TATA SPONGE IRON LIMITED

TECHNO-ECONOMIC FEASIBILITY REPORT FOR 1.38 Mt/yr INTEGRATED STEEL PLANT AT JODA, ODISHA

EXECUTIVE SUMMARY

MECON LIMITED
RANCHI 834002

01 EXECUTIVE SUMMARY

01.01 Preamble

M/s Tata Sponge Iron Limited (TSIL) has its manufacturing facility at Bilaipada (in Joda Block of Keonjhar District in Orissa), was initially set up as a joint venture company between Tata Steel and the Industrial Promotion and Investment Corporation of Orissa Limited (IPICOL), in the name of as Ipitata Sponge Iron Limited. It has moved on since, becoming an associate company of Tata Steel following the former's acquisition of IPICOL's stake in 1991. The name of the Company has been changed to Tata Sponge Iron Limited w.e.f 24th September, 1996. Subsequently, w.e.f. 28th August, 2012, Tata Sponge Iron Limited became the subsidiary of Tata Steel Limited.

After establishing itself in sponge iron business, M/s TSIL intends to go up the value chain of iron ore into production of steel. As such the Indian steel industry is recovering as indicated by crude steel production of 95 Mt in 2016 compare to 89.4 Mt and 87.3 Mt in 2015 and 2014 respectively. World steel association's short range outlook for 2017-18 also indicates strengthening of the steel markets. Further, the ministry of steel, Govt. of India, also aims to achieve 300 Mt steel production capacity and about 240 Mt steel demand by year 2030-31 in its latest ***National steel Policy 2017 (NSP-2017)***. A major part of that new steel demand is expected to come from affordable housing, expansion of railway networks, development of domestic shipbuilding industry, opening up of defense sector for private participation and an anticipated growth in automobiles.

The national objective can only be achieved through setting up new green field projects and adding capacity in existing plants through brownfield expansion. M/s TSIL have availability of land bank, adjacent perennial water source, reliable power supply, very closely located iron ore mines and linkage to railway network. Having such resources are very strong reasons to venture into steel business. Therefore, the decision of M/s TSIL to enter into steel industry by setting up a steel plant appears to be contributing into the national steel vision.

As a first step towards setting up a steel plant, M/s TSIL have planned to carry out feasibility studies for the same. In this connection, M/s TSIL also assigned MECON for preparing a feasibility report for setting up 1.38 Mt/yr integrated steel plant in two phases. Phase-I will have production capacity of about 829,000 t/yr crude steel through BF-BOF route for ultimate production of rebars. Phase-II, envisaged to be implemented after completion of phase-I, will have production capacity of about 555,600 t/yr crude steel through DR/BF-EAF route for ultimate production of bars and wire rods in alloy steel grades.

01.02 Crude steel production and finished Product-mix

The proposed steel plant project of M/s TSIL has been envisaged for crude steel production of 829,000 t/yrbillets in phase-I and 555,600 t/yrbillet/ blooms in phase-II. Thus, aggregate crude steel production capacity of the proposed plant will be about 1.38 Mt/yr,

The following product-mix in respective phases has been envisaged to be produced as finished product from above crude steel in respective phases.

Product-Mix

Phase of project	Product	Quantity, t/yr
Phase-I	TMT bars	800,000
Phase-II	Low alloy steel grade long products for forging and engineering application	533,400

01.03 Process routes and facilities considered

In order to ensure above production in respective phases suitable technological units based on BF-BOF route in phase-I and DR/BF-EAF route in phase-II have been selected for the proposed plant.

Configuration of major technological facilities

Sl. No.	Technological facilities	Configuration	
		Phase-I	Phase-II (Additional)
1.	Coke Ovens (Non-recovery)	-	0.6 Mt/yr
2.	Sinter plant	1 x 132 m^2	1 x 50 m^2
3.	Blast furnace	1 x 1050 m^3	1 x 370 m^3
4.	Basic oxygen furnace	1 x 90 t	-
5.	Electric Arc Furnace	-	1 x 90 t, 90 MVA
6.	Secondary refining units		
	- Ladle furnace	1 x 90 t, 18 MVA	2 x 90 t, 18 MVA
	- VD unit	-	1 x 90 t
7.	Billet caster	1 CCM	1 CCM
8.	Bloom Caster	-	1 CCM
9.	Bar mill	0.8 Mt/yr	-

10.	Bar & Wire rod mill	-	0.53 Mt/yr
11.	Oxygen plant (On BOO Basis)	650 tpd	250 tpd
12.	Captive Power Plant	1x4 MW (Gas based)	1x42 (WHRB)

Process cum Material flow of both phases are given as annexure I and annexure II respectively for phase I and phase II.

A brief description of facilities is as given hereunder.

01.03.01 Coke Ovens (Non-recovery)

Coke is required as prime burden material for charging into blast furnace in iron making. In phase-I, coke has been assumed to be purchased. However, in phase-II, in order to meet the requirement of coke in both phases a coke ovens of "Vertical Type Heat Recovery Stamp Charged Coke Oven Battery" has been considered, consisting of groups of ovens each. To cater the coal requirement, a Coal Tower with stamping station is envisaged in the middle of batteries. On each longitudinal end of the ovens, Quenching Tower has been considered.

The raw gas generated during coal carbonisation is being burnt totally inside the battery itself for heating and the generated waste gas shall be sent to chimney via waste heat recovery boiler for generating steam that can be used for generating electric power.

01.03.02 Sinter plant

In order to meet the agglomerated burden requirement of the blast furnace and considering advantage of utilising most of metallic waste materials of the plant, sinter plants of suitable size has been

envisaged for the proposed integrated steel plant.

The sinter plant will consist of the following main technological units:

- Fuel & flux crushing unit
- Flux screening unit
- Storage and Proportioning unit
- Mixing unit
- Balling unit
- Sintering and Cooling unit
- Cold sinter screening unit
- Waste gas handling unit
- Plant dedusting unit
- Junction houses & galleries

The above units will be interconnected by conveyor galleries & junction houses for conveying raw mix, finished sinter, hearth layer and sinter return fines.

01.03.03 Blast furnace

For production of 953,800 t/yr hot metal in phase-I and 385,400 t/yr hot metal in phase-II, suitable size blast furnaces have been envisaged in respective phase.

The Blast Furnaces have been envisaged to operate with sized iron ore, sinter, coke, coal dust, fluxes, additives and provision of pellet charging.

The hot metal produced will be charged in BOF of steelmaking shop. In emergency situations, hot metal will be cast in a pig casting machine, envisaged in phase-I and will cater to requirements in both phases. The liquid slag will be granulated at cast house slag

granulation unit. The BF top gas will be cleaned in cyclone & gas cleaning system, and distributed to the stoves, runner drying and balance to gas network. In case of emergency, excess BF gas shall be flared through flare stack.

Major units of Blast Furnace Complex

Sl. No.	Unit description
.	Blast Furnace Proper with Bell Less Top Charging Equipment
.	Cast House with twin Tap hole & Fixed spouts for hot metal tapping
.	Blast Furnace Control Building & other electrical rooms
.	Slag Granulation System for Cast House and Dry Slag Pits
.	Hot Blast Stoves – 3 nos. including Waste heat recovery system
.	Cyclone, Gas Cleaning Plant & Flare Stack
.	Pulverized Coal Preparation & Injection System
.	Common Ladle repair shop with PCM pouring bay and hot metal transfer bay
.	Pig Casting Machine and pig storage yard

01.03.04 Basic oxygen furnace

In phase-I, The BOF shop is envisaged to produce 8,54,600 t of liquid steel per annum for which one basic oxygen converter will be installed. The shape of the converter will be symmetrical top with fixed converter bottom. Facilities for inert gas purging from converter bottom have been envisaged. Medium for inert gas blowing will be argon / nitrogen depending upon the grade of steel. Top conical portion of converter vessel will be protected with slag shield.

The BOF shop will be provided with following major design features.

- One (1) converter operation practice
- Combined blowing facilities in converter
- Nitrogen slag splashing facility
- Top relining facilities in converter
- Facilities for minimising slag carryover into steel ladle during tapping
- Emergency lance lifting facilities in case of power failure
- Hot metal temperature measurement in charging ladle
- Slag sensing device in steel ladle
- Automatic and dynamic process control model based on BOF gas analysis
- Secondary emission control facilities.

01.03.05 Electric arc furnace

Phase-II of the project envisages production of 572,800 t/yr alloy grade steel. In order to meet the requirement one electric arc furnace has been considered.

The electric arc furnace will be of AC Arc Furnace with ultra-high power transformer. Major technological features of electric arc furnace unit will be as follows.

➢	Eccentric bottom tapping
➢	Water cooled side wall panels and roof
➢	Water spray cooling of the graphite electrodes
➢	Foamy slag practice

➢	Oxygen lancing system
➢	Automatic Temperature & Sampling System
➢	Carbon Injection system
➢	Continuous charging of direct reduced iron (DRI)
➢	Hot metal charging with launder
➢	Oxy fuel burners

01.03.06 Secondary refining units

One Ladle furnace of in phase-I and in phase-II two additional ladle furnaces, and one VD unit, have been envisaged under secondary refining units.

01.03.07 Steel casting facilities

State-of-the-art continuous casting facilities have been considered for the present project in each Phase. For the continuous casting shop, the cast product shall be 829,000 t/yr billets in phase-I 555,600 t/y Billets/ Blooms in phase-II to feed the downstream rolling mills in respective phases.

01.03.08 Bar mill

In Phase – 1, one Bar Mill has been envisaged. The proposed mill will roll 800,000 t/yr of TMT rebar from continuously cast billets..

01.03.09 Bar & Wire rod mill

In Phase – II, one Bar & Rod Mill has been envisaged. The proposed mill will roll about 533,400 TPYLow alloy steel grade long products for forging and engineering application from continuously cast billets & blooms.

01.04 Site and infrastructure

01.04.01 Site

The proposed site for 1.38 Mt/yr integrated steel plant is located at Joda,just on the Western side of the existing Tata Sponge Iron limited, in Keonjhar district of Odisha. The site is at about 153 km from Tatanagar and about 265 km from Bhubneshwar the capital of Odisha. The nearest airport is at Ranchi at a distance of about 240 km for the proposed site. The site for proposed plant is located adjacent to National Highway, NH-215 and MurgaMahadev railway station within 1Km range from the proposed site in its North direction. The plant site is located at the coordinates 22°28'15.5" Latitude, 85°28'37.9"Longitude.

01.04.02 Power

The prime source of power supply for the proposed project will be 220 KV JODA substation of Orissa Power Transmission Corporation Ltd (OPTCL) at Joda. Additionally, surplus power from existing plant and power generation from proposed captive power plant (1x4 MW) based on surplus BF gas will also be utilized to meet the power requirement of the proposed plant in phase-I. However, in phase-II, 1x42 MW power generation based on WHRB will also be additionally available besides grid.

01.04.03 Water

Kundra Canal located in South of existing TSIL plant at a distance of about 500 meter, will be the source of water for the proposed plant. Required water for the plant will be drawn from intake well with pump house.

01.04.04 Land

The land details for the proposed project is given below.

Sl. No.	Description	Area (in acre)
A.	Land Available	
1.	Existing plant	56
2.	Township	94.22
3.	Vacant land in existing premises	157
4.	In process of being acquired	26.49
	Total (A)	322.36
B.	Land Requirement for plant proper	
1.	Existing plant	56
2.	Proposed Plant proper(Ph-I + II)	233.62
3.	Dump area	15.1+11.39=26.49
4.	Storage & other services	2.5
5.	RMHS area	3.75
6.		
	Total (1+2+3+4+5)	322.36
7.	Green belt	
	Total Requireent (33% of 322.36) Available Further required	106.38 46.09 60.31
	Total (B)	382.67
C.	Further Land Requirement to be procured (B-A)	60.31

M/s TSIL has confirmed that the additional land requirement, as shown above, will be made available in due time and procurement is in process.

01.05 Raw materials

The annual gross requirement of various raw materials for both phases in the proposed steel plant is given below.

Estimated gross annual requirement of major raw

Sl. No.	Raw material	Quantity Gross (t/yr)	
		Phase-I	Phase-II
1	Iron ore lump (BF grade)	352,100	142,100
2	Iron ore fines for sinter plant	1,135,500	459,000
3	Limestone for sinter plant	83,200	33,700
4	Dolomite for sinter plant	85,700	34,600
5	Non coking coal for CDI	155,300	62,700
6	Purchased coke	447,500	NIL
7	Purchased coking coal	NIL	856,500
8	Purchase coke breeze	46,000	NIL
9	Quartzite	50,100	20,300
10	Calcined Lime (SMS grade)	88,100	46,900
11	Calcined Dolo (SMS grade)	21,400	14,300
12	Ferro-alloys	9,400	23,000
13	Aluminium	1,700	1,200
14	Flourspar	650	430
	Total	**2,476,650**	**1,694,300**

01.06 General layout and transportation

The relative locations of various units have been shown in the general layout drawing.

The salient features of the layout have been indicated below.

Sl. No.	*Item*	Feature
1.	Area within plant boundary	307.22 acres
	Area under advanced acquisition	15.14 acres
	Total Area	322.36 acres
2.	Length of road	
a.	7.0 m wide Phase-I Phase-II	 5.80 Km 2.60 Km

Sl. No.	*Item*	Feature
b.	4.0 m wide Phase-I Phase-II	 2.35 Km 1.00 Km
3.	No. of road gates Phase-I Phase-II	 3 Nos. NIL
4.	Length of boundary wall	Existing
5.	No. of watch towers Phase-I Phase-II	 6 Nos. 3 Nos.

The area for the proposed plant has been accounted within the plant boundary however a part of raw water reservoir and bar & wire rod mill, central stores and repair shop have been accommodated in the existing township area. However colony on the eastern side of the existing public road where director's bungalow and recreation facilities is existing has not been encroached.

01.07 Power requirement

The estimated power requirement of the proposed steel plant is as follows.

	Phase-I	Phase-II
Maximum Demand (MVA)	81	108
Annual energy consumption (10^6kWH)	363	443

Shop wise power demand and energy consumption is given in annexure-III and annexure-IV for phase-I and phase-II respectively.

01.08 Requirement of water

The total make-up water requirement of the plant after proposed expansion has been to about 950 m3/hr. Make-up water requirement

for phase-I and phase-II will be about 950 m^3/hr and 900 m3/hr respectively. Water balance diagram is given in annexure-V and annexure-VI for phase-I and phase-II respectively.

01.09 Auxiliary facilities

Adequate auxiliary and service facilities have been envisaged in both phases. The surplus in-plant gases have been utilised for in-house power generation in both phases. The gas balance is given in Annexure VII.

01.10 Project planning

The phase- I of the project has been planned to be commissioned in **36 months** from the **"Zero-date"** which is reckoned as **"order placement of main technological units"**. However, the execution of the proposed project would call for meticulous planning, monitoring and control during engineering, procurement and construction stage of the project.

Phase-II of the project has been envisaged to be completed in 24 months after 12 months of completion of phase I.

01.11 Manpower planning

In order to operate and maintain the plant facilities, including its technical and general administration needs, adequate manpower has been envisaged. The manpower estimate covers the top management; middle and junior level executives and other supporting staff. The category wise break-up of manpower is indicated below.

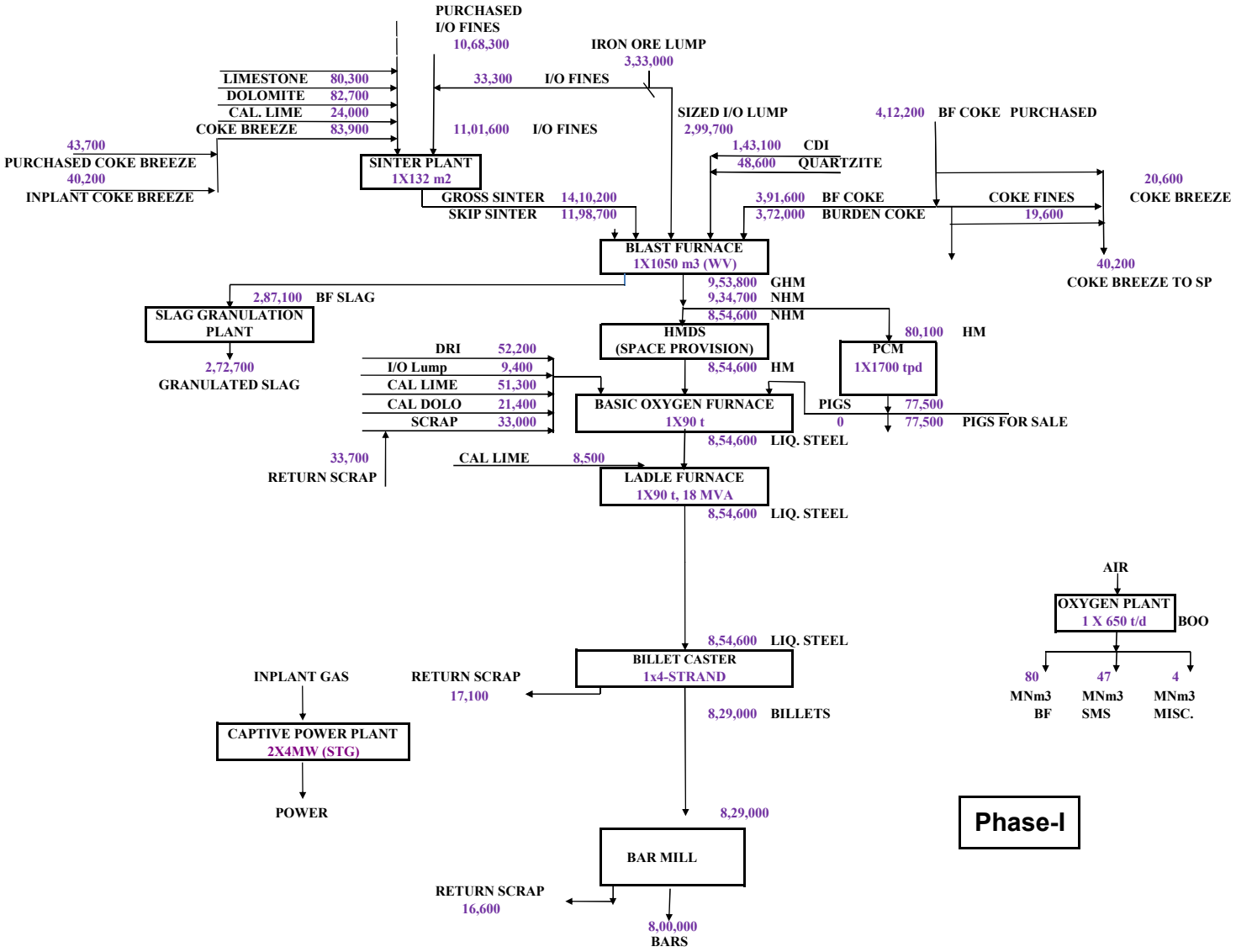
Category wise break-up of manpower

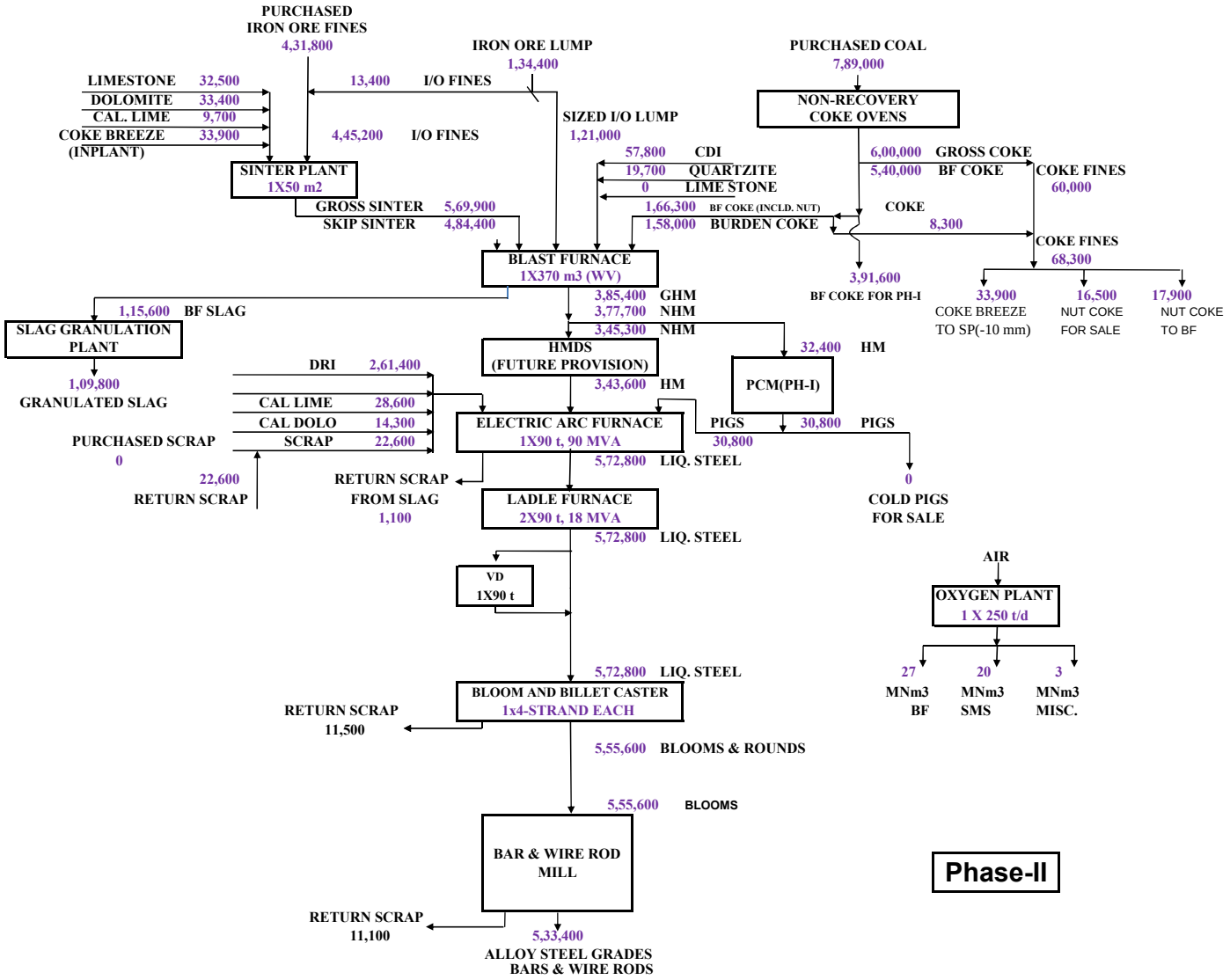
Sl. No.	Category	Requirement	
		Phase-I	Phase-II
1.	Managerial	43	46
2.	Executive	80	86
3.	Highly Skilled	194	146
4.	Skilled	513	367
5.	Clerical	100	80
	Total	**930**	**726**

01.12 Capital costs

The estimated capital cost for proposed expansion project works out to be Rs. 2784 Crore and Rs. 2561 Crore in phase-I and phase-II respectively.

ANNEXURES


PURCHASED
I/O FINES
10,68,300
IRON ORE LUMP
3,33,000
LIMESTONE 80,300
DOLOMITE 82,700
CAL. LIME 24,000
COKE BREEZE 83,900
33,300 I/O FINES
SIZED I/O LUMP
2,99,700
11,01,600 I/O FINES
4,12,200 BF COKE PURCHASED
1,43,100 CDI
48,600 QUARTZITE
43,700
PURCHASED COKE BREEZE
40,200
INPLANT COKE BREEZE
SINTER PLANT
1X132 m2
20,600
COKE BREEZE
GROSS SINTER 14,10,200
SKIP SINTER 11,98,700
3,91,600 BF COKE
3,72,000 BURDEN COKE
COKE FINES
19,600
BLAST FURNACE
1X1050 m3 (WV)
40,200
COKE BREEZE TO SP
9,53,800 GHM
9,34,700 NHM
8,54,600 NHM
2,87,100 BF SLAG
SLAG GRANULATION PLANT
HMDS
(SPACE PROVISION)
80,100 HM
PCM
1X1700 tpd
2,72,700
GRANULATED SLAG
DRI 52,200
I/O Lump 9,400
CAL LIME 51,300
CAL DOLO 21,400
SCRAP 33,000
8,54,600 HM
BASIC OXYGEN FURNACE
1X90 t
PIGS 77,500
0 77,500 PIGS FOR SALE
8,54,600 LIQ. STEEL
33,700
RETURN SCRAP
CAL LIME 8,500
LADLE FURNACE
1X90 t, 18 MVA
8,54,600 LIQ. STEEL
AIR
OXYGEN PLANT
1 X 650 t/d
BOO
8,54,600 LIQ. STEEL
BILLET CASTER
1x4-STRAND
80
MNm3
BF
47
MNm3
SMS
4
MNm3
MISC.
INPLANT GAS
RETURN SCRAP
17,100
8,29,000 BILLETS
CAPTIVE POWER PLANT
2X4MW (STG)
POWER
8,29,000
BAR MILL
RETURN SCRAP
16,600
8,00,000
BARS
Phase-I

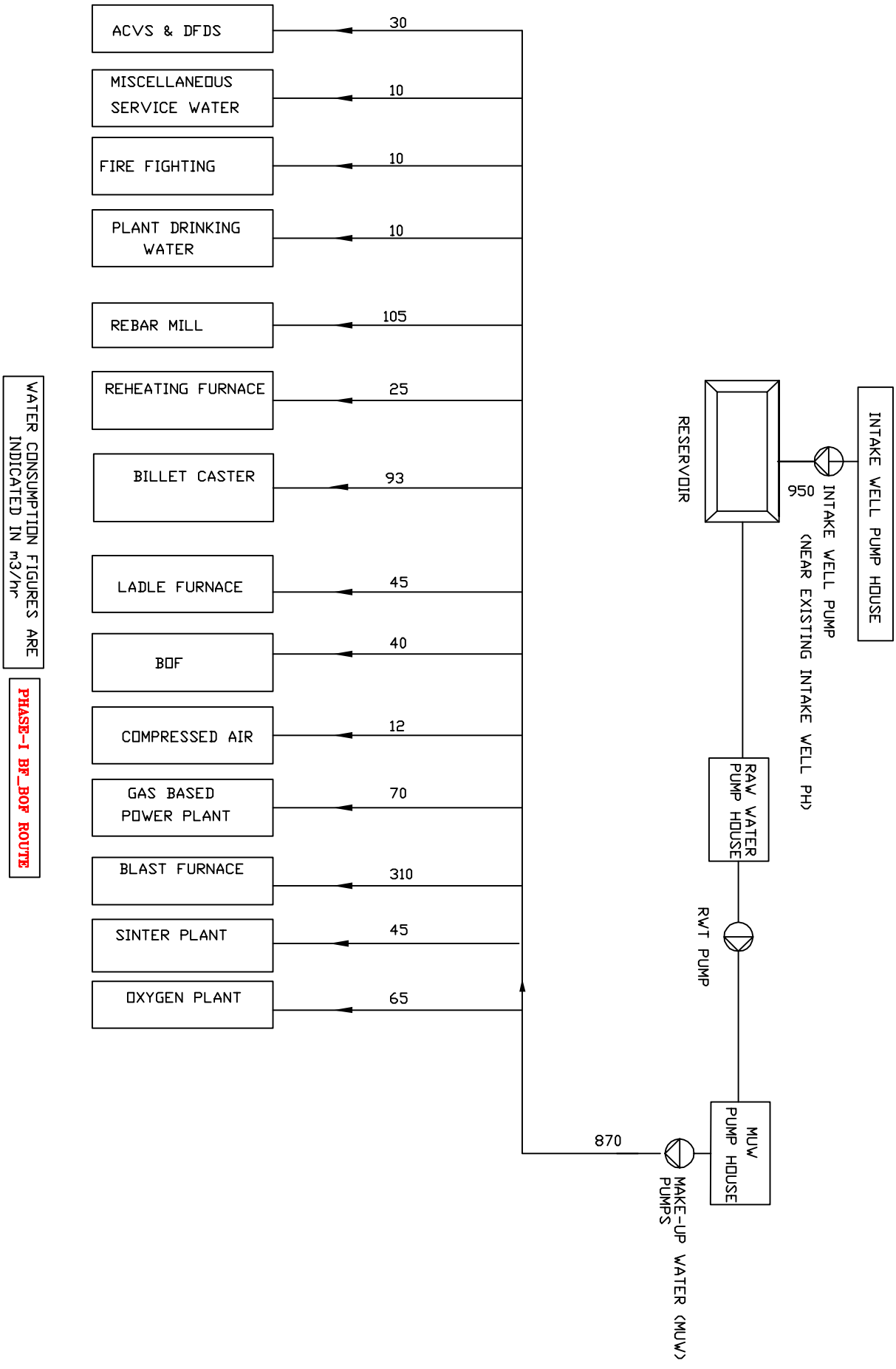

PURCHASED IRON ORE FINES
4,31,800
IRON ORE LUMP
1,34,400
PURCHASED COAL
7,89,000
LIMESTONE 32,500
DOLOMITE 33,400
CAL. LIME 9,700
COKE BREEZE (INPLANT) 33,900
13,400 I/O FINES
4,45,200 I/O FINES
SIZED I/O LUMP
1,21,000
NON-RECOVERY COKE OVENS
SINTER PLANT
1X50 m2
57,800 CDI
19,700 QUARTZITE
0 LIME STONE
6,00,000 GROSS COKE
5,40,000 BF COKE
COKE FINES
60,000
GROSS SINTER 5,69,900
SKIP SINTER 4,84,400
1,66,300 BF COKE (INCLD. NUT)
1,58,000 BURDEN COKE
COKE
8,300
COKE FINES
68,300
BLAST FURNACE
1X370 m3 (WV)
3,91,600
BF COKE FOR PH-I
33,900
COKE BREEZE TO SP(-10 mm)
16,500
NUT COKE FOR SALE
17,900
NUT COKE TO BF
1,15,600 BF SLAG
3,85,400 GHM
3,77,700 NHM
3,45,300 NHM
SLAG GRANULATION PLANT
HMDS
(FUTURE PROVISION)
32,400 HM
1,09,800
GRANULATED SLAG
DRI 2,61,400
CAL LIME 28,600
CAL DOLO 14,300
SCRAP 22,600
3,43,600 HM
PCM(PH-I)
PURCHASED SCRAP
0
ELECTRIC ARC FURNACE
1X90 t, 90 MVA
PIGS 30,800
30,800 PIGS
22,600
RETURN SCRAP
RETURN SCRAP
FROM SLAG
1,100
5,72,800 LIQ. STEEL
0
COLD PIGS
FOR SALE
LADLE FURNACE
2X90 t, 18 MVA
5,72,800 LIQ. STEEL
AIR
OXYGEN PLANT
1 X 250 t/d
VD
1X90 t
27
MNm3
BF
20
MNm3
SMS
3
MNm3
MISC.
5,72,800 LIQ. STEEL
BLOOM AND BILLET CASTER
1x4-STRAND EACH
RETURN SCRAP
11,500
5,55,600 BLOOMS & ROUNDS
5,55,600 BLOOMS
BAR & WIRE ROD MILL
Phase-II
RETURN SCRAP
11,100
5,33,400
ALLOY STEEL GRADES
BARS & WIRE RODS

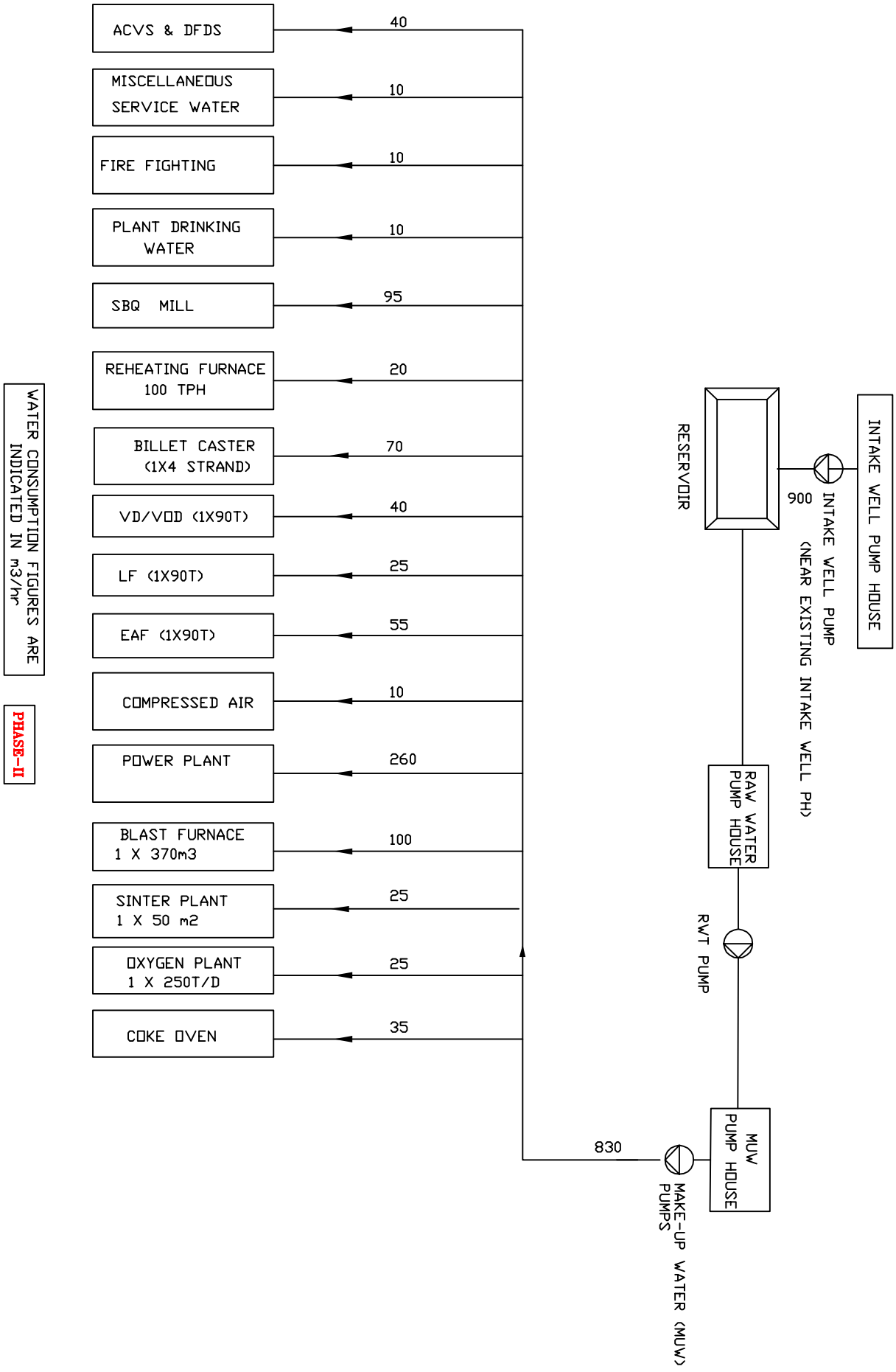
Phase – I Shop wise Power Demand and Energy consumption

Sl. No.	TSIL Joda Odisha	Shop/Area wise Maximum Demand (Phase-I)	Annual Energy Consumption in MU(kWh)
	Section/Shop	MD IN KVA	
1	RMHS	2111	7
2	Sinter plant	10742	47
3	BF	10954	51
3a	BF blower station	15975	69
4	BOF	5696	24
5	Ladle furnace	13092	56
6	Billet caster	2493	08
7	Bar mill	20904	84
8	Oxygen Plant	15569	-
9	CAS	1800	8
10	Other Auxiliaries	2000	9
	Total IN KVA	101336	363
	Maximum Demand of the entire plant (Considering Simultaneous Diversity Factor of x 0.8)	81069 ~ 81MVA	

Phase II Shop wise Power Demand and Energy consumption

Sl No	Section/Shop	Shop/Area wise Maximum Demand (MD in KVA)	Annual Energy Consumption in MU(kWh)
1	RMHS	2050	9
2	SINTER PLANT	5200	23
3	COKE OVEN	1550	7
4	BF	4000	18
4a	BF BLOWER STATION	6000	27
5	EAF	68250	197
6	LADLE FURNACE	13238	46
7	SMS AUXILIARIES	950	3
8	CASTER	1750	8
9	BAR & WIRE ROD MILL	19500	72
10	OXYGEN PLANT	6050	-
11	CAS	1800	8
12	STG & WHRB AUXILIARIES	3750	17
13	OTHER AUXILIARIES	1750	8
	TOTAL IN KVA	**135388**	**443**
	Maximum Demand of the entire plant (Considering Simultaneous Diversity Factor of x 0.8)	**108310 ~ 108 MVA**	


ACVS & DFDS
30
MISCELLANEOUS SERVICE WATER
10
FIRE FIGHTING
10
PLANT DRINKING WATER
10
REBAR MILL
105
REHEATING FURNACE
25
BILLET CASTER
93
LADLE FURNACE
45
BOF
40
COMPRESSED AIR
12
GAS BASED POWER PLANT
70
BLAST FURNACE
310
SINTER PLANT
45
OXYGEN PLANT
65
WATER CONSUMPTION FIGURES ARE INDICATED IN m3/hr
PHASE-I BF_BOF ROUTE
RESERVOIR
950
INTAKE WELL PUMP (NEAR EXISTING INTAKE WELL PH)
INTAKE WELL PUMP HOUSE
RAW WATER PUMP HOUSE
RW/T PUMP
MUW PUMP HOUSE
870
MAKE-UP WATER (MUW) PUMPS


ACVS & DFDS
40
MISCELLANEOUS SERVICE WATER
10
FIRE FIGHTING
10
PLANT DRINKING WATER
10
SBQ MILL
95
REHEATING FURNACE 100 TPH
20
BILLET CASTER (1X4 STRAND)
70
VD/VOD (1X90T)
40
LF (1X90T)
25
EAF (1X90T)
55
COMPRESSED AIR
10
POWER PLANT
260
BLAST FURNACE 1 X 370m3
100
SINTER PLANT 1 X 50 m2
25
OXYGEN PLANT 1 X 250T/D
25
COKE OVEN
35
WATER CONSUMPTION FIGURES ARE INDICATED IN m3/hr
PHASE-II
RESERVOIR
900
INTAKE WELL PUMP
(NEAR EXISTING INTAKE WELL PH)
INTAKE WELL PUMP HOUSE
RAW WATER PUMP HOUSE
RWT PUMP
MUW PUMP HOUSE
830
MAKE-UP WATER PUMPS (MUW)

1. TRUCK HOPPER
2. RAW MATERIAL STORAGE
3. SINTER PLANT
4. STOCK HOUSE
5. BLAST FURNACE
6. COKE OVEN
7. PIG CASTING MACHINE
8. STEEL MELTING SHOP/CASTER
9. ROLLING MILL
10. PCI COAL SHED
11. PCI
12. SLAG GRANULATION PLANT
13. TRT
14. GAS CLEANING PLANT
15. CAST HOUSE DEDUSTING
16. DEDUSTING UNIT – SMS
17. DEDUSTING STOCK HOUSE
18. ESP
19. OXYGEN PLANT
20. CALCINED LIME & DOLO STORAGE
21. STG
22. WHRB
23. BOF GAS HOLDER
24. SWITCH YARD
25. COMPRESSED AIR STATION
26. HT/LT SUBSTATION
27. ECR
28. DG STATION
29. WATER SUPPLY FACILITIES
30. WATER TREATMENT PLANT
31. FIRE WATER P/H
32. PROPANE STORAGE
33. FUEL OIL STORAGE
34. LAB. BUILDING
35. CENTRAL STORES
36. REFRACTORY STORAGE
37. MECHANICAL REPAIR SHOP
38. ELECTRICAL REPAIR SHOP
39. RAW WATER RESERVOIR
40. WELFARE BUILDING AND CANTEEN
41. ROAD WEIGHBRIDGE
42. TRUCK PARKING AREA
43. ADMINISTRATIVE BUILDING
44. WASTE DUMP
45. SECURITY POST

SYMBOL LEGEND

- EXISTING UNITS
- PROPOSED UNITS (PHASE–I)
- PROPOSED UNITS (PHASE–II)
- PROPOSED ROAD
- CONVEYOR WITH JH
- EXISTING BOUNDARY

50 0 50 100 150 200

SCALE IN METRES

REV	DATE	ZONE	DESCRIPTION	BY	VERIFIED
			REVISIONS		

REFERENCES — DRG.No.

TATA SPONGE IRON LIMITED

मेकॉन लिमिटेड

MECON LIMITED

SECTION	GL&T
LOCATION	RANCHI
DESIGNED	R.P
DRAWN	R.P
CHECKED AND VERIFIED	I.A
APPROVED	SIG.

1.3 MT INTEGRATED STEEL PLANT AT JODA, ODISHA

GENERAL LAYOUT

SCALE- AS SHOWN | SHEET 1 OF 1 | REV 0