# 2.0 PROJECT DESCRIPTION

## 2.1 Introduction

This chapter addresses the details of the proposed 30 MW Power Plant including basic fuel requirement, utilities and services, infra-structural facilities and sources of pollution, their quantity, treatment and disposal of the waste.

## 2.2 Plant Layout

The features of the proposed layout are as follows:

- Process departments have been consolidated into comprehensive production units requiring short conveying distances and elevations and lengths of gas ducts;
- Sufficient space has been provided for ease of operation and maintenance;
- The lengths of power cables have been minimized by suitably locating load distribution centers in respect of process departments; and
- Outward movements of materials from customers/suppliers have been segregated from internal plant traffic.

The google imagery, photographs of proposed plant area and layout showing raw material, fly ash and other storage areas are given in **Figure-2.1, Figure-2.2 and Figure-2.3**.

## 2.3 Size or Magnitude of Operation

Taking into account, reliability of equipment and matching capacities between the different sections of the plant, the type of equipment/ installation of system and the departmental capacities of the plant, have been arrived. A brief description of proposed utilities and major equipment is given in the **Table-2.1**.

**TABLE-2.1**
**DETAILS OF PROPOSED FACILITIES**

| Sr. No. | Title | Details |
|---|---|---|
| 1 | Plant capacity | 30 MW |
| 2 | Land | 3.0 ha (available within existing premises of DCW) |
| 3 | Process adopted | AFBC boilers with Air cooled condensers |
| 4 | Coal requirement | 0.21 MTPA |
| | Source | Singareni collieries /Imported |
| 5 | Water requirement | 550 $m^3$/day |
| | Source | Rainwater collected in mine pit |
| | Cooling water system | Re-circulating cooling water system. Cooling tower is provided. |
| 6 | Emission sources and their control | |
| | CPP (TG boilers) | ESP (>99.9% efficiency with emission <50 mg/$Nm^3$) |
| 7 | Power requirement | 37 MW |
| 8 | Manpower | Construction : 300<br>Operation : 50 |

Note:*Application for long term linkage from Singareni Collieries is in progress. It is proposed to use the imported coal as an interim arrangement to meet the coal requirement.

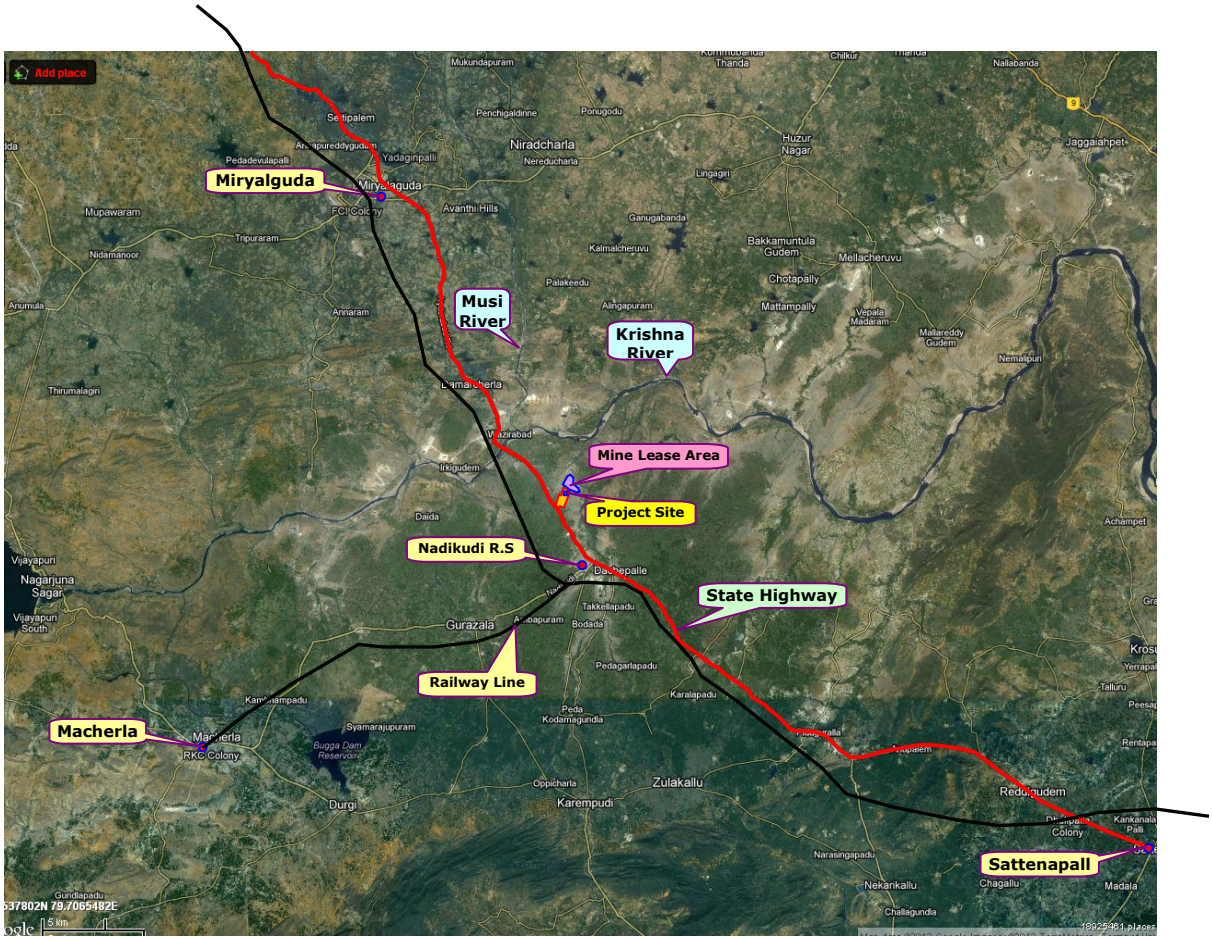



**FIGURE-2.1**
**GOOGLE IMAGE**

EXISTING PLANT VIEW

RAW MILL BAG HOUSE & STACK

COOLER ESP

BAG FILTER FOR CEMENT MILL

BAG FILTER FOR COAL MILL

**FIGURE-2.2**
**PHOTOGRAPHS SHOWING EXISTING PLANT FACILITIES**

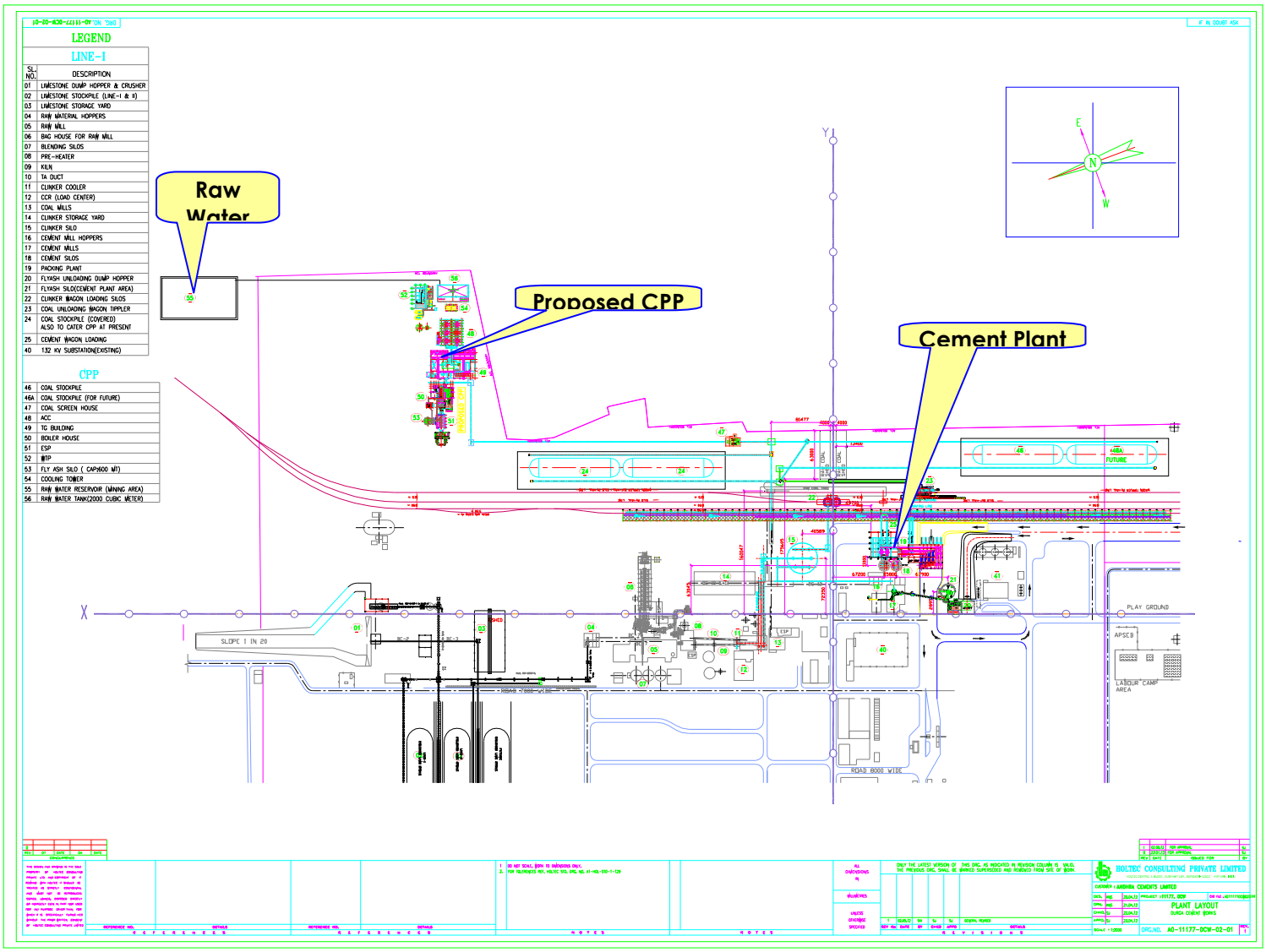
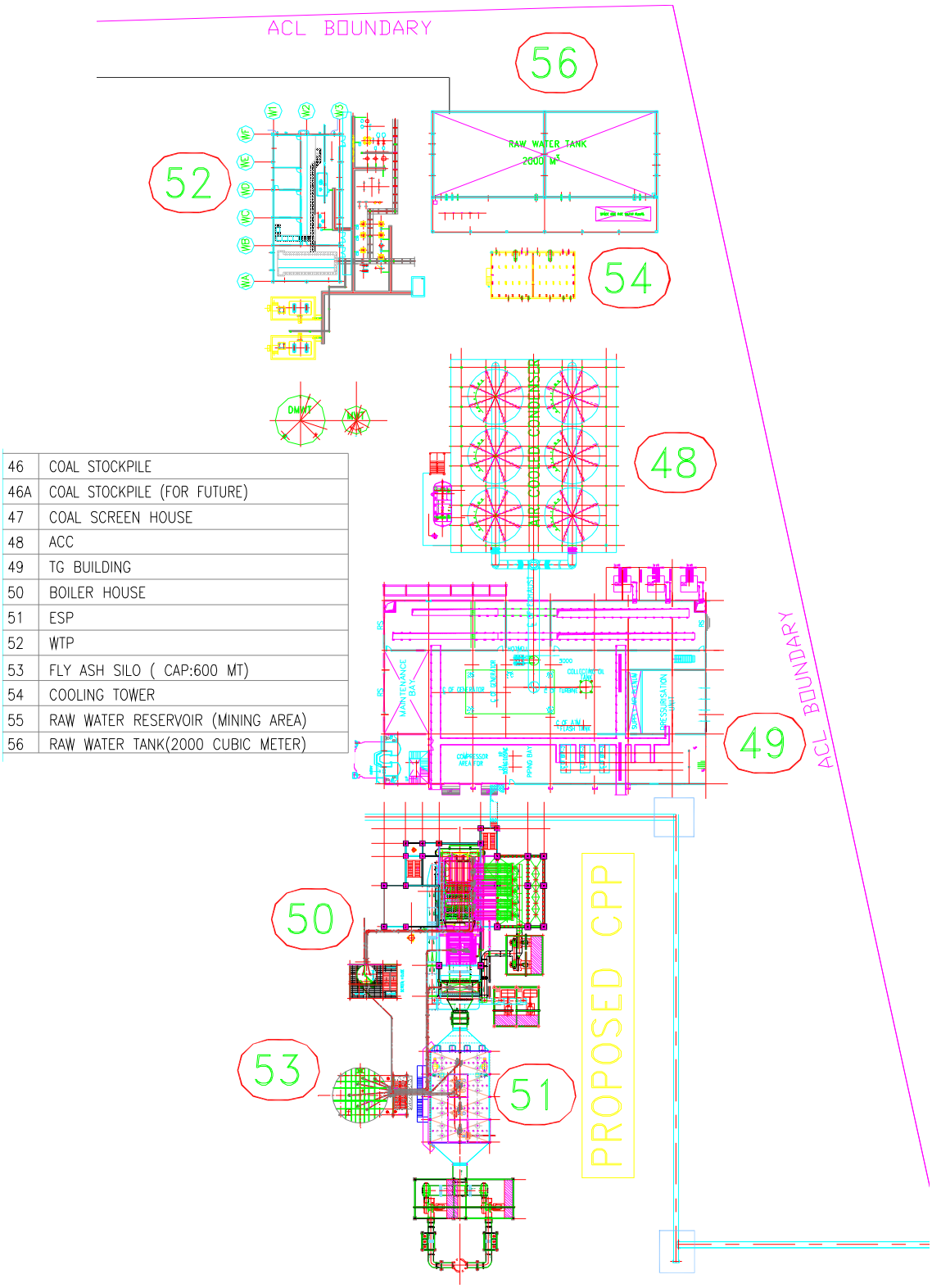



**FIGURE-2.3(A)**
**PLANT LAYOUT**




| | |
|---|---|
| 46 | COAL STOCKPILE |
| 46A | COAL STOCKPILE (FOR FUTURE) |
| 47 | COAL SCREEN HOUSE |
| 48 | ACC |
| 49 | TG BUILDING |
| 50 | BOILER HOUSE |
| 51 | ESP |
| 52 | WTP |
| 53 | FLY ASH SILO ( CAP:600 MT) |
| 54 | COOLING TOWER |
| 55 | RAW WATER RESERVOIR (MINING AREA) |
| 56 | RAW WATER TANK(2000 CUBIC METER) |

**FIGURE-2.3(B)**
**PROPOSED CPP PLANT LAYOUT**

## 2.4 Process Description

To meet the energy requirement of existing 2.31 MTPA cement plant, 30 MW coal based power plant with Atmospheric Fluidized Bed Combustion (AFBC) type boiler is proposed within the plant premises. The details of proposed power plant are presented in **Table-2.2**.

**TABLE-2.2**
**DETAILS OF PROPOSED CAPTIVE POWER PLANT**

| Sr. No. | Features | Description |
|---|---|---|
| 1 | Boiler | 132 TPH |
| 2 | Type of boiler | Atmospheric fluidized bed combustion boiler |
| 3 | Turbine | Steam turbine at 84 ata pressure 480 $\pm 3^0$c combined Rankin cycle |
| 4 | Generator | 0.8 PF with cold air circuit water cooled housing |
| 5 | Exhaust steam condensation | Air cooled condenser |
| 6 | Power evacuation | 132 Kv transmission line |
| 7 | Pollution control equipment | Electro Static Precipitator with 99.9% efficiency |

### 2.4.1 Fuel Requirement and Quality

The annual coal requirement will be around 0.21 MPTA for the proposed 30 MW power plant which will be sourced from Singareni Collieries Limited with an average GCV Coal of 3200 Kcal/kg/ Imported with GCV of 5300 Kcal/kg.

### 2.4.2 Description of Plant and Machinery

*2.4.2.1 Steam Turbine and Auxiliaries*

The steam turbines would be single casing, non reheat, and regenerative, condenser type. The turbine is rated for 30 MW with rated steam inlet condition of 62 ata $480^0$C and 0.1 ata condenser backpressure with associated feed water heaters in service. The turbine would be complete with all the accessories customarily supplied, by the manufacturers such as governing and protection system, turbine oil system its auxiliaries, turbine gland seal system, turning gear, supervisory and operating instruments with all necessary indicating and control devices to permit the unit to be replaced on turning gear, rolled, accelerated and synchronized from the central control room.

*2.4.2.2 Steam Generator (Boiler)*

The Steam Generator (Boiler) is of Atmospheric Fluidized Bed Combustion (AFBC), which is well-established mode of burning fuels, which permit the solids to escape from the combustor with the flue gas but then capturing them in external spacing device. The carried-over bed material and un-burnt fuel particles are returned to the bottom of combustor vessel. It has been proposed AFBC boilers with steam generation capacity of 132 TPH capacity attached to 30 MW capacity Turbo generator set respectively. The generator would be rated for 25000 kW, 11 kV, 50 Hz, 3000 rpm, 0.1 power factor with static excitation. The generator stator core, stator coil and rotor would be air-cooled.

*2.4.2.3 Coal Handling System*

The coal required for the power plant is being received at site through railway siding by railway wagons. The coal required will be about 0.21 MTPA. This requirement will met from the coal unloading and handling facilities. Crushed coal at the intermediate coal bunker from where a reclaim hopper and other series of proposed conveyors, crusher and screens would feed coal to proposed boilers. All the equipment will be designed for 132 TPH capacities.

*2.4.2.4 Ash Handling System*

Ash Handling Plant (AHP) design would be based on the worst coal quality and maximum ash content and the bottom ash and fly ash equipment parameters would be guided by the following:

- Coal consumption : 575.34 TPD
- Ash generation at 45% ash content : 258.90 TPD
- Fly ash : 207.12 TPD
- Bottom ash : 51.77 TPD

The ash handling system will include the collection of ash in various ash hoppers and transportation of both bottom and fly ash to storage silos by pneumatic pressure conveying. Each AFBC boiler consists of following hoppers for collection of ash:

i) Bottom ash hoppers with ash coolers;
ii) Economiser hopper for fly ash;
iii) Air heaters hopper for fly ash; and
iv) ESP hoppers for fly ash.

The bottom ash, which will be at a temperature of 200°C after bottom ash coolers of the boiler, is conveyed to bottom ash silo with the help of scrapper conveyor or dense phase system. Two 200 tonne capacity silo for fly ash and one number of 100 tonnes capacity silo for bottom ash is constructed.

The fly ash from the ESP and economizer hoppers is conveyed by installing dense phase pneumatic ash handling system to fly ash silo. From the fly ash silo, fly ash is being transferred to the cement plant for PPC production. Total fly ash generated in the power plant is being utilized in the cement plant for producing PPC. A separate silo near the cement mill will be constructed for storage of fly ash. The bottom ash collected will be sent to the bottom ash silo from where it will be suitably disposed depending on its quality. Typical coal handling scheme is shown in **Figure-2.4** and duct routing layout for coal crusher is shown in **Figure –2.5**

*2.4.2.5 Ash Disposal*

The CPP would generate ash about 258.90 TPD. Out of this quantity, about 207.12 TPD will be fly ash and the balance 51.77 TPD would be bottom ash. Fly ash generated at power plant will be 100% utilized by the cement plant. Thus, at any point of time, there will not be any disposal or stacking of the fly ash. The flow chart showing the process in power plant is shown in **Figure-2.6** and energy balance is given in **Figure-2.7**.

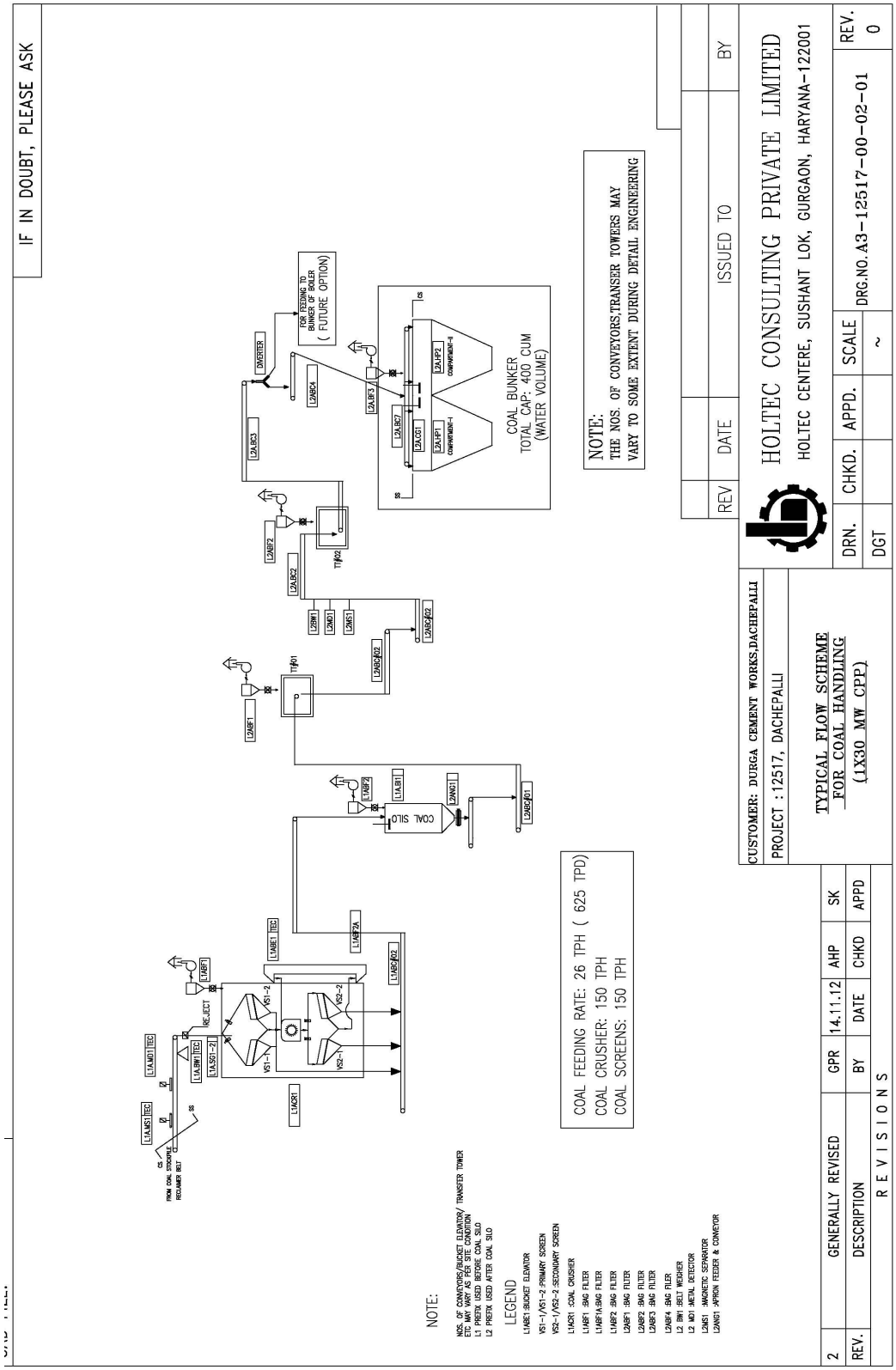



**FIGURE-2.4**
**COAL HANDLING PLANT**

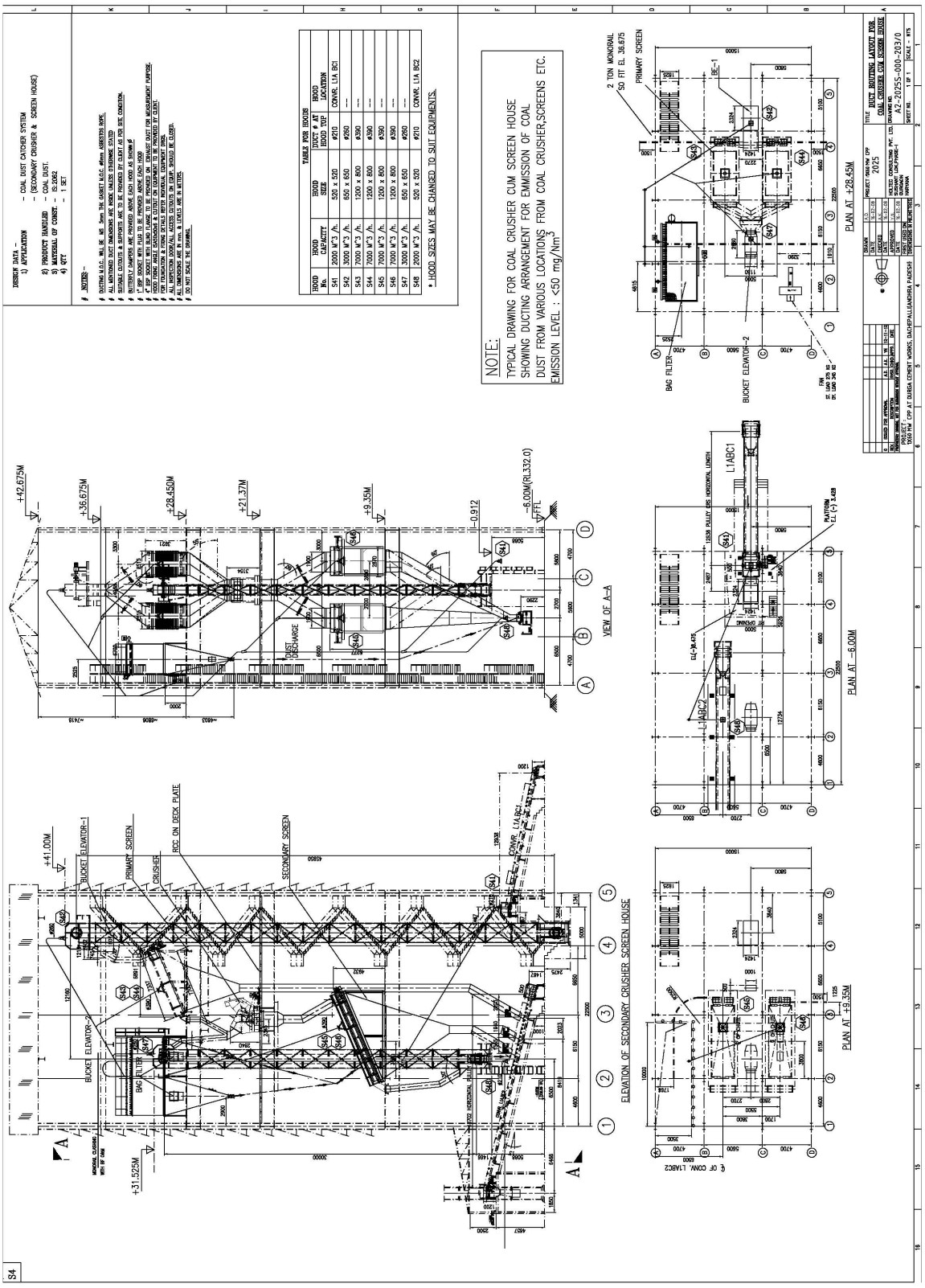



**FIGURE-2.5**
**CRUSHER ROUTING –SCHEMATIC DIAGRAM**

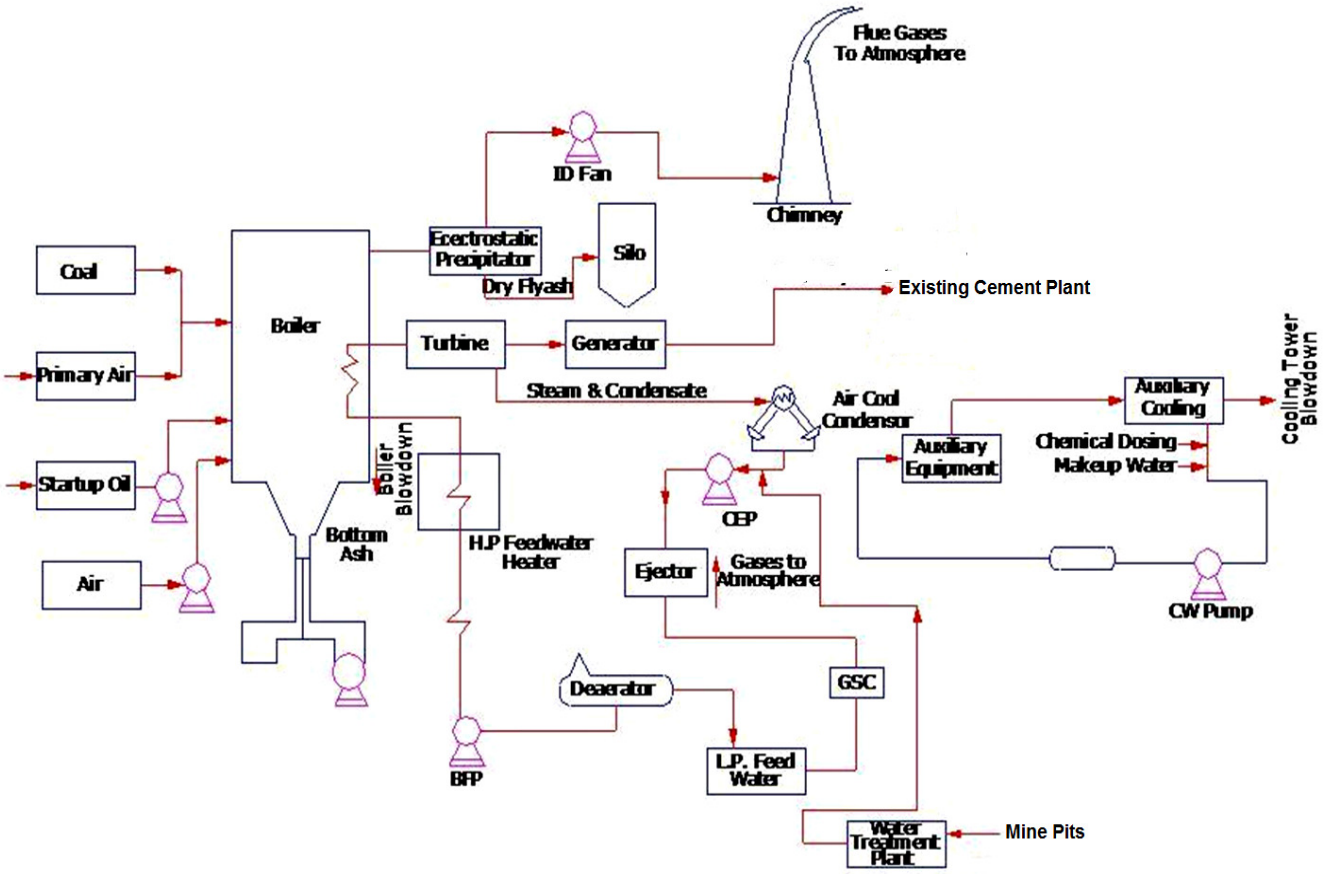



**FIGURE-2.6**
**PROCESS FLOW CPP**

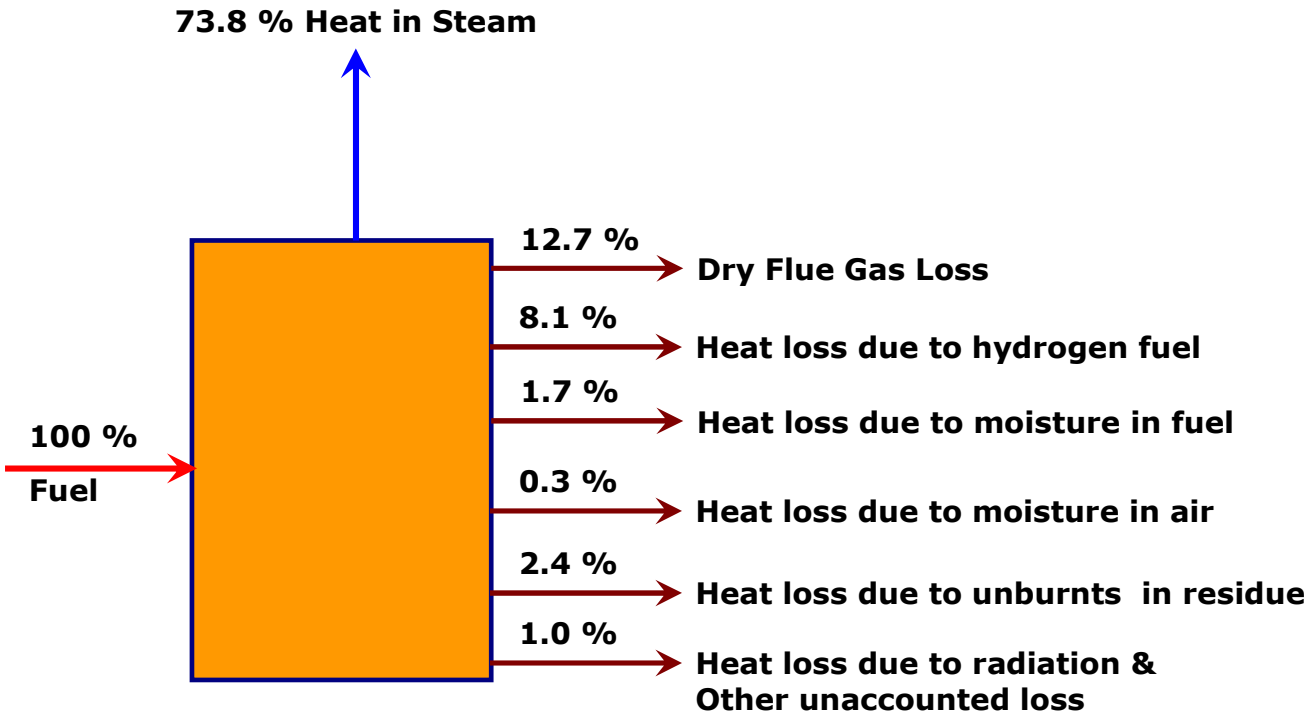



**FIGURE-2.7**
**ENERGY BALANCE**

*2.4.2.6 Fire Protection System*

Hydrant system is proposed for the interior and exterior of the station building, the boiler platforms, the bunker area and the electrostatic precipitator area, coal handling area, ash-handling area, WT plant and CW pump house. An automatic high velocity water spray system is proposed for the various transformers and turbine oil tanks. Automatic sprinkler system and fire detection system is proposed for the coal conveyor. Portable hand appliances are proposed for extinguishing small fires in the selected areas of the plant.

*2.4.2.7 Air Cooled Condensers*

Air-cooled condenser will be considered for condenser cooling system. The air-cooled condenser will have number of modules with each module having tube bundles. The tubes will be having finned type either of aluminum or carbon steel galvanized material. All necessary indicating and control instruments will be provided for operation of the turbine generators. The control panels will be located in the main plant control room at powerhouse building operating floor. Installation of Air-cooled condenser reduces the precious water requirement to a great extent.

*2.4.2.8 Power Plant Control*

The control system of the proposed power plant will be through distributed Digital Control Systems (DCS). This control system will utilize the state of the art technology so as to offer higher reliability, flexibility and availability.

## 2.5 Fuel Requirement

- ***Source of Coal***

Coal requirement will be 0.21 MTPA and is proposed to be sourced from Singareni Collieries. Application for the long term indigenous coal linkage has been submitted and is in process. Alternatively, it is also proposed to use the indigenous coal to be procured through e-auction which would be of E and F grade quality. The quality of the coal to procure either from Singareni Collieries or through e-auction is expected to be is presented in **Table-2.3**.

**TABLE-2.3**
**EXPECTED COAL QUALITY**

| Sr. No. | Parameter | Worst Case |
|---|---|---|
| 1 | GCV, Kcal/kg | < 3000 |
| 2 | Ash, % | 45.0 |
| 3 | Volatile matter, % | 21 |
| 4 | Moisture, % | 15 |
| 5 | Sulphur content, % | 0.5 |

The characterization of and coal are given in **Table-2.4.**

**TABLE-2.4**
**COAL CHARACTERIZATION**

| Sr. No. | Parameter | Concentration |
|---|---|---|
| 1 | Moisture % | 10 |
| 2 | Ash % | 45 |
| 3 | Sulphur % | 0.5 |
| 4 | Carbon | 36.2 |
| 5 | Hydrogen | 1.7 |
| 6 | Oxygen | 6.0 |
| 7 | Nitrogen | 0.6 |
| 8 | Calorific value (Gross on Dry) (Kcal/Kg) | 3200 |
| 9 | Size of coal | 90 mm |
| 10 | Cadmium | 2.9 mg/kg |
| 11 | Thalium | 9.8 mg/kg |
| 12 | Mercury | 0.3 mg/kg |
| 13 | Antimony | 3.1 mg/kg |
| 14 | Arsenic | 1.0 mg/kg |
| 15 | Lead | 21.4 mg/kg |
| 16 | Chromium | 19.8 mg/kg |
| 17 | Cobalt | 2.9 mg/kg |
| 18 | Copper | 9.8 mg/kg |
| 19 | Nickel | 21.2 mg/kg |
| 20 | Manganese | 49.8 mg/kg |
| 21 | Vanadium | 27.6 mg/kg |
| 22 | Zinc | 46.8 mg/kg |
| 23 | Selenium | 0.36 mg/kg |
| 24 | Strontium | 3.6 mg/kg |

## 2.6 Land Requirement

Land requirement for the proposed CPP is around 3-ha, out of 141.57-ha land available for cement plant which is already in industrial use and in procession of DCW. The proposed power plant will be built within existing cement plant premises hence no change in landuse. No additional land acquisition. The existing land-use breakup within the cement plant complex is given in **Table-2.5**.

**TABLE-2.5**
**LAND USE BREAK-UP**

| Sr. No. | Description | Area (ha) |
|---|---|---|
| 1 | Cement plant | 91.86 |
| 2 | Captive power plant | 3.00 |
| 3 | Green belt development | 46.71 |
| | ***Total*** | ***141.57*** |

***Source: DCW***

Hence, no Rehabilitation & resettlement (R & R) issues involved as the land required is already in possession of DCW.

## 2.7 Water Requirement

The water requirement for the proposed project is about 550 $m^3$/day, which will be met from rain water collected in mines pit. Mine is located at about 1.2-km from boundary in NE direction. The break-up of water required for the CPP is as given in **Table-2.6.**

**TABLE-2.6**
**WATER REQUIREMENT**

| Sr. No. | Particulars | Consumption |
|---|---|---|
| 1 | Boiler feed water make up considering DM plant process requirement | 459.3 |
| 2 | Ventilation System | 6.1 |
| 3 | Potable water in Plant | 17.6 |
| 4 | Washing & Sanitation | 20.9 |
| 5 | Gardening and landscaping | 14.3 |
| 6 | Water Treatment Losses | 31.9 |
| | Clarifier Sludge | - |
| | **Total** | **550** |

- **Source of Water Required**

The water required for the plant including Cement plant and limestone mine will be sourced from mine pit where the rain water will be stored. The total area of the pit is about 120-ha where it can be capable of storing 395910 cubicmeter/annum. The detailed calculations pertaining to the storage of water is given below:

| | | |
|---|---|---|
| Pit area | - | 120-ha (1200000 sqm) |
| Annual rainfall | - | 439.9 mm ( 0.4399 m) |
| Infiltration factor | - | 0.75 |
| Water storage in pit | = | 1200000*0.4399*0.75 |
| | = | 395910 cubicmeter/annum |
| | = | 1084.68 cubicmeter/day |

**Water requirement in Integrated Plant**

| | | | |
|---|---|---|---|
| 1. | 30 MW CPP – Durga Cements | - | 550 $m^3$/day |
| 2. | Andhra cements – Mine | - | 60 $m^3$/day |
| 3. | Cement Plant | - | 420 $m^3$/day |
| | ***Total*** | **=** | ***1030 $m^3$/day*** |

Water sourced from pit = 1084.68-1030
= 54.68 $m^3$/day
(balance water in pit)

The water collected in mine pit is sufficient for plant requirement. Hence, no alternative water source is required.

## 2.8 Power Requirement

The estimated power demand for the plant is about 37 MW. 24 MW shall be catered by power plant and rest of the power requirement shall be met from State power grid.

## 2.9 Manpower

The requirement of personnel for the proposed power plant has been made keeping in view of the following:

- Technical concept of plant, including process control and instrumentation;
- Smooth and efficient operation of the plant;
- Effective co-ordination between the various departments within the plant;
- Optimum organization with well defined and judicious job distribution;
- Optimum utilization of different grades of workmen and supervisory staff; and
- Maximum capacity utilization of the facilities.

The total manpower requirement during construction stage will be about 300 no and during operation phase requirement will be about 50 nos. including skilled and unskilled workers. The shortfall of any technical manpower will be made up by gradual recruitment.

## 2.10 Proposed Schedule and Approval for Implementation

The plant construction will be completed in a period of 24-months from the date of receipt of all the approvals from statutory authorities.

## 2.11 Utilities and Services

### 2.11.1 Machinery Stores

Adequate storage facilities for machinery spares and other consumables, including an open yard, have been established to meet the requirement of plant.

### 2.11.2 Workshop

Based on the location of the plant, a reasonably good workshop facility has been established with the existing cement plant, both for mechanical and electrical equipment repairs and maintenance. Some facilities will be used for CPP requirement.

### 2.11.3 Time Office and Security Office

The time office and security office complexes will be established.

### 2.11.4 Fire Fighting System

For protection of the plant against fire, all yards and plants have been protected by any one or a combination of the following systems:

- Hydrant system;
- High pressure water sprinkler system;
- Foam system;
- Portable fire extinguishers; and
- Mobile high-pressure fire hydrant system.

Hydrant system will feed pressurized water to hydrant valves located throughout the plant and also at strategic locations within the cement plant colony.

2.11.5 Township

A full fledged township comprising of guest house, school, shopping centre, club, etc. is already in place, which will be used for accommodating the CPP persons also. The township will have essential facilities for key plant personnel.

2.11.6 Infrastructure Facilities for Labour Force

Presently no infrastructure, except an all weather good motorable public road, is available in the area. Thus, the infrastructure like offices, workshop, colony, electricity etc. will be added.

All the workers will be housed in labour colony to be built by respective contractor, which will be located near the project site. The colony which will be temporary in nature will have the following amenities:

1 Drinking water facility – Drinking water will be supplied through water tankers/community taps;
2 Community kitchen will be provided by contractor for the workers;
3 Sanitation facilities will be constructed which will include the adequate number of separate toilets for men and women. The make shift treatment plant will be installed and treated wastewater will be utilized in greenbelt development;
4 Bins will be installed to collect municipal waste from the colony;
5 Small play ground and child care centers will be developed in the colony;
6 Fuel (kerosene/LPG) will be supplied to the labours for cooking to prevent tree felling.
7 Medical facilities with first aid, pre medical visiting facilities & transportation facilities as required.

2.11.7 Canteen

Tea and snacks will be provided to the personnel working in the plant. A pantry will also be provided in the Office Complex.

2.11.8 First Aid Room

First aid room of adequate size with required equipment will be established within CPP premises near the office, whereas the first aid station near the workings is of mobile type. Rest shelter of standard design will be provided near the first aid station. Cool and wholesome drinking water will be provided at the shelter in suitable container

## 2.12 Sources of Pollution

2.12.1 General

In the process as well as the auxiliary plants, along with the useful products and by-products, different waste materials will also be generated. These waste materials mainly include gaseous emissions, wastewater and solid wastes from the utilities:

- The emissions include the dust from handling operations;
- The main atmospheric pollutant in the stack and fugitive emissions would be Particulate Matter (PM);
- The CPP and sanitation are the source of wastewater generation; and
- Ash is the solid waste generated in coal based power plant where it is 100 % utilized for manufacturing of cement.

2.12.2 Gaseous Emissions

- ***Stack Emissions***

In the proposed power plant the main sources of emissions will be from stack attached to boiler. The emission of particulate matter from all the stacks will be limited to 50 mg/Nm$^3$. The details of stacks emission and proposed controlled equipment are given in **Table-2.7**.

**TABLE-2.7**
**SOURCE OF EMISSION**

| Stack Attached to | Stack Height (m) | Stack Dia (m) | Velocity (m/s) | Temp ($^0$C) | Particulate Emission rate (mg/Nm$^3$) | Control equipment |
|---|---|---|---|---|---|---|
| Boiler | 77 | 2.0 | 15.96 | 140 | 50 | ESP |
| Crusher | 40 | 1 | 12 | 70 | 50 | Bagfilter |
| Raw Mill-I & II | 70 | 3.5 | 10 | 120 | 50 | Bagfilter |
| Cooler | 30 | 3 | 10 | 80 | 50 | Bagfilter |
| Coal Mill – I | 30 | 1 | 14 | 80 | 50 | Bagfilter |
| Coal Mill-II | 30 | 1 | 14 | 80 | 50 | Bagfilter |
| Cement Mill – I | 32 | 1.25 | 12 | 80 | 50 | Bagfilter |
| Cement Mill – II | 31 | 1 | 12 | 80 | 50 | Bagfilter |
| Cement Mill- III | 35 | 1.25 | 12 | 80 | 50 | Bagfilter |

2.12.3 Wastewater Generation and Treatment

Water requirement for the proposed power plant is estimated to be 550 m$^3$/day. The water balance for the proposed plant is presented in **Table-2.8**.

**TABLE-2.8**
**WATER BALANCE**

| Sr. No. | Units | Requirement | Losses/use | Wastewater Generation | Remarks |
|---|---|---|---|---|---|
| 1 | Boiler feed water make up considering DM plant process requirement | 459.3 | 216.0 | 243.1 | Sent to STP and sent to guard pond after neutralization |
| 2 | Ventilation System | 6.1 | 4.9 | 1.5 | Sent to Guard Pond |
| 3 | Potable water in Plant | 17.6 | 3.4 | 14.1 | For greenbelt after treatment in STP |
| 4 | Washing & Sanitation | 20.9 | 4.1 | 16.9 | Treated water from STP sent to guard pond |
| 5 | Gardening and landscaping | 14.3 | 14.1 | - | - |

| Sr. No. | Units | Requirement | Losses/use | Wastewater Generation | Remarks |
|---|---|---|---|---|---|
| 6 | Water Treatment Losses | 31.9 | - | 22.1 | Sent to Guard Pond |
| | Clarifier Sludge | - | - | 9.8 | Low lying area |
| | **Total** | **550** | **243** | **307** | 120-Dust suppression<br>9.8-Landfill<br>14.1-Greenbelt<br>120- IBD quenching |

➢ ***Wastewater Generation at Power plant***

The total wastewater generated from various units of the CPP is about 243.1 $m^3$/day and about 64 $m^3$/day is the domestic & other waste water generated which will be treated in the Sewage treatment plant. Therefore the total wastewater for handling at the power plant is about 307 $m^3$/day.

Wastewater from filtration unit, softener and DM plant will be neutralized before disposal to guard pond. Wastewater from plant drains (service water) and cooling water) along with wastewater from neutralization tank will be let into the guard pond.

➢ ***Wastewater Generation from Sanitary Uses***

Wastewater generation will be mainly due to the sanitary wastewater generated due to domestic uses. The sanitary wastewater will be treated in Sewage Treatment Plant (STP) and will be utilized for green belt development.

2.12.4 Solid Waste Generation and Utilization

Bottom ash and Fly ash will be generated from the proposed Coal based captive power plant. The coal consumption is estimated at 575.34 TPD at 100% installed capacity. The ash content of the coal is estimated to be in 45%. Based on the above ash content, the bottom ash (20%) and fly ash (80%) generation is estimated to be 51.77 and 207.12 tons/day respectively. The fly ash generated from the proposed 30 MW power plant is (100%) utilized in cement plant for manufacturing the Portland Pozzolona Cement (PPC).

➢ ***ETP***

Solid waste in the form of sludge is generated from the STP and ETP. The dried waste is used as manure for green belt development.

The details of the solid waste generated from the proposed power plant are given in **Table-2.9.**

**TABLE-2.9**
**DETAILS OF SOLID WASTE GENERATION**

| Sr. No. | Unit | Solid Waste | Method of Disposal |
|---|---|---|---|
| 1 | Fly ash from CPP | 207.12 TPD | Utilized for manufacture of PPC |
| 2 | Bottom ash from CPP | 51.77 TPD | Utilized in land filling and in raw mill |
| 3 | Sludge from STP | 30 TPM | Used as manure in horticulture |

2.12.5 Scheme for Fly Ash Loading, Storage and Transport

The flyash, from ESP hopper, is unloaded pneumatically into the silo. This storage silo is also provided with a high efficiency bag filter for the purpose of venting. Hence the fine flyash, carried away with this venting air gets collected in the bag filter, leaving unpolluted air into the atmosphere. These fines are put back into the process. Now, the fly ash from silo will be transported, by pneumatic means, to either raw mill or cement mill, for taking it into the process. Fly ash taken to the surge bins of raw mill/cement mill area, is put into the mill or corresponding point, for further process. Here rotary air locks are employed for the purpose of discharging the material from bins and thus eliminating the leakage.

The following are the measures taken to eliminate the possible problems of pollution due to fly ash.

- Pneumatic transportation of fly ash from power plant to cement mills;
- During loading/unloading the direct coupling of the flexible duct with the opening of bulker, ensures a totally dust free atmosphere at these stations;
- High efficiency bag filter for silo venting;
- Another bag filter at pumping area, for venting of pumps and extraction equipment;
- Rotary air locks adopted for the discharge of surge bins;
- High efficiency air tight seals at the entry/exit of ducting from silo; and
- Transfer point dust collectors.

2.12.6 Noise Pollution

The noise generation from the proposed power plant can be broadly categorized into two types *viz.* Area and Point sources. All the equipment used can be categorized as point sources and the vehicular traffic movement can be treated as area source. The noise levels of existing machinery are given in **Table-2.10**.

**TABLE-2.10**
**NOISE LEVELS OF MACHINERIES IN CPP**

| Sr. No. | Location | Noise Levels dB(A) |
|---|---|---|
| 1 | Turbine | 85 |
| 2 | Cooling towers | 61 |
| 3 | CW pump house | 63 |
| 4 | Air compressor | 84 |

All these noise generating equipment are enclosed and continuous presence of workers is not required at these equipment. People working at high noise generating equipment are provided with earplugs.

## 2.13 Greenbelt Development

Total 33% of the plant area will be developed as green belt/ green cover. Local species will be selected in greenbelt and plantation. Density of plantation 2500 trees/ha will be maintained. The treated sanitary wastewater will be used in green belt development.