

CHAPTER-XI

COAL HANDLING PLANT AND DESPATCH
(ALL OPTIONS)

11.1.0 INTRODUCTION:

There are numbers of closely overlying workable seams in the proposed quarry area. Due to the above reason in-pit conveyor system has been proposed. It is proposed to produce (-) 100 mm coal by using surface miners and then transport the same up to CHP by using Inpit conveyor system. There are some existing developed w/g mine standing on pillars. These coal will be evacuated with the help of 35Te truck & Backhoe combination. These coal would be discharged to hopper of Feeder breaker by 35Te truck. The crushed coal from Feeder breaker would be further crushed to (-) 100mm size by secondary crusher and loaded onto Inpit belt conveyor. It is proposed to dispatch (-) 100mm size coal to distant consumers by rail. To meet the above requirement a CHP with coal storage in 20000Te bunker and rapid loading system with 4000Te Silo has been provided for dispatch of coal to the distant consumers by rails. Road dispatch facility has also been provided to meet the requirements of distant customers. Capacity of this CHP is 6.0 mty.

11.2.0 BASIC DATA:

- | | | |
|-------|--------------------------|---|
| i. | Target out put | 6.0 mty |
| ii. | Life of the mine | 27years |
| iii. | Quality of coal | Grade F |
| iv. | Mine operation | 3 shifts/day |
| v. | CHP operation | 3 shifts/day |
| vi. | Customer | Power houses & Misc. |
| vii. | Mode of transport to CHP | By Inpit Conveyors |
| viii. | Dispatch of coal | |
| | - to distant consumers | through rail |
| | - to local consumers | by trucks |
| ix. | Storage facility | 1)Over head RCC Bunker of 20000te
2) Silo 4000te |

- x. Loading arrangement Rapid loading system
@ 3600-5500 tph
- xi. Weighing arrangement of coal
 - to distant consumers Pre-weigh hopper below Silo & rail weighbridge.
 - to local consumers Road weigh bridges
- xii. End product for dispatch (-) 100 mm

11.3.0 INPIT CONVEYING SYSTEM

11.3.1

- i) Coal mined by surface miner require no crushing arrangement, whereas coal mined by Backhoe & 35Te Trucks combination will require two stage crushing.
- ii) Coal mined by surface miner will be transported to inpit by 35te trucks/dumpers to coal receiving station, where reclaim feeder will be laid.
- iii) Reclaim feeder will receive the coal and feed to Inpit belt conveyors.
- iv) Around 4.5 MTY production will come from the surface miner & 1.5MTY will come from Backhoe & 35Te Trucks combination.
- v) Installation of conveyor of Inpit will start from 3rd year onwards.
- vi) In initial period of Inpit conveyors will be laid along the haul road directly from the surface after getting the proper gradient.
- vii) In final stage of Inpit Conveying System there will be 8 nos.of conveyors IC1 to IC8 will be of 1400 mm wide and 1800 tph capacity.
- viii) In Inpit Conveying System 2 sets of 1400 mm wide & 1800 tph have been provided in the main haul road, out of which one will be working and other will be stand bye.
- ix) Inpit conveyor will be connected with the main CHP at surface.
- x) Each Inpit conveyor will be fed by two nos. of Reclaim feeder & one Feeder breaker, which in turn fed to another Inpit conveyor.

11.4.0 COAL HANDLING PLANT (CHP)

11.4.1 Coal from inpit conveyor will feed to main CHP's with the help of conveyors IC7 and IC8. These Inpit conveyor discharge on to tripper belt conveyor C1 or C2 of main CHP. Tripper belt conveyor C1 or C2 will discharge the coal to 20000Te Overhead bunker.

11.4.2 The conveyors C3/C4 will be of 1600 mm wide and of 2200 tph capacity. The belt conveyor C3/C4 will installed bellow the 20,000te bunker. These conveyors will elevate coal and discharge onto silo of 4000te capacity.

11.4.3 The overhead bunker will be of twin slit type. At each slit two numbers (one working & one standby) plough feeders of 2200 tph capacity (av.) will be provided for

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reclaiming coal from the bunker at a regulated rate and discharge on reclaim cum loading belt conveyors C3/C4.

Ultrasonic type level switches will be provided on the carriage of the traveling tripper of the conveyors C1/C2 to monitor the high level of coal in the bunker. In case high level is reached in the bunker, it gives signals so that tripper can move to the next place for discharging coal in the bunker. Similarly low level switches will also be provided in bunker to stop the plough feeder provided at the bunker opening in case a pre-determined low level is reached. Two numbers of partition walls will be provided in the bunker which will be helpful during maintenance and repair. The floor of the bunker will be provided with proper slopes for easy drainage of water. The slanting surface of the bunker will be provided with suitable liners for smooth flow of coal.

11.4.4 The Silo will be of 4000 te capacity and of RCC construction. The Silo will be designed and constructed on mass flow concept to reduce the possibilities of rat holing/arching taking place during evacuation process. Provision for air blasters/air cannons along with suitable air compressor have been made to avoid rat holing/arching inside the silo so that continuous coal flow is assured. The air blasters will be located at different levels. Ultrasonic type high level limit switches will be provided in silo to stop the plough feeder below bunker of a predetermined high level reached in the bunker. Similarly low level limit switches will be provided to close bunker discharge gates if a predetermined low level is reached in the bunker. The conical portion of the silos will be provided with 10 mm thick stainless steel liners and up to a height of 1 m in the vertical walls. The vertical walls will be lined with 40 mm thick epoxy based ironite lining. There will be 4 numbers outlets below the silo. At each outlet one number of hydraulically operated emergency gate will be installed. These will be used in emergency cases during the maintenance of the equipment below the silo and will be operated through independent hydraulic power pack. Further, one number hydraulically operated silo discharge gate will be installed below each emergency gate. The coal will fall into a steel hopper of flush capacity of 115 cum through silo discharge gates. The hopper walls will be lined with 10 mm thick stainless steel liners. The pre-weigh hopper will be mounted on four numbers of load cells each of 60 t capacity to weigh the coal before it is discharged. Below the pre weigh hopper a hydraulically operated swing chute with a flow control gate will be provided by which the wagons will be choke loaded. The wagons will be moved by means of creep controlled diesel locomotive while they are being loaded. Track logic system will be provided on the rail lines to identify the wagons and send signal to the central processing unit for operating the swing chute. The loading system will have print out facilities to have records of dispatch.

11.4.5 Coal dispatches through rail will be weighed in the pre-weigh hopper located below the bunker before loading into the wagons. Coal dispatches by trucks through road will be weighed on 100 t capacity road weigh bridge (1 no.).

11.4.6 SAMPLING: Automatic sampling system with primary sample collector, belt feeder, secondary sampler, crusher, tertiary sampler, bag collector, bucket elevator will

be provided near silo. The primary sample collector will collect coal from the belt conveyor C3 and C4 discharging into the silo.

11.5.0 DUST SUPPRESSION ARRANGEMENT: Dust suppression arrangement has been provided to suppress dust at all transfer points, truck receiving station, over the RCC bunker below the over head RCC bunker, below truck loading hoppers etc. The dust suppression arrangement will be by spraying plain water in atomized/mist form to have better dust suppression. Necessary full cone type nozzles, valves, pipes, pumps, sump, pump house etc. will be provided.

11.6.0 FIRE FIGHTING ARRANGEMENT: Fire fighting arrangement as per statutory requirements will be provided. Fire detection and alarm system will be provided. Fire extinguishers, sand buckets will be provided in control room, substation/MCC rooms, compressor room, hydraulic power pack room, pump house, drive houses etc. to put-off minor nature of fires.

11.7.0 CHUTES: Closed chutes will be provided at all the transfer points to avoid dust nuisance and for proper flow of material. The chutes will be properly lined.

11.8.0 LIFTING TACKLES: Electric hoist blocks suitable for mounting on mono rails will be provided at the drive houses of belt conveyors, maintenance bay of plough feeders to lift the equipment during erection, repairing and maintenance. Traveling type pulley blocks suitable for mounting on mono rails will be provided at transfer points, sampler house, pump house, compressor room etc. to lift the equipment. Fixed type pulley blocks of suitable capacity will be provided in the towers of the counter weights provided for H-loop take up of the belt conveyors. Passenger lift of 1 t. capacity will be provided near 500 te RCC bunker for transport of material and men in the bunker complex. An inspection trolley with cage will be provided over 500 te bunker for inspection of outer and inner surfaces of bunker.

11.9.0 HARD STAND: Three numbers of hard stands will be provided one each near 4000 te silo and drive house of conveyor C3 and C4 for maintenance of equipment.

11.10.0 CONDITION MONITORING: Suitable condition monitoring system to monitor the condition of motor winding and bearing temperatures of the HT motors, oil and bearing temperatures of the gear boxes will be provided.

11.11.0 BELT VULCANIZING: Belt vulcanizing units suitable for vulcanizing of steel cord/N-N belting will be provided. Belt handling device will also be provided to pull the belting during erection and jointing of belting.

11.12.0 Heat sensors will be provided at various levels in the silo to monitor the temperature inside the silo to take proper steps in case of emergency.

11.13.0 The control room near the weigh bridge will be of modular construction and located very near to the weighbridge and on right hand side of the road for communication with the driver. The control room will be air conditioned. Proper illumination, earthing system, lightning protection system will be provided near the weigh bridge. The weigh bridges are of pit less electronics type. The weigh bridges will be provided with required electronics, printout facilities. The print out facility will facilitate in keeping records of weighment.

11.14.0 POWER SUPPLY/ILLUMINATION:

11.14.1 POWER SUPPLY ARRANGEMENT:

Four numbers of 6.6 kV Double Circuit Overhead lines with from the project substation will be drawn up to 4 nos of substations out of which 2 nos will be located in inpit conveying section & 2 nos will be located in CHP & silo section and will be strategically located to cater to the inpit & CHP loads.

All the equipment in the chp will be operated at 6.6 kv/415v/230v, 50 Hz supply.

At each substation required 6.6 kv switch boards, power transformers, lighting transformers, 415V MCC, lighting switch boards, auxiliary power distribution boards etc. will be provided.

All the required protections for over current, short circuit, earth fault and earth leakage will be provided.

11.14.2 ILLUMINATION: The conveyor gantries, transfer houses, drive houses, various floors in silo/bunker/truck loading hoppers, will be illuminated by 70W HPSV lamps with well glass fittings. For illumination of chp outdoor yard high masts 15/30 m with 400 w metal halide lamps will be provided at suitable location. The service buildings such as MCC room, transfer room, control room and other buildings will be illuminated with help of CFL lamps of suitable rating. Service roads will be illuminated by means of 250W HPSV lamps in street light fittings mounted on poles.

11.15.0 CENTRAL CONTROL SYSTEM:

All the equipment working in the coal flow other than overhead RCC bunker will be operated and controlled sequentially from central place. For this purpose one control room will be provided over the substation located near the bunker(20,000 te cap.). All the equipment in coal flow will be controlled from the control room. The other equipment which are not in the coal flow will also be controlled from the control room. A second control room will be provided at silo for control of the reclaim section. The control system will be of PLC type. Local control switches will be provided to facilitate for repair and maintenance of the equipment. PLC system will be provided along with mimic panel, enunciator panel in the control room.

11.16.0 Required earthing system, lightning protection system, safety equipment, communication equipment will be provided. The substations will be pressurized and control room will be air conditioned.

11.17.0 MANPOWER REQUIREMENT

The detail manpower requirement for operation and maintenance of CHP are shown in Appendix B.

11.18.0 CAPITAL REQUIREMENT

The capital requirement with year wise phasing & brief-specification of the equipment are shown at Appendix A.3.5.

RAILWAY SIDING (ALL OPTIONS)

11.19.0 INTRODUCTION

A railway line will be constructed up to Chhal open cast project from the proposed rail corridor which is about 5 km. This will consist of permanent way, culverts, bridges, electrification, signaling, block stations etc. A railway siding consisting of one load standage line (suitable for 58 box N wagons), one empty standage line (suitable for 58 box-N-wagons), engine escape line, one loading station, crossovers, turnouts, electrification, signaling etc. will be constructed at a suitable location near the project for loading of coal through a Silo of 4000te capacity. The transportation of coal will continue to be at Rabertson siding till construction of new rail line upto Chhal OCP.

11.19.1 WEIGHMENT

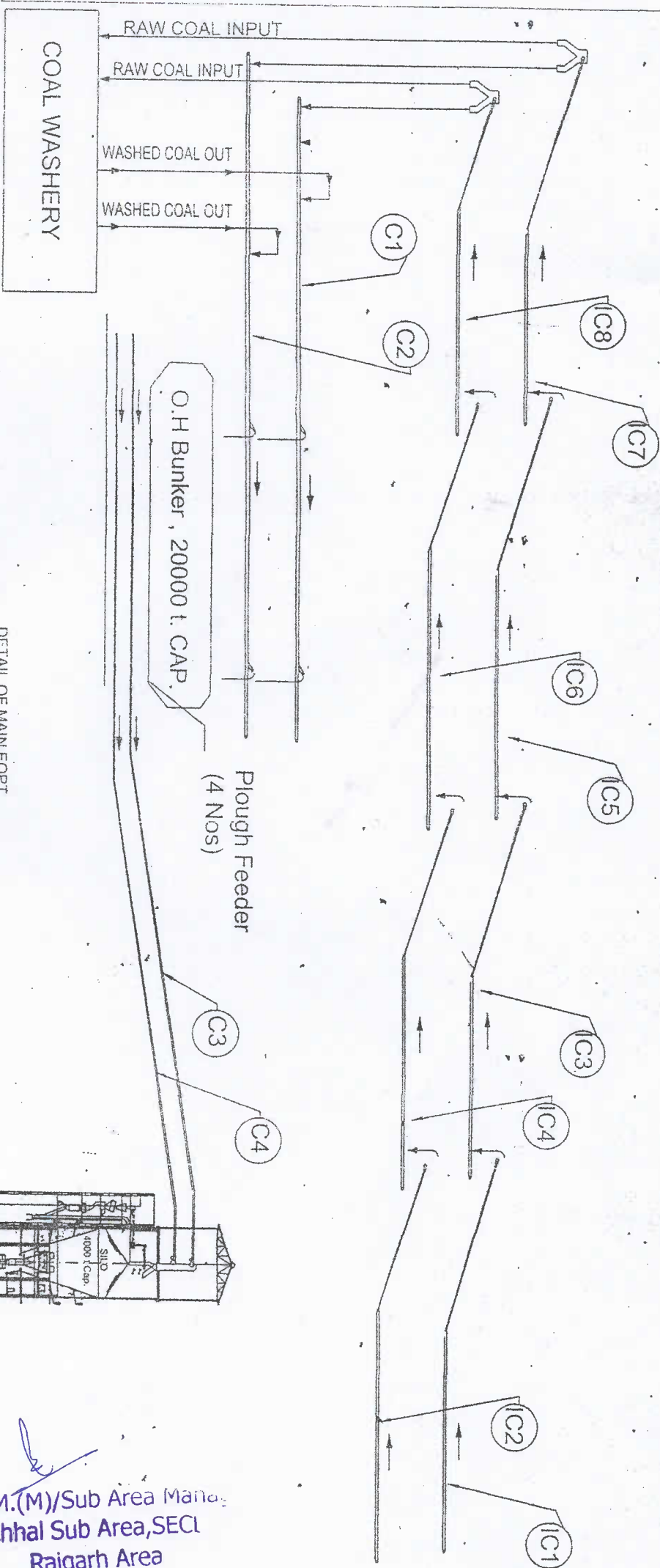
Weighment of coal will be done by pre-weigh hopper installed below the Silo of 4000te & rail weighbridge 100Te installed over the loading line.

11.19.2 MAINTENANCE AND ILLUMINATION

A maintenance shed has been provided near the siding for maintenance of diesel locomotive engine. It is proposed to outsource the maintenance of diesel engine. So no provision of equipment has been made for maintenance, however an E.O.T. crane has been provided in the shed. Proper illumination arrangement will be provided near the siding and loco shed for easy operation at site.

11.19.3 CAPITAL REQUIREMENT

The capital requirement for railway siding including the 5km incoming line from the proposed rail corridor with phasing is shown at Appendix A-5. The estimated cost for construction of the 5km rail line has been included in Appendix A-5.



COAL WASHERY

CONVEYOR DETAIL

S.No.	CONV.	WIDTH in mm	LENGTH in m.	POWER in Kw.	tph.
1	IC 1/IC2	1400	400	2x350 each	1800
2	IC 3/IC4	1400	400	3x300 each	1800
3	IC 5/IC6	1400	400	3x300 each	1800
4	IC 7/IC8	1400	400	3x300 each	1800
5	CI/IC2	1400	170	2x300 each	1800
6	CI/IC4	1600	400	3x300 each	2200

DETAIL OF MAIN EQPT.

S.No.	PARTICULAR	Cap.	Qty.
1	Slits	4000 t.	1 No.
2	Plough feeder	2200 tph	4 Nos.
3	Automatic sampler		1 No.
4	Passenger lift		1 No.
5	Diesel loco		1 No.
6	Rapid loading system	3600-5000 tph.	1 No.
7	OH. RCC. Bunker	20,000t.	1 No.
8	Road/rail weigh bridge	100 t.	3 Nos.

FOR CHHAL OCP(6.0 Mty)
COAL FLOW DIAGRAM

Dy.G.M.(M)/Sub Area Manager
Chhal Sub Area, SECI
Raigarh Area