EXECUTIVE SUMMARY

of

Installation of Induction Furnace, Rolling Mill & Submerged Arc Furnace

At Plot No A- 24, A- 30 MIDC Area, Tadali Growth Centre, District – Chandrapur, Maharashtra

Project Proponent:

M/s. Grace Industries Limited.

Prepared By

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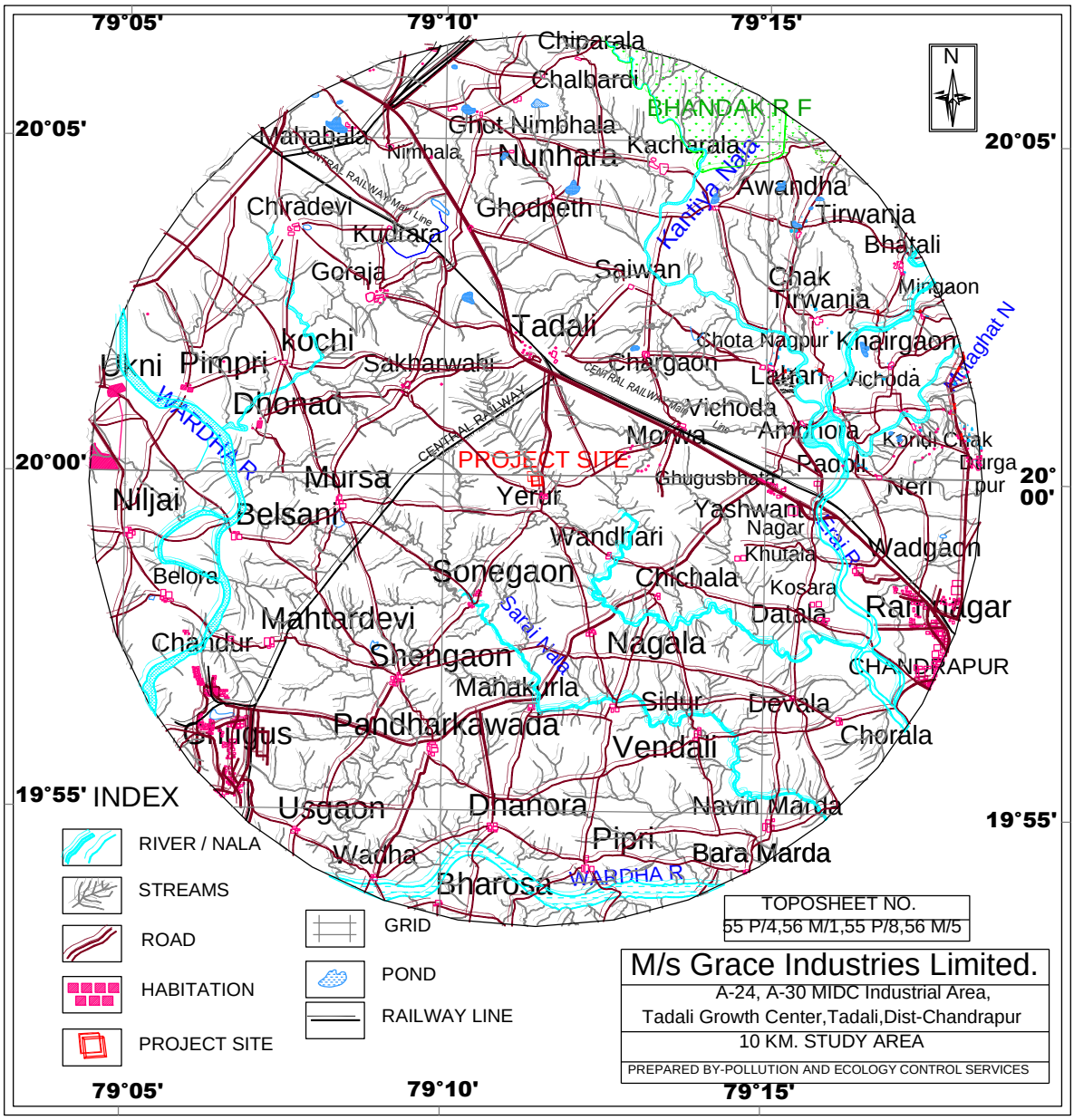
Dhantoli, Nagpur.

NABET No. : QCI/NABET/EIA/ACO/18/0684

EXECUTIVE SUMMARY

PREAMBLE

Demand and production of steel is increasing day by day and the developing countries like China, India are increasing their production capacity significantly. Total world steel production has crossed 1200 million metric tons per year, of which China is producing more than one third of total production. The existing supply of bars and rods is adequate to meet both local and global demand of steel. In near future to meet the growing demand of bars and rods the manufactures are adding new units to sustain the demand surge. The domestic demand for bars and rods will witness an average annual growth of about 6% during 2009-16.Grace Industries Limited has proposed to install Induction Furnace (15TPH x 4No.) to produce 18000TPM (2,16,000TPA) M. S. Billets, Ingots; 2 Rolling Mills to produce 18000TPM (2,16,000TPA) Hot Rolled Long product, TMT and 2 x 9 MVA Submerged Arc Furnace to produce 6000 TPM (72000 TPA) Ferro Alloys. The proposed unit of Induction Furnace, Rolling Mill, Gasifier & Submerged Arc Furnace will be installed at Plot No. A – 24 &A – 30.



Source: SOI Toposheet

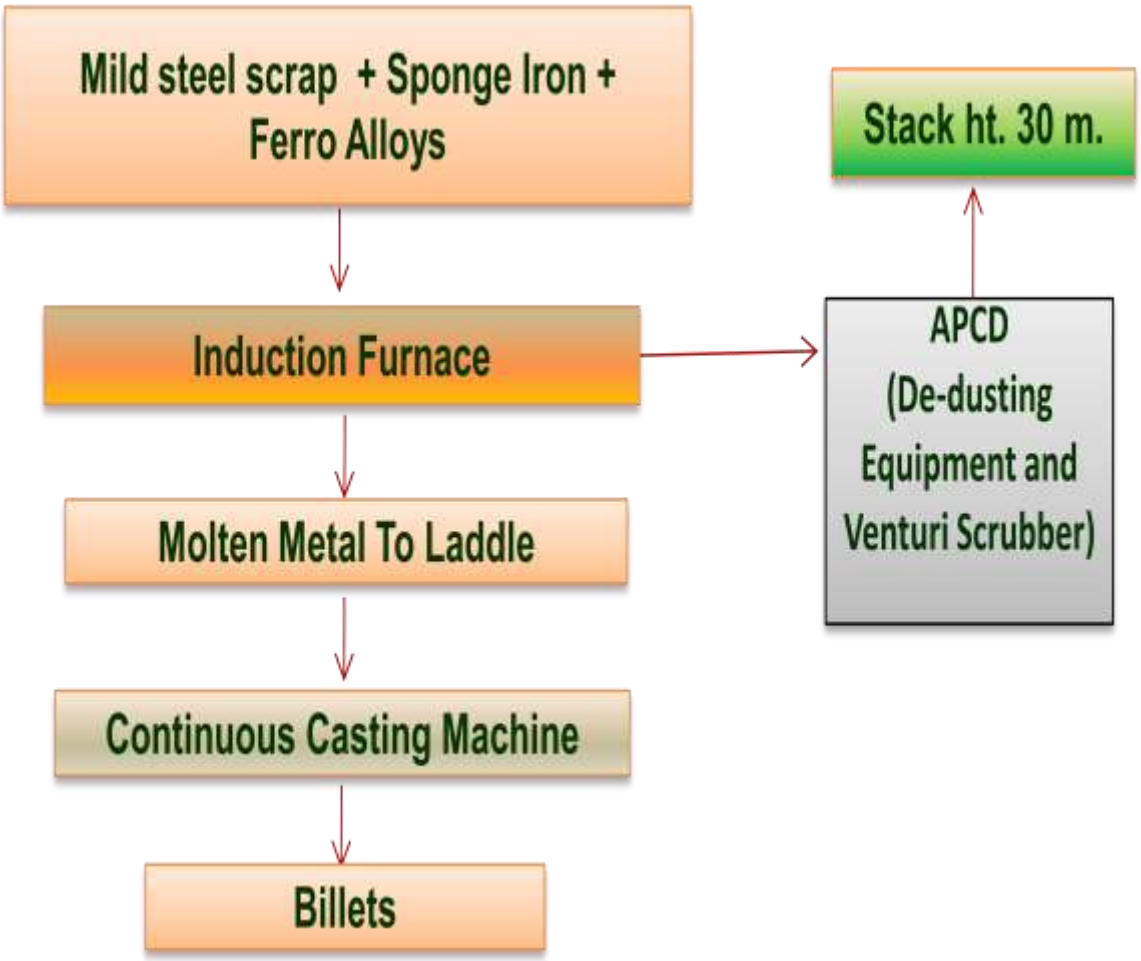
Topographical Map (10 km Radius)

DESCRIPTION OF PROCESS

INDUCTION FURNACE

The company will manufacture M.S. Billets by using sponge Iron and scrap as raw materials. Silicon & manganese are added as alloying elements using medium frequency induction furnace and continues casting technology.

In the Induction Melting Furnace where the iron melts at a temperature of about 1650^0C. When the total charge gets melted into hot liquid metal then the metallurgy of steel in terms of carbon, phosphorous content, alloy elements etc is controlled. Based upon the composition of the molten steel, additives like Silico, Manganese will be added to get the requisite composition and grade of steel. For production of billets the molten material is poured into a ladle and then transported to Continuous Casting machine with the help of overhead cranes. The ladle is placed over the Continuous Casting machine to cast the molten steel into required size of ingots/billets. This is an automatic machine, which is totally programmed to cut the Billets once the pre set value is reached. The Cut Billets are transported by a handling crane and stored in the Storage yard as per the Grade and Quality for dispatch. The hot gases from the Furnace are being handled by special de-dusting equipment followed by Ventury scrubber before it is let out to atmosphere through a Self Supported Chimney.

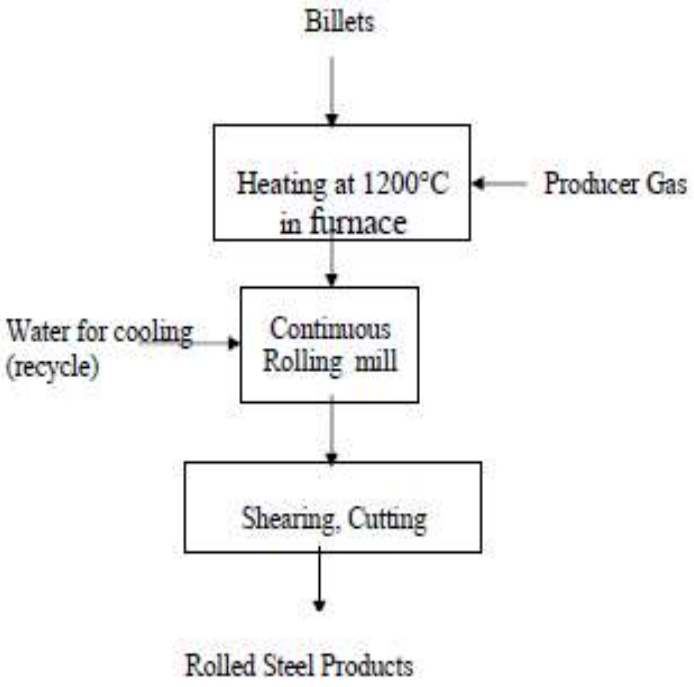


PROCESS FLOW CHART OF INDUCTION FURNACE

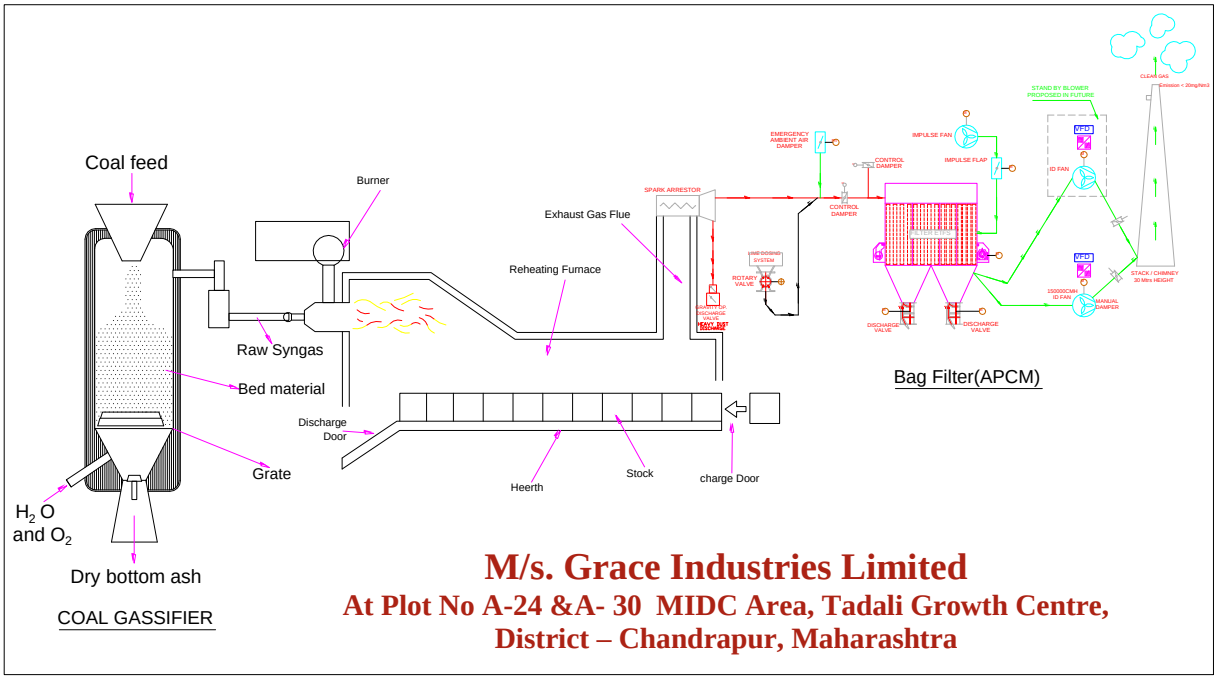
Rolling Mill

The billets are used in re-rolling mills for production of construction bars, angles channels, etc. The billets have edge over use of ingots for production of these products. With small change in production process like Laddle Refining & Gas Purging the alloy steel billets may be used to manufacture of steel product as EN 8, EN 9, EN 19 VC (vanadium chromium), which are used in engineering industries and also by forging industries as value added.

The raw material required in this plant is MS Billets. The production mix will be based on production of the bars and Rod sizes 8mm Dia.(min.), & 32 mm dia (max.).



Process Flow Diagram of Rolling Mill

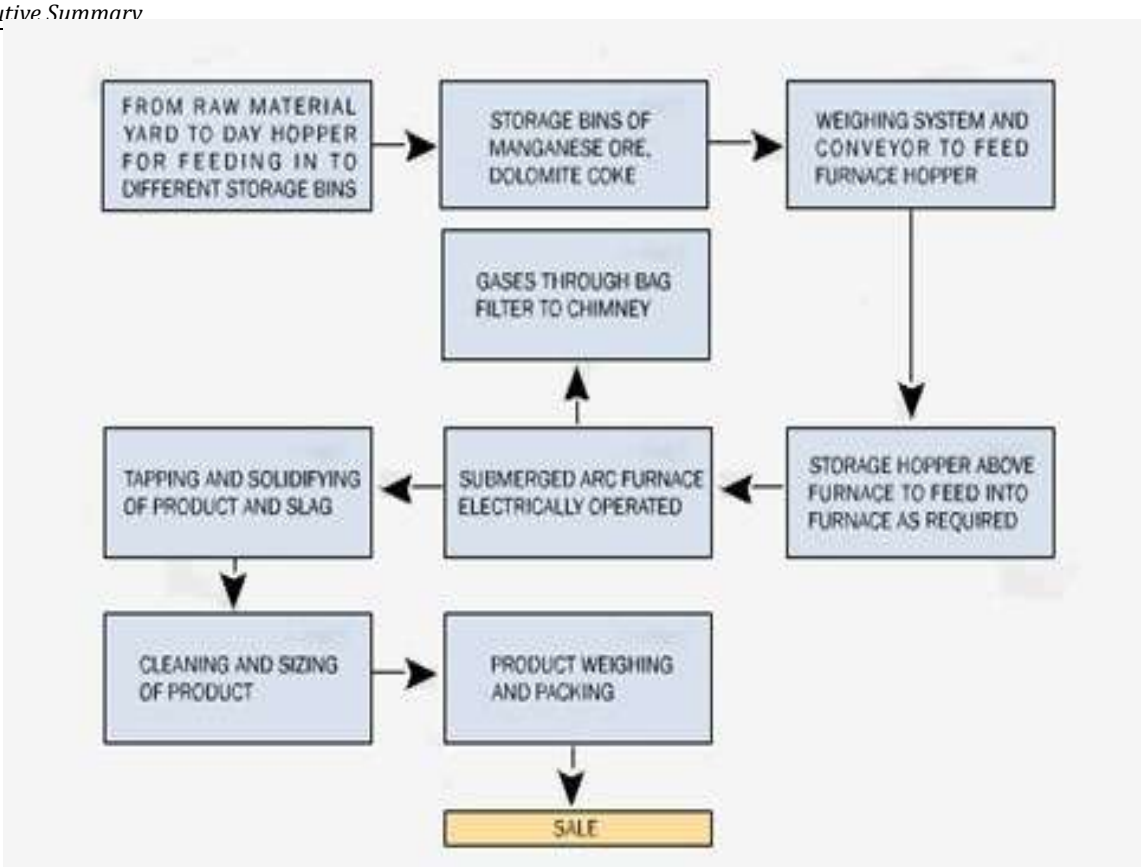


Process Flow Diagram of Coal Gasifier

Sub-merged Arc Furnace (Proposed)

Production of Silico Manganese / Ferro Manganese in submerged arc electric furnace is a process of smelting (reduction of oxide and melting of alloy and slag) of manganese flux. The gangue in the ore is slagged off with dolomite as flux. Reduction of oxides of manganese and iron (present in Mn ore) and quartz is carbo-thermic process which results in formation of respective carbides necessitating fixed carbon input in the form of coke. Impurities such as phosphorus sulphur etc. also get reduced into the metal. The flue gas will let out through the chimney. The manufacturing process is continuous. Pre-mixed raw materials are fed continuously into the furnace in required proportions through overhead storage hoppers.

The liquid metal and slag are tapped out at regular intervals through common tap holes. The metal is timed into cast iron moulds and the slag granulated for disposal. The metal, after stripping from the moulds are sized according to the customers requirement and dispatched as loose in bulk or packed in gunny bags.



Manufacturing Process of Ferro Alloys

DESCRIPTION OF ENVIRONMENT

Air Environment

The baseline environmental quality for the September, October, November, and December 2017 was assessed in an area of 10 km radius around the proposed project site**.**

The predominant wind directions are from E and S.

The ambient air quality monitored at 8 locations selected based on predominant wind direction, indicated the following ranges;

PM_{10}	-	38.3 to 63.4 µg/m^3.
$PM_{2.5}$	-	18.6 to32.4µg/m^3
SO_2	-	7.1 to21.4µg/m^3
NO_x	-	14.5 to 38.5µg/m^3

Industrial Area Residential, Rural Area (CPCB Norms)	100 µg/m^3	60 µg/m^3	80 µg/m^3	80 µg/m^3

The concentrations of PM_{10}, $PM_{2.5}$, SO_2 and NO_x were found within the National Ambient Air Quality Standards (NAAQ).

Water Environment

A total 11 samples including six surface &five ground water samples were collected and analyzed. The water samples were analyzed as per Standard Methods for Analysis of Water and Wastewater, American Public Health Association (APHA) Publication.

The data indicates that the ground water as well as the surface water quality are below the stipulated standard for drinking water (IS 10500 – 1993 except high concentration of total coli form in surface water, which may be due to the human activities.

Noise Environment

Noise levels measured at eight stations are within limit of 55.0 dB (A) for Residential Area or 75.0 dB (A) for Industrial Area as given in MoEF Gazette notification for National Ambient Noise Level Standard.

Area Code	**Category of Area**	**Limits in dB(A) Leq**	
		Day time	**Night time**
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone**	50	40

****Silence zone is defined as area up to 100 meters around premises of hospitals, educational institutions and courts. Use of vehicle horns, loud speakers and bursting of crackers are banned in these zones

Land Environment

The observations of soil characteristics are discussed parameter wise below;

(a) Texture of soil samples from agriculture lands and waste land are silty loam.

(b) Colour of soil samples from agriculture and waste lands are gray.

(c) The bulk density of soil samples from waste land are in the range of 1.43 to 1.47 g/cc and sample from agriculture land (S-2) are in the range of 1.45 to 1.51 g/cc and sample from agricultural land (S-3) are in the range of 1.46 to 1.51 g/cc.

(d) Soil samples from waste land have pH values between 6.80 to 7.10 and sample from agriculture land (S-2) have 7.4 to 7.7 and sample from agricultural land (S-3) have 7.2 to 7.4 ranges of pH values. The pH values are indicating nature of soil samples is neutral to alkaline.

(e) Soil samples from waste land have conductivities between 0.486 to 0.619mmhos/cm and conductivities of soil sample from agriculture land (S-2) ranges between 0.196 to 0.218mmhos/cm and conductivities of soil sample from agricultural land(S-3) ranges between 0.199 to 0.220 mmhos/cm.

(f) Soil samples from waste land have Organic Matter between 0.05 to 0.10 % and sample from agriculture land(S-2) have between 0.30 to 0.39 % Organic Matter and sample from agricultural land(S-3) have between 0.34 to 0.44%. These values represent moderate fertility of soils.

(g) Soil samples from waste land have concentration of Available Nitrogen values ranged between 20 to 40 kg/ha and samples from agriculture land (S-2) range between 120 to 160 kg/ha and samples from agricultural land (S-3) range between 140 to 180 kg/ha Available Nitrogen value.

(h) Soil sample from waste land have concentration of Available Phosphorous values ranged between 37.7 to 44.6 kg/ha and soil samples from agriculture land (S-2) have concentration values ranges from 46.2 to 68.5 kg/ha and samples from agricultural land (S-3) have concentration values ranges from 24.6 to 45.4 kg/ha.

(i) Soil sample from waste land have concentration of Available Potassium values range between 919.4 to 1162.3 kg/ha and sample from agriculture land (S-2) concentration of Available Potassium as its values range between 423.5 to 514.2 kg/ha and sample from agricultural land (S-3) have values range between 378.2 to 394.6 kg/ha.

(j) Characteristic of Waste land soil is a little deficient in nutrients concentration. Whereas, agricultural land soils are moderately suitable for cultivation of climatic crops and have average fertility.

ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

Air Environment

Operation phase

The impacts on air quality due to source of the air pollutant in the proposed facilities have been identified.

Sources of Emissions

Emissions released from the stack during operation phase will get dispersed in the atmosphere and finally reach the ground at a specified distance from the sources. From the proposed activities the possible environmental impact on air quality has been envisaged due to the following sources.

In this case the source emission is envisaged from furnace. Three Stacks of height of 30 m are proposed for proper dispersion of gases.

Raw Material Handling / Transport System

The possible pollutants are fugitive dust emissions from raw materials handling areas viz. loading / unloading, fuel stockyard, crushing units etc. The major sources of pollution from proposed units can be classified under the following heads:

- Pollutants in the waste gases namely, suspended particulate matter (SPM), sulphur dioxide, NOX and Carbon monoxide, etc.
- Fugitive dust generated during vehicular movement

Mitigation Measures

- Installation of Ventury Scrubber, Bag Filters followed by Stack of 30m height.
- The particulate matters and air borne metallic particles are generated from the transfer of molten steel to the mold and from the cutting of the product by oxy-fuel torches during continuous casting.
- Exhaust should be fitted to filters and other relevant abatement equipment, especially in the casting and finishing shops, wherever it is applicable.

Impact on Water Environment

Operation phase

Water is required in the plant mainly for the purpose of equipment cooling, in Ferro alloys, Induction furnace. Water is also required for drinking, sanitary, and firefighting purposes. In order to conserve water and minimize the make-up water requirement, it is proposed to adopt recirculating system after proper treatment for the equipment cooling. In recirculating system same water re-circulate again and again and some make water is added for evaporation losses. The outflow from the toilets of the plant buildings shall be led to Packaged Type STP for treatment. Out of the total water requirement of 260 KLD for the proposed plant only 41 KLD waste water will be generated which will be treated in settling tank and reused in process.

Impact on Noise Environment

Operation phase

During operation, the major noise generating sources are crushing mill, auto loading section, electric motors etc. These sources will be located far off from each other. Under any circumstances the noise level from each of these sources will not exceed 85 dB (A). Noise levels generated in the project site will be confined to the noise generating plant units hence the impact of noise levels on surroundings will be insignificant.

Mitigation Measures

The noise levels stipulated by Central Pollution Control Board at any point of time will not exceed the standards. The equipments will have inbuilt noise control devices. The measured noise level produced by any equipment will not exceed 85 dB(A) at a distance of 1.0-m from its boundary in any direction under any load condition. The noise produced in valves and piping associated with handling compressible and incompressible fluids will be attenuated to 75 dB(A) at a distance of 1.0 m from the source by the use of low noise trims, baffle plate silencers/line silencers, acoustic lagging (insulation), thick-walled pipe work as and where necessary. The general mitigation for the attenuation of the noise are given below:

- By providing padding at various locations to avoid sharp noise due to vibration.
- Other than the regular maintenance of the various equipment, ear plugs/muffs are recommended for the personnel working close to the noise generating units;
- All the openings like covers, partitions will be designed properly
- Inlet and outlet mufflers will be provided which are easy to design and construct.
- All rotating items will be well lubricated and provided with enclosures as far as possible to reduce noise transmission.
- The insulation provided for prevention of loss of heat and personnel safety will also act as noise reducers.

Impact on Terrestrial ecology

The reserved forest in the study area is in patches. There is no designated ecological park or Bio Reserve/Wild life sanctuary in the 10 km radius of the proposed plant site. The impact on terrestrial ecology will be negligible and shall be insignificant. The flora fauna Report is attached as **Annexure IV**.

SOLID WASTE

Operation phase

The solid waste generation in the proposed activities is given in following Table

Solid Waste Generation & Mitigation Measures

Waste	Quantity	Mitigation Measures
Slag	720 TPM	Non-Hazardous, non-toxic will be used for hardening of internal roads,working area, concreting.
Tail cutting	540 TPM	100% reuse in Induction Furnace
Fly Ash	200 TPM	Fly ash will be used for brick manufacturing.
Ferro / Silico Manganese Slag	900 TPM	100% Ferro manganese slag will be used in Plant for production of Silico manganese. In case silico manganese will be produced then the slag will be sold to brick plant & used for road making.

The slag generated from induction furnace which is non hazardous and non toxic in nature, is being used for hardening of internal roads, working area, concreting Slag generated is crushed at site. Iron particles are separated by using magnetic separator. Crushed slag (Sand) is being used in hardening of working area.

SOCIO-ECONOMIC ENVIRONMENT

Operation phase

The impacts of the proposed project, during its operation, on demography and socio-economic condition can be identified as follows.

- Negative impacts can be depletion of natural resources like water and land, depletion in air quality if proper mitigative measures are not taken.

- Increase in employment opportunities and Reduction in migrants to outside for employment.
- Growth in service sectors.
- During operation phase technical and nontechnical people will be employed.
- Increase in consumer prices of indigenous produce and services, land prices, house rent rates and Labour prices.
- Improvement in socio-economic environment of the study area.
- Improvement in transport, communication, health and educational services.
- Increase in employment due to increased business, trade commerce and service sector.
- The overall impact on the socio economic environment will be significant.

The management of M/s Grace Industries Ltd has proposed to give preference to local people for recruitment in semi skilled and unskilled categories.

ENVIRONMENT MONITORING PROGRAMME

The environmental monitoring is important to assess performance of pollution control equipment installed in the proposed project of M/s Grace Industries Ltd. The proposed project is of manufacturing of 18000 TPM M.S. Billets, 18000 TPM TMT Bars and 6000 TPM Ferro Alloys. The sampling and analysis of environmental attributes including monitoring locations will be as per the guidelines of the Central Pollution Control Board/ State Pollution Control Board.

Environmental monitoring will be conducted on regular basis by M/s Grace Industries Ltd to assess the pollution level in the proposed plant as well in the surrounding area. Therefore, regular monitoring program of the environmental parameters is essential to take into account the environmental pollutant of the study area. The objective of monitoring is:

- To verify the result of the impact assessment study in particular with regards to new developments;
- To follow the trend of parameters which have been identified as critical;
- To check or assess the efficiency of the controlling measures;

- To ensure that new parameters, other than those identified in the impact assessment study, do not become critical due to the commissioning of proposed facilities;
- To check assumptions made with regard to the development and to detect deviations in order to initiate necessary measures;
- To establish a database for future Impact Assessment Studies for new projects.

The attributes, which needs regular monitoring, are specified below:

- Air quality
- Water and wastewater quality;
- Noise levels;
- Soil quality;
- Ecological preservation and afforestation; and
- Socio Economic aspects and community development

ENVIRONMENT MANAGEMENT PLAN

Air Environment

The sources of air pollution are coal handling system, materials transportation, raw materials feeding to the operating equipments. The automatic process equipments will be employed for the raw material feeding system. Stacks of adequate height of 30 m is proposed for proper dispersion of flue gases. The following Environmental Management Plan will be implemented to control air emissions from Induction Furnace and Gasifier.

Action Plan to Control and Monitor Secondary Fugitive Emissions from all the Sources

- The primary fume pick up from Induction Furnace will be by a canopy hood placed over the furnace and to convey the same single walled MS duct will be employed.
- Venturi Scrubber, Bag Filters followed by stacks will be installed.

- Fugitive emission from material unloading operations, material transfer points will be controlled fully with total enclosure.
- Coal will be transported in tarpaulin covered trucks.
- Fugitive as well ambient air quality monitoring shall be carried out on regular basis to ensure the compliance with National Ambient Air Quality Standards (NAAQS). The ambient air quality within the factory premises shall not exceed the standards (PM_{10} 100µg/m^3, $PM_{2.5}$ 60µg/m^3 SO_2 80µg/m^3, NO_x 80µg/m^3 and CO 04µg/m^3) prescribed by CPCB.
- The monitoring frequency of air quality shall be as per the consent issued by State Pollution Control Board and reports shall be submitted as part of compliance. The records will be maintained.
- Effective steps shall be taken to control fugitive emission inside the plant. All internal roads will be Tar Roads. Efficient arrangements will be provided to control fugitive dust emission during handling/transportation of Raw materials / finished product etc
- Water sprinklers will be installed for dust suppression.
- The emission from induction furnace area will be extracted and treated in a fume extraction system.
- Fumes will be evacuated directly from induction furnaces through hoods with swirling mechanism and ducting.
- Avenue plantation will be strengthening further to control fugitive emissions & gaseous pollutants to keep clean and healthy environment.
- During induction melting of steel scrap, lot of sparks gets generated. For the purpose of arresting sparks & flame, it is necessary to have an arrestor which arrests sparks. The device provided will be a centrifugal cyclone, which removes sparks and also collects coarser particles. The collected dust in the cyclone hopper can be drained periodically into a drum when the system is shut or a continuous motorized rotary air lock valve can be provided.

Noise Environment

- The industry will take care while procuring major noise generating machines/equipment to ensure that the manufactures have taken adequate measures to minimize generation of noise.
- The areas where noise levels are high will be partitioned off, noise levels will be minimized at the source, and noise reflection and transmission will be minimized.
- The workers working in the high noise areas will be provided with ear muffs/ear plugs.
- Acoustic laggings and silencers will be provided in equipment wherever necessary. Ventilation fans shall be installed in enclosed premises.
- The silencers and mufflers of the individual machines shall be regularly checked
- The noise level shall not exceed the limit 75 dB (A) during the day time 70 dB (A) night time within the plant premises.
- Provision of insulating caps and lids at the exit of noise source and providing polystyrene, etc. as noise insulation material will be adopted. All the openings will be covered and partitions will be acoustically sealed.
- Avenue plantation around the plant area will reduce the noise level further. Training of personnel is recommended to generate awareness about damaging effects of high noise levels.

Water Environment

- Total water requirement for the proposed project is 260 m^3/day. The source of water is met through MIDC. The Water requirement is primarily for industrial use (for cooling only), make-up, dust suppression system, green belt, domestic and other miscellaneous use.
- The Wastewater generated from the cooling purpose & Air Pollution Control Devices will be treated in the settling tank within the premises and the treated water will be re-used back to the process.

- The domestic wastewater will be treated in Packaged Type STP of 15 KLD and treated water used for greenbelt development. Hence, the zero wastewater discharge is proposed for the proposed project.

Management Plan of Solid waste

- Solid waste is non hazardous and non-toxic in nature.
- Slag from Induction Furnace will be crushed and used in hardening of working area, construction of internal village roads.
- 100% Ferro manganese slag will be used in Plant for production of Silico manganese. In case silico manganese will be produced then the slag will be sold to brick plant & used for road making.100% use of tailing from Rolling Mill in Induction Furnace.
- Fly ash will be used for brick manufacturing.

Socio Economic Environment

The project proponent would aid in the overall social and economic development of the region. The plant will give employment to about 300 people of local area. In order to mitigate the adverse impacts likely to arise in the proposed project activities and also to minimize the apprehensions to the local people, it is necessary to formulate an affective EMP for smooth initiation and functioning of the project. The suggestions are given below:

- Communication with the local people will be established regular basis by project authority to provide an opportunity for local youth.
- Project authorities will undertake regular environmental awareness program on environmental management
- Job opportunities are the most demanding factor, the local people as per their education will be employed.
- For social welfare activities to be undertaken by the project authorities, collaboration should be sought with the local administration, gram panchayat, block development office etc for better coordination.

Occupational Safety & Health Management

Project proponent will provide all necessary provisions under Factory Act. In addition a Safety committee will be formed and manned by equal participants from Management and Workers. All personal protect equipments like Safety shoes, helmet & uniform will be issued to each employee based on the nature of job involved. In case a person inhales CO, he should be removed to fresh air and given mediated oxygen through a mask for 30 minutes and if required cardiopulmonary resuscitiation should be performed.