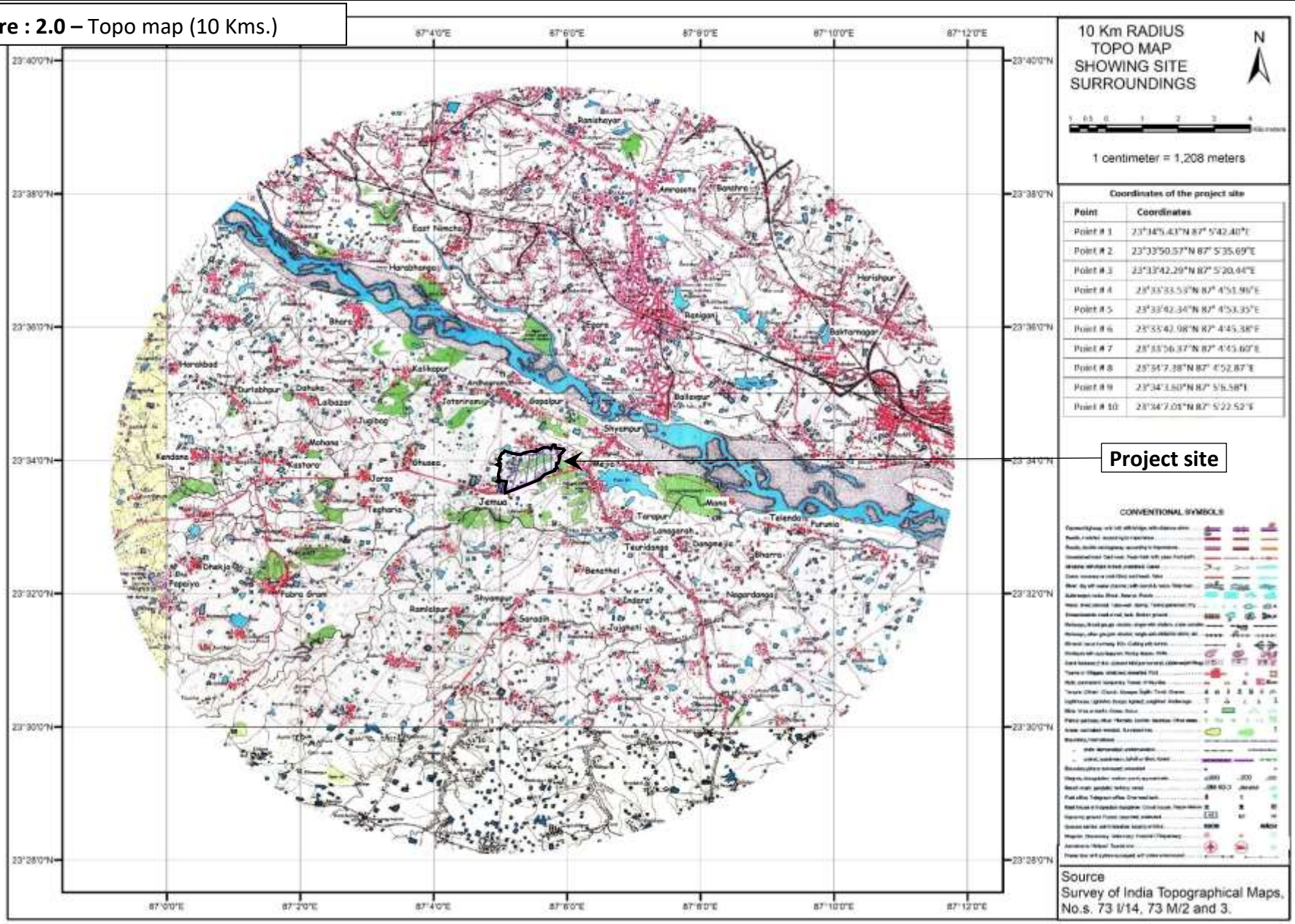
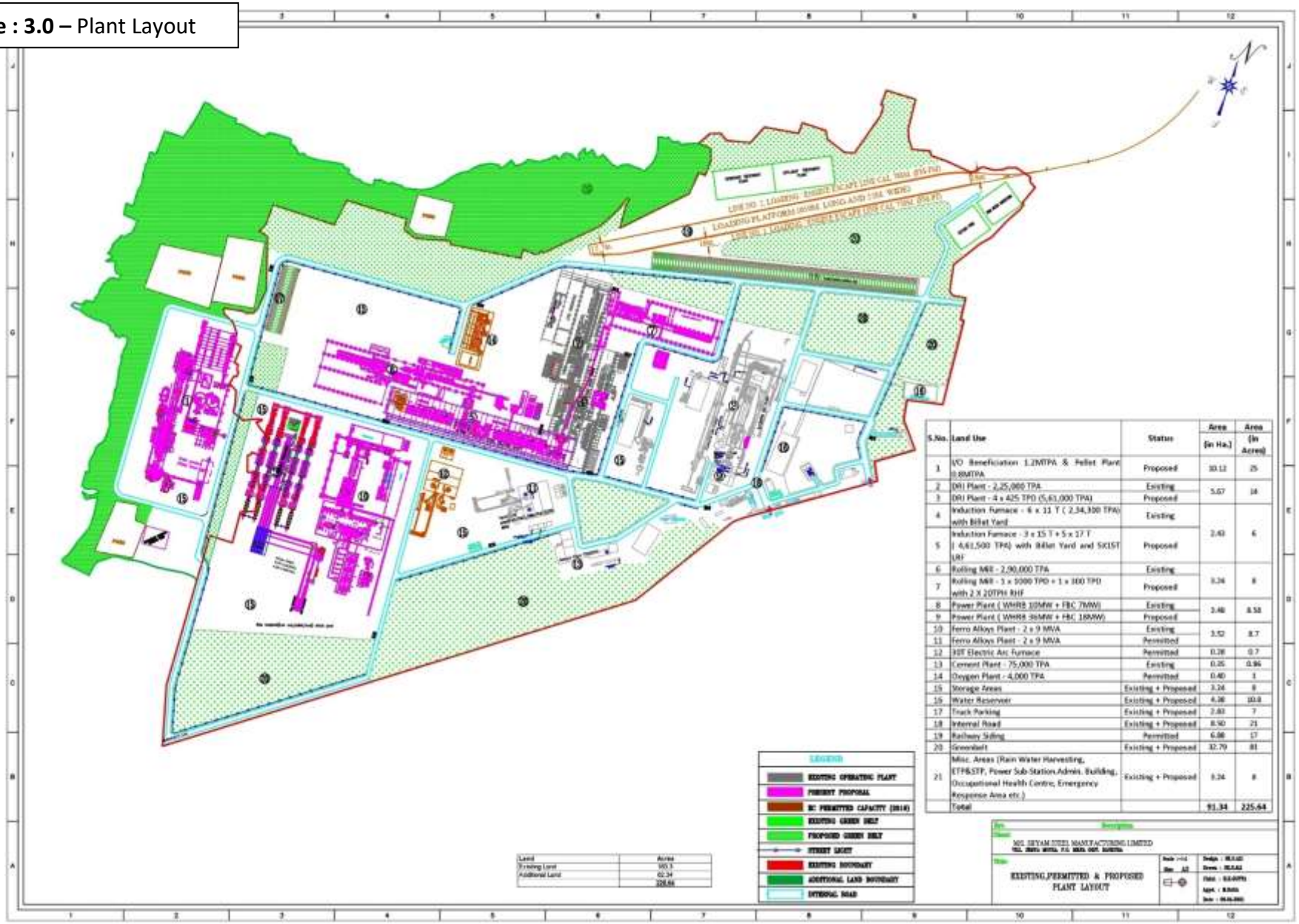


Figure : 3.0 – Plant Layout



S.No.	Land Use	Status	Area (in Ha.)	Area (in Acres)
1	I/O Beneficiation 1.2MTPA & Pellet Plant 0.8MTPA	Proposed	10.12	25
2	DRI Plant - 2,25,000 TPA	Existing	5.67	14
3	DRI Plant - 4 x 425 TPD (5,61,000 TPA)	Proposed		
4	Induction Furnace - 6 x 15 T (2,34,300 TPA) with Billet Yard	Existing	2.43	6
5	Induction Furnace - 3 x 15 T + 5 x 17 T (4,61,500 TPA) with Billet Yard and SICIST LRF	Proposed		
6	Rolling Mill - 2,90,000 TPA	Existing	3.24	8
7	Rolling Mill - 1 x 1000 TPD + 1 x 300 TPD with 2 X 20TPH RHF	Proposed		
8	Power Plant (WHRB 10MW + FBC 7MW)	Existing	3.48	8.58
9	Power Plant (WHRB 9MW + FBC 18MW)	Proposed		
10	Ferro Alloys Plant - 2 x 9 MVA	Existing	3.52	8.7
11	Ferro Alloys Plant - 2 x 9 MVA	Permitted		
12	IGT Electric Arc Furnace	Permitted	0.28	0.7
13	Cement Plant - 75,000 TPA	Existing	0.25	0.96
14	Oxygen Plant - 4,000 TPA	Permitted	0.40	1
15	Storage Areas	Existing + Proposed	3.24	8
16	Water Reservoir	Existing + Proposed	4.38	10.8
17	Truck Parking	Existing + Proposed	2.83	7
18	Internal Road	Existing + Proposed	8.90	21
19	Railway Siding	Permitted	6.88	17
20	Greenbelt	Existing + Proposed	32.79	81
21	Misc. Areas (Rain Water Harvesting, ETP&STP, Power Sub-Station,Admin. Building, Occupational Health Centre, Emergency Response Area etc.)	Existing + Proposed	3.24	8
	Total		91.34	225.64

Figure : 4.0 – Google Earth Map showing Existing plant and additional adjoining land

3.3 DETAILS OF THE ALTERNATE SITES

No alternative site has been considered, as the proposed expansion will be taken up partly in the existing plant premises and partly in the land adjoining the existing plant.

3.4 SIZE OR MAGNITUDE OF OPERATION

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

Table No. 3.2 :Plant configuration and production capacity

S. No.	Unit (Product)	Existing Operating plant	Capacity for which EC obtained in 24th May, 2019	Present Proposal	Final Configuration after Present Proposal
		[1]	[2]	[3]	[4] = [1] + [3]
1.	Iron Ore Beneficiation plant (concentrated Iron ore)	---	---	1.2 MTPA	1.2 MTPA
2.	Iron Ore Pellet Plant (I/o Pellets)	---	---	0.8 MTPA	0.8 MTPA
3.	DRI Kilns (Sponge Iron)	2,25,000 TPA	3,46,500 TPA (3 x 350 TPD)	5,61,000 TPA (**4 x 425 TPD will be installed instead of 3 x 350 TPD**)	7,86,000 TPA
4.	Induction Furnace with CCM & LRF (MS Ingots / Billets / Hot Billets)	2,34,300 TPA	3,96,000 TPA (8 x 15T)	4,61,500 TPA (**3 x 15T & 5 x 17T with 5 x 15T LRF will be installed instead of 8 x 15 T)**	6,95,800 TPA
5.	Electric Arc Furnace	Nil	1,98,000 TPA (1 x 30 T)	1,98,000 TPA (1 x 30 T) **[Retained EC permitted capacity]**	1,98,000 TPA (1 x 30 T)
6.	Rolling Mill (Hot Rolled TMT / Structural / Cold Rolled Bars / Wire Rod) (80 % Hot charging with Hot Billets and remaining 20% through 2X20TPH RHF)	2,90,000 TPA	4,29,000 TPA (2 x 650 TPD)	4,29,000 TPA (**Change in configuration of EC permitted capacity to 1 x 1000 TPD + 1 x 300 TPD**)	7,19,000 TPA

S. No.	Unit (Product)	Existing Operating plant	Capacity for which EC obtained in 24th May, 2019	Present Proposal	Final Configuration after Present Proposal
		[1]	[2]	[3]	[4] = [1] + [3]
7.	Ferro Alloy Plant (FeSi/FeMn/SiMn/FeCr)	2 x 9 MVA (FeMn 32,400 TPA / SiMn 32,400 TPA / FeCr – 27,000 TPA / FeSi – 15,600 TPA)	2 x 9 MVA (FeMn 32,400 TPA / SiMn 32,400 TPA / FeCr – 27,000 TPA / FeSi – 15,600 TPA)	2 x 9 MVA (FeMn 32,400 TPA / SiMn 32,400 TPA / FeCr – 27,000 TPA / FeSi – 15,600 TPA) **[Retained EC permitted capacity]**	4 x 9 MVA (FeMn 64,800 TPA / SiMn 64,800 TPA / FeCr – 54,000 TPA / FeSi – 31,200 TPA)
8.	Power Plant (WHRB)	10 MW	24 MW	Increase in WHRB Power from 24 MW **to 36 MW (4 x 9 MW)**	46 MW
9.	Power Plant (FBC)	7 MW	25 MW (1 x 25 MW)	**Reduction in Power Plant from 25 MW to 18 MW**	25 MW
10.	Oxygen Plant	Nil	4,000 TPA	4,000 TPA **[Retained EC permitted capacity]**	4,000 TPA
11.	Cement Plant	75,000 TPA	Nil	---	75,000 TPA
12.	Coal / Coke / Chrome fines Briquette	Nil	1,00,000 TPA	1,00,000 TPA **[Retained EC permitted capacity]**	1,00,000 TPA

3.5 MANUFACTURING PROCESS

3.5.1 IRON ORE BENEFICIATION

Beneficiation is a process, which removes the gangue particle like Alumina, Silica from the Iron Ore. Basically, it separates Fe_2O_3 or Fe_3O_4 from other impurities in the iron ore. In this process the Fe content is improve to maximum possible extent. The highest can be 70% i.e. purest form.

Process Description

Iron ore fines reclaimed from the blending stockpile shall be conveyed into a surge bin within the beneficiation plant building. Ore drawn from the surge bin by a belt weigh feeder will be fed to a spiral screw type classifier.

Washed ore from spiral classifier will be screened for +4 mm and -4 mm fractions over a scalping screen. Undersize fraction of -4 mm will be pumped to sizing screens for screening off -1 mm fraction. Oversize fractions of +4 mm from the scalping screen and +1 mm from the sizing screens are ground in a primary ball mill in closed circuit with sizing screens to get 100% -1 mm solids suitable for gravity separation in spirals.

Washed sizing screen underflow fraction of -1 mm will be pumped to dewatering cyclones. Underflow of dewatering cyclones is beneficiated by gravity separation through two stage spirals viz., rougher and cleaner spirals. Concentrate from spirals circuit is ground to a size consistency of 100% passing 100 mesh and ~70% passing 325 mesh in secondary ball mills in closed circuit with classifying cyclones. Ground concentrate from the classifying cyclones overflow as well as the overflow from dewatering cyclones ahead of spirals will be pumped to concentrate thickener. Concentrate thickener underflow thereafter will be filtered to get a product with 8% moisture max. The filter cake will be conveyed to stockpile.

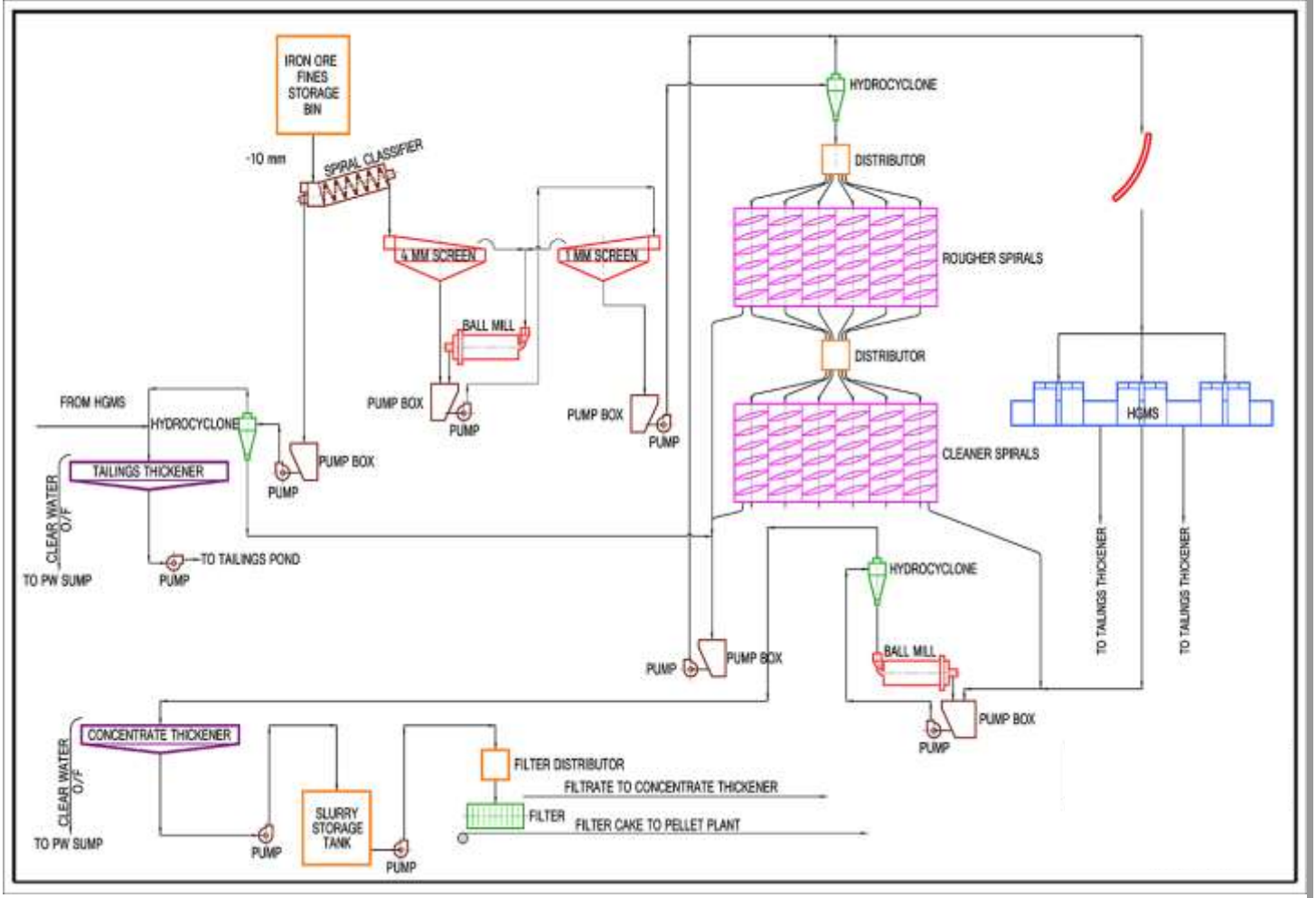
Tailings from the spirals circuit will be pumped to a linear screen to ensure a 100% -1 mm size solids in the slurry will be fed to high gradient magnetic separators to recover feebly magnetic Fe units. Concentrate from high gradient magnetic separators will be diverted to secondary ball mill discharge pump box for grinding along with spiral concentrate, to desired fineness.

Tailings from high gradient magnetic separators will be fed to tailings thickener.

Spiral classifier overflow will be pumped to de-sliming cyclones. Overflow from these de-sliming cyclones will be fed to the tailings thickener. Underflow from de-sliming cyclones will be diverted to spiral tailings pump box in turn to high gradient magnetic separators to recover Fe units as much as possible.

Tailings thickener underflow will be taken to a filter press and the dewatered cake obtained will be stored in a yard. Clear water from concentrate thickener, filter press flows by gravity back into the process water sump for recirculation. Process schematic diagram of manufacturing process of Pellets is shown as Fig.3.5. Total capacity of Iron ore Beneficiation plant will be 1.2 MTPA (throughput).

Figure 5.0 :Schematic Diagram showing Beneficiated I/O Manufacturing Process



3.5.2 IRON ORE PELLETISATION

The process of pelletization enables converting Iron Ore Fines into Uniform sized Iron Ore Pellets, that will be charged into the DRI kiln for production of sponge iron. Pellets are uniform size, with purity of 63%- 65% contributing to faster reduction and high metallization rates. Pellets with their high, uniform mechanical strength and high abrasive strength. The iron ore pelletization unit comprises of following sections:

a) Drying & Preparation of raw materials:

Generally Iron Ore Fines, Lime Stone and Dolomite fines & Coal (Anthracite & Bituminous) available, contain more than 6-7% moisture and require drying before grinding. The drying will be carried out in separate dryers for iron ore, coal & a common dryer for lime stone & dolomite. LDO along with oil fired boilers will be used for heating the air required for drying. The moisture content in the dry material will be controlled. The low-grade Iron Ore Fines will pass through a screen for separation. Oversize/ under size moves to the primary grinding circuit.

b) Grinding

The Iron Ore Fines will be ground to the required size by dry grinding in Ball mill and sent to the proportioning room. Bentonite in ground form will be send to proportioning building. A provision for the Bentonite grinder will also be provided if necessary. Lime stone, Dolomite will be ground together by VRM grinder and sent to the proportioning building. Anthracite & bituminous coal will be ground separately with the common grinder and send to the proportioning building.

c) Mixing and Blending

In the proportioning room the iron ore powder will be blended with other raw materials i.e, Bentonite, Lime Stone, Dolomite & Bituminous Coal in desired proportion. Small quantity of water will be added during blending operation. This raw mix will be ready for Pellet making and stored in feed hopper.

d) Pelletization

Controlled quantity of raw mix will be fed on disc Pelletizers. Some amount of water will be sprinkled for producing Pellets. These Pellets will pass through oversize and undersize screens.

e) Screening

Pellets produced in Pelletization sections will pass through oversize and undersize screens. Reject Pellets will be sent back to raw mix silos and sized Pellets will be fed into Induration Furnace.

f) Travelling Grate Furnace

A Travelling Grate Furnace will be used for induration of Pellets. This will be divided into *four* sections (Up draught drying zone, Down draught drying zone, Pre-heating zone-1, Pre-heating zone-2). The green pellets travel successively in higher temperature zones to acquire strength gradually. Hot Pellets at around 850 ^{o}C to 1000^{o}C from this Travelling grate will be dropped into the Kiln for further strengthening. The heat source of draft drawing zone, down draft drawing zone is pre-heating zone to of the Traveling grate. Heat source of pre-heating zone-1 is the waste gases of cooler zone-2. The heat source of pre-heating zone-2 is the kiln waste gases. Additional heat source of kiln is cooler zone-1.

g) Rotary Kiln

Rotary Kiln receives Pellets from the Induration Furnace where Pellets have to withstand high temperatures of approx. 1250^{o}C – 1350^{o}C. Here the Pellets gain more hardness due to high temperature. Pulverized anthracite coal will be used as a fuel inside the Kiln. After passing

through the Kiln, the Pellets will be hardened and acquire the desired strength. Then these pellets will pass through the Cooler.

h) Cooler

Grate Cooler receives hot Pellets with temperature up to 1250°C coming from Rotary Kiln. Cooler has its own blowers to blast the air from bottom for cooling. The hot air from the first zone will be used as combustion air in the kiln. The hot blast of the second zone will be used in the pre-heating zone-1 and Pre-heating zone-2 of travel grate and the air from the 3rd zone will be discharged to the atmosphere through chimney as its dust concentration is well within the permissible limits of pollution norms. Volume of cooling air in all the three zones is regulated automatically through the temperature control loops as per the requirement. Cold Pellets at about 100ºC will be discharged on to the conveyors and then conveyed to the stock pile/ loading hoppers.

i) Stacking

The screened Pellets of required size duly cooled at air cooler and subsequently by natural cooling will be transported to Bunkers.

j) Recovery of Dust and Spillage

Dust from drying zones and preheating zones of traveling grate, dust from the wind boxes of traveling grate and dust collected through de-duster of technological process will be sent to dust bins via belt conveyors. From the dust bins they will be sent to the proportioning rooms for reuse. Bulk spillage (dry Pellets) produced at the discharge end of Traveling Grate and will be fed into the kiln from the feed chute of the kiln feed end by bucket elevation along with spillage from Kiln feed end. Almost all the dust and bulk spillage are re-circulated and recovered.

***k)* Pulverized Coal Preparation & Injection System:**

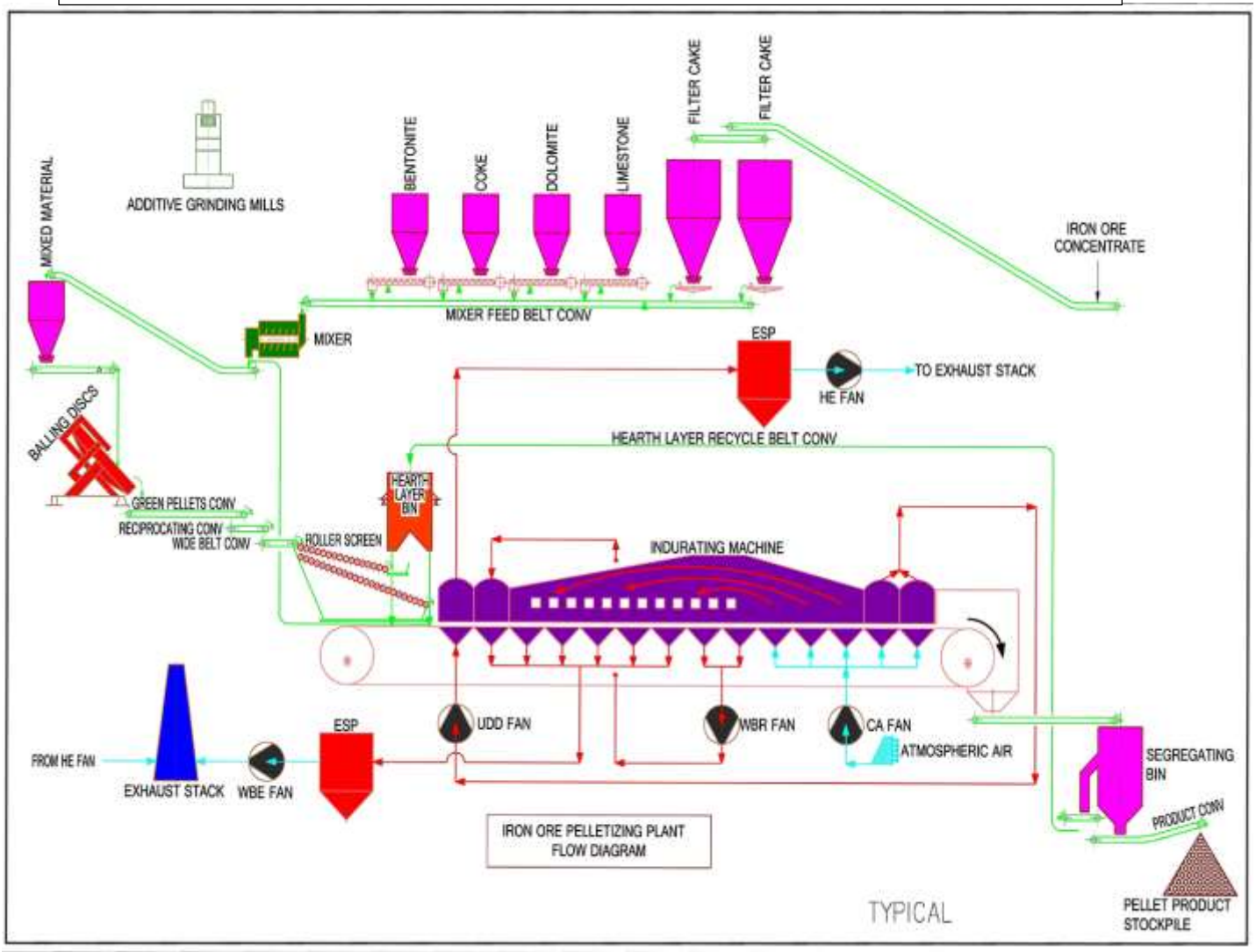
A Pulverized Coal Preparation & Injection System (PCPIS) will be provided to prepare the fuel for the pelletization process. The fuel used will be anthracite coal. The PCPIS consists of coal crushing, drying, grinding and pulverizing system. For the purpose of drying, LDO will be used in burners to feed the hot air needed. The PCIPIS will inject the pulverized coal from the discharge end of the Kiln.

l) Waste Gas System:

To achieve the fuel economy, an efficient and environment friendly technology will be adopted wherein the waste heat of the pelletization process will be used for successive drying of the green balls and also as heat source required in the kiln & different stages of Travelling Grate

furnace. The waste gases from Pre-heating zone-1, Up draught & Down draught drying zone will be cleaned in ESP and released to the atmosphere through a stack. The same ESP will be used for pre-heating zone-2 waste gases before cleaning the gases in cyclones. The outlet particulate emission will not exceed 30 mg/Nm3. Process schematic diagram of manufacturing process of Pellets is shown as Fig.6.0. Capcity of Pellet plant will be 0.8 MTPA.

Figure 6.0 :Schematic Diagram showing Pellet Manufacturing Process



3.5.3 DRI KILN BASED SPONGE IRON PLANT

4 x 425 TPD to be established instead of 3 x 350 TPD as per EC permission dt. May 2019

(SPONGE IRON – 5,61,000 TPA WITH WHRB FACILITY)

The process of manufacturing sponge iron basically involves direct reduction of iron oxide (iron ore Pellet/iron ore) using coal as heating medium as well as reducing agent and dolomite as flux. When that occurs, the departing oxygen causes micro pores in the ore body making it porous.

Sponge iron is distinct due to its high metallic iron content and consistent chemical and physical characteristics. This provides secondary steel manufacturers flexibility in preparing their furnace charge to produce finer quality steels than what is possible using steel scrap only.

- Some of the features of the sponge iron produced are:
- High iron content and high degree of metallization
- Uniform and consistent quality
- Lower Sulphur and Phosphorus content
- Negligible tramp element
- Minimum dust generation during material handling
- Good flow ability in bins, pipes and conveyors for continuous and trouble free charging
- Superior technical support to induction furnace operators

The quality of sponge iron is primarily ascertained by the percentage of metallization (removal of oxygen), which is the ratio of metallic iron to the total iron present in the product.

Coal, Iron ore and dolomite are mechanically ground/ pulverized to the desired mesh size. Each item of the raw material is then sized using vibratory screens and stored in bins for eventual use in the process. Iron ore, coal and dolomite of the required particle size will be fed by means of conveyor systems in the predetermined ratio in the rotary kiln. Air and LDO will be injected into the kiln at the time of lighting up through air tubes and oil burner provided in the kiln. Control facilities to maintain the desired temperature profile and other operating conditions are built in the process to ensure quality products. The hot product discharge from the kiln is indirectly cooled in a rotary cooler by spraying water on the shell of the cooler. The discharge from the cooler will be taken to vibrating screen for separation of material as per size. The sized material will pass through magnetic separators so that sponge iron gets separated from Char/Dolochar. After separation, respective products will be taken to finished yard for dispatch or directly loaded in to trucks from bunker.

The flue gases will be taken from Kiln exhaust to the inlet of Boiler where the heat of waste gases will be absorbed by the water in the water wall and steam will be generated, which will be heated in super-heaters. The super-heated steam will be fed to steam receiver near TG Set. The feed water will be taken from feed line installed. The flue gases will be emitted from Chimney through ESP. The outlet emission from ESP will be less than 30 mg/Nm^3.

Main Processing System - Kiln

The main process occurs in Rotary Kiln of 80 m Length and 4.3 m Dia. made by boiler quality Plate. However consultant is working to optimize the dimension of the kiln to get the production with the required quality and in quantity with the raw material specified for the project. The Drive unit consists of 2 Nos. Main drive gear box and 2 Nos. Auxiliary gear box. The Kiln will be supported by four Nos. Tyres and eight nos. support Rollers, One girth Gear and Two Pinions. Calibrated quantity of air will be fed to the kiln by 8 Nos. of shell air fan mounted on the kiln shell. The Iron Ore is reduced by the carbon monoxide generated by coal. The product of Kiln will be taken to a Rotary Cooler which is also sealed and discharged to a conveyor at < 90°c.

The cooler discharge also sealed with a collecting hopper. There will be 4 nos. slip seals at Kiln Inlet, Kiln Outlet, Cooler Inlet & Cooler Outlet being made up of Ni hard steel. The seals are also being lubricated to avoid falls air entry and gas leakage.

At inlet side of the Kiln a back flow chute is made which is sealed with a Double Pendulum Flap Gate Valve.

Cooling System

The material will be discharged in the Rotary Cooler (45 m Length and 3.6 m diameter) from Kiln is around 1000^0C. The Drive Unit consists one Main gearbox and one Auxiliary gearbox. The cooler will be supported by Two Tyres and four Support rollers. This will be cooled by indirect cooling system. The hot water will be collected and passed through the cooling tower. The same water will be recirculated. Makeup water will be added to compensate for evaporation loss.

Product Separation System

The Cooler Discharge material consists of Sponge Iron Lumps & Fines and Char will be taken to a vibratory screen and two Nos. Magnetic separator by belt conveyor. The Magnetic and Non Magnetic material will be separated here and stored in fully closed hoppers.

The Product House consists of bins for Sponge Iron Lumps, One silo for Sponge iron Fines, One silo for Char, One bin for Char (Large), One bin for Char (Fine) & One bin for –1 mm Sponge Iron fines.

Waste Gas Cleaning System

The flue gas coming out from the Rotary Kiln will pass through a Dust Settling Chamber, in which the heavier dust will settle down. The bottom of the dust settling chamber will be immersed in the wet scrapper water which is working as the sealing to avoid the gas leakage and false air entry.

Then the gas passes through the After Burning Chamber in which the Carbon Monoxide and un-burnt carbon burns completely by air supplied through A.B.C. fans.

The hot gases will be taken to the Waste Heat Recovery Boiler of 36 TPH capacity. The heat will be transferred to the boiler coil and the steam is generated. Then the flue gases will pass through an electro static precipitator in which the gases will be treated to bring down the particulate emission to less than 30 mg/Nm^3. The stack height will be in accordance with the CPCB norms .

The dust collected from ESP will be sent to dust bin by pneumatic conveying system. Finally the stored dust in the dust bin will be taken to brick manufacturing plant and excess quantity will be disposed off to the brick manufacturing plants/cement manufacturing plant.

Waste Heat Recovery Facility and generation of Power

The major facilities for 36 TPH Waste Heat Steam generation are as under:

- 36 TPH WHR Boiler and Accessories - 4 Nos.
- Electrical equipment & power distribution system - 4 Sets
- Steam pipe for steam from boiler to steam receiver near TG Set -4 Sets
- Feed water pipe for feed water from discharge line of feed – 4 Sets

Boiler

The waste heat recovery boiler system is a vertical, natural circulation, top supported, single drum, water tube type and three-pass design. The boiler consists of the following components:

- Water wall
- Evaporators
- Economizer
- Super-heater
- Steam drum

- Ducts, expansion joints
- Safety valve

The waste gases have to be subjected to a waste gas treatment for conditioning with regard to its temperature, dust content, combustible constituents and contaminates before it can be used in WHRB.

Waste gases from the rotary kiln will pass through a horizontal duct chamber called dust settling chamber, which is located beneath the After Burning Chamber (ABC).

Dust settling chamber reduces the waste gas velocity and thereby removes larger dust particles by gravity, retards pressure fluctuations; achieve uniformity of gases with regards to temperature and concentration of combustibles.

At the end of dust settling chamber the waste gases change their direction of flow and move upward into combustion area of ABC. A water nozzle controls the inlet temperature of gas. The combustion in ABC takes place in a controlled temperature range between 950^0C to 1000^0C.

The high temperature hot flue gases from the kiln pass into the boiler through the inlet duct. The inlet duct will be refractory lined to take care of high temperature. Necessary expansion joints area will be provided to take care of thermal movement in ducting and refractory lining.

The water wall in the 1st heat transfer section arranged in the direction of gas flow. The entire section will be made of water-cooled enclosure formed by tube fusion welded panel or fine welded panel tubes. Front and rear wall are continuous and connected to top/bottom headers. The side walls will be provided with headers, which in turn are connected to steam drum by supply/riser tubes.

Evaporators will be located in the second pass after super heater –I in the direction of gas flow. It consists of inclined coil assembly made of plain tubes, inlet and outlet headers and connected links. Evaporator II & III will be located in the third pass in the direction of gas flow. These evaporators coil consist of plain tubes similar to evaporator-I

Economizer is the last heat transfer section in the direction of gas path. Economizer section consists of plain tube assembly, inlet and outlet headers and connected links.

Super heater I & II are located in the 2nd pass in the direction of gas flow. It consists of plain tube assembly, inlet and outlet headers and connected tubes. A de-superheating station will be installed to control the steam temperature.

A steam drum of suitable size is installed at the top of the boiler.

Suitable connecting flange with expansion joints at boiler inlet, ducting with expansion joints between pass 2 & 3 and pass-3 casing duct up to economizer are provided. The gases coming out of the boiler pass through this duct and enter into the Electrostatic Precipitator. Necessary expansion joints will be provided to take care of the thermal movements, along with suitable supporting arrangements. Safety valves as per the provision of IBR will be provided to relieve the excess pressure of steam into the atmosphere.

The Gases coming out of ESP will be discharged into the atmosphere through Stack. There will be one combined stack for two kilns. Total there will be 2 nos of stacks.

The steam will be taken from Boiler to the steam receiver installed at Power Plant through dedicated pipeline of boiler quality pipes.

WHRB PROCESS OF POWER GENERATION

The steam generated from WHRB will be sent to the turbine for generation of power. The steam leaving from Boiler drum will be further heated in convective Super Heater, Primary and Secondary Super Heater by the hot Flue gas. The steam leaving the Boilers will have 110 ATA pressure and 540°C temperature. The Flue gases will be discharged into atmosphere after separation of particulate matter with the help of E.S.P. through Chimney. The Flue gas discharge temperature after E.S.P. will be 160°C. The heat energy available in the steam will be converted in to mechanical energy, thereby rotating the Turbine. The Turbine will drive the Generator to produce electricity.

Specifications of Boiler

Boiler	Waste Heat Recovery Boiler
Capacity (Max)	36 TPH
Type	Single drum water tube type with Radiant Chamber
No. of Boilers	4
Working Pressure (S/H Outlet)	110 ATA
Temperature	540 ± 5°C
Type	Water Tube
Auxiliary associated with Boiler	ID Fans, Air/Flue Gas ducting, Ash Hoppers, Dense Phase Ash Handling System & associated piping & ducting
Heat Source	Exhaust flue gas from Sponge Iron Rotary Kiln

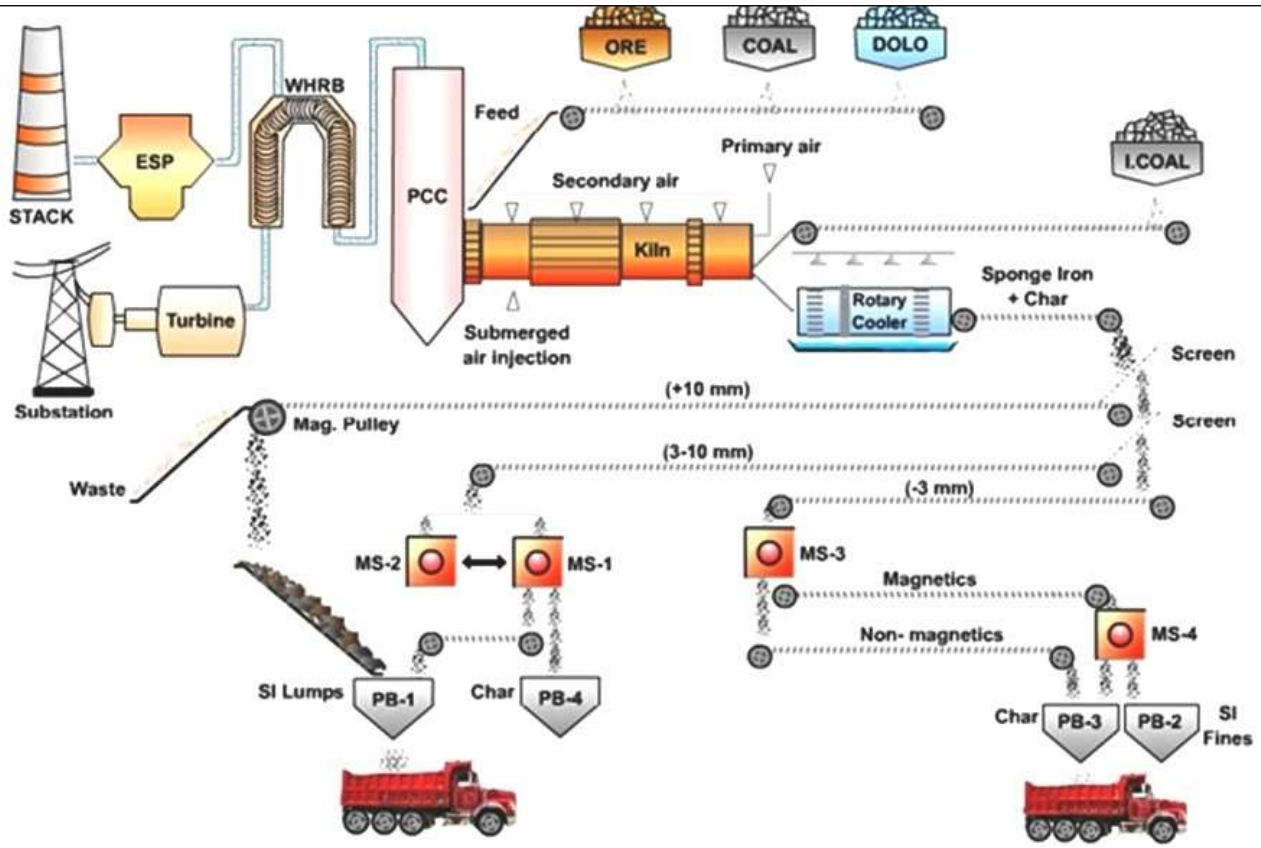
Specification of Electro Static Precipitator

Capacity	3,02,600 m^3/Hr
Gas Temperature (Optg/max.)	175 / 200 Deg. C
Gas Pressure	(-) 300 mmwg

Moisture content	15%
ESP Inlet Dust concentration	15 gm/Nm^3
ESP Outlet Dust emission	< 30 mg/Nm^3

The steam produced in WHRBs of Sponge Iron in expansion will generate 4 x 9 MW i.e. 36 MW .

Figure 7.0 : Schematic Diagram showing Sponge Iron Manufacturing Process and WHRB Power Generation



3.5.4 POWER PLANT

54 MW (36 MW from WHRB from flue gases of DRI Kilns + 18 MW from FBC Based Boiler)

In the EC accorded by MOEF&CC on 24th May 2019, CFBC power plant capacity is 25 MW. Now it has been proposed to reduce the CFBC power plant capacity to 18 MW (lesser by 7 MW)

The Power Plant will consist of 4 nos. of WHR Boilers and 1 no. of CFBC Boiler Turbine Generator set with their auxiliaries.

Boilers (Steam Generation)

- 4 Nos. of WHR Boilers - Steam at 540°C and 110 ATA
- 1 No. of CFBC Boiler – Steam at 540°C and 110 ATA

For Thermal Power Plant coal & water are the essential raw material in the process. The coal and Dolochar is brought to the coal hoppers by conveyors. The coal from the hoppers will be fed by vibro-feeder to a coal conveyor. The coal from the conveyor will pass through coal crusher, where the size of the coal i reduces to -30 mm size. Subsequently the crushed coal will be fed to the vibratory screen where the size of the coal has been bifurcated in less than 30 mm & more than 30 mm size. The Coal size having more than 30 mm will be brought again to the crusher the after crushing the size will reduce to less than 30 mm size. The coal passing through vibrating screen of less than 30 mm size will be transported through the belt conveyor to the coal bunker. Now the coal available in the bunker will be ready for burning in the boiler. Boiler consists of Steam Drum, water wall tube, PSH, SSH, Eco, Air heater. Initially the DM water is filled in the boiler up to the center level of the Steam Drum provided on the top of the boiler, this will ensure filling of DM water of all water side parts such as economizer, bed coils, all the four walls of the boiler.

Initially ID fan started to maintain the natural draught in the furnace. Subsequently FD fan will be started. The FD fan draws the air from the atmosphere and delivers to the air heater and subsequently passes to air box / Burner provided with the boiler. The PA fan will be started to convey coal inside the Boiler after attaining ignition temperature.

Lighting up of the Boiler is done through LDO and subsequently the main fuel i.e. coal and Dolochar mix will be fired through coal feeders/ Mills. Air for combustion is mainly provided FD.

The heat of the combustion gasses (approx 1000^{o}C to 1100^{o}C) is absorbed by water circulating the boiler tubes. The heat of combustion gas transforms the water to steam at temp 540^{o}C and pressure of 110 ATA.

The ID fans sucks out the flue gas through ESP and finally discharge the Flue gases into the atmosphere through Chimney of adequate height as per CPCB norms. While passing the dust-laden gas in the ESP, all the dust is removed in the hoppers of the ESP and subsequently passes to the ash storage silo.

Boiler is generating steam of the desired parameters of the turbine and the generated steam will pass through the turbine.

TURBINE:

The Steam Turbine is directly coupled with Generator and Exciter / Gear Box driven. Steam will pass through the turbine and at the last stage it will pass through the condenser where all the

exhaust steam will be condensed into the water by indirect cooling in the condenser. The turbine rotates at the desired speed as it will be coupled with the generator and exciter directly or through gear box. Generator generates AC current as per the manufacturer's recommended voltage. Now the power will be available at the generator terminals & it can be fed to substation. In the process Mechanical energy will be converted into the electrical energy.

WATER:

Water from water reservoir in the plant will be pumped to DM plant and clarifier plant. In the DM plant water will be purified to suit the Boiler. In Clarifier plant, the water will be purified to the desired extent and this water will be used as the make up to the small Induced draft Cooling Tower user for cooling of TG auxiliary however turbine condenser shall be air cooled type.

COAL HANDLING SYSTEM:

The coal required for Power Plant is of size more than 30 mm and whereas the coal received > 50 mm & Dolochar received from Sponge Iron is of size < 10 mm. Thus the coal received is required to be crushed and screened.

The coal received will be feed into ground hopper. This will be crushed and screened as per boiler size requirement from the screen it will be fed into traveling tripping trolley installed on the coal bunkers and the oversize coal will be again fed for re-crushing to crusher. Traveling Tripper trolley installed above the Coal Bunker will facilitate uniform distribution of the coal into the bunkers. The Coal handling system consists of the following major equipment:

- Ground Hopper
- Impact Crusher
- Vibrating Screen
- Conveyor Belt
- Traveling Tripper Trolley
- Stacker and Re-claimer

COAL YARD:

The coal required for the power plant will be stored in covered shed. Floor of the yard will be concrete floor and there will be partition walls for proper stacking of the coal and it is proposed to construct shed for storing the coal for rainy season requirement.

ASH HANDLING SYSTEM:

For handling of fly ash of the steam generator, dense phase, pneumatic conveying system is provided. The ash collected in the hoppers located in economizer, air pre-heated sections of SG and ESP hoppers will be pneumatically conveyed and collected in a silo from where the ash will be disposed off for brick manufacturing and sold to cement plants.

COMPRESSED AIR SYSTEM:

The compressed air is required for operation of control valves pneumatic cylinders, conveying of Ash through ash handling system.

COOLING WATER SYSTEM:

Air cooled condensers will be provided in the power plant to reduce the water consumption significantly.

LIGHTING:

Lighting load will be supplied through lighting transformer of unity ratio installed at lighting distribution boards. Lighting transformers will feed lighting distribution board. Lighting panels/receptacle panels for various areas will cater the actual lighting and power receptacle requirement of the plant.

CONTROL SYSTEM:

D.C.S. control system along with turbo-visory system shall be adopted for thermodynamics system of power generation. All equipments will be centrally controlled and monitored from the control room with choice to run locally, whenever required.

MECHANICAL EQUIPEMENTS AND SYSTEMS

Boiler	CFBC
Capacity	1 x 72 TPH
Capacity (Max)	1 x 18 MW
Working Pressure (S/H Outlet)	110 ATA
Temperature	540°C
Type	Coal Fired Boiler
Auxiliary associated with Boiler Feed	ID Fans, FD Fans, PA Fans, Electrical Feed Pumps, Air/Flue Gas ducting, Ash Hoppers, Dense Phase Ash Handling System & associated piping & ducting.

The other utilities of plant consist of Coal Handling System, Auxiliary Cooling water for SG and TG, DM water plant, softener plant, ash-handling system etc. Each boiler will be connected with an ESP of 99.8% efficiency. The de-dusting system will be installed at various junction points to control the emission.

ELECTRO STATIC PRECIPITOR

Make	Any reputed make like ACC/Thermax / Ricco etc.
Specification	
Gas Temperature (Optg/max.)	160 Deg. C
Gas Pressure	(-) 250 mmwg max.
Moisture content	10 % to 12 %
ESP Inlet Dust conc.	15 gms/Nm^3
ESP Outlet Dust emission	< 30 mg/Nm^3

The Gas coming out from ESP will be discharged to air through stack. There will be one stack in power plant boiler area.

SOx & NOx Control in Power plant :

- As CFBC boiler is proposed, limestone will be used as bed material and will absorb sulphur from coal. However lime dosing will also be adopted to bring down the particulate emission to < 100 mg/Nm^3.
- In CFBC Boiler, the combustion temperature will be 850-900^{0}C. Hence no Thermal NOx formation during combustion. Necessary low NOx burners with 3-stage combustion, flue gas recirculation & auto combustion control system will be provided to achieve NOx emission of < 100 mg/Nm^3.

Figure 8.0 : Schematic Diagram showing Power generation

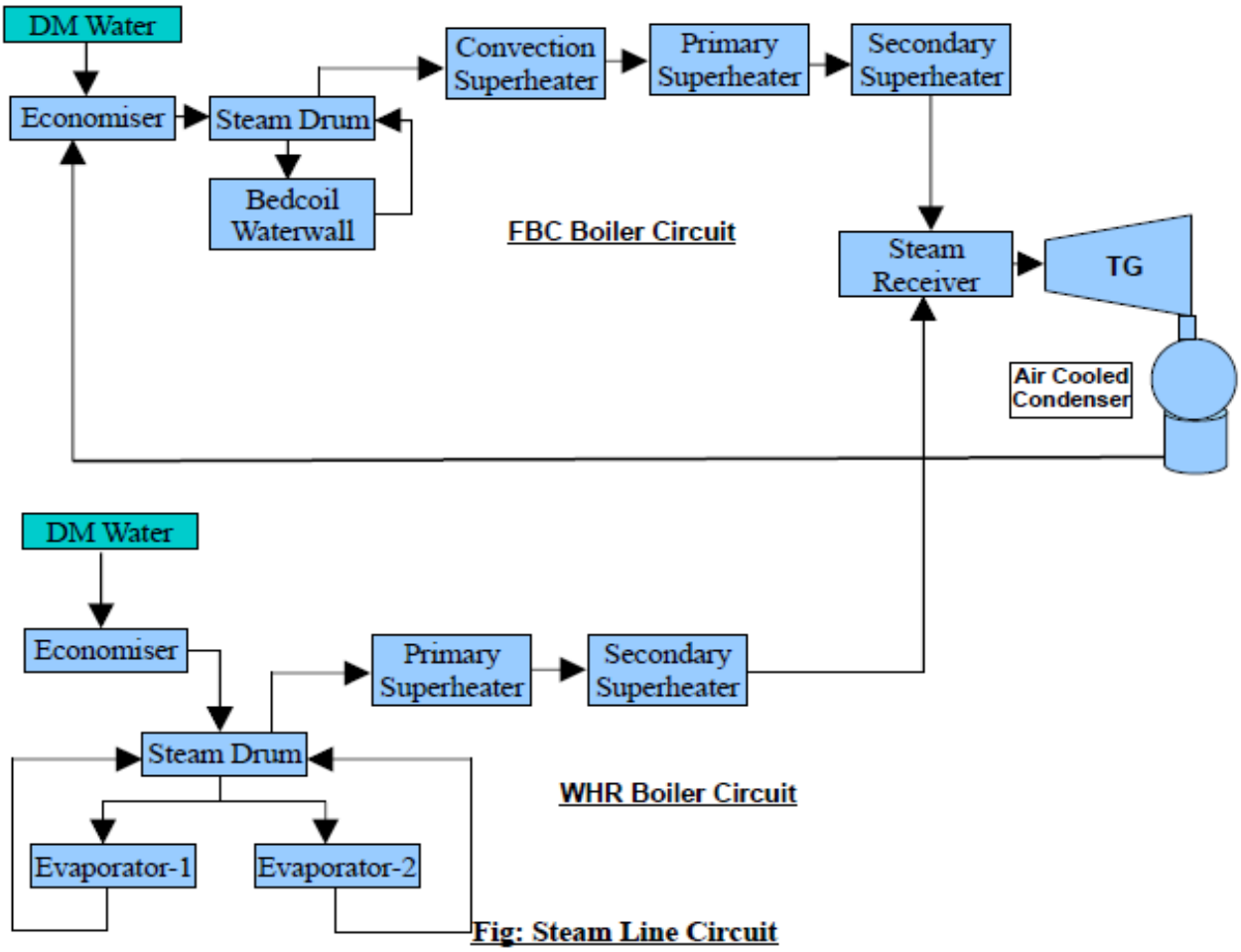
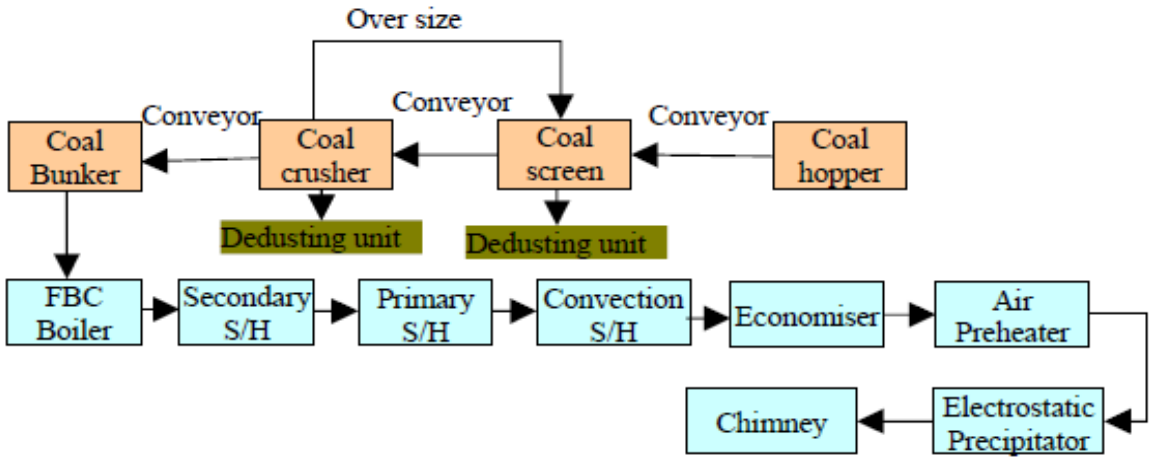


Fig: Steam Line Circuit



3.5.5 STEEL MELTING SHOP

(3 x 15T & 5 x 17T INDUCTION FURNACES instead of permitted 8 x 15 T Induction Furnaces, along with CCM & 5 x 15T LRFs)

(Steel Billets – 4,61,500 TPA)

Induction furnace works on the principle of Induction melting of scrap and sponge iron with the help of electric power. An alternating electromagnetic field induces eddy current in the metal so that the electrical energy converts into heat whose quantity depends on the resistively of the charge. If the charge consists of metal scrap, chips and other metal rejections then the eddy currents arise between separate pieces of charge because of high contact resistance. So small charge pieces required increase frequency of current that feeds the induction heater in order to speed up melting of the charge. Induction furnaces operate on current of commercial frequencies (50Hz) or on current of higher frequencies from 500 to 2000 Hz. Induction furnaces are beneficial in steel making for low melting loss.

An induction furnace constitutes a single larger primary coil made of water-cooled copper tube. The working voltage is impressed across the terminals of the coil. These furnaces have a great much application for melting of Iron, Steel and Nonferrous.

This type of furnace has a rammed lining. The ramming material silica mass contains should more than 96% silica and minimum of Al_2O_3 & Fe_2O_3. Before ramming the material, a steel template kept inside the furnace and rammed the material between the template and the insulated coil of the induction heater. To minimize the consumption of electric power and cut down the melting period the crucible wall must be as thin as possible. During running the furnace one must keep watch on the state of lining because it operates under most unfavorable condition. The inside of crucible lining is in contact with liquid metal while its outside surface contacts the water-cooled induction.

Charging: - The pieces of scrap should be kept on the bottom gently to avoiding impacts into a compact heap. The scrap pieces/ sponge iron should be in small size that provides good compaction of the batch without leaving spacing between the charge and crucible wall. This offer an advantage of quick melting of the charge with a minimum power spent in the stage for the heat. The zone of a highest temperature during the meet lies in the power part of the crucible therefore it is practical to place first high melting scrap on the crucible bottom. Large and high melting pieces should stand parallel and close to the crucible was while low melting

components should be in the middle of the crucible. Small capacity furnaces are loaded manually and the large capacity furnaces with the aid of buckets.

Melting: - At the beginning of melting the furnace works for 5 to 10 minutes on low power until the surge of current fed from the generator disappear. The furnace power is then brought up to a maximum. The charge melts with the crucible held closed. When the charge approaches the fluid stages then the solid pieces are pressed back with a crow bar. The furnaces is then loaded to its capacity by adding small size of scrap as soon as the charge melted, the slag is formed to protect the metal from oxidation and to avoid reduce the melting loss. If the slag generates in excess it should be skimmed off periodically, at the last to deoxidized the metal with Ferromanganese, Silico-manganese and Ferro-silicon. Now the metal is ready to tap for either in ingot or billet casting.

Air Emission Control System

In order to control the air emissions in the induction furnaces, dust extraction system will be installed. It consists of suction hood, bag filters etc. Suction hood mounts on the head of furnace; the flue gases will be sucked through the hood.

The blower sucks the flue gases through hood along with pipe, which will connect to the bag filters. The blower sucks the flue gases through hood along with pipe, which connects to the Bag filters. The cool and fresh air will be exhausted through a common Stack of 30 Mtr height for each two furnaces. Hence there will be total 4 nos stacks. The outlet particulate emission will be < 30 mg/Nm^3.

Ladle Refining Furnace

The LRF installation will be single station system with provision for arc heating, inert gas stirring, and addition of ferroalloys and additives. The LRF will be complete with the transformer, Ladle stirring System Aluminum wire feeder, Carbon injecting device, additives storage and addition system, Sampling and temperature measuring device .A fume extraction and cleaning system consisting of bag filters, ID fan and chimney with the related ductwork will be provided.

Auxiliary Equipment:

The auxiliary facilities required for the LRF will be include the transfer cars, slag handling facility, hydraulic and lubrication systems, Electrode rippling station.

Instrumentation and Automation

A modern DCS process automation system will provide control of process functions, sequencing and interlocking and to execute safety controls. Specific features shall include

power demand control, electrode regulation and control and charge optimization. The system shall be microprocessor based complete with field instruments comprising measuring units, transmitters, load cells, actuators, Programmable Logical controller.

Continuous Casting Machine (CCM)

Billet caster:

The billet caster shall be complete with ladle stand, mould assembly, Strand guide segments and supports withdrawal and straightening system, mould cooling system, Cut-off equipment incl. length measuring device, marking machine etc. Requisite dummy bar and facilities for Dummy bar disconnecting and a dummy bar receiver will be included. The billet casting will be done through 2 Nos of casters having three strands each.

Auxiliary Equipment:

The auxiliary facilities required for the Billet caster will be included. This will include operating platform, cooling bed, ventilation system for spray chambers, equipment for collection and disposal of crop-ends.

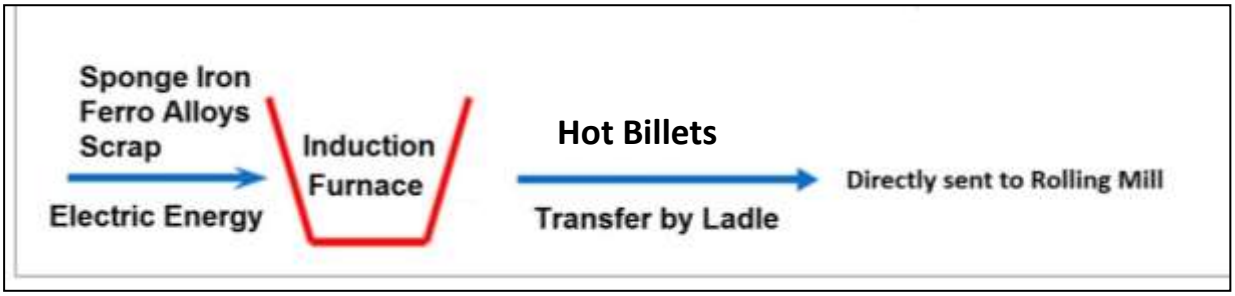
Repair and assembly facilities shall be created for moulds, segments and Tundish.

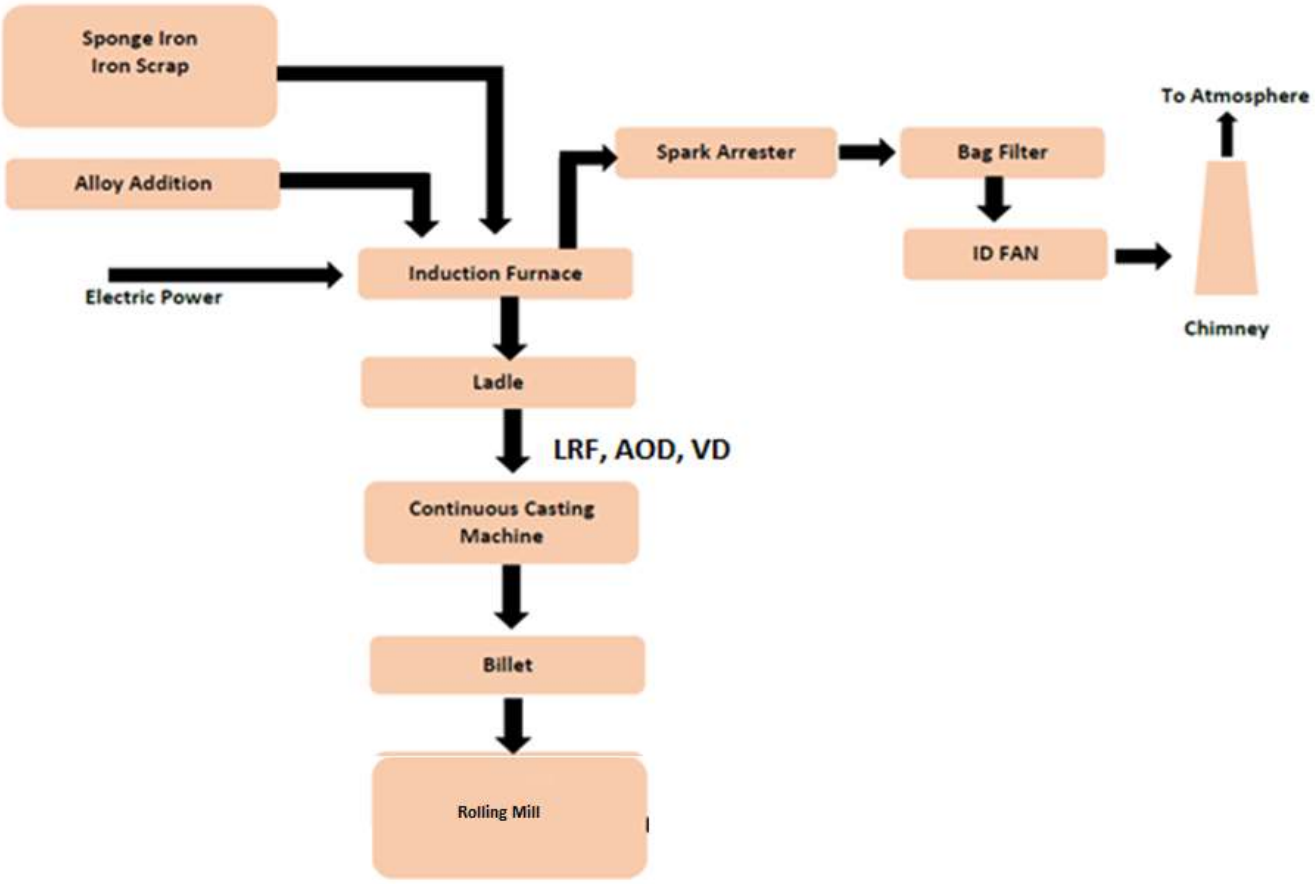
Facility for the preparation of tundish drying, Hydraulic system, Centralized lubrication system, scale handling system shall also be developed.

Instrumentation and Automation:

A modern DCS process automation system shall be provided for control of process functions, sequencing and interlocking and to execute safety controls. Specific features shall include mould level control, computer aided quality control, and process monitoring. The system shall be microprocessor based complete with field instruments comprising measuring units, transmitters, load cells, actuators, PLCs and communication system.

Figure 9.0 : Schematic Diagram showing manufacturing of hot billets





3.5.6 ROLLING MILL

Permitted Rolling Mills as per EC are 2 x 650 TPD. Now it has been proposed to change configuration of Rolling Mill to 1 x 1000 TPD & 1 x 300 TPD and the production will remain same i.e. 4,29,000 TPA along with 2 x 20 T RHF.

Rolling mills of 1 x 1000 TPD & 1 x 300 TPD capacity will be installed. Hot Billets from the Induction Furnaces (with 80% hot charging) will be used Rolling Mill for production of TMT bars/Angles/Channels, etc.

Bar Mill

The bar mill will be designed to produce TMT bars of size 8 mm to 36 mm.

Process Description

The billets generated through continuous casting machine shall be charged to reheating furnace for heating it to required temperature suitable for rolling. The billets will be rolled through a series of roughing and finishing stands and then pass through quenching unit to produce TMT bars with defined physical properties and size.

The TMT bars will be rolled from steel billets of 100 x 100 sqmm to 130 x 130 sqmm section, entering into roughing stands and then passing through a series of continuous stands and finishing stands with intermediate shears and loopers to achieve the final size of TMT bar/wire rod.

The three major stages of conversion of steel billets into TMT bars are:

1) Quenching: When a hot rolled bar leaves the final mill stand, it is instantaneously quenched using a special water spray system at very high pressure in the quenching box. This is done to harden the surface while the core still remains hot and soft. This is a microprocessor based controlled cooling process.

2) Self tempering: After leaving the quenching box, the core continues to supply heat to the surface since it is relatively at a higher temperature. This causes the tempering of the outer layer into a tampered structure.

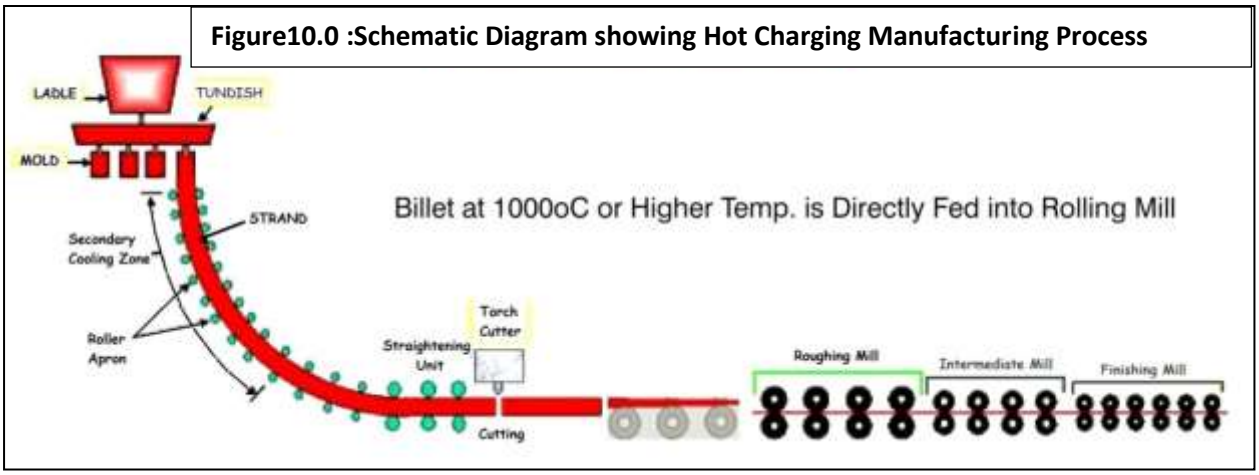
3) Atmospheric Cooling: Atmospheric cooling of the bars are done in cooling bed for normal cooling of the TMT bars to achieve ductile core and a strong outside layer.

The final finished TMT bar will be carried to the shearing area where the TMT bars will be cut into desired length. Then it will be forwarded through roller tables to counting and tying/packing area where bundles of TMT bars will be made and then transferred to stock yard for dispatch.

80% of production from Rolling mill will be through hot charging and 20% will be through Reheating furnace with Producer Gas / Compressed Natural Gas/LDO as fuel.

The flue gases coming out from Reheating furnace will be discharged into the atmosphere through a stack of suitable height as per CPCB norms. There will be one stack to the reheating furnace.

Figure10.0 :Schematic Diagram showing Hot Charging Manufacturing Process



3.5.7 FERRO ALLOY UNIT

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/FeMn. 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 Si O_2. Charcoal and a small percentage of Coal is used as reductants. Mill Scale / Iron Ore is added to obtain Ferro Silicon. FeOis reduced to Fe and SiO_2 is reduced to Si Combining with Carbon and produced as FeSi.

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

THE PROCESS:

Ferro Alloys will be smelted at about 1350 – 1500^{0}C Temperature. This will be achieved by a conventional, Open 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.

DESIGN DETAILS OF 9 MVA FURNACE

S.No.	Particulars	UOM	Value
1.	Furnace Capacity	KVA	9000
2.	Transformer power	KVA	11000
3.	Secondary Voltage	V	162
4.	Electrode maximum current	A	570
5.	Electric furnace phase numbers	Nos.	3
6.	Current frequency	Hz	50
7.	Electrode diameter	Mm	1050
8.	Electrode type	-	Self – leaking
9.	Electrode PCD	Mm	2600
10.	Electrode operational stroke	Mm	1200
11.	Shell inner diameter	Mm	7800
12.	Shell height	Mm	4500
13.	Bath diameter	Mm	Top - 6200 Bottom - 5400
14.	Depth of bath	Mm	2500

S.No.	Particulars	UOM	Value
15.	Tap hole numbers	Nos.	3
16.	Water rate for cooling calculated	Cum/hr	300
17.	Air rate calculated for blasting threeElectrodes	Nm^3/hr	3000
18.	Stack Height	Meters	30

Electrical parameters

Parameters of Steps:

Name of the Parameter	Measuring results at tap changer		
Indicator Position	**1**	**9**	**17**
Output, kW	5500	5500	5500
LV Voltage, V	95	158.5	175
No. Load Current, %	1.2	0.28	0.15
S. C. Losses at 75°C	11.6	6.0	3.95
Impedance Voltage at 175 volts	54.8	77.5	75.4
H. V. winding resistance	0.0592	0.0764	0.0952

L. V. winding resistance to D.C. at 18°C	0.000187 ohm
Break down voltage of oil	60Kv

Voltage and Frequency on the Primary side:

a. Rated voltage of H. V. winding, V 33,000

b. Rated frequency of system, Hz 50

Availability of compensation of reactive power:

At the substation for each furnace, one bank of 4800KWAR capacitor with reactor is maintained for compensating reactive power.

Dimensions of the melting space of the furnace:

Furnace bath diameter and depth, mm 6400 * 2500

Description of lining:

Bath is lined mainly with 45% Al_2O_3 bricks. The thickness of Alumina brick lining at the level of bottom melting space is 975 mm, further 988 mm thick carbon tamping paste lining was done.

a. Diameter of Electrode : 1050 mm

b. Electrode pitch diameter : 2625 mm

Quality of the electrode paste:

Apparent Density – Raw paste	:	1.60 g/cc min.
Baked paste	:	1.35 g/cc min.
Porosity, %	:	26 – 28
Electrical resistivity, ohm mm^2/m	:	90
Compressive strength of baked paste, kg/cm^2	:	150 min.
Young's modulus of baked paste, kg/cm^2	:	2.5 – 4 * 104

The way of dosing and charging of raw material:

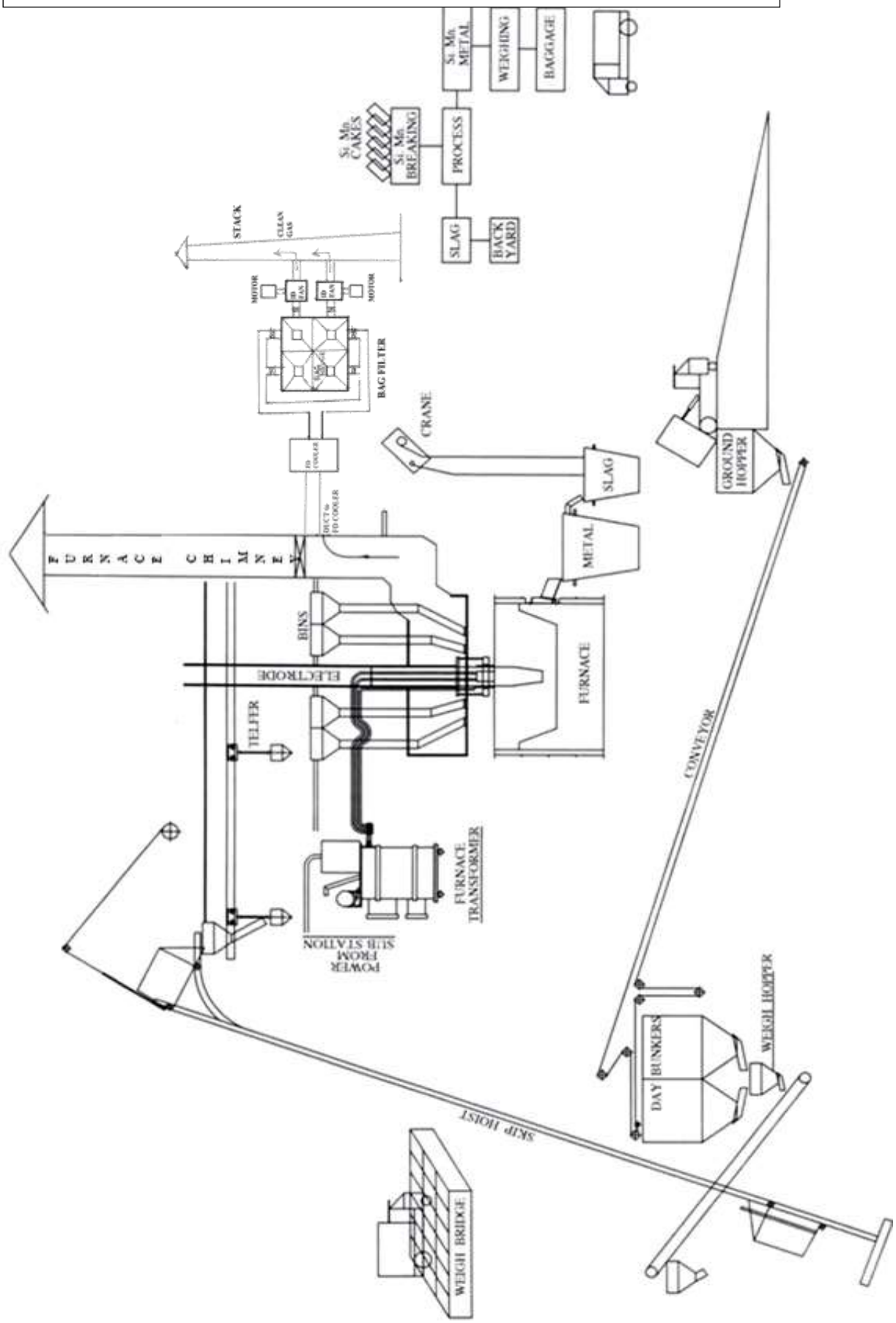
Controlled raw material feeding through chutes and dozing by forklifts.

Power consumption details:

Power requirement for each product:

Type of Ferro Alloys	Power requirement
Ferro Silicon	8500 Kwh/ton
Ferro Manganese	2800 Kwh/ton
Silico Manganese	4200 Kwh/ton
Ferro Chrome	3600 Kwh/ton

Figure11.0 :Schematic Diagram showing Ferro Alloys Manufacturing Process



PROCESS OF FERRO CHROME RECOVERY (ZIGGING PLANT)

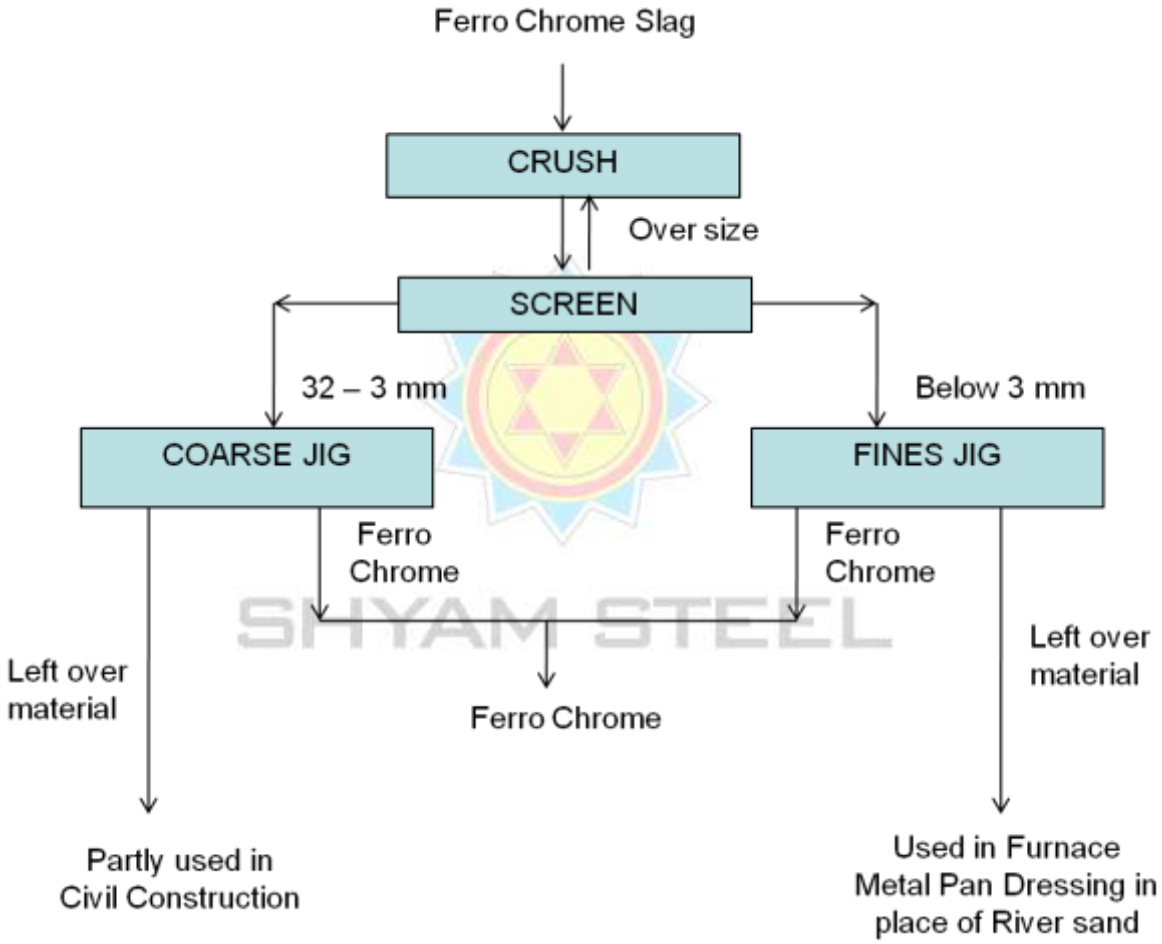
Ferro chrome recovery process involves the following steps

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.



3.6 RAW MATERIAL REQUIREMENT

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

Table No. 3.3 : Raw Material Requirement, Source & Mode of Transport

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
1.	**For Iron Ore Beneficiation Plant (12,00,000 TPA – throughput capacity)**					
a)	Iron ore fines		12,00,000	Rungta Mines, Essel Mines & Other mines in Barbil & Jharkand	~ 500 Kms.	By rail & road (through covered trucks)
2.	**For Pellet Plant (Pellets) - 8,00,000 TPA**					
a)	Iron Ore Concentrate		8,80,000	Own generation	---	Through covered conveyers
b)	Bentonite		6,400	West Bengal	~ 200 Kms.	By road (through covered trucks)
c)	Limestone		12,000	Madhya Pradesh	~ 500 Kms.	By road (through covered trucks)
d)	Anthracite Coal		8,000	Jharkhand	~ 200 Kms.	By road (through covered trucks)
3.	**For DRI Kilns (Sponge Iron) – 5,61,000 TPA (4 x 425 TPD)**					
a)	Pellets (100%)		8,00,000	Inhouse generation	---	---
				Or		
b)	Iron ore (100%)		9,53,700	Barbil, Orissa NMDC, Chhattisgarh	~ 500 Kms.	By Rail & Road (through covered trucks)
c)	Coal	Indian (100%)	7,30,000	ECL, West Bengal / MCL Odisha	~ 600 Kms.	By rail & road (through covered trucks)
		Imported (100%)	5,00,000	Indonesia / South Africa / Australia	~ 270 Kms. (from Haldia Port)	Through sea route, & by road (through covered trucks)
d)	Dolomite		28,050	Chhattisgarh	~ 600 Kms.	By rail & road (through covered trucks)
4.	**For Steel Melting Shop (MS Ingots / Billets/Hot Billets) – 4,61,500 TPA (3 x 15T & 5 x 17T induction furnaces with CCM & LRF)**					
a)	Sponge Iron		4,43,040	Own generation	---	Through covered conveyers
b)	Pig Iron		55,380	West Bengal	~ 100 Kms.	By road

S.No.	Raw Material		Quantity (TPA)	Sources	Distance from site (in Kms.)	Mode of Transport
						(through covered trucks)
c)	MS Scrap		41,535	West Bengal	~ 100 Kms.	By road (through covered trucks)
d)	Ferro alloys		5,538	Own generation	---	By road (through covered trucks)
5.	**For Rolling Mill through Hot charging & RHF (Hot Rolled TMT / Structural / Cold Rolled Bars/Wire Rod) – 4,29,000 TPA**					
a)	Hot Billets / Billets / Ingots		4,51,600	Own generation	---	----
b)	LDO / LSHS		7,000 Kl/annum	Nearby IOCL Depot	~ 100 Kms.	By road (through Tankers)
6.	**For FBC Boiler [Power Generation 1 x 18 MW]**					
a)	Indian Coal (100%)		1,21,000	ECL, West Bengal / MCL Odisha	~ 600 Kms.	By rail & road (through covered trucks)
	OR					
b)	Imported Coal (100%)		88,000	Indonesia / South Africa / Australia	~ 270 Kms. (from Haldi Port)	Through sea route, rail route & by road (through covered trucks)
	OR					
c)	Dolochar + Indian Coal	Dolochar	1,40,250	Inhouse generation	---	Through covered conveyors
		Indian Coal	43,500	ECL, West Bengal / MCL Odisha	~ 600 Kms.	By rail & road (through covered trucks)
	OR					
d)	Dolochar + Imported Coal	Dolochar	1,40,250	Inhouse generation	---	Through covered conveyors
		Imported Coal	31,850	Indonesia / South Africa / Australia	~ 270 Kms. (from Haldi Port)	Through sea route, rail route & by road (through covered trucks)

3.6.1 MODE OF TRANSPORT OF RAW MATERIAL AND FINISHED PRODUCTS

- SSML is in the process of having its own Railway Siding upto the plant site .
- Most of the major materials required for expansion will be transported by Rail.
- 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 expansion project will be 167 trucks /day.
- Existing Raod network is capable of taking additional traffic load due to expansion project & Internal roads in the proposed expansion 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 PRODUCTS

Sponge Iron (1,17,960 TPA) & Rolled products (4,29,000 TPA) will be sold to domestic consumers & also will be exported.

3.7 WATER REQUIREMENT AND ITS SOURCE

- Water required in the existing plant is 1050 KLD and same being sourced from Damodar river
- Water required for the proposed expansion project will be 3420 KLD and same will be sourced from Damodar river.
- Air cooled condensers have been provided in existing power plant. In expansion also air cooled condensers will be provided.
- Total water requirement after the proposed expansion will be 4470 KLD.
- Water permission from Damodar Valley Corporation has already been obtained for 1.3 MGD (i.e. 5909.75 KLD).
- Hence seprate water drawl permission will not be required even after the present expansion also.

3.7.1 WATER BALANCE (FOR PROPOSED EXPANSION)

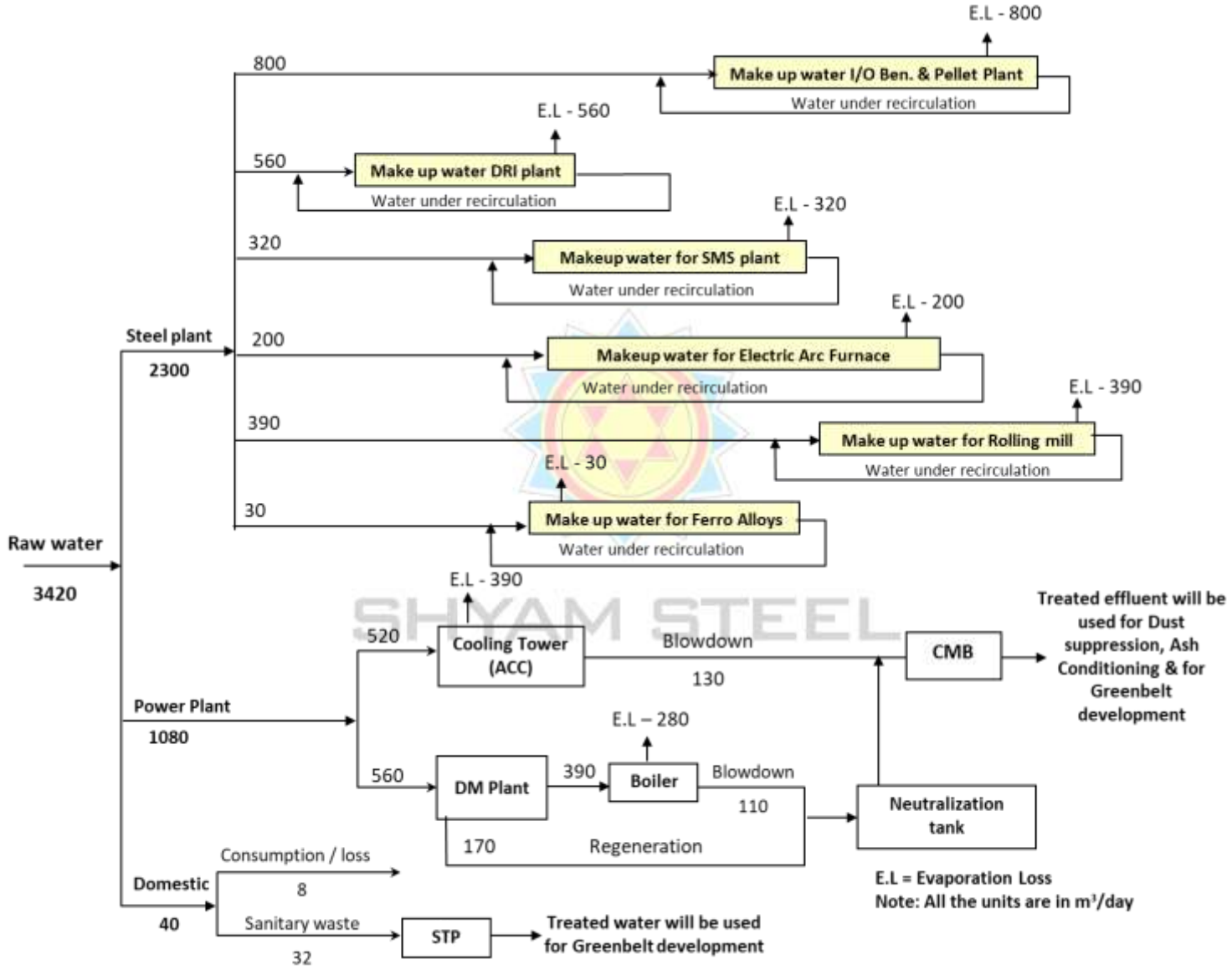


Table No. 3.4: WATER REQUIREMENT & BREAK-UP FOR EXISTING & PROPOSED EXPANSION

S.No.	Unit	Quantity in KLD		
		Existing Plant	Proposed Expansion	Total after Expansion
1.	Iron Ore Beneficiation Plant (Beneficiated Iron Ore)	---	500	500
2.	Pellet Plant (Pellet)	---	300	300
3.	DRI Kilns (Sponge Iron)	100	560	660
4.	Induction Furnace (MS Ingot/Billet/Hot Billets)	200	320	520
5.	Electric Arc Furnace	---	200	200
6.	Rolling Mill with RHF	200	390	590
7.	Ferro Alloy Plant	30	30	60
8.	Cement Plant	150	---	150
9.	Power Plant (WHRB & FBC)	350	1080	1430
10.	Domestic	20	40	60
	Total water requirement	**1050**	**3420**	**4470**

3.8 WASTEWATER GENERATION & ITS MANAGEMENT

Existing

- There is no wastewater discharge from the existing plant as Closed circuit cooling system is being adopted.
- Boiler blowdown & DM plant regeneration wastewater is being treated in Neutralization tanks and is being mixed in a Central Monitoring Basin (CMB). The treated effluent from CMB is being utilized for dust suppression, ash conditioning and for greenbelt development.
- Effluent from Rolling mill is being treated in an oil separator followed by settling tank. The treated effluent is recycled back.
- Sanitary wastewater, which is being treated in Septic tank followed by Soak pit.
- Zero liquid effluent discharge is being maintained in the existing plant.

Proposed

- There will be no effluent discharge in the I/O Beneficiation, Pellet Plant, DRI Unit, Induction Furnace Unit, Electric Arc Furnace, Ferro Alloys as closed circuit cooling system will be adopted.
- Effluent from Rolling mill will be sent to settling tank and will be recycled through closed circuit cooling system.

- Effluent from power plant will be treated in ETP and after ensuring compliance with WBPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Air cooled condenser will be provided in the power plant, which will reduce the water consumption significantly. Hence wastewater generation will be also be minimized.
- Sanitary waste water will be treated in STP and after treatment it will be utilized for greenbelt development.
- Zero liquid effluent discharge practice will be continued in the proposed expansion also.

Table No. 3.5 :WASTEWATER GENERATION AND ITS BREAKUP

S.No.	Source	Generation (KLD)		
		Existing Operating plant	Proposed Expansion	After Proposed Expansion
1.	DRI Kilns	---	---	---
2.	Induction Furnaces	---	---	---
3.	Electric Arc Furnace	---	---	---
4.	Submerged Electric Arc Furnaces	---	---	---
5.	Power Plant	133	410	543
	a) Cooling Tower blowdown	42	130	172
	b) Boilers blowdown	36	110	146
	c) D.M. plant regeneration water	55	170	225
6.	Sanitary Wastewater	16	32	48
	Total	**149**	**442**	**591**

EFFLUENT TREATMENT PLANT

pH of the boiler blowdown will be between 9.5 to 10.5. Hence a neutralization tank will be constructed for neutralizing the boiler blow down. DM plant regeneration water will be neutralized in a neutralization tank. After neutralization, these two effluent streams will be mixed with Cooling Tower blowdown in a Central Monitoring Basin (CMB). The treated effluent will be utilized for dust suppression, ash conditioning and for Green belt development. No effluent will be let out of the plant premises. Hence Zero discharge concept will be implemented.

3.8.1 TREATED EFFLUENT DISPOSAL DURING MONSOON

Effluent quantity to be used for ash conditioning : 91 m^3/day

Effluent to be used for dust suppression in CHP : 300 m^3/day

Effluent to be used for Greenbelt development : 200 m^3/day

81 acres of greenbelt will be developed by using the treated effluent. Treated effluent which is proposed to be utilized for greenbelt during non-monsoon period, will be used as make up water for Rolling Mill, during monsoon.

3.9 SOLID WASTE GENERATION & ITS MANAGEMENT

The following is the solid waste generation from existing, proposed & after expansion

Table No. 3.6: SOLID WASTE GENERATION AND IT BREAK UP

S.No	Waste	Quantity (TPA)			Method of disposal
		Existing	Proposed	After expansion	
1.	Tailing from Beneficiation plant	--	1,40,000	1,40,000	Tailings from thickener will be taken to filterpress and the dewatered tailings cake be stored in the yard with 30 days capacity. This will be given to Ceramic industries/ cement plants.
2.	Pellet Plant (ESP & Bagfilter dust from dedusting system)	--	2,200	2,200	Will given to Brick manufacturing units.
3.	Ash from DRI	32,400	1,00,000	1,32,400	Is being utilized in the existng Cement Plants (Partly) & given to Brick manufacturers (partly). In expansion Ash will be utilized in brick making unit and excess if any will be supplied to other brick manufacturer / Cement Plant.
4.	Dolochar	54,000	1,40,250	1,94,250	Is being utilized in the exising AFBC boiler based power palnt. The same practice will be continued after expansion also.
5.	Kiln Accretion Slag	1620	5,049	6,669	Is being given to road contractors for road construction & given to brick manufacturer and same practice will be continued after the proposed expansion also.
6.	Wet Scraper Sludge	2400	7,517	9,917	Is being given to road contractors for road construction & given to brick manufacturer and same practice will be continued after the proposed expansion also.
7.	SMS Slag	32,800	64,610	97,410	Presently it is utilized in the slag crusher unit of M/s. Shyam Steel Industries Ltd. (Sister Concern unit) at Bamunara Industrial Estate, where it is processed for metal recovery. The remaining material after the recovery process is further used as Raw material for Brick manufacturing unit at M/s. Shyam Steel Industries Ltd.

8.	End cuttings from rolling Mill	7,631	11,289	18,920	Reused in SMS
9.	Miss Rolls & Mills Scales from Rolling Mill	7,631	11,289	18,920	Will be used in existing and proposed SMS & Ferro Alloys plant captively
10.	Ash from Power Plant (with Indian Coal + Dolochar)	40,920	1,07,043	1,47,963	Is being to M/s. BMR Enterprises, who is a supplier of ash to M/s. Ultratech Cement Ltd., Durgapur. In the proposed expansion project also ash will be given to M/s. BMR Enterprises for utilisation of ash in cement manufacturing.

3.10 POWER REQUIREMENT AND ITS SOURCE

Power requirement for the existing plant is 42.70 MW and same is being met from Captive Power plant and Damodar Valley Corporation (DVC). Power required for propsed expansion will be 105.5 MW and will be met partly from proposed 54 MW captive power plant and remaining 51.5 MW from Damodar Valley Corporation (DVC).

Following is Power consumption break up for each unit in the proposed expansion:

Table No. 3.7: BREAK UP OF POWER REQUIREMENT FOR EXPANSION

S.No.	Unit	Power Consumption	Power Requirement (in MW)		
			Existing / Permitted	Proposed	After proposed expansion
1.	I/O Benefication & Pellet Plant	60 Kwh/ton	---	10.0	10.0
2.	DRI	75 Kwh/ton	1.75	5.3	7.05
3.	SMS	750 Kwh/ton	19.50	43.7	63.20
4.	EAF	---	---	20.50	20.50
5.	Rolling Mill	95 Kwh/ton	3.50	5.1	8.60
6.	Cement Plant	---	0.75	---	0.75
7.	Ferro Alloys	9000 Kwh/ton	14.50	14.50	29.00
8.	Oxygen Plant	---	---	1.00	1.00
9.	Power Plant – WHRB	Aux. Consumption @ 10%	1.00	3.6	4.60
10.	Power plant – FBC	Aux. Consumption @ 10%	0.70	1.8	2.5
Total			**41.70**	**105.5**	**147.2**

Total Captive Power Generation from expansion : 54 MW (36 MW WHRB + 18 MW CFBC)

Total Power Consumption in proposed expansion : 105.5 MW

Remaining power of 51.5 MW for proposed expansion will be sourced from Damodar Valley Corporation (DVC).

3.11 AIR EMISSION & ITS MANAGEMENT

Following are Air Emission Control Systems are proposed in the present expansion project:

Table No. 3.8: AIR EMISSION CONTROL SYSTEMS

S.No.	Source	Control Equipment	Air Emission at the outlet
1.	Pellet Plant	Electro Static Precipitator (ESP)	PM < 30 mg/Nm^3
2.	DRI kilns with WHRB's	Electro Static Precipitators (ESP)	PM < 30 mg/Nm^3
3.	Induction Furnaces with CCM & LRFs	Fume Extraction system with bag filters	PM < 30 mg/Nm^3
4.	CFBC Boiler	Electro Static Precipitators	PM < 30 mg/Nm^3
		Limestone will be used as bed material and act as sulphur absorbent. Lime dosing will also be done	SOx < 100 mg/Nm^3
		Combustion temperature will be around 800-850^{0}C, which is not conducive for thermal NOx formation. Low NOx burners with 3-stage combustion, flue gas recirculation and auto combustion control system will be provided.	NOx < 100 mg/Nm^3

Note : Apart from the above Fume Extraction System with bagfilters, dust suppression system, covered Conveyers, mechanical dust sweepers etc. will also be installed.

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, allPrimary metallurgical processing industries (Sponge Iron> 200 TPD & 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 plant 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 National Highway # 60
Rail	:	Nearest station – Raniganj Railway Station – 4.4 Kms.
Air	:	Panagarh Airport – 34.0 Kms.

4.2 LAND FORM, LAND USE & LAND OWNERSHIP

Land Form

- Existing steel plant located at J.L.No. 11, Jemua Mouza, Mejia Block, Bankura District, West Bengal.
- Existing plant is located in 66.1 Ha./ 163.3 Acres of land.
- Proposed expansion will be taken up partially in the Existing plant (i.e. 66.1 Ha./ 163.3 Acres) and partially in the land adjacent to the existing plant (i.e. 25.24 Ha./ 62.34 Acres) and agreement of sale have been done for the additional land.
- Total land after proposed expansion will be 91.34 Ha./ 225.64 Acres.

Land use

- Existing plant land (66.1 Ha./ 163.3 Acres) is mostly converted for Industrial purpose. Additional land (25.24 Ha./ 62.34 Acres) proposed for the expansion proposal will be converted for Industrial purpose from agricultural purpose.

Land Ownership

- Existing (66.1 Ha./ 163.3 Acres) is in possession of management and agreement of sale have been done for additional land (25.24 Ha./ 62.34 Acres).

4.3 TOPOGRAPHY

The plant site is undulating with level difference of 10 m. The site is sloping from SW to NE side. Due to the proposed project, some topographical changes will occur due the excavations, construction activities pertaining to project. The Topographical map is shown Figure No. 2

4.4 EXISTING LAND USE PATTERN

Existing plant is situated in the 66.1 Ha./ 163.3 Acres of land, which is mostly converted for Industrial Purpose. Proposed expansion will be carried out in the existing land and additional land (25.24 Ha./ 62.34 Acres) situated adjacent to the existing plant. Additional land will be converted to Industrial purpose from agricultural purpose.

Table No. 4.1 : Environment Setting

S.No	Particulars		Distance from the site (within 10 kms.)
1.	Habitation	:	Jemua Village (SW Direction) – 0.1 Kms.
2.	National Park	=	Nil
3.	Wild life sanctuaries	=	Nil
4.	Eco Sensitive Areas	=	Nil
5.	Forests	=	No Reserve Forest exists with the study area Gangajalghati PF (East Direction) – 3.0 Kms.
6.	Surface water bodies	=	Damodar River (NE Direction) – 1.5 Kms. Galghata Jhor Nallah (South Direction) – 0.5 Kms. Chouphari Nallah (SE Direction) – 3.7 Kms. Mejia Bil Reservoir (East Direction) – 1.3 Kms. 4 no.s of rain fed pond are present in the additional land proposed for expansion proposal and same will not be disturbed & will be utilised as water reservoirs.
7.	Costal Regulation Zone [CRZ]	=	Nil

4.5 EXISTING INFRASTRUCTURE

Good infrastructure is available in the vicinity of Plant; some of the key features are listed below:

- It is an expansion proposal to be taken up partly in existing land and remaining in adjoining land.
- Well connected to National Highway.
- Availability of water (Damodar river) within the study area.
- Excellent Rail connectivity.

4.6 SOIL CLASSIFICATION

The existing plant site is industrial land and soil hard soil in nature. Detailed soil investigation will be submitted in the EIA report.

Chapter – 5 : PLANNING BRIEF

5.1 PLANNING CONCEPT

Shyam Steel Manufacturing Ltd. is an existing plant located J.L.No. 11, Jemua Mouza, Mejia Block, Bankura District, West Bengal-722143.

Chronology of permission obtained:

- Existing plant has obtained Environment Clerance from MoEF&CC vide F.No.J-11011/724/2007 – IA II (I) dated 4th August 2008. Accordingly obtained Consent to Establishment and Consent to Operate from the WBPCB for few units and same are under operation.
- Subsequently another EC has been obtained from MoEF&CC vide F.No.J-11011/724/2007 – IA II (I) dated 24th May 2019 for expansion of steel plant.
- Later obtained NIPL Certificate (for capacities of EC dt. 4th August 2008) vide dt. vide letter no. 406-2N-29/2019 (E)-PT-II dt. 26th April 2021 from West Bengal Pollution Control Board (WBPCB) for increase in production capacity of Sponge Iron, Induction Furances & Rolling Mill.

Now, the present expansion proposal, which will be taken up partly in existing plant and the partly in the land adjacent to the existing plant premises, is as follows:

- Establishment of New Iron ore Beneficiation plant & Pellet Plant as part of backward integration.
- Reduction in FBC Power plant capacity from 25 to 18 MW as per EC permission accorded by MoEF&CC vide dated 24th May 2019.
- DRI, SMS, Rolling Mill units have not been implemented. Now it has been proposed to install 4 x 425 TPD of DRI Kilns instead of 3 x 350 TPD of DRI Kilns as permitted in EC dt. 24th May 2019.
- Installation of 3 x 15T & 5 x 17T Induction Furnaces along with CCM & LRFs instead of 8 x 15 T Induction Furnaces as permitted in EC dated 24th May 2019.
- Change in Rolling Mill configuration to 1 x 1 000 TPD & 1 x 300 TPD along with 2 x 20T RHF instead of 2 x 650 TPD as permitted in EC dated 24th May 2019.

The following are the cpapcities of of products as per EC permission accorded on 24th May 2019 & the present proposal:

Table No. 5.1 :Plant configuration and production capacity

S. No.	Unit (Product)	Existing Operating plant	Capacity for which EC obtained in 24th May, 2019	Present Proposal	Final Configuration after Present Proposal
		[1]	[2]	[3]	[4] = [1] + [3]
1.	Iron Ore Beneficiation plant (concentrated Iron ore)	---	---	1.2 MTPA	1.2 MTPA
2.	Iron Ore Pellet Plant (I/o Pellets)	---	---	0.8 MTPA	0.8 MTPA
3.	DRI Kilns (Sponge Iron)	2,25,000 TPA	3,46,500 TPA (3 x 350 TPD)	5,61,000 TPA (**4 x 425 TPD will be installed instead of 3 x 350 TPD**)	7,86,000 TPA
4.	Induction Furnace with CCM & LRF (MS Ingots / Billets / Hot Billets)	2,34,300 TPA	3,96,000 TPA (8 x 15T)	4,61,500 TPA (**3 x 15T & 5 x 17T with 5 x 15T LRF will be installed instead of 8 x 15 T)**	6,95,800 TPA
5.	Electric Arc Furnace	Nil	1,98,000 TPA (1 x 30 T)	1,98,000 TPA (1 x 30 T) **[Retained EC permitted capacity]**	1,98,000 TPA (1 x 30 T)
6.	Rolling Mill (Hot Rolled TMT / Structural / Cold Rolled Bars / Wire Rod) (80 % Hot charging with Hot Billets and remaining 20% through 2X20TPH RHF)	2,90,000 TPA	4,29,000 TPA (2 x 650 TPD)	4,29,000 TPA (**Change in configuration of EC permitted capacity to 1 x 1000 TPD + 1 x 300 TPD**)	7,19,000 TPA
7.	Ferro Alloy Plant (FeSi/FeMn/SiMn/FeCr)	2 x 9 MVA (FeMn 32,400 TPA / SiMn 32,400 TPA / FeCr – 27,000 TPA / FeSi – 15,600 TPA)	2 x 9 MVA (FeMn 32,400 TPA / SiMn 32,400 TPA / FeCr – 27,000 TPA / FeSi – 15,600 TPA)	2 x 9 MVA (FeMn 32,400 TPA / SiMn 32,400 TPA / FeCr – 27,000 TPA / FeSi – 15,600 TPA)	4 x 9 MVA (FeMn 64,800 TPA / SiMn 64,800 TPA / FeCr – 54,000 TPA / FeSi – 31,200 TPA)

S. No.	Unit (Product)	Existing Operating plant	Capacity for which EC obtained in 24th May, 2019	Present Proposal	Final Configuration after Present Proposal
		[1]	[2]	[3]	[4] = [1] + [3]
				[Retained EC permitted capacity]	
8.	Power Plant (WHRB)	10 MW	24 MW	Increase in WHRB Power from 24 MW **to 36 MW (4 x 9 MW)**	46 MW
9.	Power Plant (FBC)	7 MW	25 MW (1 x 25 MW)	**Reduction in Power Plant from 25 MW to 18 MW**	25 MW
10.	Oxygen Plant	Nil	4,000 TPA	4,000 TPA **[Retained EC permitted capacity]**	4,000 TPA
11.	Cement Plant	75,000 TPA	Nil	---	75,000 TPA
12.	Coal / Coke / Chrome fines Briquette	Nil	1,00,000 TPA	1,00,000 TPA **[Retained EC permitted capacity]**	1,00,000 TPA

5.2 POPULATION PROJECTION

In the 2011 census, Bankura municipality had a population of 3,596,292 out of which 1,840,504 were males and 1,755,788 were females, constituting 954 females per 1000 male as sex ratio. The projected population of Bankura municipality will be 4,45,365 by 2021 consdiering growth rate of 25% per decade and by 2031 it will be 5,56,706.

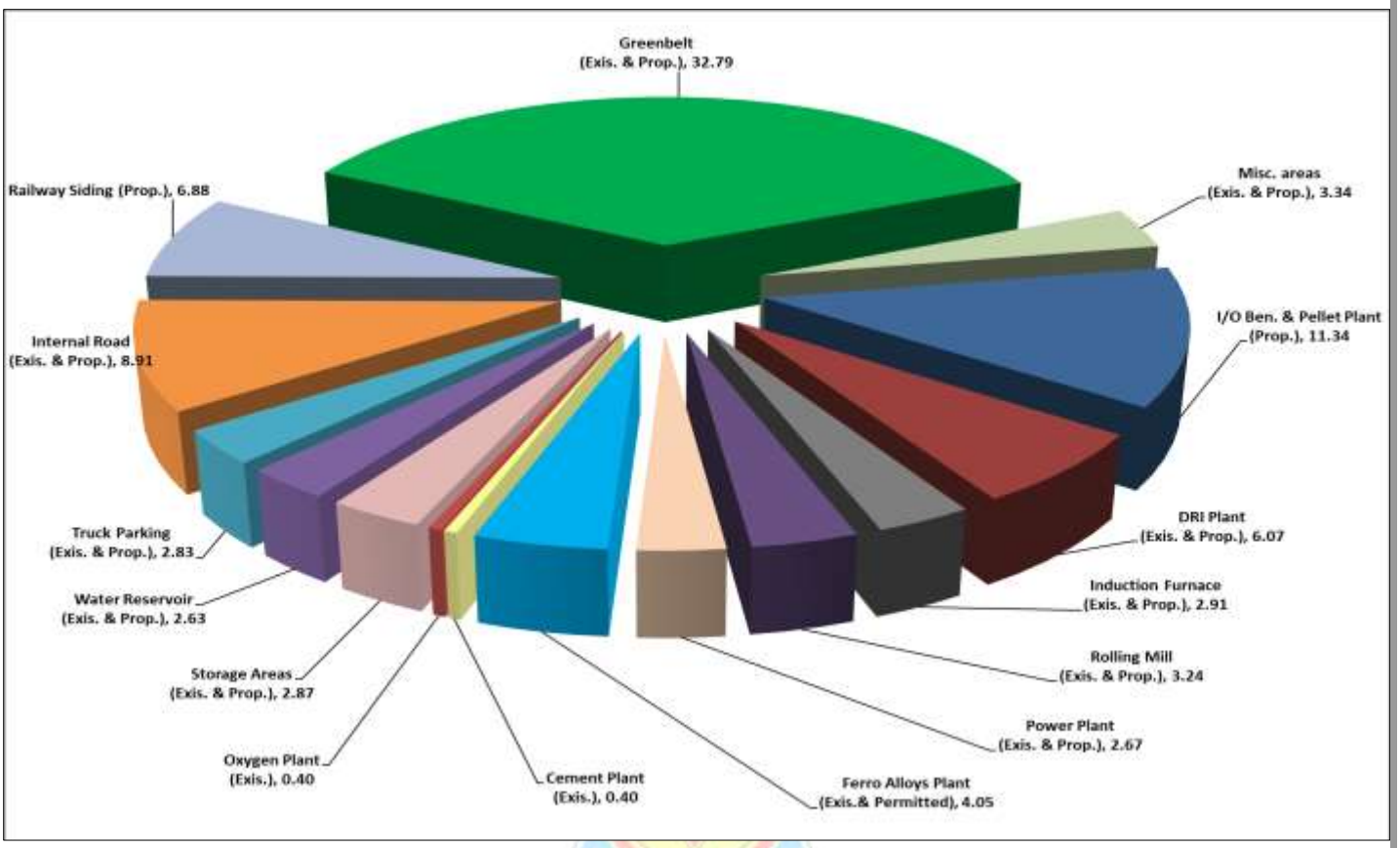
5.3 LAND USE PLANNING

Total land after proposed expansion will be 91.34 Ha./ 225.64 Acres. The following is land use planning / statement of the plant area:

Table No. 5.2 : Land Use Statement (Existing & Proposed)

S.No.	Land Use	Status	Area (in Ha.)	Area (in Acres)
1	I/O Beneficiation 1.2MTPA & Pellet Plant 0.8MTPA	Proposed	10.12	25
2	DRI Plant - 2,25,000 TPA	Existing	5.67	14
3	DRI Plant - 4 x 425 TPD (5,61,000 TPA)	Proposed		
4	Induction Furnace - 6 x 11 T (2,34,300 TPA) with Billet Yard	Existing	2.43	6
5	Induction Furnace - 3 x 15 T + 5 x 17 T (4,61,500 TPA) with Billet Yard and 5 X 15T LRF	Proposed		
6	Rolling Mill - 2,90,000 TPA	Existing	3.24	8
7	Rolling Mill - 1 x 1000 TPD + 1 x 300 TPD with 2 X 20TPH RHF	Proposed		
8	Power Plant (WHRB 10MW + FBC 7MW)	Existing	3.48	8.58
9	Power Plant (WHRB 36MW + FBC 18MW)	Proposed		
10	Ferro Alloys Plant - 2 x 9 MVA	Existing	3.52	8.7
11	Ferro Alloys Plant - 2 x 9 MVA	Permitted		
12	30T Electric Arc Furnace	Permitted	0.28	0.7
13	Cement Plant - 75,000 TPA	Existing	0.35	0.86
14	Oxygen Plant - 4,000 TPA	Permitted	0.40	1
15	Storage Areas	Existing + Proposed	3.24	8
16	Water Reservoir	Existing + Proposed	4.38	10.8
17	Truck Parking	Existing + Proposed	2.83	7
18	Internal Road	Existing + Proposed	8.50	21
19	Railway Siding	Permitted	6.88	17
20	Greenbelt	Existing + Proposed	32.79	81
21	Misc. Areas (Rain Water Harvesting, ETP&STP, Power Sub-Station.Admin. Building, Occupational Health Centre, Emergency Response Area etc.)	Existing + Proposed	3.24	8
	Total		**91.34**	**225.64**

Figure 5.1: Pie Diagram showing Land use Statement



5.4 ASSESSMENT OF INFRASTRUCTURE DEMAND (PHYSICAL & SOCIAL)

Basic infrastructure demand would be first to have better road connectivity, availability of clean and pure drinking water, availability of good schools, availability of Hospitals, community halls, public toilets, easy and faster means of transportation and connectivity to nearby town and city, availability of uninterrupted electricity etc. are the present assessed demands for sustained and healthy growth of nearby area of site. Since it is an existing plant most of these infrastructural facilities are already existing. Additional infrastructural facilities will come with further expansion of the industry.

5.5 AMENITIES / FACILITIES

For the social development activities in the area are being carried out regularly in the area. With the proposed expansion, social infrastructural facilities will further be increased in the area . The company will plan to construct community halls, roads, provide drinking water, educational facilities, etc. provision of mobile medical van for the free treatment for nearby villagers, etc based on the social impact assessment.

Chapter – 6 : PROPOSED INFRASTRUCTURE

6.1 INDUSTRIAL AREA (PROCESSING AREA)

The main plant area comprises of Iron ore beneficiation plant, Pellet plant, DRI Kilns, SMS with CCM, LRF, Rolling Mill, WHRB based Power Plant, CFBC based Power Plant, raw material storage, product storage, waste storage , Railway siding, internal roads, water reservoir, truck parking, etc.

6.2 RESIDENTIAL AREA (NON PROCESSING AREA)

No Township / Colony is proposed, however facilities like Admin building, canteen, rest rooms facilities will be provided.

6.3 GREENBELT

The plantation and green belt development will also be taken care in the plant and the space reserved for plantation will be more than 33% of the total plant area i.e. 32.79 Ha. (81 acres) which is inclusive of existing greenbelt. SSML will take-up extensive green belt development by planting about 2500 trees per Ha. it has been proposed to develop 15-20 meters wide green belt along the periphery inside the factory premises.

6.4 SOCIAL INFRASTRUCTURE

As apart of expansion the company will take-up social infrastructure development by strengthening the roads, construct community hall, providng drinking water facility, infrastructural facilities to schools, etc. in the nearby villages. For the economical development of the people in the area, the company will provide top most priority in employment as per qualification & eligibility.

6.5 DRINKING WATER MANAGEMENT

Plant drinking water and sanitation requirement will be sourced from Damodar river. Water drawl permission has already been obtained from Damodar Valley Corporation (DVC) for 1.3 MGD capacity.

6.6 SEWERAGE SYSTEM

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.

6.7 INDUSTRIAL WASTEWATER MANAGEMENT

Existing

- There is no wastewater discharge from the existing plant as Closed circuit cooling system is being adopted.
- Boiler blowdown & DM plant regeneration wastewater is being treated in Neutralization tanks and is being mixed in a Central Monitoring Basin (CMB). The treated effluent from CMB is being utilized for dust suppression, ash conditioning and for greenbelt development.
- Effluent from Rolling mill is being treated in an oil separator followed by settling tank. The treated effluent is recycled back.
- Sanitary wastewater, which is being treated in Septic tank followed by Soak pit.
- Zero liquid effluent discharge is being maintained in the existing plant.

Proposed

- There will be no effluent discharge in the I/O Beneficiation, Pellet Plant, DRI Unit, Induction Furnace Unit, as closed circuit cooling system will be adopted.
- Effluent from Rolling mill will be sent to settling tank and will be recycled through closed circuit cooling system.
- Effluent from power plant will be treated in ETP and after ensuring compliance with WBPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Air cooled condenser will be provided in the power plant, which will reduce the water consumption significantly. Hence wastewater generation will be also be minimized.
- Sanitary waste water will be treated in STP and after treatment it will be utilized for greenbelt development.
- Zero liquid effluent discharge practice will be continued in the proposed expansion also.

6.8 SOLID WASTE MANAGEMENT

The Following is the solid waste generation and disposal of existing, proposed expansion and after proposed expansion:

Table No. 6.1: SOLID WASTE GENERATION AND ITS MANAGEMENT

S.No	Waste	Quantity (TPA)			Method of disposal
		Existing	Proposed	After expansion	
1.	Tailing from Beneficiation plant	--	1,40,000	1,40,000	Tailings from thickener will be taken to filterpress and the dewatered tailings cake be stored in the yard with 30 days capacity. This will be given to Ceramic industries/ cement plants.
2.	Pellet Plant (ESP & Bagfilter dust from dedusting system)	--	2,200	2,200	Will given to Brick manufacturing units.
3.	Ash from DRI	32,400	1,00,000	1,32,400	Is being utilized in the existng Cement Plants (Partly) & given to Brick manufacturers (partly). In expansion Ash will be utilized in brick making unit and excess if any will be supplied to other brick manufacturer / Cement Plant.
4.	Dolochar	54,000	1,40,250	1,94,250	Is being utilized in the exising AFBC boiler based power palnt. The same practice will be continued after expansion also.
5.	Kiln Accretion Slag	1620	5,049	6,669	Is being given to road contractors for road construction & given to brick manufacturer and same practice will be continued after the proposed expansion also.
6.	Wet Scraper Sludge	2400	7,517	9,917	Is being given to road contractors for road construction & given to brick manufacturer and same practice will be continued after the proposed expansion also.
7.	SMS Slag	32,800	64,610	97,410	Presently it is utilized in the slag crusher unit of M/s. Shyam Steel Industries Ltd. (Sister Concern unit) at Bamunara Industrial Estate, where it is processed for metal recovery. The remaining material after the recovery process is further used as Raw material for Brick manufacturing unit at M/s. Shyam Steel Industries Ltd.
8.	End cuttings from rolling Mill	7,631	11,289	18,920	Reused in SMS
9.	Miss Rolls & Mills Scales from Rolling Mill	7,631	11,289	18,920	Will be used in existing and proposed SMS & Ferro Alloys plant captively
10.	Ash from Power Plant	40,920	1,07,043	1,47,963	Is being to M/s. BMR Enterprises, who is a supplier of ash to M/s. Ultratech Cement

	(with Indian Coal + Dolochar)				Ltd., Durgapur. In the proposed expansion project also ash will be given to M/s. BMR Enterprises for utilisation of ash in cement manufacturing.

6.9 POWER REQUIREMENT

Power requirement for the existing plant is 42.70 MW and same is being met from Captive Power plant and Damodar Valley Corporation (DVC). Power required for propsed expansion will be 105.5 MW and will be met partly from proposed 54 MW captive power plant and remaining 51.5 MW from Damodar Valley Corporation (DVC).

Following is Power consumption break up for each unit in the proposed expansion:

Table No. 6.2: BREAK UP OF POWER REQUIREMENT FOR EXPANSION

S.No.	Unit	Power Consumption	Power Requirement (in MW)		
			Existing / Permitted	Proposed	After proposed expansion
1.	I/O Benefication & Pellet Plant	60 Kwh/ton	---	10.0	10.0
2.	DRI	75 Kwh/ton	1.75	5.3	7.05
3.	SMS	750 Kwh/ton	19.50	43.7	63.20
4.	EAF	---	---	20.50	20.50
5.	Rolling Mill	95 Kwh/ton	3.50	5.1	8.60
6.	Cement Plant	---	0.75	---	0.75
7.	Ferro Alloys	9000 Kwh/ton	14.50	14.50	29.00
8.	Oxygen Plant	---	---	1.00	1.00
9.	Power Plant – WHRB	Aux. Consumption @ 10%	1.00	3.6	4.60
10.	Power plant – FBC	Aux. Consumption @ 10%	0.70	1.8	2.5
Total			**41.70**	**105.5**	**147.2**

Total Captive Power Generation from expansion : 54 MW (36 MW WHRB + 18 MW CFBC)

Total Power Consumption in proposed expansion : 105.5 MW

Remaining power of 51.5 MW for proposed expansion will be sourced from Damodar Valley Corporation (DVC).

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

SSML is an Existing plant is located at J.L.No. 11, Jemua Mouza, Mejia Block, Bankura District, West Bengal. Existing plant is located in 66.1 Ha./ 163.3 Acres of land.

Proposed expansion will be taken up partially in the Existing plant (i.e. 66.1 Ha./ 163.3 Acres) and partially in the land adjacent to the existing plant (i.e. 25.24 Ha./ 62.34 Acres) and agreement of sale have been done for the additional land.

Total land after proposed expansion will be 91.34 Ha./ 225.64 Acres..

There is no displacement of people. No rehabilitation and resettlement is required as the proposed additional land does not have any habitations. Thus R & R issues are not applicable.

Chapter – 8 : PROJECT SCHEDULE & COST ESTIMATES

8.1 PROJECT SCHEDULE

Proposed project will be implemented in 4-5 Years from the date of receipt of Environmental Clearance from the MoEF&CC, New Delhi & Consent To Establish from WBPCB.

8.2 ESTIMATED PROJECT COST

The estimated cost of the proposed project is Rs. 1410 Crores including pre-operative expenses and margin money for working capital requirements. The following is the breakup of it.

Table No.8.1: Estimated Project Cost

S.No.	Unit	Project cost (Rs in Crores)
1.	Iron Ore Beneficiation & Pellet Plant	300
2.	Sponge Iron Plant	300
3.	Induction Furnaces with LRF, CCM	130
4.	Electric Arc Furnace	40
5.	Rolling Mill	140
6.	Power Plant	265
7.	Ferro Alloy	45
8.	Oxygen Plant	40
9.	Land, land development, water, power evacuation & Misc.	50
10.	Interest during construction, Engineering consultancy for execution of entire plant	100
TOTAL PROJECT COST		**1410**

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

Shyam Steel Manufacturing Ltd. 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.