PRE-FEASIBILITY REPORT

By

Shyam Ferrous Limited

[Expansion of Steel Plant – Production of MS Billets (69,070 TPA to 1,29,070 TPA), Production of TMT bars & Structural Steel (60,000 TPA to 1,44,000 TPA) in the existing plant premises]

at

Sy.No.67/2, Village Devarapalli, Mandal Hindupur,

District Ananthapur, Andhra Pradesh
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Chapter –1: EXECUTIVE SUMMARY

1.1 SALIENT FEATURES OF THE PROJECT

Shyam Ferrous Ltd. (SFL), is an existing Steel Plant located at located at Sy.No.67/2, Village Devarapalli, Mandal Hindupur, District Ananthapur, Andhra Pradesh. Existing plant has obtained Environmental Clearance from MoEF&CC vide F.No. J-11011/635/2009-IA II (I) dated 23rd November 2010. Now as part of expansion, we are planning to enhance the production capacity of MS Billets and TMT bars & Structural Steels as mentioned below:

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<td>Steel Melting Shop (Induction Furnace, Induction casting Moulds, Ladle Refining Furnace, Continuous Casting Machine)</td>
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<td>IF - 1 x 15 MT &amp; 1 x 9 MT (under construction) LRF – 17.5 TPD (MS billets - 51,250 TPA)</td>
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<td>2.</td>
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1.2 PROJECT PROPONENT

Shyam Ferrous Limited has been promoted by well established entrepreneur belongs to Andhra Pradesh and already running Steel Plant unit at Village Devarapalli, Mandal Hindupur, District Ananthapur, Andhra Pradesh.
Chapter – 2: INTRODUCTION OF THE PROJECT / BACKGROUND INFORMATION

2.1 BRIEF DESCRIPTION OF THE NATURE OF THE PROJECT

Shyam Ferrous Limited is located at Village Devarapalli, Mandal Hindupur, District Ananthapur, Andhra Pradesh. The Company is already operating 1 x 4 MT Induction Furnace unit and 60,000 TPA capacity Rolling Mill.

Now the company intends to

- Enhance production capacity of MS Billets by installing 1 x 20 T capacity Induction furnace with Concast from 69,070 TPA to 1,29,070 TPA.
- Enhance production capacity of TMT bars & Structural Steel products from 60,000 TPA to 1,44,000 TPA.

Proposed expansion will be carried out in the existing plant premises only.

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

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

2.3 DEMAND AND SUPPLY GAP
Demand for steel is high and as soon as they are processed they will be supplied to nearby industries.

2.4 EXPORT POSSIBILITY
As the Indian steel industry has entered into a new development stage from 2007-08, riding high on the resurgent economy and rising demand for steel. Rapid rise in production has resulted in India becoming the 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.

2.5 DOMESTIC/EXPORT MARKETS
While the demand for steel will continue to grow in traditional sectors such as infrastructure, construction, housing automotive, steel tubes and pipes, consumer durables, packaging, and ground transportation, specialized steel will be increasingly used in hi-tech engineering industries such as power generation, petrochemicals, fertilizers, etc. The new airports and railway metro projects will require a large amount of steel. Hence the domestic and export markets for steel sector will rise.
2.6 EMPLOYMENT GENERATION (DIRECT AND INDIRECT) DUE TO THE PROJECT

The estimated manpower requirement for the proposed project is 50 numbers; the total manpower requirement for the entire plant is 50 numbers inclusive of staff and security. They will comprise of 20 % of skilled labors, 40 % of semi-skilled labors and 40 % of unskilled labors.
Chapter – 3 : PROJECT DESCRIPTION

3.1 TYPE OF THE PROJECT

Shyam Ferrous Limited is located at Village Devarapalli, Mandal Hindupur, District Ananthapur, Andhra Pradesh. The Company is already operating 1 x 4 MT Induction Furnace unit and 60,000 TPA capacity Rolling Mill.

Now the company intends to

- Enhance production capacity of MS Billets by installing 1 x 20 T capacity Induction furnace with Concert from 69,070 TPA to 1,29,070 TPA.
- Enhance production capacity of TMT bars & Structural Steel products from 60,000 TPA to 1,44,000 TPA.

Proposed expansion will be carried out in the existing plant premises only.

3.2 LOCATION OF THE PROJECT

- Existing plant is located at Sy.No.67/2, Village Devarapalli, Mandal Hindupur, District Ananthapur, Andhra Pradesh.
- Existing plant is located in the 9.9 acres of land.
- Proposed expansion will be carried out in the existing plant premises only.
- The project area will span between Latitude 13°44'36.47"N - 13°44'26.67"N & Longitude 77°30'12.01"E - 77°30'13.03"E.
- The entire project area will fall in the Survey of India topo sheet no. 57 G/6.
- The Index map of the project site is shown in Figure – 1.
3.3 DETAILS OF THE ALTERNATE SITES

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

3.4 SIZE OR MAGNITUDE OF OPERATION

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3.5 MANUFACTURING PROCESS

3.5.1 STEEL MELTING SHOP

In Steel Melting Shop (SMS), Sponge Iron will be melted along with melting scrap and fluxes to make pure liquid steel and then to mould it in required size billets. The SMS will consist of following equipment and subassemblies:

*Induction Furnace:* Induction Furnaces is a device to melt the charge material using electrical power. It consists of Crucible lined with water cooled induction coils, Electrical system to give controlled power to induction coil, Hydraulic tilting system, Heat exchanger to cool the circulating water, water softener for generating soft water, furnace transformer, Power Factor improvement system and surge suppressor.

*Ladles:* Ladles are pots with refractory lining inside to withstand 1600°C temperature. It has side arms so that can be lifted with the help of crane. Ladles are used to stores the liquid steel from Induction Furnace and take it for further processing. Ladles are with bottom nozzle and pneumatically operated gate for discharge of liquid.

*Cranes:* Electric Over-head (EOT) cranes of various capacities are used to carry the ladles/materials at different places. Cranes are used in Melting hall to charge melting scrap,
remove the ladles to the LRF, further to place it over the Tundish of the Continuous Caster, to remove billets from the cooling bed and store at designated places, and also for other petty use. Accordingly, the sizes, capacity and numbers of cranes are decided.

**Continuous Casting Machine (CCM):** CCM is used to continuously cast the liquid steel in required cross section and in length. It consists of Tundish, Mould, Bow with Withdrawal mechanism, straightening mechanism and cooling bed, hydraulic system for withdrawal mechanism, water pumps and cooling towers for water spray on the withdrawn section as well as on the cooling bed. Dummy bar is provided to start the casting. Tundish is a rectangular vessel, lined with refractory and having discharge nozzle with pneumatically operated gate. A stand is erected over it where the ladle is stationed for discharging the liquid in it. Mould is of copper with water cooled jacked. Its cross-section in the bottom is of the size of which billet is to be drawn. Initially the dummy for of the same size is kept inserted. When the liquid steel is poured in the mould, the dummy bar is drawn slowly, so that the liquid steel in partially frozen state comes out of the mould. Water spray nozzles are installed to spray water over the just drawn billet to cool it further and to harden the skin of the drawn billet.

There will be 1 no. of 20 T Induction Furnaces in the SMS plant. MS Ingots/ MS Billets will be produced in Continuous Casting Machine.

### 3.5.2 ROLLING MILL

A pusher type furnace has been envisaged for the heating of Ingots/Billets. The furnace will be end charging and side discharging. It will have single row as well as double row charging facility. The furnace will be heated with FO. The furnace combustion system will comprise of air blowers, FO storage, supply and preheating system and other associated facilities. The product of combustion will leave the furnace at charging end and exhausted through underground flue tunnel and passed through a metallic tubular recuperator before finally let off to a self-supporting steel chimney of sufficient height. A set of instrument will be used for smooth operation of the furnace.
Bar and Round mill

A cross country type mill has been envisaged for the plant. The stands have been grouped into roughing, intermediate and finishing groups. Roughing group will have 4 (four) stands, intermediate group will have 8 (eight) stands and finishing mill will have 8 (eight) stands. Roughing group of stands will be driven by one motor. 4 nos. of intermediate stands will be driven by two motors and balance 4 nos. will be driven by a separate motor. Each stand of finishing group will be driven by single motor. Necessary guides and troughs will be provided at entry and exit of mill stands.

One wire rod outlet has been provided in the mill. The wire rod line will have 4 stand blocks driven by a single motor through gear box. Coil forming and handling of coil is provided.

Automated tilting, drop type tilter and feeding arrangement will be provided in roughing group of stands. Repeaters have been provided in roughing / intermediate stands as necessary.

Design provision has been made for introduction of slit rolling facility in future to roll 8 mm, 10 mm & 12 mm rebars in two strands. The rebars discharged from the mill will pass through a water cooling system comprising cooling pipes with high pressure water nozzles for rapid water quenching. At the cooling pipes the bar skin temperature will be reduced to about 600°C. The core of the bar still remains hot. This entrapped heat tempers the bar. This thermo-mechanical treatment of the bars increases tensile strength without adversely effecting weldability and elongation properties. This process eliminates requirement of cold twisting of bars for production of rebars.

A dividing shear, to cut the products to cooling bed length, will be located immediately after the water cooling system. This shear will divide all products to cooling bed lengths. Rake type cooling beds have been envisaged to receive the rolled product. Cooling bed will be provided with incoming and outgoing roller tables. One cold shear has been provided to cut the bars coming out of cooling bed into commercial length of 6 to 12 m. The bar products will be formed into bundles and will be strapped by strapping machine manually.

The finished products will be removed by overhead EOT crane and stored in the storage area or dispatched through road vehicles.
In the proposed expansion project, Rolling Mill will be installed for producing 84,000 TPA Structural Steel & Rolled Products.
3.6 RAW MATERIAL REQUIREMENT

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

<table>
<thead>
<tr>
<th>Raw Material</th>
<th>Quantity (TPA)</th>
<th>Sources</th>
<th>Mode of Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>For Steel Melting Shop (MS Billets)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sponge Iron</td>
<td>50,000</td>
<td>Own generation</td>
<td>----</td>
</tr>
<tr>
<td>Scrap</td>
<td>21,500</td>
<td>Own generation</td>
<td>----</td>
</tr>
<tr>
<td>Ferro alloys</td>
<td>1,000</td>
<td>Local Area</td>
<td>By road (through covered trucks)</td>
</tr>
<tr>
<td>For Rolling Mill (TMT bars &amp; Structural Steels)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steel billets</td>
<td>90,000</td>
<td>Own generation</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Purchased from outside</td>
<td>By road (through covered trucks)</td>
</tr>
</tbody>
</table>

3.7 WATER REQUIREMENT AND ITS SOURCE

Water required for the proposed expansion project will be 100 KLD and same will be sourced from Ground Water source. Following is the break up of water requirement:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Water requirement</th>
<th>Quantity in KLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Steel Melting Shops</td>
<td>80</td>
</tr>
<tr>
<td>2.</td>
<td>Rolling Mills</td>
<td>15</td>
</tr>
<tr>
<td>3.</td>
<td>Domestic</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

3.8 WASTEWATER GENERATION & ITS MANAGEMENT

- There will be no effluent generation in the SMS & Rolling Mill as closed circuit cooling system will be adopted.
- Sanitary waste water will be treated in septic tank followed by sub-surface dispersion trench.

3.9 POWER REQUIREMENT

Power requirement for the existing plant is being met from APTRANSCO. Power required for proposed expansion project will also be sourced from APTRANSCO.
Chapter – 4 : SITE ANALYSIS

4.1 INFRASTRUCTURE

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

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

4.2 CONNECTIVITY

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

<table>
<thead>
<tr>
<th>Component</th>
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<tr>
<td>Road</td>
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</tr>
<tr>
<td>Air</td>
<td>Bangalore Airport – 90.0 Kms.</td>
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</table>
Below mentioned table gives brief regarding environmental setting of the project site

<table>
<thead>
<tr>
<th>S.No</th>
<th>Particulars</th>
<th>Distance from the site</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>Habitation</td>
<td>Devarapalli - 1.5 Kms.</td>
</tr>
<tr>
<td>2.</td>
<td>National Park</td>
<td>No National Park is situated within the 15 km radial distance periphery</td>
</tr>
<tr>
<td>3.</td>
<td>Wild life sanctuaries</td>
<td>Nil</td>
</tr>
<tr>
<td>4.</td>
<td>Eco Sensitive Areas</td>
<td>Nil</td>
</tr>
<tr>
<td>5.</td>
<td>Forests</td>
<td>Nil</td>
</tr>
</tbody>
</table>
Kundar River – 6.5 Kms. | |
| 7.   | Costal Regulation Zone [CRZ] | Nil                                                        |
| 8.   | Interstate Border            | Karnataka – Andhra Pradesh Interstate Border – 4.0 Kms.    |

4.2 LAND DETAILS

- Existing plant is located at Sy.No.67/2, Village Devarapalli, Mandal Hindupur, District Ananthapur, Andhra Pradesh.
- Existing plant is located in the 9.9 acres of land.
- Proposed expansion will be carried out in the existing plant premises only.
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5.2 POPULATION PROJECTION

As of 2011 Census of India, the city had a population of 151,677. It had a growth of about 25 thousands compared to the last census in 2001, where it stands at 125,074. The present total population constitute, 76,625 males and 75,210 females — a sex ratio of 982 females per 1000 males, higher than the national average of 940 per 1000. 16,309 children are in the age group of 0–6 years, of which 8,263 are boys and 8,046 are girls. The average literacy rate stands at 76.40% with 103,538 literates, significantly higher than the state average of 67.41%.

Telugu is the official and widely spoken language. Kannada and Urdu are the other languages spoken.
There are no major human settlements in the close vicinity of the project site. The manpower requirement will be sourced from the local areas to the extent possible; hence not much of settlement of outside people is anticipated in the area. However population concentration may increase around the project site due to increase in ancillary activities.

5.3 LAND USE PLANNING

- Existing plant is located at Sy.No.67/2, Village Devarapalli, Mandal Hindupur, District Ananthapur, Andhra Pradesh.
- Existing plant is located in the 9.9 acres of land.
- Proposed expansion will be carried out in the existing plant premises only.
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5.4 AMENITIES / FACILITIES

Facilities like canteen, rest room has already been provided in the existing plant as basic facilities to workers. No other additional facilities are proposed.
Chapter – 6 : PROPOSED INFRASTRUCTURE

6.1 INDUSTRIAL AREA (PROCESSING AREA)
The main plant area comprises of Furnace sheds, Rolling mill area, raw material storage and product storage etc.

6.2 RESIDENTIAL AREA (NON PROCESSING AREA)
No colonization is proposed; however, facilities like canteen, rest room and indoor games facilities will be provided in the proposed plant and one Admin building is also proposed.

6.3 GREEN BELT
More than 1/3rd of total land availability is reserved for plantation i.e. greenery.

Greenbelt development plan
- Local DFO will be consulted in developing the green belt.
- Greenbelt of 33% of the area will be developed in the plant premises as per CPCB guidelines.
- 10 m wide greenbelt is being maintained all around the plant.
- The tree species to be selected for the plantation are pollutant tolerant, fast growing, wind firm, deep rooted. A three tier plantation is proposed comprising of an outer most belt of taller trees which will act as barrier, middle core acting as air cleaner and the innermost core which may be termed as absorptive layer consisting of trees which are known to be particularly tolerant to pollutants.

6.4 SOCIAL INFRASTRUCTURE
Social infrastructure will be developed as per need based in the Villages of the close vicinity of the project.
6.5 CONNECTIVITY

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

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6.6 DRINKING WATER MANAGEMENT

It is estimated that 5 KLD of water will be required for domestic purpose during operation of proposed project.

The desired amount of water will be Sourced from Ground water sources.

6.7 WASTEWATER GENERATION & ITS MANAGEMENT

- There will be no effluent generation in the SMS & Rolling Mill unit as closed circuit cooling system will be adopted.

- Sanitary waste water will be treated in septic tank followed by sub-surface dispersion trench.
Chapter – 7: REHABILITATION & RESETTLEMENT (R & R) PLAN

No rehabilitation and resettlement is required as existing steel plant is already in operation at Sy.No.67/2, Village Devarapalli, Mandal Hindupur, District Ananthapur, Andhra Pradesh.

Existing plant is located in the 9.9 acres of land.

Proposed expansion will be carried out in the existing plant premises only.
8.1 PROJECT SCHEDULE

Proposed Project will be implemented in 48 months from the date of receipt of Environmental Clearance from the MoEF&CC, New Delhi & Consent from APPCB.

8.2 PROJECT COST

The estimated cost for the proposed expansion project will be Rs. 25 Crores.
Chapter – 9 : ANALYSIS OF PROPOSAL

9.1 FINANCIAL AND SOCIAL BENEFITS

With the implementation of the proposed expansion 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 expansion 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 expansion project.

9.2 SOCIO-ECONOMIC DEVELOPMENTAL ACTIVITIES

The management is committed to uplift the standards of living of the villagers by undertaking following activities / responsibilities as the part of Corporate Social Responsibility.

- Health & hygiene
- Drinking water
- Education for poor
- Village roads
- Lighting