CHAPTER-X

COAL HANDLING & DESPATCH ARRANGEMENTS

10.1 INTRODUCTION

The Project report for Chandragupt OCP has been prepared for the production of 15.0 Mty of ROM coal. The total production of coal has been proposed from three sections, namely Section-1, 2 & 3. The coal production have proposed through surface miner as well as shovel dumper. A Coal handling plant has been proposed at surface near quarry mouth to cater entire production either through surface miner or shovel dumper. Accordingly facilities of receiving, crushing, storage & loading /conveying arrangement has been envisaged. Crushing facility has been envisaged to cater the entire production of ROM coal through Shovel - Dumper.

10.2 DESIGN PARAMETERS

10.2.1 BASIC DATA

The following parameters has been considered while designing & planning of different units of coal handling plant:

Sl. No	Particulars	Considered Summarised Data
(a)	Coal production of mine	15.0 Mty
(a)	Coal Handling Plant Capacity	15.0 Mty
(b)	Number of working days/year	30
(c)	Number of working shift/day	3 (8 hrs. each)
(d)	Number of effective working hours/day	15
(e)	Type of unloading dumper at receiving pit of CHP	Rear Discharge Dumper
(f)	Feed size of ROM. coal (in mm)	1200 mm from shovel dumper & (-)100 mm through Surface miner.
(g)	Despatch size (in mm)	(-) 100 mm
(h)	Type of loading	i) By belt conveyors to Silo & RLS into wagons.
(i)	Loading hours	Round the clock.
(j)	Average Grade of coal	Power grade
(k)	H.G.I.	40-60
(l)	Consumer	Power station.
(m)	Mode of Despatch	By conveyer & RLS

SANJEEV KUMAR
MANAGER
CHANDRAGUPTA OPENCAST PROJECT
CCL, AMRAPALI-CHANDRAGUPTA AREA

10.2.2 CHP WORKING SCHEDULE

The coal handling plant will be working in three shifts per day and seven days a week basis with its all units like receiving of ROM coal, conveying, storage in ground bunker, reclamation and load out system through belt conveyers & RLS.

10.2.3 SYSTEM CAPACITY

The handling capacity of the CHP has been planned to match with the production capacity of the mine. Ten nos. of receiving hoppers have been envisaged to receive coal produced through surface miners. Coal produced through surface miners (about 75-80%) will be brought at surface by rear discharge and unloaded in to receiving hoppers. Total ten nos. (2x5 hoppers) have been provided to receive surface miner coal (-100 mm). Each truck receiving hoppers have been provided with electromagnetic vibrating feeder to reclaim coal at under width conveyors. Two nos. of conveyors each having nominal capacity 2000tph and 1600 mm width have been provided under set of 5 nos. of hoppers. Out of five nos. of hopper in each series only four will be operative.

Coal produced through blasting will about 20-25%. As such one no. of sizer having nominal capacity of 1500 TPH have been envisaged for receiving, crushing in two stages and conveying of coal up to bunkers through belt conveyors.

The coal will be stored in two nos. of bunkers at surface. This has been selected to meet any fluctuations of coal output from the mine or due to irregularities of despatch / transport system and seasonal fluctuations. For coal produced through surface miner the nominal system capacity has been selected as 2000 tph for each stream. One stream of nominal capacity 1500 tph has been proposed for coal receiving, crushing conveying for coal produced through shovel dumpers. The nominal capacity of each reclaim or loading conveyors from ground bunker to Silo have been kept 1800 tph. For key plan of proposed coal handling system, please refer drawing.

10.2.4 SALIENT FEATURES

The following factors have been considered in finalising the location and system of proposed Coal handling System:

- Mine boundary, surface, flak and quarry floor
- Mine entry
- Conveying and Loading / feed arrangement
- Topography
- Availability of space
- Receiving arrangements (size of coal and type of dumpers)
- Crushing facility for part of coal produced from shovel dumpers

SANJEEV KUMAR
MANAGER
CHANDRAGUPTA OPENCAST PRO
CCL, AMRAPALI-CHANDRAGUPTA

- Power supply and distribution network
- Miscellaneous facilities like dust control system, fire fighting and ventilation system. Plant cleaning and infrastructure for preventive maintenance are also envisaged.
- Necessary Electrical, interlocking, signalling and communication facilities.

10.2.5 SYSTEM DESCRIPTION

The CHP will have the following functional units as shown in the key plan of CHP. Receiving Pits for ROM shovel dumpers & surface miner coal, Sizers & belt conveyors

- Ground storage bunkers & Reclamation
- Conveying up to railway siding through belt conveyors.
- Loading of coal through Silo & RLS.
- Loading of sized /Crushed coal (-100mm) through Silo & RLS
- Dust control system
- Dust suppression system
- Noise control system
- Fire Protection system
- Plant cleaning system
- Plant preventive maintenance
- Weighment

10.2.6 PLANT DESCRIPTION

10.2.6.1 Receiving and Crushing Arrangement

Entire ROM coal produced from mine /Project either through Shovel - Dumper combination or Surface miner (-100 mm coal) will be transported by dumpers at surface and discharged to respective receiving hoppers.

For shovel dumper, coal crushing system (at Receiving pit) near mouth of quarries has been provided. One no. of primary and subsequently one secondary sizer of suitable capacity (nominal 1500 tph capacity) has been envisaged for crushing of this coal. The coal will be crushed up to (-) 100 mm size in two stages by primary and secondary sizers. There is one independent stream for crushing of coal up to (-) 100 mm size having nominal capacity 1500 tph. ROM Coal from receiving hopper will be fed to primary sizer through apron feeder. The crushed coal from primary sizer (nominal capacity 1500 TPH each) will be collected by conveyors (1C3) and fed to secondary sizer (nominal capacity 1500 TPH each). The crushed coal from secondary sizer will be collected by conveyor (2C3) and fed to any tripper conveyors (3C3 or 3C4) respectively. This coal from tripper conveyors will spread and stored in ground bunker- 2 of 20,000 te Capacity.

SANJEEV KUMAR
MANAGER
CHANDRAGUPTA OPENCAST PROJECT
CHANDRAGUPTA AREA

Width and nominal capacity of all above conveyors (1C3& 2C3) in proposed CHP system will be 1600 mm and 1500 tph respectively.

For coal produced through surface miner (-100 mm size): Ten nos. of receiving hoppers have been envisaged at receiving pit near quarries mouth to receive coal produced through surface miners. Coal produced through surface miners (About 10.5 MTY) will be brought at surface by rear discharge and unloaded in to receiving hoppers. Total ten nos. (2x5 hoppers) have been provided to receive surface miner coal (-100 mm). Each truck receiving hoppers have been provided with electromagnetic vibrating feeder to reclaim coal at under width conveyors. Two nos. of conveyors each having nominal capacity 2000 tph and 1600 mm width have been provided under hoppers. Each conveyors will cater set of 5 nos. of hoppers. Out of five nos. of hopper fitted with Vibrating feeders in each series only four will be operative at a time. The surface miner coal from receiving hoppers will be collected by either of conveyors (1C1 &1C2) and fed to any conveyor (2C1 &2C2). Coal from conveyors (2C1 &2C2) will be fed to tripper conveyors (3C1 or 3C2) respectively. This coal from tripper conveyors will spread and stored in ground bunker- 1 of 20,000 te Capacity.

Width and nominal capacity of all above conveyors (1C1 &1C2 /2C1 &2C2/3C1 & 3C2) in proposed CHP system will be 1600 mm and 2000 tph respectively. Key plan and Coal flow arrangement of the proposed coal handling system has been shown in drawing.

10.2.6.2 Storage Bunker and Reclamation system

The crushed coal received through crushing system will be fed to respective tripper conveyors as stated above.The coal from the tripper conveyors (3C1-3C2 & 3C3-3C4) will uniformly discharge coal from one end of the bunker to other end with the help of trippers & cascading chute. This ground bunkers (above ground) have been provided for total storage facility of 40,000 te capacity (2x20000 te) to meet the requirement of fluctuation of coal production. The bunker shall be designed & constructed in a manner so that minimum sloping angle of 55 deg. to the horizontal may be achieved and it will have two slits type opening (in each bunker) for plough feeder at the bottom for reclamation of coal. Below the bunker slits opening reclaim conveyors are provided to collect coal reclaimed through plough feeders. The nominal capacity of the each reclaim conveyors (4C1 - 4C2 & 4C3 - 4C4) and plough feeders shall be of 1800 tph and widh 1600 mm. Each bunker have been provided with four nos. of plough feeders out which two will be working at a time in each bunker.

Reclaim conveyors (4C1 - 4C2 & 4C3 - 4C4) shall feed coal to (5C1 - 5C2 & 5C3 - 5C4) belt conveyors which shall finally feed to 4000te to 2 no silos.

Width and nominal capacity of all above reclaim conveyors in proposed CHP system will be 1600 mm and 1800 tph respectively.

Width and nominal capacity of all above reclaim conveyors in proposed CHP system will be 1600 mm and 1500 tph respectively.

10.2.6.3 Load out and despatch system

Following facilities have been envisaged for conveying, loading despatch of coal from the proposed CHP. The total nominal rated coal production of the Project will be 15.0 Mty.

Sized coal (-) 100 mm stored in bunkers of CHP will be reclaimed through 4 nos. of plough feeders (2 nos. in each bunker). The respective pair of reclaim conveyors fitted below each bunkers will receive sized raw coal from bunkers. Coal reclaimed through plough feeders will be collected by any reclaim conveyors (4C1-4C2 & 4C3-4C4) as per system requirement. Reclaim conveyors (4C1 - 4C2 & 4C3 - 4C4) shall feed coal to (5C1 - 5C2 & 5C3 - 5C4) belt conveyors which shall finally feed to 4000te size to 2 no silos.

Width and nominal capacity of each reclaim conveyor will be 1600 mm and 1800 tph respectively.

Two nos. Silo having capacity of 4000te each have been envisaged on the proposed Chandragupt (Amrapali) railway siding for loading and despatch of coal. Coal from Silo will be loaded into railway wagons through Rapid load out system (capacity 6500 tph) for final despatch of coal to the desired customers.

10.2.6.4 Dust Control System

The Dust control system envisages both dust extraction as well as dust suppression system.

10.2.6.5 Dust Suppression System

The objective of this system is to eliminate the air borne coal dust or suppress the dust at its source. The system involves confinement of the dust within the dust producing area by a curtain of moisture and wetting the coal dust by direct contact between the particles and droplet of water. Adequate number of precision anti-clog nozzles will be installed at suitable locations for suppressing dust by spraying water mixed with suppressant. Suitable control for dust suppression shall be provided and the system shall be so inter-locked that it functions only when the conveyor system is operating or the loading operation is on.

10.2.6.6 Noise Control

Noise pollution causes fatigue to operating personals. Provision will therefore be made to keep down the noise level to the extent possible. All machine mountings will have in their foundations anti-vibration pads/sheets for reducing the vibration and thereby noise. All transfer chutes and hoppers shall have wear resistant rubber or ultra-high molecular weight plastic / synthetic liners of various thickness as per design requirement and their suitability.

SANJEEV KUMAR
MANAGER
CHANDRAGUPTA OPENCAST PROJECT
CCL, AMRAPALI-CHANDRAGUPTA AREA

10.2.6.7 Fire Fighting System

Necessary fire fighting system has also envisaged for the plant, which includes fire hydrant tees at strategic locations in sufficient quantity with suitable water supply pipe lines to cover the entire plant. Also portable type fire extinguishers to deal with electrical / oil /ordinary fires shall be provided at all strategic locations in the plant.

10.2.6.8 Plant cleaning system

To facilitate cleaning at strategic locations ample number of high pressure water serving points have been envisaged. These service points will be so located that entire working area in the plant or equipment working place can be reached. These service points will be provided with quick connecting hose couplings for easy fixing and dismantling of hoses.

To handle discharge from plant effluent and washing of the plant area, sump pumps of suitable design and capacities have also been envisaged where required. Plant effluent shall be discharged through open drain/ pipe.

10.2.6.9Plant Preventive Maintenance

For effective maintenance of all the equipment, there will be sufficient working space around the equipment/machinery. All the equipment and conveyor discharge drums/transfer points, etc shall have covered and well ventilated housing complete with access stair ways, hand rails, platforms, cross-over ladders, etc as required.

Necessary mono-rails electric hoists and chain pulley blocks at suitable points of adequate capacity will also be provided on respective floors.

10.2.6.10 Weighment

For the purpose of Weighment of coal handling and dispatched in the CHP, one belt weigher of suitable capacity have been provided in each receiving and despatch circuit of the CHP conveyors. Four nos. of road weigh bridges have also been provided for weighment of coal during initial years of mine operations.

Three nos. in motion rail weigh bridges have also been provided for weighment of empty and loaded rakes for dispatch of coal.

SANJEEV KUMAR
MANAGER
CHANDRAGUPTA OPENCAST PROJE
CCL, AMRAPALI-CHANDRAGUPTA AR

10.3 ELECTRICALS

The electrical system shall comprise:

- Power reception and distribution system
- Centralized sequence control–cum–interlocking, automation, signaling and instrumentation system
- Illumination of plant and adjacent area

- Centralized welding circuit
- Earthing

10.4 DRAWINGS

A tentative key plan and coal flow of the proposed coal handling system has been given in the drawing.

10.5 RAILWAY SIDING

The proposed railway siding with MGR bulb facilities of adjacent Amrapali Project will be used for loading and dispatch of coal from the mine. The siding would take-off from Manatu station (Near Shivpur) of the proposed Arterial (Tori-Shivpur) line. The approximate distance of the proposed alignment taking off from Manatu station of main Arterial to railway siding of the Amrapali OCP is about 14 Km for single link line and yard portion with MGR bulb. Considering the volume of coal to be despatched through rail, provision for double link line with necessary yard facilities have been envisaged in the proposed siding system. Necessary rail lines in the yard / MGR has been envisaged to accommodate three nos. Silo for loading of coal into railway wagons through RLS. The coal of Chandragupt mine may also be evacuated through this railway siding. As such additional lines in link as well as in yard portion may be required.

Provision has been made in the proposed siding to inter-link in MGR systems so that loading of rakes will be made by any silos & RLS to any consumer wagons for loading and despatching of coal from this project. As such additional rail lines in yard have been proposed to facilitate loading through any Silo simultaneously.

For the proposed production, coal from this Project will be loaded at Amrapali siding through Silo and RLS. Sufficient rail lines in yard and link portion at Amrapali siding has been envisaged to facilitate the loading operation. Provision has been envisaged that two loading chutes of RLS fitted below each silo will be placed on two different rail lines for loading of coal into rail wagons.

SANJEEV KUMAR
MANAGER
CHANDRAGUPTA OPENCAST PROJECT
CCL, AMRAPALI-CHANDRAGUPTA AREA