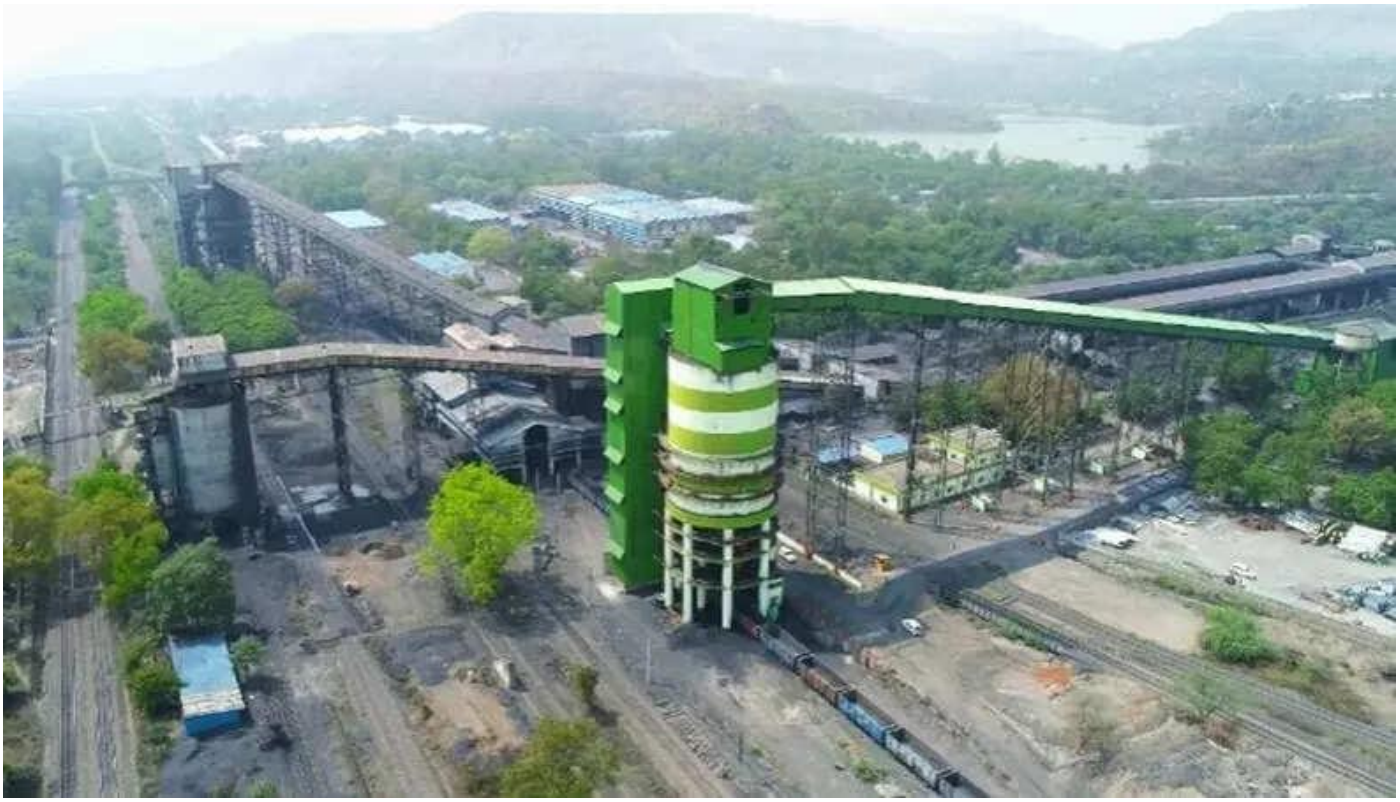


STANDARD NIT
FOR
COAL HANDLING PLANT
(TURNKEY CONTRACTS)
VOLUME –II (TECHNICAL)
(November 2026)

The information given in this document is not to be communicated either directly or indirectly to the press or to any person not holding any official position in CIL/ Government.

TENDER DOCUMENT FOR PLANNING, DESIGN, ENGINEERING, SUPPLY, CONSTRUCTION, FABRICATION, ERECTION, INSTALLATION, TESTING, TRIAL RUN AND COMMISSIONING ON TURNKEY EXECUTION BASIS OF COAL HANDLING PLANT (___ MTY) FOR _____ OCP

AT

_____ COALFIELDS LIMITED,

_____

VOLUME - II: TECHNICAL

_____ 20__

Central Mine Planning & Design Institute Ltd.
(A Subsidiary of Coal India Ltd.)
Gondwana Place, Kanke Road,
Ranchi - 834008 (Jharkhand)

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CHAPTER - I

INTRODUCTION

1.0 Location

The _____ Opencast project falls within _____. It is located in the_____ Coalfields.

0.0 Communication

Information about Road, Rail & Air connectivity.

1.0 Topography

Information about ground topography and salient features.

2.0 Climate

Information about climate such as temperature in Summer & winter; humidity and rainfall.

3.0 About this tender

The project report for _____ OCP has been approved for the production of _____ Mty of coal per annum. Coal production of _____ mty has been proposed from ____ quarries. Coking /non-coking coal will be produced from the mine.(Delete whichever is not applicable) The peak production of coking coal will be _____ mty and non-coking coal will be _____ mty. _____ Coal produced will be loaded into railway wagons through belt conveyors and RLS for despatch to the desired customer. A coal handling system has been envisaged on the surface to handle _____ Mty of surface miner / blasted coal. This tender document has been prepared for _____ Mty coal handling and dispatch.

The quality of the coal is _____grade. _____ Mty crushed coal will be supplied to _____ through Indian Railways. Coal from truck receiving station shall be sent to bunker through conveyors, before it is dispatched to _____.

Sufficient storage has been provided in the coal handling system to meet the eventualities of disrupted coal production in the mine or delay in off-take by Indian Railways. Considering the fact that a very high tonnage of coal has to be dispatched within the stipulated time, a rapid loading system for loading into railway wagons has been adopted.

The coal handling plant shall have facilities for receiving coal from rear discharge dumpers/tippers of _____te, crushing, conveying, storing, reclamation and loading into railway wagons. The coal handling plant has also been provided with suitable fire fighting and communication facilities.

The scope of this tender broadly includes construction of receiving arrangement, storage of coal in a self flowing overhead ground bunker, rapid loading system with silo, dust suppression and extraction, firefighting etc.

The Key plan showing the CHP is given on the tender drawing.

This tender document is for construction of coal handling plant on turnkey basis and operation and maintenance with defect liability period of 05/10 years (delete whichever is not applicable).

4.0 GENERAL

In case of any contradiction between these parts/sections of the NIT, the purchaser should be contacted for clarification. Also, where there are discrepancies in text and drawings, the data given in the text is to be followed. All the equipment and facilities are to be supplied by the successful bidder within the estimated time period. All equipment / systems shall be designed, fabricated and selected as per relevant Indian standard / international standards and up to date engineering practices and necessary inspections / test certificates shall be submitted along with equipment supply to certify the quality and genuineness of critical components and capacity and other technical parameters of the equipment/systems.

4.1 Necessary technical parameters have been given in the subsequent clauses of this document for design of the plant. Tenderers / Bidders are required to carry out checks to ensure guaranteed performance of the system.

4.2 Tenderers/ Bidders are requested to get themselves acquainted with the various provisions of this document before submitting their offer. Tenderers may visit the site at their own cost to get the necessary details and become conversant with the site conditions. Due to undulations of the site, the levels etc. shown in the drawings are indicative and have been given for the tendering purpose only. Bidders are required to make an assessment of the site conditions and other related data as required, before tendering their offers so as to include in their offers all the expected costs due to variations in the levels etc. as indicated in the drawings.

CHAPTER - II

BASIC DATA & SYSTEM DESCRIPTION (for Design Purpose Only)

1.0 BASIC DATA

Production capacity of the mine (ultimate)	:	
No. Of working days considered/year		330 Days
No. Of working shifts/day	:	3
No. Of effective working hours/shift	:	5 Hrs.
Method of coal winning	:	
Details of Dumper for Coal	:	
Quality and other parameters of coal Grade	:	
Hardgrove Grindability Index (H.G.I.)	:	
% of inherent moisture	:	
% of surface moisture	:	
Bulk Density (t/m^3)	:	
Specific gravity of coal	:	
Compressive strength of coal	:	
% of shale & sand stone	:	
Feed size of Surface miner/ crushed coal/RoM Coal –(Nominal)	:	
Consumer	:	
Mode of despatch	:	
No. of wagon loading point	:	
Capacity of RLS	:	

Rake size	:
Loading schedule	:
Maximum temperature	:
Minimum temperature	:

2.0 SYSTEM DESCRIPTION (Refer COAL FLOW DIAGRAM) As per Configuration (Delete whichever is not applicable)

2.1 System Capacity

The system capacity of the coal handling plant shall be designed in such a way so that it can cater to fluctuations in the coal production within an overall rated production of _____ MTY.

(*System description to be mentioned here*)

2.2 Storage

Self-flowing Over ground storage bunker of _____ tonne capacity have been envisaged to take care of any irregularity in the off take schedule of railways.

2.3 Loading

On an average _____ rakes of roughly _____ tonne capacity each will be loaded per day depending upon the availability of rakes. The loading rate of up to _____ TPH has been envisaged through Rapid Loading System to load into the wagons of Indian railway.

2.4 Silo

_____ no(s). of concrete silo of 4000 tonne self-flowing capacity with two no. of pre-weigh hopper has been envisaged. 4000 te Silo along with two number of silo loading conveyors with a capacity of ____TPH each and will be sufficient to load full rakes of wagons within the stipulated time.

3.0 Description of CHP

3.1 Receiving Arrangement & Crushing of ROM Coal

(*Receiving and crushing arrangement to be mentioned here).*

3.2 Storage

(Coal storage arrangement to be mentioned here).

3.3 Loading

The silo feeding conveyors _____ (nomenclature) will discharge coal into the silo. These conveyors will be of ____ mm width, ____ TPH capacity each. These conveyors will load coal into the 4000 tonne capacity silo. The silo will always remain full. Silo shall be equipped with two sets of rapid loading gates and skirts. The silo shall be designed for self-mass-flow. The system shall consist of two sets of pre-weigh bin (100te capacity each) arrangements which shall be placed preferably over two separate tracks. The required quantity of coal equivalent to the pay load capacity of the railway wagon will be discharged into the pre-weigh bin before it is discharged into the wagon. The pre-weigh bins will be located just below the 4000 tonne capacity silo. A rapid loading chute will be placed below each pre-weigh bin to regulate and direct the flow of coal into wagons.

4.0 **Retractable OHE**

Erection & Commissioning of collapsible Rigid OHE is not in the scope of this tender Document, however necessary provision/arrangement of space, clearance, and other relevant requirement shall be made for erection & commissioning of collapsible Rigid OHE in future as per requirement.

However, following should be considered for installation of collapsible Rigid OHE during the construction of Silo:

Rigid retractable OHE underneath silo shall be kept in isolation with the other OHE network of railways.

The span for retractable OHE shall be as per requirement. The layout of rail track has been considered in a straight line underneath the silo. Apart from this the rail track will be straight considerably either side of the silo as per RDSO guidelines with necessary competent approval of zonal chief electrical engineer. 25 m straight is essentially required on either side of the silo. Beyond that the rail layout shall be as per railway norms as well as land availability.

Providing required necessary document/drawing/support for obtaining approvals of suitable rigid retractable OHE system below the silo from Chief Electrical Engineer of concerned zonal railways is the responsibility of the bidder, based on the RDSO guideline No. TI/MI/0044(09/2017) Rev-1 dated 18.9.17 or latest.

Arrangement for integration of collapsible Rigid OHE with control system of Silo will be the scope of this tender document.

5.0 **Environmental Protection Measures**

Necessary measures for dust suppression and ventilation shall be provided at various places as required. Dust suppression arrangement shall be provided at dumper discharge point, transfer point, bunker top and loading point.

For plant safety and fire hazard condition monitoring and suitable type (Dry and hydrant) fire fighting equipment shall be provided to cover entire coal handling plant.

6.0 Metal detectors, Magnetic Separators & Belt Weighing

To protect the belt from damage by ferrous and non-ferrous materials, metal detectors and Magnetic separator have been provided in the coal handling plant. These devices shall be located on conveyors _____.

One number of belt weighing scale has been envisaged in each conveyor. These will be located on the conveyors _____.

There shall be a common control room for all equipment in accordance with pre-determined sequence for starting and stopping. But provision for local control of any equipment shall also be provided for emergency purpose. Sequence inter-locking between different equipment shall also be provided.

7.0 Sampling system

A sampling unit shall be located at silo loading conveyors (_____). The collected sample shall be sent to laboratory for analysis.

8.0 Brief description of works:

The tender is for construction of CHP as shown in tender drawing and Defect liability for a period of 60/120 months (delete whoever is not applicable) from the time of completion of the trial operations as mentioned in Volume-I of tender document. Operation and maintenance of proposed CHP shall be covered under this tender during entire Defect liability period.

The brief description of works is as under:

1) Truck receiving and crushing station, truck receiving hopper, truck loading station, crushers, feeders, collecting conveyors. (Delete whichever is not applicable)
2) ___ nos. of conveyor from receiving hoppers to 4000 te Silo including _____ nos tripper conveyors.
3) Truck receiving and crushing station consisting of _____ nos crusher(primary) with crusher(secondary) of _____ capacity (Delete whichever is not applicable) and _____ te hopper capacity. Truck receiving hopper consisting of ___ nos. receiving hopper of ____te capacity each with ___ tph vibro-feeder each.
4) Transfer cum drive house (_____) and one drive house /cum sampling house (_____).
5) Two-way chute with motorised flap gate at discharge of conveyor _____.
6) _____ nos. _____ te over-ground bunker with 4 nos. plough feeders of _____ tph capacity each in each Over Ground Bunker.
7) _____ nos. 4000 Te Silo with Rapid Loading System having 2 nos. 100 te pre - weigh hoppers and provision for OHE system.

8) Automatic sampler and sample preparation house.

9) Safety and dust control system.

10) Chutes & liners as per requirement.

11) Equipment (Motorised belt reeling/unreeling drum) for belt erection/ replacement and vulcanising during maintenance of conveyor belt shall be made available at site

12) Electrical sub-station___, ___, ___& ___ at ___, ___, ___ & ___ respectively (edit as per applicability).

13) Remote and sequential control and monitoring system of each stream.

14) Control of drives in receiving pit complex; drives of all conveyors and equipment of bunkers and Rapid Loading System.

15) Illumination system in receiving pit complex, bunker, conveyor gantry, transfer/drive houses, Silo and substations under the scope of work.

16) Traffic Contol Console at Truck Receiving Station.

17) Description of HT/LT cables, Earthing & Lightning Protection System.

18) Description of CCTV Systems.

19) Communication/Loud hailing/Public Adressing system for CHP.

20) Necessary lifting tools (motorised hoist, chain pulley block) and tackles and spot repair facilities.

21) Ventilation system for CHP wherever required.

22) Plant cleaning and drainage.

23) Condition Based Monitoring system.

24) Design and engineering, erection, commissioning and associated civil and structural works with site office and rest rooms.

25) Drinking water and toilets, roads with lighting system and fencing for entire CHP and water supply system for firefighting system.

26) Firefighting system of all streams of CHP. Necessary piping, pumps, valves, pump house, associated power supply system etc. are within the scope of this work.

27) Suitable no. stationery compressors of suitable capacity for plant cleaning in addition to portable compressor

28) Any other item(s) not included in the above list but necessary for efficient operation and maintenance of the entire plant.

CHAPTER - III

SCOPE OF SUPPLY AND WORKS

1. BRIEF DESCRIPTION OF EXISTING SYSTEM

GENERAL

1.1 This tender document for ____ CHP is for planning, design, engineering, manufacture, supply, shop fabrication, assembly, testing, packing, transportation to site, insurance, delivery to site, receipt, unloading, handling, storage at site, fabrication at site, installation and erection including all civil, structural works and associated electrical & mechanical works and other allied auxiliary facilities such as retractable OHE system, ventilation, dust extraction & dust suppression system, office cum store building, drinking water supply system, firefighting etc. for coal handling plant **including operation and maintenance for 05/10 years (delete whichever is not applicable).**

1.2 The equipment and works introduction (Chapter-I), system description and basic data sheet (Chapter-II), and technical specification (Chapter-IV) are indicative and not limited to the description and/or list given.

1.3 All mechanical & electrical equipment and systems and civil works are within the scope of supply and works of contractor.

2.0 SCOPE OF SUPPLY:

2.1 Equipment, Accessories and Facilities

2.1.1 List of mechanical equipment, accessories Facilities is given in **Annexure-III.1.**

List of conveyors and belting is given in **Appendices-A and B** respectively.

Location for installation of electric hoist & chain pulley blocks is given in **Appendix-C**

2.1.2 List of electrical equipment and accessories is given in **Annexure-III.2**

3.0 **Scope of works and services:**

3.1 The scope of work covers all the related civil and structural works, transportation, insurance, storage at site, erection and commissioning, performance tests, detailed engineering, PAT & FAT and handing over of plant and includes but not limited to the following:

I. Design & engineering of all mechanical, electrical, civil and structural works of the plant.

II. Erection and commissioning of all the plants and equipment, Supervision at site and Inspection & testing.

III. PAT & FAT may be completed with/without the operation of OHE if siding is not electrified.

IV. Defect liability for a period of 60/120 months (delete whoever is not applicable) from the time of completion of the trial operations as mentioned in Volume-I of tender document. Operation and maintenance of proposed CHP shall be covered under this tender during Defect liability.

V. Performance and guarantee tests, Final acceptance.

VI. Training of plant personnel as detailed in elsewhere.

VII. Any other works/services not mentioned but required for the completion and commissioning of the plant.

3.2 All the items and works specified in this document and any other equipment and work found necessary but omitted is deemed to have been covered in the scope of supply and works in the tender without any increase in the contract price.

3.3 Obtaining approvals from Weights and Measure Department is the responsibility of the bidder.

3.4 Air, water and noise levels shall be within the permissible limits as specified in the bid document. Additional requirement and stipulation by State/ Central Pollution Control Board, if any, on the subject shall also be applicable.

3.4 Adherence to Indian Standards:

All the works including designs, drawings, construction, fabrication, testing, erection, etc. shall be done strictly as per Indian Standards. In absence of Indian standards, International standards like British, American, German or Russian may be used. A copy of the standard used shall be furnished along with the concerned drawing /document during approval.

3.6 The equipment list indicates only broad parameters and the accessories required for successful commissioning / operation of CHP shall be considered to be part of the total works. The other terms and conditions of works including technical, commercial, etc shall be governed by the clauses of the bid and contract.

3.7 The technical parameters to be furnished are subject to scrutiny/approval at the detailed design stage that may undergo minor changes keeping in view the system requirement and various codes of practices/regulation by the statutory bodies. This is also true for drawings. The parameters not specifically mentioned in the bid document shall be decided at the time of detailed engineering subject to owner's approval.

4.0 **Details of works and services:**

4.1 Design Engineering

i) Elaboration and furnishing of system design/drawing, based on actual parameters of equipment to be supplied. The system design as proposed in the plant description shall form the basis of this elaboration.

ii) Preparation and furnishing of all relevant detailed engineering drawings based on system/design drawing included in this Tender Document. This includes fabrication, assembly, installation, erection drawings, etc.

iii) Furnishing of detail design calculations in support of different design and equipment selection parameters.

iv) Furnishing of equipment specification supported by manufacturer's illustrative pamphlets and literature.

v) Furnishing of operational, maintenance and spare parts manual supported by the illustrative pamphlet and literature of manufacturers.

vi) All approved/As-Built drawings and documents shall be supplied in five copies in addition to one soft copy in AUTOCAD on CD. Final drawing/literature shall be presented in the form of document.

vii) All drawings shall comply with current Indian Standard specifications and shall be sufficiently detailed with dimensions and shall be clear and legible.

viii) The bidder shall submit detailed time schedule in the form of PERT Network for complete plant and subsequently for each major activity for monitoring purpose. The same shall be updated from time to time. This is essential in view of maintaining time schedule. The successful bidder shall have to submit monthly/quarterly progress report of the various works being carried out.

4.2 Erection and Commissioning

4.2.1 Erection & commissioning of tail end frame with drum, external cleaner, skirt board, intermediate structures, take-up, drive head including motor, gear box & couplings, discharge drum, conveyor rollers, single / two-way discharge chute for conveyors, safety switches and laying/replacement of suitable belting and vulcanising of conveyors.

4.2.2 Erection & commissioning of entire plant comprising of truck receiving hoppers, coal receiving complex, Rapid loading system to facilitate loading through electric loco, provisioning of necessary space/clerances for retractable arrangement of electric OHE within the loading area (as per requirement), Vibratory feeders, Sampling system, belt weigher, magnetic separator, metal detector, chain pulley block, electric hoist, manual hoist, fire-fighting system along with associated accessories, erection and commissioning of dust suppression system, condition monitoring system and remote control and monitoring system.

4.2.3 Erection and commissioning of dust suppression and ventilation equipment at different locations.

4.2.4 Construction/Installation of receiving hoppers shall be designed to receive feed from ____T or low capacity rear discharge dumpers. Dimensions mentioned in the drawing are only indicative. These may change at detailed design stage. (Refer tender drawing).

4.2.5 Installation of lifting and hoisting devices.

4.2.6 All Transfer points as indicated in the tender drawing.

4.2.7 All the belt conveyors, two-way / one-way discharge chutes with motorised flap gate as shown in tender drawing.

4.2.8 Construction of _____ nos. _____ Te OH RCC ground bunker suitable for installation of plough feeders and tripper conveyors. Acoustic/Radar level indicators will be provided in the bunker to show the coal level position.

4.2.9 All Transfer / drive houses as indicated in the tender drawing

4.2.10 _____ no. 4000 te RCC Silo with pre weigh hopper consisting of hydraulic power pack, cylinders, guillotine type gates for high-speed load out, arch breakers, load cells, wagon loading telescopic chute and temperature sensors.

4.2.11 **Rapid loading system**

The loading will be done through rapid loading system on an average one wagon per minute. The loading shall be controlled from control room located at first floor of the silo. The rate of loading will be around _____ tph matching the creep speed of locomotive. Necessary provisioning of space/clearances shall be provided for Rigid retractable OHE system below the Silo for movement of electric loco. The erection of OHE is not in the scope of the Tender.

The rakes will be hauled by a creep-controlled locomotive at 0.8 to 1.2/1.5 km/hr(as per availability). Suitable nos. of Acoustic/Radar level indicators will be provided in the silo to show the real-time coal level position. Air blasters shall be provided to avoid /break the arch formation inside the silo and to ensure smooth coal flow through the silo. The system shall have the switches for emergency stop of feed conveyors in case of over filling of silo. There shall be temperature sensors to indicate the abnormal temperature inside the silo and provide caution so that fire fighting measures can be taken up. A Passenger/Freight lift has also been envisaged at silo.

To ensure better loading and weighing accuracy pre-weigh loading system shall be adopted. No separate wagon weighing system is required. There shall be two loading pockets preferably one over each track. Silo shall be provided with periodic inspection facilities.

4.2.12 **Sampling system**

For determining the quality of coal despatched by each rake there shall be provision of automatic sampling of coal from the coal streams of in feed conveyors to the silo. The sampling system shall conform to BIS /ISO/ASTM specifications and shall consist of a primary sampler fitted to each in feed conveyor and a primary sample belt conveyor to collect coal samples from the two separate sample discharge chutes and to convey the primary sampled coal to the sample preparation system.

4.3 Miscellaneous Systems:

4.3.1 Safety devices

All the equipment and conveyors in the circuit shall be provided with necessary safety devices such as emergency stop switches, overload protection, wire-netting, railing type or guards, pull chords switches, belt sway switches, zero speed switches, brakes, holdback devices, etc wherever applicable. All equipment in both the streams will be started and stopped from the central control room in a pre-determined sequence consecutively i.e. one by one with a definite time lag. The sequence of starting of drive will be in the reverse direction of coal flow, while stopping of the drives will be in the direction of coal flow. In case of stoppage of any equipment in the circuit for any reason, all the preceding equipment/conveyors shall be stopped automatically.

Pre-start hooters shall be blown to alarm the operating and maintenance personnel. All the floors and distant transfer houses shall be provided with audio-visual signals to alarm the working personnel locally. Necessary walkways and crossovers shall be provided along the conveyors. Under-netting shall be provided wherever conveyors cross any roads or working areas as elaborated elsewhere.

4.3.2 Pollution control

Dust suppression

Proper water supply arrangement for dust suppression will be made at dust generating points so that all working space remains free of dust. For dust suppression water jets will have to be provided in receiving pit area, silo loading point, transfer houses. Fog type dust suppression shall be used at all the enclosed areas. For proper ventilation in all the working floors, arrangements for installing exhaust fans/ventilation fans with ducting will have to be made as detailed elsewhere in the tender document. All civil works pertaining to dust suppression and extraction shall be as per system requirement. Dust suppression system should be suitable for water which is available at Project.

The pumping sets for the dust suppression/control should have 100% stand-by at each location.

Necessary measures shall also be taken for noise and vibration control.

4.3.3 **Repair facilities**

Necessary spot repair facilities shall be provided for plant and equipment including lifting tools and tackles. Provision for site storage of spares and tools shall also be made. All lubrication charging points shall be dust free. A drum of suitable diameter and slow speed drive arrangement shall be provided at each drive house of conveyor system. This will facilitate automatic changing of conveyor belt.

4.3.4 **Chutes and liners**

Chutes shall be designed for a smooth flow of coal and they shall be lined with suitable replaceable SS-409 liners. Wherever the flow of coal is likely to be obstructed due to moist nature of coal or due to long arm of chute, the facility of chute actuators and chute block switch along with tripping arrangement shall be provided as specified. Conveyor chutes shall be carefully designed with respect to the coal trajectory to minimise impingement and wear on lining plates.
All the chutes feeding to Secondary sizer shall be designed such that the coal stream coming from the discharge pulley is uniformly distributed along the entire length of sizer rolls.

4.3.5 **Drinking water and other facilities**

Facilities for distribution of drinking water shall be provided all along the plant with provision of toilet facilities at suitable points as detailed in civil section.

4.3.6 **Plant cleaning and drainage**

Suitable arrangements shall be made for cleaning of plant especially at the spillage point with the help of water hydrants and vacuum cleaners in case of electrical panels and plant equipment. Water and compressed air pipe line network along with connection/tapping points with control valves at suitable intervals shall be provided in the receiving pit floors, transfer and drive houses, conveyor galleries (maximum interval of 50 meters), sub-stations, etc. for pressure cleaning of floor chutes, walkways etc. Proper drainage arrangement shall be made all along the plant so that water or slush accumulation is avoided. At every probable spillage point suitable arrangement shall be made for cleaning. Debris chute shall be provided for discharge of effluents from each floors of Transfer/Drive/Sampling Houses.

The effluent shall be discharged into a suitable location / ETP by drainage or through pumps, pipes, etc. These shall be served by portable compressors as envisaged in the bid document.
Proper drainage arrangement will have to be made all along the plant so that water or slush accumulation is avoided.

Water and compressed air pipe line network along with connection /tapping points with control valves at suitable intervals shall be provided in the receiving pit floors, pent houses, secondary sizer house, transfer and drive houses, conveyor galleries, sub-stations, ground bunker etc. for pressure cleaning of floor, chutes, walkways etc. Stationery compressors as per requirement shall be provided in addition to portable compressors for proper cleaning throughout the coal handling plant. Proper drainage arrangement will have to be made all along the plant so that water or slush accumulation is avoided.

4.3.7 Fire fighting of total coal handling plant

Fire fighting system shall comprise of (a) hydrant system, (b) mobile fire extinguishers (c) water spray system comprising of automatic medium velocity water spray system (d) automatic sprinkler system.

Fire fighting system shall be designed to meet the various requirements laid down in the specification & relevant Indian/International standards(latest).

Hydrant system: The fire hydrant system shall be designed considering the entire plant generally as ordinary hazard as per Specification in Chapter IV and shall consists of a net work of over ground piping feeding pressurised water to a number of double headed hydrant valves located through out the entire coal handling plant.

MVWS System: MVWS system shall be provided in all conveyors as detailed elsewhere.

Portable & Mobile Extinguishers: Portable extinguishers of carbon dioxide type, dry powder type & soda acid/DCP type shall be installed at suitable locations all along the plant as per Specification(Chapter IV). Mobile extinguishers of required number shall be provided.

Different types, as described above, shall confirm to the latest BIS/ International standards.

4.3.8 Site office and rest room, etc

An office of suitable size for CHP shall be provided for engineers/supervisors and a rest room for workers shall be provided. Other service buildings shall be provided as detailed elsewhere and/or, as per requirement.

5.0 ELECTRICAL

Scope of supply and work related to CHP & its peripherals shall be described.

(Details to be mentioned as per project requirement)

6.0 CIVIL AND STRUCTURAL WORKS

6.1.1 GENERAL

The scope of work under this contract shall include design, construction and successful commissioning of all civil and structural works, supply of detailed survey drawing showing contour, geo-technical investigation including the supply of geo-technical report, supply of detailed design, working drawings including all relevant calculations and all necessary works as may be needed for testing and commissioning, elimination of all teething trouble, performance test and handing over of the plant as envisaged in detailed scope of work and system description. The necessary construction, erection, commissioning of equipment related to civil engineering works shall be provided and transported to the site of work by the contractor. Due consideration shall be given for economy, architecture and functional utilities. This is a contract for purchase of complete installation including planning and design, manufacture, execution, supply, erection of civil & structural work. Accordingly, all works needed for successful completion and operation of the plant shall be covered in the Scope of work whether specifically mentioned here or not.

Battery Limit

For the purpose of defining the scope of work of this chapter within the CHP site, the battery limit of the CHP is defined as all areas wherever the proposed CHP elements are located including all service buildings, infrastructural and developmental facilities proposed/required for successful execution and operation of the plant. It will also include those areas adjacent to these facilities as required for successful implementation of the project up to a minimum distance of 25m from the proposed facilities.

Adherence to Indian Standards

All the works including designs, drawings, construction, fabrication, testing, erection, etc. shall be done strictly as per relevant BIS Code of Practices. Wherever Indian Standard is not available, other international/global standards may be used only as per its applicability and justification with due consent of the same from subsidiary or its consultant.

BASIC SCOPE

The scope of work covers all the related civil and structural works, detailed designing of the same and successfully commissioning of the civil and structural works for handing over the plant. This shall inter alia, include the following:

6.1.1.1 Design & engineering of all civil and structural works of the plant.

6.1.1.2 Execution of all civil/structural works consisting of the following:

a) Detailed survey of site including contour map preparation to be submitted with coordinate system on National grid. There should be minimum two reference points from Colliery Grid. Reference points should also be surveyed with DGPS and mentioned WGS Coordinate for future co-relation with any grid.

b) All the geo-technical investigation required for the work including furnishing the geo-technical report, collection of hydrological, blasting and rainfall data including any other data related to design and execution.

c) Preparation of construction site

The owner shall provide a hindrance free site in this respect. Any electrical line, elements of drainage/ sewage/ water supply system, buildings/ sheds/ temporary structures, pavements/yards etc. which may create problems in execution of the project shall be cleared by the owner, if not otherwise mentioned in this document, on written request from the contractor. The time schedule of these clearance activities during/prior to construction shall be mutually agreed after due discussion.

The scope of the tender does not include, if not otherwise mentioned particularly elsewhere in this document, removal of coal, scrap material, machineries, construction material etc. kept by the owner in the site.

Generally, the existing natural nallahs shall not be diverted. If required, such diversion of natural nallahs, if not otherwise mentioned in the document, shall be carried out by the contractor considering the catchment area and drainage requirement of the site and its surroundings as well as hydraulic design with approval of the owner. The responsibility of procurement of any requisite permission for such diversion of water bodies and roads if the case arises will be with the owner.

Diversion of existing roads, to the extent possible shall be avoided. In case of crossovers of the system alignment and the existing roads, the existing roads shall not be diverted unless otherwise specifically mentioned in the NIT. If,

CHP elements like Receiving Pit complexes, bunkers, hoppers, silos, transfer /drive houses etc. excluding the conveyor gantries have been proposed to be located on an existing road, such road will be diverted by the contractor with due consultation with the owner if not otherwise specifically indicated in the NIT. However, minor diversions/repairing/re-profiling of a small part of the existing roads if required for execution or for safe and efficient operation of the plant shall be under the scope of this contract.

Unless otherwise noted elsewhere, removal of all existing underground elements like foundations/ tunnels/ wells/ retaining structures/ sump/ culverts etc. as per requirement shall be done by the contractor.

Removal of existing overburden materials, debris etc. shall be done by the contractor if not otherwise specifically mentioned in this document.

Existing bushes, hedges and minor plantation shall be cleared by the contractor as per requirement. Major plantations shall be cleared by the contractor and the permission required if any will be the responsibility of the owner.

d) Supply of fabricated structural steelwork and shaped rebars as required.

e) Supply of all civil construction materials and other materials required.

f) Execution of all civil works.

g) Fabrication and erection of structural steel work.

h) All civil and structural works required for equipment and accessories under supply.

i) Excavation/ construction/ erection/ installation and commissioning of all auxiliary services such as sanitary, drainage, roads, retaining walls, pavements, office and service buildings, lighting towers, landscaping/ grading/ levelling/fencing/site clearing as detailed elsewhere.

j) Transportation of all construction materials to site, whether procured from within the country or from other countries.

k) Water supply arrangement for potable, industrial and firefighting purposes.

l) Drainage and treatment (for domestic sewage and industrial effluent) including its dovetailing with the existing system and Rainwater harvesting system as per the approval.

m) Firefighting arrangement.

n) Roads, pavements, retaining walls, culverts, bridge etc.

o) All protective measures for proper drainage for safety of structures, against ingress of water / seepage due to seasonal nallahs and its tributaries which may be flowing through the construction site area as per actual site conditions and requirement.

p) All protective measures for slope stability of overburden and excavated earth as per requirement.

q) All protective measures for safety of men and materials during construction against rail/dumper movements on existing railway tracks/haul roads.

r) On written request of the contractor, the owner shall provide water to the extent needed by the contractor for construction, maintenance (and operation if the same is under the scope of this NIT) of CHP. The owner shall provide such water supply at one point near the CHP plant, water charges shall be deducted from the contractor's bills. Contractor shall procure and install a water meter for this purpose. The rate of water charges shall be decided by the owner. Withdrawal of surface/sub-surface water from within the owner's land by the contractor shall be allowed only after due permission from owner.

s) Erection and commissioning of all the plants and equipment.

t) Inspection and testing.

u) Performance guarantee.

6.1.1.3 Perception and remedial measures for the safety of entire CHP area under the scope keeping in view the adjoining natural and artificial features such as hill slopes, nallah, buildings, etc.

6.1.1.4 This being a turnkey contract, successful completion and commissioning of the plant shall be responsibility of the contractor.

6.1.2 DESIGN /ENGINEERING

6.1.2.1 DESIGN CRITERIA

All detailed design and working drawings will be developed with proper co-ordination and inter-relation with mechanical and electrical equipment. The design criteria for civil engineering works shall be as per the latest standards, codes & recommendations by Bureau of Indian Standards or Indian Road congress or MORTH specifications. In absence of suitable IS specifications,

codes approved by other recognized international bodies may be used as per its applicability & justification with due consent of owner or its consultant.

The contractor shall be responsible for and shall pay for any alterations of the work due to any discrepancies, errors or omissions in the design and drawings or other particulars supplied by him, whether such design, drawings or other particulars have been approved by customer or not.

All the RCC members shall be painted with Heavy Duty Masonry paints, (like premium acrylic based) for providing durable and long lasting finishing that shall be resistant to weathering and harsh conditions after initial prime coat.

All the structural steel members shall be sand blasted and painted with minimum two coats of epoxy paint after prime coat. The thickness and coats of epoxy paint shall be as per environmental conditions prevailing at the site.

The contractor shall be responsible for and shall pay for any alterations of the work due to any discrepancies, errors or omissions in the design and drawings or other particulars supplied by him, whether such design, drawings or other particulars have been approved by customer/owner/consultant or not.

6.1.2.2 DESIGN PARAMETERS

Design parameters & other aspects related to design of civil & structural related to CHP & its peripherals shall be described.

A. Loads

Loads to be considered in design shall be as per relevant BIS codes of practices. Generally, in design the effect of dead loads, live loads, load due to impact, vibration, erection, wind load, seismic loads, dust load and load due to surcharge and moving vehicles, effect of blasting etc. wherever applicable shall be considered. The loads due to equipment shall be supplied by the contractor. In general, dead load, live load, wind loads, etc. shall be as per BIS-875 (latest edition). Seismic loads to be considered in design shall be as per BIS 1893 (latest edition). However minimum loads for different structures shall be as described hereunder:

i) Dead Load

Dead loads on the structure shall include self-weight of the complete structure with flooring, finishing, fixtures, partitions, wall panels and all equipment

supporting structures, weight of equipment of semi-permanent nature etc. including all likely dead loads to be experienced by the structure during its life time.

The following unit weight of material shall be considered for computation of loads. Loads given in IS: 875 (Part-I) shall be made use of for material not listed below.

Materials:	**Minimum Unit weight**
Plain cement concrete:	2.40 t/cum
Reinforced cement concrete:	2.50 t/cum
Brick masonry:	2 t/cum
Floor Finish:	2.4 t/cum
Hollow block:	1.5 t/cum
Structural Steel:	7.85 t/cum

1.2 t/cum for load calculation.

However, the higher of the actual unit weight as determined from laboratory test data or the minimum unit weight of coal shall be considered.

Dead loads for process materials shall be as per mechanical/ technological load data.

Note: For volume calculation of silos/bunkers/hoppers etc. maximum unit weight of coal shall be taken as 0.8T/cum.

ii) Imposed Load/ Live Load

a) Imposed loads in different areas shall include live loads, dust loads, equipment loads, coal load in conveyor, cable trays, small pipe racks / hangers, erection loads, operation / maintenance loads etc. The loads considered shall not be less than that specified in IS: 875 (Part II). For special use areas live loads shall be revised upward as necessary as per the technological requirement.

The following minimum live loads shall be adopted for design of buildings / structures		
a)	Flat roof	Accessible roof – 200 kg/m^2 (150 kg/m^2 for LL and 50 kg/m^2 for dust load)
		Non-accessible roof – 150 kg/m^2 (75 kg/m^2 for LL and 75 kg/m^2 for dust load)
b)	Inclined Roof	As per IS:875 for live load plus 50 kg/m^2 dust load.

c)	For building floors where equipment are located	500 kg/m^2 for light duty 700 kg/m^2 for medium duty 1000 kg/m^2 for heavy duty or equipment load (when placed elsewhere) whichever is higher
d)	Maintenance platform	500 kg/m^2
e)	Walkway of conveyor gallery	300 kg/m^2
f)	Office room/ substation	300 kg/m^2
g)	Stair case	400 kg/m^2
h)	Equipment loads	As per Manufacturer's load data
i)	Toilet rooms	200 kg/m^2
k)	Culverts and their allied structures including RC Hume Pipes	As per IRC standard for Class 'AA' loading or as per functional requirement whichever is higher.
l)	Cable rack	As per Electrical/Structural load data
m)	Underground structures (including trenches / drains etc.)	500 kg/m^2
n)	Pre-cast trench covers	500 kg/m^2

b) Reduction of Live Load may be done in accordance with the provisions of IS: 875 and IS:1893 in case of seismic analysis.

Note: In case the erection load on any particular area is higher than the specified live load of that area then the design of structure shall be done based on erection loads.

c) Impact Factor

If not specifically mentioned by the equipment manufacturer the following impact factors shall be considered.

Due to moving hoists etc.:
for electrically operated hoist – 1.25
for hand operated hoists- 1.1

For floor beams directly supporting drive machinery like head end / tail end / drive pulleys, motor, gear boxes etc. - 1.5

iii) Wind Load

The design wind load shall be calculated as per provisions of IS: 875 (Part-3) Latest.

iv) Seismic Load

Structures shall to be designed as per codal provisions of IS:1893 for earthquake loads. The loads due to Earthquake are generated by the response of the structure to design spectrum as specified in IS1893. The mass to be considered in seismic analysis shall comprise of full dead load and minimum percentages of live loads for calculating inertia masses shall be as given below:

Sl. No.	Description	Percentage of Design Live load
1	Uniformly distributed live loads on floors up-to and including 3 kN/sqm	25 %
2	Uniformly distributed Live loads on floors above 3 kN/sqm	50 %
3	Roof	0 %

v) Earth pressure load

a) Earth pressure for all underground structures shall be calculated using coefficients of earth pressure (active/passive/at rest). Necessary load combination for water retaining structure to get worst loading for design shall also be considered.

b) In addition to earth pressure and ground water pressure, surcharge load as calculated (minimum 10kN/sqm) at ground level shall also be considered for the design of all underground structures including channels, sumps, cable and pipe trenches, etc. to take into account the vehicular traffic in the vicinity of the structure.

vi) Blasting

Effect due to blasting is to be considered while designing the structures, as per the provision of BIS: 6922 with latest revision:

B. Load Combinations

All structures shall be designed for the most critical combinations of dead loads, live (imposed) loads, equipment loads, crane loads, erection loads, wind loads,

seismic loads and any other loading conditions which can occur during the design life of the facility. Equipment specific loads shall be judiciously combined to provide worst effect.

Load Conditions for Underground Structures

Following loading conditions shall be considered in addition to the loading from super structure for the design of sumps, trenches and other underground structures.

i) Only liquid pressure from inside and no earth pressure & ground water pressure from outside (applicable only to the structures which are liable to be filled with water)

ii) Earth pressure & ground water pressure from outside and no water pressure from inside.

Structure shall be checked against buoyancy due to ground water during construction and operation stage considering ground water level at finished ground level and factor of safety shall be 1.2

C. Liquid Retaining Structures

RCC liquid retaining structure like water storage tanks/ sumps will be made leak proof and designed in accordance with latest IS: 3370 (Part I to IV) by using Limit state method.

The crack width shall be restricted to 0.2 mm for water retaining structures in case it is designed with limit state method.

However, the parts of such structures not coming in contact with storage liquid shall be designed according to IS: 456. The thickness of clear cover shall be as stipulated in IS: 3370.

All underground structures will be designed minimum for moderate exposure condition as per Table 3 of IS: 456.

D. Machine Foundations

The design of machine / equipment foundation will be as per IS: 2974 and IS: 456. Frequency and amplitude criteria shall meet the requirement as laid down by the relevant codes or machine manufacturers.

It is desirable that Foundations of equipment subjected to dynamic loading including sizers are isolated from adjoining floors / foundations to prevent

propagation of vibration to adjoining structures and shall be done as far as far as possible. However, for Crushers, such isolation is compulsory.

E. Stability of Structures

Following minimum factor of safety will be followed:
a) Factor of safety against overturning: As per Cl 17.1.2 of IS 1904.
b) Factor of safety against sliding: As per Cl 17.1.1 of IS 1904
c) Factor of safety against uplift due to hydrostatic forces: 1.2

F. Minimum Thickness of Concrete Structural Elements

The following minimum thickness shall be provided:

1	Suspended floor / slab / walkways / canopy slabs, etc.	125 mm.
2	Ground floor slab (non-suspended)	125 mm.
3	Ground floor for Bunker	200 mm.
4	Water Retaining slabs / walls	200 mm.
5	Cable / pipe trenches / underground pits / Launder walls and base slab	100 mm.
6	All footings (including raft foundations)	350 mm.
7	Parapets	125 mm.
8	Sunshades/ Chajja	100 mm. at edge
9	Pre-cast Louvers / fins	50 mm.
10	Pre-cast trench cover slabs / floor slabs	75 mm.
11	Paving	100 mm.
12	Basement walls and base slab	200 mm.
13	RCC Silo Shell Wall	300mm
14	Ground Bunker Inclined Slab	300mm

G. Concrete Mix

Minimum grade of concrete for different work shall be as follows unless otherwise stated elsewhere in this document:

Plain Cement Concrete (PCC)

i) PCC : M-10
ii) PCC for pavement for Railway track : M-20

Reinforced Cement Concrete (RCC)

i)	Grade slab :	M20
ii)	Grade slab for Bunker :	M25
iii)	General RCC members :	M25

iv)	Retaining wall :	M30
v)	Pre-cast RCC members :	M25
vi)	PQC Roads/CC Pavement :	M40
vii)	Water retaining structure :	M30
viii)	Silo, Bunker, Underground tunnels, RCC hoppers and Other Important Structures :	M30

H. Structural Steel

All the structural steel work shall be done as per relevant IS code. However minimum thickness of steel members shall not be less than 6mm except for hollow sections. All GI members shall be 900 GSM zinc coated as per relevant IS code (latest edition).

I. Iron Profile Sheet

Sheeting shall be of precoated galvanized iron profile sheets of shape, size and pitch as approved by Engineer-in-charge with a total coated thickness of 0.50 mm with zinc coating as per IS code (latest edition). The sheet shall be fixed using self drilling /self tapping screws of size (5.5x 55 mm) with EPDM seal, complete upto any pitch in horizontal/ vertical or curved surfaces.

J. Survey, Soil Investigation Report

The soil investigation and survey reports enclosed with the Notice Inviting Tender (NIT) are preliminary and indicative in nature and are intended solely to facilitate realistic estimation of the cost of the work. The bidder shall be responsible for visiting the site, familiarising himself with the existing site conditions, including surface and subsurface characteristics, and assessing all factors that may affect the execution of the work. The bidder may, if considered necessary, undertake additional soil investigation and survey at his own cost for the purpose of bid preparation.

After award of the work, the successful bidder/contractor shall carry out a detailed soil investigation and topographical survey in accordance with the requirements stipulated in the NIT and the applicable codes and standards.

Any variation in site conditions, soil parameters, quantities or other relevant details between the preliminary soil survey reports enclosed with the NIT and the detailed investigation and survey carried out by the contractor shall be duly accounted for by the contractor in fulfilling his contractual obligations. No

additional payment, compensation or claim shall be admissible solely on account of any such variation or discrepancy, and the bidder shall make due allowance for the same while preparing and submitting his bid.

K. Foundation

Foundations for structures and equipment shall be designed to resist the worst conditions of loadings and shall be generally designed as per the provisions of IS: 1904. As per prevalent sub-soil condition, foundations may be considered as shallow or deep foundations. The depth of foundation shall be determined based on loadings on foundation, safe bearing capacity at the foundation level, constructional and technological requirements. The maximum allowable bearing pressure for design of foundation shall correspond to values recommended in the detailed soil investigation report. Wherever any open foundation is recommended in virgin soil, minimum depth of open foundation may be 1.5 m from natural ground level, subject to 1.0 m below bottom of any fill and 500 mm in case of rocky strata. Small and lightly loaded foundations may be kept over fully compacted filled up soil.

Minimum size of pedestal shall be arrived by the following method & the maximum shall be considered

i) Base plate size plus 75mm at all four sides,
ii) Distance between two extreme bolts plus 5 times diameter of bolt from centre of extreme bolts at all four sides.

6.1.2.3 ANALYSIS & DESIGN

All RCC and steel structure shall be designed as per stipulations indicated here and relevant IS Codes of practice of latest revision. In the analysis of structures, the worst loading combination of belt pulls, equipment loads, their impact, wind/seismic loads/blasting effect, coal and other loads as envisaged shall be considered. Considering the hostile and highly dusty environment prevalent in coal mine areas, the allowable interaction ratio for the design of steel structures shall be limited to 0.85

6.1.2.4 DESIGN DRAWING & DETAILED ENGINEERING

Broadly all the dimensions as given in NIT document/drawings are to be followed for bidding purpose. In case of conflicting or varying provisions in the NIT text vis-à-vis NIT drawings, the provisions made in the text shall be guiding. These dimensions are indicative only & may require changes during detailed design.

6.1.2.5 PREPERATION OF DRAWING

All drawings shall be prepared in accordance with the provision of latest Indian Standards.

All drawings should be prepared on AutoCAD in standard format

All drawings shall be sufficiently detailed and dimensioned to help in speedy construction, fabrication and erection of structures.

Wherever, any structure is presented in more than one sheet of drawings, same scale and notations shall be used in all the sheets for linking the drawings with each other.

All modifications made in structure during various stages of construction should be duly incorporated in working drawings.

Bar bending schedule, detailed material list and specification of works shall be prepared / detailed.

Working drawing shall also include general arrangement drawings showing plans at different levels with sectional elevations.

Separate detailed drawing shall be prepared for inserts and anchor bolts including their fixing details.

The design drawings associated with steel structure should show the force in the members, complete details of all members, joints, gusset plates, welding, riveting, bolting, etc. The drawings should also show the weight of each assembly/sub-assembly as far as possible.

In addition to design drawings, fabrication drawings shall also to be prepared, showing item-wise details, erection units, materials list, details of fasteners with assembly, etc.

6.1.2.6 SUBMISSION/APPROVAL

All required documents including design calculations, drawings and other documents have to be submitted in hard copies as well as in soft copies also compatible to the owner and its consultant as detailed hereunder in sequential manner. The methodology of such submission has also been deliberated below.

Submittals from contractor have been classified in five categories. The details are provided in the following table. The documents shall be submitted as per the schedule furnished in the form of the PERT diagram during agreement.

Table 1

CATEGORY	TYPE OF DOCUMENTS	ACTION BY OWNER/CONSULTANT OF OWNER
APPROVAL (A)	All construction drawings etc. Design Basis Report	For scrutiny and recommendation for owner's approval by consultant.
ACCEPTANCE (C)	Soil Report Laboratory Test Report PERT Diagram etc.	To be accepted by the owner and considered as reference by consultant.
REFERENCE (R)	Detail Design Calculation	For scrutiny. If felt necessary, comments to be communicated to contractor.
INFORMATION (I)	Mix Design Fabrication Drawings Bar bending Schedule Bill of quantities etc. All Survey Drawings All GA/Layout drawings Master Drawing List	For information. If felt necessary, shall be scrutinized and comments communicated to contractor.
AS-BUILT (B)	As built Drawing	For Final information

A. Hard copy submission:

i) All required documents including design calculations, drawings and other documents as per requirement are to be submitted in hard copies as detailed hereunder.

Table 2

Category	Type	No. of copies			
		For initial Scrutiny as per requirement	For final scrutiny as per requirement	Post Approval /Acceptance	Total required copies
(1)	(2)	(3)	(4)	(5)	(6) (3 or 4+5)

Category	Type	No. of copies			
		For initial Scrutiny as per requirement	For final scrutiny as per requirement	Post Approval /Acceptance	Total required copies
A	All construction drawings etc. Design Basis Report	2	2	4	6
C	Soil Report Laboratory Test Report PERT Diagram etc.	2	2	0	2
R	Detail Design Calculation	2	2	0	2
I	Mix Design Fabrication Drawings Bar bending Schedule Bill of quantities etc. All Survey Drawings All GA/Layout drawings Master Drawing List	2	2	0	2
B	As built Drawing	6			

ii) On submission of drawings/documents on standard size sheet in hard copies by contractor, the same shall be scrutinised by the owner/its consultant. If they are found in order, the same will be approved and the contrator shall be accordingly conveyed for submission of additional copies as per Table 2. If any revision is required, the contractor shall revise the same, and submit copies as deliberated in the same table for further scrutiny.

iii) Detail design calculations shall include STAAD input file or the software compatible with the owner and it's consultant, analysis of force/stress in the structure along with the source (except BIS codes) from where data have been taken. Photocopies of such data shall be submitted along with the design.

iv) In addition, contractor shall also submit soft copies of all above drawings/documents including STAAD input files, unrestricted original

deisgn excel files with formula, source file of any other design software used etc. Soft copies of the survey plan, General Layout drawings as well as all As-built drawings shall have to be submitted in both pdf and AutoCAD format. Additionally, if the owner/its consultant requires any of the other system/construction drawings in AutoCAD format, the contractor shall submit the same. For other documents, soft copies in the relevant software format may also have to be provided by the contrator as per owner requirement. The As-built drawings in pdf format as well as in in AutoCAD format shall be submitted in a storage device. None of the soft copies shall be restrictive in nature.

v) The soft copies can be either mailed to the owner (or its consultant if asked by the owner or both) or submitted in storage devices.

B. Soft copy submission:

i) It has been clarified earlier that depending on situation, the owner may permit the contractor to submit all required documents including design calculations, drawings and other documents in soft copies as detailed hereunder.

ii) Contractor shall submit soft copies of all 4 categories of above drawings/documents as detailed in Table 1, including STAAD input files, excel files with formula etc.

iii) Soft copies of the survey plan, General Layout drawings as well as all As-built drawings shall have to be submitted in both pdf and AutoCAD format. Additionally, if the owner/its consultant requires any of the other system/construction drawings in AutoCAD format, the contractor shall submit the same. For other documents, soft copies in the relevant software format may also have to be provided by the contrator as per owner requirement. The As-built drawings in .pdf format as well as in in AutoCAD format shall be submitted in storage device. None of the soft copies shall be restrictive in nature.

iv) All soft copies in pdf format shall be duly signed and stamped by the contractor.

v) The soft copies can be either mailed to the owner (or its consultant if asked by the owner or both) or submitted in storage devices.

vi) Additionally, Contractor shall submit Hard copies on standard size sheet/document for scrutiny as per Table 3 below.

Table 3

Category	Type	No. of copies		
		For initial Scrutiny as per requirement	For final scrutiny as per requirement	Post Approval /Acceptance for final stamping
1	2	3	4	5
A	All construction drawings etc. Design Basis Report	1	1	6
C	Soil Report Laboratory Test Report PERT Diagram etc.	1	2	0
R	Detail Design Calculation	1	2	0
I	Mix Design Fabrication Drawings Bar bending Schedule Bill of quantities etc. All Survey Drawings All GA/Layout drawings Master Drawing List	2	2	0
B	As built Drawing	6		

vii) These drawings/documents shall be scrutinised as per requirement by the owner/its consultant. If they are found in order, the same will be approved in soft copy. The contractor will submit drawings approved and duly stamped by owner/its consultant as per Table 3 above. If any revision is required, the contractor shall revise the same, and submit the revised drawings/documents in soft copies as well as in hard copies as per Table 3 for further scrutiny as per requirement.

C. As Built Drawings

Contractor shall make necessary correction /modification in the drawing as per actual work and shall prepare as built drawing. The Contractor shall supply such

6 (six) sets of prints of as built drawing to the Owner. The same will hold good for other documents also to be supplied by the Contractor under the heading of basic scope. All drawings should be prepared on AutoCAD in standard format and storage device containing such drawing shall also be supplied along with hard prints.

D. PERT NETWORK

After the issue of letter of Intent, the bidder will prepare a master plan PERT NETWORK incorporating all the major activities for the successful installation and commissioning of plant on turnkey basis and submit it to owner for approval and comments.

The detailed PERT NETWORK will be prepared for all major activities enlisted in the master PERT NETWORK. The detailed PERT NETWORK will be further discussed with customer and form the basis of monitoring of the project as a whole or activity wise. Necessary corrections will be carried out from time to time by the bidder in consultation with the representative of customer but within the overall limit of time as described in master NETWORK. All the activities of the contract will proceed on the line of approved PERT NETWORK.

4.5.2.6.1 Procedure of Approval of drawings under Category A

The Owner shall have the final say in the approval of drawings. Drawings so submitted will become the property of the owner. The approval of the drawings does not absolve the Contractor from the overall responsibility of the plant for its successful operation. The Contractor shall be responsible for and shall pay for any alterations of the work due to any discrepancy, errors or omissions in the drawings or particulars supplied by him, even though owner has approved such drawings or other particulars.

Scrutiny and approval of drawings may be carried out by the owner/through the consultant engaged by owner. Approval process for Hard copy submission as well as for Soft-copy submission is deliberated below:

A. Hard copy submission:

If on scrutiny, the submitted drawings are found to be in order, the same will be conveyed to the contractor. Then the contractor will submit requisite no. of additional copies as per table 2 above. All the finalised drawings (total six copies) shall be duly signed and stamped by the owner/its consultant. One copy of such signed/stamped drawing shall be returned to the contractor.

If on scrutiny, it was felt that the submitted drawings need revisions, the same will be conveyed to the contractor. The contractor shall carry out the necessary rectification in drawings after discussion with owner in a reasonable time as agreed upon mutually and re-submit such revised drawings for approval of owner. Revised drawings shall then again be scrutinised and if found in order, the same will be conveyed to the contractor. Then the contractor will submit requisite no. of additional copies as per table 2 above. All the finalised drawings (total six copies) shall be duly signed and stamped by the owner/its consultant. One copy of such signed/stamped drawing shall be returned to the contractor.

B. Soft copy submission:

If on scrutiny, the submitted drawings are found to be in order, the soft copies of the drawings shall be duly signed/stamped by the owner/its consultant and mailed back to the contractor. The contractor will take the prints of these signed and stamped drawings and will be conveyed to the contractor. Then the contractor will submit requisite no. of copies as per table 3 above to the owner. The owner will return one of these copies to the contractor after putting their signature on these drawings. The balance copies shall be kept by the owner for record.

If on scrutiny, it was felt that the submitted drawings need revisions, the same will be conveyed to the contractor. The contractor shall carry out the necessary rectification in drawings after discussion with owner in a reasonable time as agreed upon mutually and re-submit such revised drawings for approval of owner. Requisite no. of hard copies of these drawings as per Table 3 are also to be submitted. Revised drawings shall then again be scrutinised and if found in order the soft copies of the drawings shall be duly signed/stamped by the owner/its consultant and mailed back to the contractor. The contractor will take the prints of these signed and stamped drawings and will submit requisite no. of copies as per table 3 above to the owner. The owner will return one of these copies to the contractor after putting their signature on these drawings. The balance copies shall be kept by the owner for record.

6.1.2.7 TECHNICAL SPECIFICATIONS

All workmanship, materials and work items shall confirm to relevant IS / BIS / MoRTH / NBC STANDARDS. In case of items not adequately covered by above mentioned Indian Standards, the CPWD / NBC / CIL guidelines and practices shall be followed.

Safety Measures FOR CIVIL WORKS

In respect of safety, Part – 7 Constructional Practices & Safety of National Building Code – 2026 (latest edition) shall be followed. Regulation no. 39 & 131 of CMR-2017 (or latest) is to be complied including the cost for such compilation. All necessary safety measures to be adopted as recommended by relevant IS / BIS code to protect adjunct / nearby structure, workmen etc.

All works shall be carried out as per the item description and design & drawing supplied and as per the relevant IS / BIS / NBC – 05 and as per direction of the Engineer-in-Charge.

6.1.2 DETAILED SCOPE OF WORK

6.1.2.1 GENERAL

The civil and structural work under its scope shall cover all aspects of work, including soil and hydrological investigation, collection of rainfall data, detailed survey, preparation of preliminary drawings with proper co-ordination and inter relation with equipment, detailed design and preparation of the complete civil and structural working drawings, execution and erection of the complete civil and structural works, including roads and pavements, sanitation, water supply for industrial, drinking and fire fighting purpose besides water supply to various buildings, drainage for storm water, development works and structure for dust suppression and extraction and cleaning as per system requirement and land development.

The execution of civil and structural work consists of providing all labour, supervision, materials, scaffolding, construction equipment, tools and plants, supply, transportation, and all incidental items not specified but implied for successful completion of the works in accordance with drawing and specification including any fee, tax, royalty as may be applicable in the work zone.

The nature of work shall generally involve chemical testing of construction water for corrosive action of chemical and other deleterious materials, earth work in filling and excavation in all types of soil and rock, dewatering, shoring, back filling around completed structures, disposal and form work, brick work, fabrication and erection of structural/miscellaneous steel, inserts, anchor bolts, RCC/chequered plates trench covers, laying of water pipe lines, sewerage system, roads, surface and storm water drainage, ventilation related to the coal handling plant, damp proofing and other ancillary works related to the coal handling plant.

The drawings as mentioned elsewhere in this contract documents give a general idea about the work to be performed. These are preliminary drawings for bidding

purpose only and are by no means the final drawings showing the full range of the work under the scope. Work has to be executed according to the approved working drawings, fabrications drawings with additions, alterations and modification made from time to time as required or approved by the customer. There shall be a brief description retroreflective boards with SS 304 grade 65 mm dia legs at all the CHP elements and the size of board & letters shall be suitably done so that they are visible from 5 m distance. Also naming of the CHP elements shall be done on the elements itself so that they are visible from minimum 150 m.

6.1.2.2 MAIN COMPONENTS OF CHP- IN BRIEF

The requirements/specifications indicated hereunder are minimum and are to be synchronised with process/functional design/normative/codal/statutory/aesthetic and such other requirements expressely stated in this document or otherwise.

The civil and structural works are related mainly to the following areas (but not limited to):

A. OVERGROUND BUNKER

Over ground bunkers shall be provided as per system drawings.

The bunker shall be over-ground type and shall be constructed of RCC framed structure. The layout and size of the bunker shall be as per system drawing. The bunker will be fed by tripper conveyors for which necessary supporting arrangement should be provided. Arrangement to seal the dust evolve during tripper discharge and level sensors to detect the coal level inside the bunker should be provided and this arrangements should be synchronized with tripper's movement.

The bunker shall have discharge arrangement as per system drawing. Necessary supporting arrangements/inserts of adequate strength shall be designed and provided for plough feeders.

The side slope of the bunker shall be around 55 degrees to horizontal. The inside face of bunker shall be provided with 8 mm thick SS 409M grade liner. Effective 2 m wide RCC walkway around the bunker shall be provided at its top along with GI hand railings and 2 mm thick & 150 mm height toe guard. Two nos. staircases on both ends of the bunker shall be provided to reach the walkway platform. Minimum width of each flight & tread shall be 1500 mm and 250 mm respectively. Maximum height of riser shall be 190mm, although risers of 150mm to 175mm will be desirable. Steps shall be of 6 mm thick GI chequered plate. The stair case shall be covered with 0.5mm thick iron profile sheeting. Minimum 12% of the roofing area

shall be covered with minimum 2mm thick GRP/FRP translucent sheets. Suitable Anti-carbonation coatings over RCC members to be provided.

The bunker shall be fully covered. The tripper house over the bunker shall be a steel structure having wall cladding and roofing same as elevated/overhead conveyor galleries. The two extreme side walkways of this house shall be as per system requirement. All these walkways shall be interconnected at the start and the end of the House. Minimum 6 mm thick GI chequered plate flooring shall be provided in walkway. GI Hand railing shall be provided on both sides of all the walkways. Detail specifications of hand rails for conveyors shall be as per relevant BIS Codes and relevant clauses of NIT and it shall be provided as per requirement. Toe guard of minimum 2 mm thick and height 150 mm shall be provided all along with hand rails.

The roof and side of the structure shall be covered with 0.5mm thick iron profile sheeting. Minimum 12% of the roofing area shall be covered with minimum 2mm thick GRP/FRP translucent sheets. Portion of roof over the bunker in between the springing and tripper houses shall be clad with provision to facilitate inspection inside the bunker from walkway platform. Suitable wind ties shall be provided.

All the facilities of maintenance, hoist, monorails, etc. shall be provided as per system drawing. The monorail for tripper shall be as per system requirement. All the necessary inserts shall have to be provided for fixing cables, supporting structures for conveyors, etc.

Bunker floor at ground level to be designed as per soil condition but not less than 200 mm thick RCC over 100 M-10 PCC over 250 mm thick boulder soling. The grade of concrete shall be minimum M-25 and 10 mm steel reinforcement at spacing of 150 mm centre to centre on both faces in both directions. The ground floor RCC surface shall be finished with 50 mm thick ironite finish. The bunker floors shall be provided with suitable slope along and across the conveyor for proper drainage. PQC Road of minimum 4.5 m wide and minimum 200 mm thick shall be provided all around the ground bunker and it shall be connected with the nearest approach road. The plinth level of various rooms provided at the ground floor of the bunker shall be minimum 300 mm higher than the floor level of bunker. There shall be lift provisions as envisaged in drawings. Proper drainage to be provided so that no water logging happens at bunker. Arboriculture and landscaping to be done in the vacant area between PQC Road and bunker. Proper rainwater piping (PVC pipe of minimum 6 kg/sqcm) shall be provided from the top of bunker to drains to be ensured.

Machinery Well (Maintenance Bay)

On the both ends of the over ground bunker, two machinery wells of suitable size as shown in the drawing have been envisaged. The floor of the wells shall be the same of that of the bunker floors. 0.5mm thick iron profile sheet roofing shall be provided as per system requirement. Outer walls of the wells shall be of brick masonry upto 3.0 m height and above 3.0m height, iron profile side sheeting shall

be provided with 0.5mm thick with louvers. 12% of the roofing and side covering shall be with minimum 2 mm thick FRP/ GRP translucent sheeting. Arrangements should be made for providing electric hoist of adequate capacity. Monorail facilities should also be provided so that equipment can be lifted/ repaired and loaded in trucks. Stairs of minimum 1.5 metre width shall be provided in both the wells of each bunker. Necessary doors with shutters and windows shall be provided as per requirement.

B. Truck Receiving Hopper Complex

As per system drawing.

Truck receiving stations consisting of over ground Structural Steel/RCC hoppers has been proposed with 10 mm thick Stainless Steel (SS) 409M grade lining on the main inclined hopper slab and 8 mm thick Stainless Steel (SS) 409M grade lining on the vertical wall shall be provided to protect the main hopper wall. There shall be no unevenness in the slope of the hoppers. The hoppers (depending on the type) should be supported on structural steel / RCC columns with RCC foundation. For reclamation from hoppers, necessary feeders with supporting structures to be installed below hoppers as per system requirement.

The layout and size of the receiving pit shall be as per system requirement. Necessary RCC retaining wall to retain pavement all around the hopper complex to be provided. RCC foundation for these equipment shall be suitably designed as per load data and specifications provided by the manufacturer. In addition to equipment load, other loads and their combinations shall also be considered as per relevant BIS codes. The receiving hoppers shall receive coal from dumpers/tipping trucks. The hoppers & retaining walls shall be suitably supported to withstand heavy impact caused during unloading by dumpers/tipping trucks. The slope of the receiving hopper shall be 55^0 (minimum) to the horizontal. There shall be floors at different levels as indicated in system drawing. Necessary space should be provided in all floors for maintenance and other repairs found necessary. GI railing shall be provided at the edges of floors. TRS floor at ground level to be designed as per soil condition but not less than 200 mm thick RCC over 100 M-10 PCC over 250 mm thick boulder soling. The grade of concrete shall be minimum M-25 and 10 mm steel reinforcement at spacing of 150 mm centre to centre on both faces in both directions. The ground floor RCC surface shall be finished with 50 mm thick ironite finish. The minimum area for this floor shall be as per functional requirement. The floor shall be provided with suitable slope and drains of adequate dimensions for proper drainage. All the drainage shall be RCC. Wherever there is space constraint, suitable RCC retaining wall shall be constructed to retain earth for ramp & platform areas.

Properly anchored RCC kerb wall & guide walls of minimum 1.2 m height as desired in the system requirement shall be provided at the dumpers/tipping trucks unloading sides of hoppers for guiding and stopping dumpers/tipping trucks and to avoid fall of dumpers/tipping trucks into the pit. Suitable encasing of columns of TRH Shed should be done to protect the columns from impact of dump

trucks/tippers. The placement of RCC pedestals/structural columns for supporting roof structure of the receiving hoppers shall be done in such a way that these pedestals/structural columns remain protected from direct impact of dumpers/tipping trucks while discharging coal into the hoppers. Suitable Anti-carbonation coatings over RCC members to be provided.

The roof shall be covered with 0.5mm thick precoated galvanised iron profile sheeting with necessary wind ties. Height of the shed shall be kept such that it does not get damaged during unloading of coal by truck/ dumpers. Suitable wind ties shall be provided as per requirement in all sheetings.

Pavement, Retaining wall & Ramp:

The receiving pit should have arrangements of receiving coal by dumpers/tipping trucks by providing suitably designed PQC platform, ramp, pavement and approach with M40 grade concrete and thickness not less than 300 mm over well compacted earth filling, separation layers as per IRC suitable for movement of dumpers/tipping trucks at RL as shown in the system drawings. The pavement shall have proper slope for drainage of storm water. The pavement and ramp shall be connected with the existing Haul road network and should be done in consultation and due approval of owner as per requirement. The ramp width shall be as per system drawing in addition to 2.0m (minimum) wide shoulders on both sides of the ramp at a gradient of not more than 1 in 16 from ground level to the platform shall be provided. The length of the ramp shall be as per system requirement. The platform & ramp shall be compacted properly in the form of layers as standard engineering practice. The side slopes of platform & ramp shall have preferably natural angle of repose for soil and as per detail engineering. The size of platforms are as shown in the drawings. All the side slopes shall be protected with RCC sloping along with suitable channels for proper drainage after proper compaction of ramp material to avoid any settlement as per IS Code. Properly designed retaining wall/toe wall to retain the earth fill wherever required shall be provided for protection of filling around receiving pit complex & ramp. This is especially true for those sides of the ramp/platform where there is space constraint for providing side slopes. Properly designed RCC retaining wall shall be constructed behind all the receiving hoppers to retain the earth filling and PQC pavement over it as per the system requirement as shown in the system drawing. The height and the length of the retaining wall shall be as per system requirement. However, in the sloping portion of the embankment, the retaining wall shall be sloped preferably in the ratio of 1:1.5 (1 vertical: 1.50 horizontal). The retaining wall shall be properly designed considering the earth pressure of the embankment filling behind it and surcharge due to movement of loaded dumpers/tipping trucks subject to minimum 100 tonne loaded dumper. Weep holes shall be provided at suitable intervals in the retaining walls as per design requirement. Drainage gallery of boulder packing behind the retaining wall shall also be provided to facilitate drainage and to avoid choking of weep holes. Necessary toe walls all

along the earth filling shall also be provided to protect the earth filling. Lighting arrangement will be made as per requirement.

Necessary RCC parapet wall of minimum 1.2 m height and suitable thickness to resist the impact of dumpers shall be provided on both sides of ramps and all along the peripheral of top of the platform for safety of vehicles. Florescent Strips needs to be placed on TRH Complex RCC wall, hopper complex vertical structures for proper visibility at night. Suitable staircases of minimum 1.5 m wide on all sides of the platform to be provided for accessing the discharge platform of TRH from ground. Suitable Anti-carbonation coatings over RCC members to be provided.

Provisions of civil and structural work for accommodating the crushers, apron feeders, rock breaker and lifting hoist etc. along with associated equipment as per system drawing shall be made.

All necessary inserts shall be provided in the area for installation of cables, pipes, ducts, hoists etc.

Exit tunnels for sides of reclaim conveyors, if required, have to be provided as per design. Proper drainage all around the TRH complex to be done so that no water logging happens.

C. Truck Loading Complex

…….no. of truck loading complex is to be constructed as per system drawing. The loading complex shall consist of ……Te structural Steel/RCC Surge bin. The thickness of structural steel hopper wall plates shall be minimum 16 mm. These plates shall be provided with minimum 8 mm thick SS 409M liner

The loading system shall be designed on mass flow condition so as to achieve the required loading rate without bridging, arching and rat holing inside. Proper safety arrangement with handrail shall be provided wherever there is opening. However, wherever handrail is not possible, toe guard of minimum 2 mm thick and 150 mm height shall be provided. Minimum 1.5 m clear walkway shall be provided around all the equipments which require access for regular operation and maintenance.

Arrangements for installation of pre-weigh hoppers, if applicable, with suitable chute as per system drawing for discharging coal has to be made.

Control room will be of structural steel and will house electrical and control equipment. It shall be provided with air conditioning facilities with provision of toughened glass double door with hydraulic door closer and false ceiling. Fully glazed fixed panels in aluminium frame with double 8 mm thick toughened glass shall be provided on the loading chute side for clear visibility of loading operations from control panel. Suitable PVC flooring shall be provided. The control room should be in tight/ dust proof and as per system requirement.

The roof shall be of Structural Steel construction with necessary openings for the

inflow of coal. Roof and side covering shall be of 0.5mm thick iron profile sheeting with windties. 12% of the roofing and side covering shall be with minimum 2 mm thick FRP/ GRP translucent sheeting.

There shall be sufficient areas of platforms and floors below the hopper with proper accessibility and head room for inspection and maintenance of pre-weigh hopper gates and its allied equipment.

All the facilities of maintenance, hoist, monorails etc. shall be provided as per requirement. All the necessary inserts shall have to be provided for fixing cables, supporting structures for conveyors etc. as per mechanical scope of work.

Foundations and construction of loading complex up to roof level and associated structures at the top is included in the Scope of work.

Staircase with GI hand railing with toe guard and side sheeting shall be constructed of structural steel supported over RCC pedestal and foundation as shown in the system drawing. Minimum width of each flight & tread shall be 1.20 m and 250 mm respectively. Maximum height of riser shall be 190mm, although risers of 150mm to 175mm will be desirable. All the flooring and steps shall be GI chequred plate of minimum 6 mm thick.

The approach road for the Truck Loading Complex and the loading area shall be PQC with minimum thickness 300 mm of M40 grade and should be designed for minimum 60 tonne loaded dumper as per relevant IS Code. Total length and width of road shall be as per system requirement.

D. Silo

…….Nos. RCC Silo is to be constructed as per system drawing. The loading complex shall be of RCC construction supported over RCC foundation and pedestals, with RCC Silo having capacity as shown in the system drawing with control room, staircase and lift. The loading complex shall be designed with provisions for retractable OHE system.

The silo shall be designed with statuary clearances (Physical and electrical) for installation of retractable OHE underneath silo . The silo columns can be used for installation of brackets for OHE. Insert plates and other requirement for OHE installations should be provided in the Silo columns.

The loading system shall be designed on mass flow condition so as to achieve the required loading rate without bridging, arching and rat holing inside the Silo. The slope of the RCC Silo shall be approximately 55˚to the horizontal. Proper safety arrangement with GI handrail shall be provided wherever there is opening. However, wherever handrail is not possible, toe guard of minimum 2 mm thick and 150 mm height shall be provided. Minimum 1.5 m clear walkway shall be provided around all equipment with GI hand railing.

Internal lining of the Loading complex shall be as given below:

S No	Location	Specification
a	Silo Wall portion (Conical Inside Wall)	8 mm thick Stainless steel plate liners with 409M grade steel
b	Wall (Vertical wall) up to full height	25 mm thick Ferrosite Lining

The plate liners are essential protection for the inside walls of silo and hence should be provided in such a way to ensure long life against wear and tear. However, the arrangement and fixation should also be carried out such that even if replacement of some part is inevitable, the same can be done easily. Arrangements for installation of pre-weigh hoppers with suitable chute as per system drawing for discharging coal to the wagon has to be made.

The roof shall be of Structural Steel construction with RCC Slab with necessary openings for the inflow of coal. Structural columns of the roof structure may be provided over the roof slab of the loading hoppers. Roof and side covering shall be of 0.5mm thick iron profile sheeting. 12% of the roofing and side covering shall be with minimum 2 mm thick FRP/ GRP translucent sheeting. Necessary windties shall be provided.

There shall be sufficient areas of platforms and floors below the hopper with proper accessibility and head room for inspection and maintenance of pre-weigh hopper gates and its allied equipment. The connection between Silo openings and pre weigh hopper shall be adequately designed to avoid any slippage.

All the facilities of maintenance, hoist, monorails etc. shall be provided as per requirement. All the necessary inserts shall have to be provided for fixing cables, supporting structures for conveyors etc. as per mechanical scope of work.

Foundations and construction of loading complex up to roof level and associated structures at the top is included in the Scope of work. Proper drainage near SILO area shall be provided along with slope protection measures. In this context, the tenderer shall investigate the soil condition at site of construction in detail at their own cost at the time of design/construction. If required light blasting may be resorted to for loosening the materials but this will not in any way entitle the bidder for any extra payment. Suitable Anti-carbonation coatings over RCC members to be provided.

Control room will be of RCC framed-cum-Brick masonry structure and will house electrical and control equipment. It shall be provided with air conditioning facilities with provision of toughened glass double door with hydraulic door closer and false ceiling. Fully glazed fixed panels in UPVC frame with double 8 mm thick toughened glass shall be provided on the loading chute side for clear visibility of loading operations from control panel. All the internal surfaces of control rooms shall be finished with plastic emulsion paint of approved quality and shade or any other finish depending upon functional need. Suitable PVC flooring shall be provided.

Staircase with GI hand railing & toe guard of minimum 2 mm thick 150 mm height and side sheeting shall be constructed of structural steel supported over RCC pedestal and foundation. Minimum width of each flight & tread shall be 1.5m and 250 mm respectively. Maximum height of riser shall be 190mm, although risers of 150mm to 175mm will be desirable. Steps shall be minimum 6 mm thick GI chequered plate. Provision of lift for Silo top shall also be there. 12% of the roofing and side covering shall be with minimum 2 mm thick FRP/ GRP translucent sheeting. Necessary windties shall be provided.

Access to the control room to be provided on both sides from the first floor. In case where multiple tracks are laid or there exists multiple tracks, proper unhindered access/pedestrian bridge for movement of men and materials from nearby approach to the silo shall be provided.

Pavement for railway track

At ground level, a railway track will be provided for loading of train wagons for which a rigid pavement suitable for ballast less track including grouting of PSC sleepers shall be provided as per norms of RITES, INDIAN RAILWAYS.

The pavement shall comprise, of layers as described elsewhere:

The thicknesses and specifications as mentioned elsewhere shall be treated as of minimum requirements. Any additional thickness or strengthening required based on the applicable railway standards, design considerations and site conditions shall be provided by the Contractor without compromising the specified minimum requirements.

Proper drainage system shall be provided around the silo to prevent stagnation of water during peak precipitation. Extent of pavement for railway track below the silo shall be as per manufacturer's recommendations but not less than 50m on either side of centre line of silo loadout system. However, laying of track is not in the scope of the bidder

E. Conveyor Gantry/Gallery for Single/Double Conveyor/Pipe Conveyor

i) General

The details of conveyors have been shown in the tender drawings. The conveyors will be housed in on ground or overhead conveyor galleries as per system requirement.

The bidder has to visit the site and get an idea of actual ground profile along the conveyors. Keeping in view the existing ground profile as well as water accumulation along the conveyor alignment, the supporting arrangement of the gantry is to be designed such that any part of the structure is not affected by water even during highest water accumulation.

Final levelling, dressing and compaction of the filled up ground, if any as per technical requirement along the alignment of conveyor is also included in the scope of this tender. Before start of actual construction over earth/OB

filling (If any) assessment of soil condition and all steps for its improvement as per design requirement are included in the scope of this tender. The foundations shall be designed in such a way that there is no appreciable settlement in due course of time. Rectification of any subsequent settlement during entire contract period including DLP is covered under the scope of this tender. Proper drainage arrangement for storm water all along the conveyor alignment considering the adjoining catchment area shall be provided. No intermediate support shall be provided inside the conveyor gallery. All the necessary gantry and trestles shall be of structural steel resting on RCC pedestal & foundation. The walkway width, as specified in the system drawings, shall remain unobstructed and clear throughout the entire height of the conveyor gallery. Suitable GI hand railing & toe guard of minimum 2 mm thick 150 mm height along the conveyor walkway shall be provided as per relevant IS Code.

At the point of road crossing sufficient clearance shall be provided between road and bottom most member of conveyor gantry, so that vehicles/dumpers can pass through safely. Such clearance shall be guided by the type of vehicles that ply on these roads as well as functional requirements. The decision of the project authority regarding such clearance shall be binding. Wherever the conveyors are crossing the roads/haul road, the spacing of trestles shall be adjusted accordingly.

At such locations, protective framed GI plate (minimum thickness 8 mm) along with stiffener as per design shall be provided to avoid spillage of coal on roads/haul roads. It should be able to take the impact of coal lumps likely to fall and acceptable thickness of coal accumulation over it. It should be accessible through properly designed stairs / ladders for periodic cleaning. The tail end of each conveyor (except Tripper conveyor) shall be extended suitably, so that spilled coal can be fed back to the conveyor.

Wherever the conveyor alignment passes in close proximity to an OB dump, the conveyor structure shall be suitably elevated such that the minimum vertical clearance between the bottom-most part of the conveyor structure and the Finished Ground Level (FGL) is not less than 2.0 m. Adequate slope protection and stabilization measures for the adjacent OB dump shall also be provided to ensure the safety and stability of the conveyor structure.

ii) On-Ground Single Conveyors

The conveyor shall be housed in a suitable enclosed gallery of structural steel having minimum 1.0 m clear wide walkway on either side of the conveyor as per system drawing.

The roof covering and side cladding shall be of 0.5mm thick iron profile sheeting. At least 67% of the side area shall be covered. 12% of the roofing area and of the side cladding area shall be covered with minimum 2 mm thick FRP/ GRP translucent sheets. Windties shall be provided.

Cross over in conveyor gantry shall be provided as required. In general cross over will be at interval of 200 m. However, this interval may be somewhat less or more at some places depending upon the location of the structures and machinery etc.

As part of the conveyor may be on the ground or in trench, some amount of cutting of different type of soil and rock may be required for laying out the conveyor system. The slope of cutting should not be steeper than 1:1 (one horizontal to one vertical). The total width of cutting should be decided in such a way that passages of minimum 1.5m width and rain water drain on both sides of the gallery to facilitate the inspection and drainage respectively can be accommodated. The sloping sides of such cutting shall be properly dressed and stable. The supports for the conveyor as per requirement shall be provided.

The floor of ground conveyor should be of concrete flooring as per design requirement with minimum of 100 mm thick RCC M25 grade over 100 mm thick mud mat concrete under laid by 150mm boulder soling packed with sand and minimum 50 mm thick ironite flooring on the top. Minimum 450 mm high guard wall shall be provided on both sides of the gallery to restrict the storm water.

iii) On-Ground Double Conveyors

The conveyor shall be housed in a suitable enclosed gallery of structural steel having minimum 1.0 m wide clear walkway on extreme sides of the conveyor gallery and a central walkway in between two conveyors as per system drawing.

The roof covering and side cladding shall be of 0.5mm thick iron profile sheeting. At least 67% of the side area shall be covered. 12% of the roofing area and of the side cladding area shall be covered with minimum 2 mm thick FRP/ GRP translucent sheets. Windties shall be provided.

Cross over in conveyor gantry shall be provided as required. In general cross over will be at interval of 200 m. However, this interval may be somewhat less or more at some places depending upon the location of the structures and machinery etc.

As part of the conveyor may be on the ground or in trench, some amount of cutting of different type of soil and rock may be required for laying out the conveyor system. The slope of cutting should not be steeper than 1:1 (one horizontal to one vertical). The total width of cutting should be decided in such a way that passages of minimum 1.5m width and rain water drain on both sides of the gallery to facilitate the inspection and drainage respectively can be accommodated. The sloping sides of such cutting shall be properly dressed and stable. The supports for the conveyor as per requirement shall be provided.

The floor of ground conveyor should be of concrete flooring as per design requirement with minimum of 200 mm thick RCC M25 grade over 100 mm thick mud mat concrete under laid by 150mm boulder soling packed with sand and

minimum 50 mm thick ironite flooring on the top. Minimum 450 mm high guard wall shall be provided on both sides of the gallery to restrict the storm water.

iv) Elevated/Overhead Single Conveyors

Elevated/Overhead conveyor shall be housed in a suitable enclosed gantry of structural steel. Minimum 1.0 m wide clear walkway shall be provided on either side of the conveyor as per system drawing with minimum 6 mm thick GI chequered plate flooring. GI Hand railing with toe guard of minimum 2 mm thick & 150 mm height shall also be provided. Detail specifications of GI hand rails for conveyors shall be as per relevant BIS Codes and relevant clauses of NIT and it shall be provided as per requirement.

Steel trestle with RCC foundation shall be provided for supporting the gantry. The bidder shall be aware about the site conditions because the site shall be handed over as it is condition. Four legged trestles shall be designed and provided for trestles of height 10m or above. Height of trestle is defined as vertical distance between FGL and top of walkway of the conveyor. This should also be provided at suitable intervals with due consideration to stability and permissible vibration. The trestles of the conveyors shall be so designed that the RCC pedestal of the trestle are 1.5m above the finished ground level. The bidder shall make necessary approaches for fabrication and erection of the conveyor system at his own cost.

The spacing of trestle for overhead conveyor gantry generally should not exceed 18 metres centre to centre. However the spacing of trestles can be varied in case of crossing over haul road/obstruction/valleys with other structures or as per design requirements which will be decided during detailed engineering stage.

Roof covering and side cladding will be of 0.5 mm thick iron profile sheeting with necessary wind ties for all conveyors. At least 67% of the side area should be covered. 12% of roofing area and side cladding area shall be covered with minimum 2 mm thick FRP/ GRP translucent sheets. There shall be no tie/strut between floor beam and roof truss for conveyor gantry except side gantry connection. Windties shall be provided.

Overall clear width of the gantries as indicated in the system drawing are minimum. This may vary on higher side depending upon the width of walkway and width of conveyor belt and its supporting arrangement. Suitable GI hand rail with toe guard of minimum 2 mm thick & 150 mm height shall be provided on both sides of the walkway for protection in all the conveyor gantries.

Cross over in conveyor gantry shall be provided as required. In general cross over will be at interval of 200 m. However, this interval may be somewhat less or more at some places depending upon the location of the structures and machinery etc.

At the point of road crossing sufficient clearance shall be provided between road and bottom most member of conveyor gantry, so that vehicles/dumpers can pass

through safely. Wherever the conveyors are crossing the roads/haul road/water bodies/infrastructures, the spacing of trestles shall be adjusted accordingly. At such locations, protective framed GI plate (minimum thickness 8mm) along with stiffener as per design shall be provided to avoid spillage of coal on roads/haul roads. It should be able to take the impact of coal lumps likely to fall and acceptable thickness of coal accumulation over it. It should be accessible through properly designed stairs / ladders for periodic cleaning. The tail end of each conveyor (except Tripper conveyor) shall be extended suitably, so that spilled coal can be fed back to the conveyor.

v) Elevated/Overhead Double Conveyors

Elevated/Overhead double conveyor shall be housed in a suitable enclosed gantry of structural steel. The clear width of the walkways shall be minimum 1.0 m on the extreme sides of the conveyor gallery. The entire space of the conveyor gallery in between the two conveyors shall form the central walkway having no cut-out. Minimum 6 mm thick GI chequered plate flooring shall be provided in walkway. GI Hand railing with toe guard of minimum 2 mm thick & 150 mm height shall be provided on both sides of the walkway. Detail specifications of hand rails for conveyors shall be as per relevant BIS Codes and relevant clauses of NIT and it shall be provided as per requirement.

Steel trestle with RCC foundation shall be provided for supporting the gantry. The bidder shall be aware about the site conditions because the site shall be handed over as it is condition. Four legged trestles shall be designed and provided for trestles of height 10m or above. Height of trestle is defined as vertical distance between FGL and top of walkway of the conveyor. This should also be provided at suitable intervals with due consideration to stability and permissible vibration. The trestles of the conveyors shall be so designed that the RCC pedestal of the trestle are 1.5m above the finished ground level. The bidder shall make necessary approaches for fabrication and erection of the conveyor system at his own cost.

The spacing of trestle for overhead conveyor gantry generally should not exceed 18 metres centre to centre. However the spacing of trestles can be varied in case of crossing over haul road/obstruction/valleys with other structures or as per design requirements which will be decided during detailed engineering stage.

Roof covering and side cladding will be of 0.5 mm thick iron profile sheeting with necessary wind ties for all conveyors. At least 67% of the side area should be covered. 12% of roofing area and side cladding area shall be covered with minimum 2 mm thick FRP/ GRP translucent sheets. There shall be no tie/strut between floor beam and roof truss for conveyor gantry except side gantry connection. Windties shall be provided.

Overall clear width of the gantries as indicated in the system drawing are minimum. This may vary on higher side depending upon the width of walkway and width of conveyor belt and its supporting arrangement. Suitable GI hand rail

with toe guard of minimum 2 mm thick & 150 mm height shall be provided on both sides of the walkway for protection in all the conveyor gantries.

Cross over in conveyor gantry shall be provided as required. In general cross over will be at interval of 200 m. However, this interval may be somewhat less or more at some places depending upon the location of the structures and machinery etc.

At the point of road crossing sufficient clearance shall be provided between road and bottom most member of conveyor gantry, so that vehicles/dumpers can pass through safely. Wherever the conveyors are crossing the roads/haul road/water bodies/infrastructures, the spacing of trestles shall be adjusted accordingly. At such locations, protective framed GI plate (minimum thickness 8mm) along with stiffener as per design shall be provided to avoid spillage of coal on roads/haul roads. It should be able to take the impact of coal lumps likely to fall and acceptable thickness of coal accumulation over it. It should be accessible through properly designed stairs / ladders for periodic cleaning. The tail end of each conveyor (except Tripper conveyor) shall be extended suitably, so that spilled coal can be fed back to the conveyor.

vi) Tripper conveyor gallery

The Tripper conveyor shall be housed in a fully covered gallery of structural steel supported on steel portals over the Ground Bunker. The gallery for the conveyors shall be as per system requirement. The roof covering and side cladding shall be 0.5mm thick Iron Profile sheeting. 12% of roofing area and the side cladding area shall be covered with minimum 2 mm thick GRP/FRP translucent sheet. Walkways shall be provided with GI chequered plate as per system requirement. Hand railing with 2 mm thick 150 mm height toe guard and wind ties shall also be provided.

vii) Pipe Conveyor

Pipe Conveyor gallery with RCC / Structural steel support system with provision of maintenance trolley for inspection and maintenance. Steel/RCC Trestle with RCC foundation shall be provided for supporting the gantry at suitable intervals. Housing for Maintenance trolley shall be provided at both ends of the Pipe Conveyor. Suitable length of transition shall be provided at the both ends of the pipe conveyor as per system drawing. This trasition shall be housed in a suitable enclosed gallery of structural steel having specifications as per system drawing with minimum 6 mm thick GI chequered plate flooring. GI Hand railing with 2 mm thick 150 mm height toe guard shall also be provided. Detail specifications of GI hand rails for conveyors shall be as per relevant BIS Codes and relevant clauses of NIT and it shall be provided as per requirement.

Roof covering and side cladding will be of 0.5 mm thick iron profile sheeting with necessary wind ties for transition zone. At least 67% of the side area should be covered. 12% of roofing area and side cladding area shall be covered with minimum 2 mm thick FRP/ GRP translucent sheets. Windties shall be provided.

Suitable Clearance shall be maintained between the bottom of pipe conveyor and HFL wherever there is river crossing/ water body.

The spacing of trestle for overhead pipe conveyor gantry generally should not exceed 24 meters Centre to Centre. However the spacing of trestles can be varied in case of crossing over rivers/haul road/obstruction/ roads/valleys with other structures or as per design requirements which will be decided during detailed engineering stage.

At the point of road crossing sufficient clearance, but not less than 8.0 m from corresponding Road Level shall be provided between road and bottom most member of pipe conveyor gantry, so that vehicles can pass through safely. Such clearance shall be guided by the type of vehicles that ply on these roads as well as functional requirements. Minimum 13m clearance should be provided between the road level and the bottom most member of gantry structure when gantries are located over Roads on which dumpers ply. The decision of the project authority regarding such clearance shall be binding. Wherever the conveyors are crossing the roads/haul road, the spacing of trestles shall be adjusted accordingly.

F. Transfer Houses (TH), Drive Houses (DH), Sampler Houses (SH), Transfer House cum Drive House (TH cum DH), Transfer House cum Surge Hopper (TH cum Surge Hopper) and Drive House cum Sampler House (DH cum SH)

i)TH, TH cum DH & TH cum Surge Hoppers

The TH, TH cum DH & TH cum Surge Hoppers shall be of RCC substructure & steel superstructure. The location of these houses have been shown in the system drawings or it may be provided as per system requirement. The area requirement of these houses shall be guided by functional and other requirements as stated elsewhere in this document. The drives of conveyor systems may be located in these Transfer Houses or in separate Drive Houses as per design/system requirement. Also, surge hoppers of various capacities as mentioned elsewhere of the tender documents/drawings as per design/system requirement may be located in these Transfer Houses.

The bidder should note that design and construction of these houses, is within the scope of this tender. These houses shall be of structural steel supported over RCC pedestals and foundation along with a provision for monorail of suitable capacity for material handling. Regarding the monorail capacity, the bidder shall refer the Electrical & Mechanical part of this tender document. Proper arrangement for fixing the head drum, tail drum etc. shall be made as per system requirement.

All the surge hoppers shall have SS 409M liners with 10 mm thick on the inclined portion and 8 mm thick on vertical portion. The base plate shall be minimum 16 mm thick structural steel.

The houses shall be properly enclosed with 0.5mm thick iron profile sheeting for roof and side cladding. 12% of the roofing and side covering shall be with minimum 2mm thick GRP/FRP translucent sheeting. Windties shall be provided.

The ground floor of these houses shall be at least 600 mm above the final accepted ground level around these houses. Grade slab at ground floor shall be as per soil conditions and design requirements subject to minimum 150 mm thick RCC (M25) over 100mm thick mud mat over 150 mm thick boulder soling packed with sand. Minimum 50mm thick ironite flooring shall be provided as floor finish. This floor shall be extended 1.5m all around beyond the house. Peripheral drains shall be provided around the house to collect effluent from floor wash.

The upper floors of these houses shall be made of 6 mm thick GI chequered plate. Proper safety arrangement with GI handrail with 2 mm thick 150 mm height toe guard shall be provided wherever there is opening. However, wherever handrail is not possible, with 2 mm thick 150 mm height toe guard shall be provided. Minimum 1.5 m clear walkway shall be provided around all equipment. Stairs with minimum 1.2m wide flight and necessary GI hand railing with 2 mm thick 150 mm height toe guard shall be provided as per requirement. Minimum width of each tread shall be 250 mm. Maximum height of riser shall be 190mm, although risers of 150mm to 175mm will be desirable. Steps shall be 6 mm thick GI chequered plate.

ii) Drive House DH & Drive House cum Sampler House (DH cum SH)

The DH & DH cum SH shall be of RCC substructure & steel superstructure. The location of these houses have been shown in the system drawings or it may be provided as per system requirement. The area requirement of these houses shall be guided by functional and other requirements as stated elsewhere in this document. If sampling system is included in any DH of any conveyor(s) then it should be of suitable size. These houses with take up arrangement is included in the scope of the tender as per system drawing/requirement. Take up tower of structural steel construction and RCC foundation, has to be constructed as per the system drawings/requirement. Arrangement of monorail for handling materials shall also be kept.

Drives shall be housed in suitable enclosed steel structures with iron profile sheeting with wind ties. Roof and side cladding shall be of 0.5mm thick iron profile sheeting. 12% of the roof and side covering shall be with minimum 2mm thick GRP/FRP translucent sheeting.

The ground floor of these houses shall be at least 600 mm above the final accepted ground level around these houses. Grade slab at ground floor shall be as per soil conditions and design requirements subject to minimum 150 mm thick RCC (M25) over 100mm thick mud mat over 150 mm thick boulder soling packed with sand. Minimum 50mm thick ironite flooring shall be provided as floor finish. This floor shall be extended 1.5m all around beyond the house. Peripheral drains shall be provided around the house to collect effluent from floor wash.

The upper floors of these houses shall be made of 6 mm thick GI chequered plate. Proper safety arrangement with GI handrail with 2 mm thick 150 mm height toe guard shall be provided wherever there is opening. However, wherever handrail is not possible, with 2 mm thick 150 mm height toe guard shall be provided. Minimum 1.5 m clear walkway shall be provided around all equipment. Stairs with minimum 1.2m wide flight and necessary GI hand railing with 2 mm thick 150 mm height toe guard shall be provided as per requirement. Minimum width of each tread shall be 250 mm. Maximum height of riser shall be 190mm, although risers of 150mm to 175mm will be desirable. Steps shall be 6 mm thick GI chequered plate.

iii) SH

Sampler house(s) as per system drawing shall be provided and shall be of RCC substructure & steel superstructure. The location of these houses have been shown in the system drawings or it may be provided as per system requirement. The area requirement of these houses shall be guided by functional and other requirements as stated elsewhere in this document.

These houses shall be housed in suitable enclosed steel structures with iron profile sheeting with wind ties. Roof and side cladding shall be of 0.5mm thick iron profile sheeting. 12% of the roof and side covering shall be with minimum 2mm thick GRP/FRP translucent sheeting. Provision for natural ventilation lighting shall be done by providing louvers

The ground floor of these houses shall be at least 600 mm above the final accepted ground level around these houses. Grade slab at ground floor shall be as per soil conditions and design requirements subject to minimum 150 mm thick RCC (M25) over 100mm thick mud mat over 150 mm thick boulder soling packed with sand. Minimum 50mm thick ironite flooring shall be provided as floor finish. This floor shall be extended 1.5m all around beyond the transfer house. Peripheral drains shall be provided around the house to collect effluent from floor wash.

The upper floors of these houses shall be made of 6 mm thick GI chequered plate. Proper safety arrangement with GI handrail with 2 mm thick 150 mm height toe guard shall be provided wherever there is opening. However, wherever handrail is not possible, with 2 mm thick 150 mm height toe guard shall be provided. Minimum 1.5 m clear walkway shall be provided around all equipment. Stairs with minimum 1.2m wide flight and necessary GI hand railing with 2 mm thick 150 mm height toe guard shall be provided as per requirement. Minimum width of each tread shall be 250 mm. Maximum height of riser shall be 190mm, although risers of 150mm to 175mm will be desirable. Steps shall be 6 mm thick GI chequered plate.

G. Service Buildings

General Specifications

The following specifications are applicable for all the service building unless otherwise mentioned :

i) All the service building except parking shed, workshop shed shall be of RCC frame

ii) Pre construction anti termite treatment shall be done for all the buildings.

iii) Minimum plinth height shall be 600 mm for all buildings & 150 mm for parking sheds.

iv) Minimum floor height shall be 3300 mm.

v) RCC flat roof with proper drainage arrangement and adequate provisions for installation, operation & maintenance of solar panels shall be provided.

vi) Chajja & portico shall be provided as per functional & architectural requirement.

vii) All the external brickwork shall be of minimum full brick thickness with 1:6 cement mortar. Internal partition shall be of half brick wall with 1:4 cement mortar. However, partly glazed half/ full partition with UPVC framing shall be provided in office portion as per architectural & functional requirement.

viii) RCC staircase with mumpty to apprach the roof shall be provided for all the buildings which has more than one floor. Minimum width of each flight and tread of stair shall be 1.5 m and 250mm respectively. Maximum height of riser shall be 150mm. Necessary railings shall be provided along the stair. Structural Steel Staircase shall be provided for access to mumpty roof.

ix) Structural Steel Staircase with suitable riser and tread shall be provided in all the single storied building for access to roof.

x) Minimum thickness and mix of cement plaster shall be as follows :

(a) Rough Side : 15 mm thick using 1:6 cement mortar

(b) Smooth Side : 12 mm thick using 1:6 cement mortar

(c) Ceiling : 6 mm thick using 1:4 cement mortar

xi) Anti skid vitrified/ceramic tiles shall be provided in floors of all toilets. Provision of toilets for physically challenged with suitable braille signage shall be made. Further, all the guidelines related to universal accessability issued by GOI shall be adopted.

xii) Granite stone flooring shall be provided in all RCC staircases.

xiii) Dado shall be provided with ceramic glazed tiles upto 2.1m height from floor in all first aid room, toilets, kitchen, pantry & kitchen wash.

xiv) All the counter/ shelves shall be of minimum 40 mm thick precast RCC slab(1:2:4).

xv) Granite top shall be provided on counters.

xvi) All the toilet doors shall have WPC frame and door shutters with required fittings.

xvii) M.S. grill with square bars shall be provided in windows. Size and arrangement of windows shall be such that it allows maximum natural light and ventilation into the buildings.

xviii) All the wood work & steel work shall be painted with synthetic enamel paint over a coat of ready mixed primer

xix) All internal water supply lines shall be of concealed CPVC pipes & external water supply lines shall be of D.I./ G.I. pipes exposed on wall.

xx) All water supply fixtures shall be of CP brass.

xxi) All the plumbing & electrical fixture/ fittings shall be approved by the EIC.

xxii) Septic tank with soak pit of adequate capacity shall be provided to treat the sewage from toilet. Necessary pipe lines, inspection pit, manholes shall be provided as per requirement for collection and conveyance of sewage from toilet to septic tank.

xxiii) All the internal wiring shall be concealed. All internal & external electrifications, lighting arrangements, ceiling fans, power points shall be provided as per requirement. Sufficient no. of exhaust fans shall be provided in kitchens & toilets.

xxiv) Roofs shall have minimum gradient of 1:100. Appropriate Integrated crystalline waterproofing compound/ admixture (such as conplast, sika-plast 304 or equivalent) shall be added with concrete. Further, fibre reinforced elastomeric liquid water proofing membrane shall be provided. Provision of gola and adequate rain water down comer shall be made.

xxv) Minimum 1m wide plinth protection of adequate specification shall be provided all around the buildings.

xxvi) Storm water drains shall be provided all around the buildings.

xxvii) Ramps shall be provided in all buildings to facilitate entry of disabled person.

xxviii) Provision of rain water harvesting shall be done for all the service buildings.

Other Minimum Specifications/Requirements :

A. Main Office Building

A. Main Office Building		
Requirements: The main office building shall have CHP office, rest room, first aid center, canteen with kitchen & pantry, store, toilets etc. as per functional requirement, with provision of separate room for each executive and supervisor. Minimum two rooms with attached toilet shall be provided for higher officials. It is desirable that the main CHP office should be located on the first floor.		
Sl.	**Items**	**Brief Description**
1	**Built-up Area**	……
2	**Type of Structure**	The building shall be a …….. storied building of RCC frame structure
3	**Flooring**	
a)	*Rooms*	Full body vitrified tiles
b)	*Kitchen*	Matt Finished vitrified tiles
4	**Frame & Shutter**	
a)	*Doors*	i) uPVC glazed doors comprising of lead free uPVC multi-chambered frame. ii) Steel door iii) Collapsible gate at main entry. iv) Toilet doors shall have WPC frame and door shutters with required fittings. Above mentioned doors shall be provided with required fittings as per functional and architectural requirement.
b)	*Cupboards*	Stainless steel tubular frame, 25 mm thick flush door shutters (one side decorative) and required fittings.
5	**Windows**	i) 2 track uPVC frame with 4 mm thick glass & required fittings, ii) uPVC fixed/casement ventilator Above mentioned windows shall be provided as functional & architectural requirement.
6	**Wall Finishing**	
a)	*POP/Putty*	1 mm thick putty on internal walls
b)	*External*	Premium Acrylic Emulsion Exterior Paint over a coat of

A. Main Office Building		
		primer
c)	*Internal*	Premium Acrylic Emulsion Paint over a coat of primer
7	**Sanitary**	
a)	*Pipe*	CPVC pipes
b)	*Single user toilet*	Minimum two.
	i) Fixtures	Wash basin, W.C., mirror with towel ring
c)	Multi user toilet	One multiuser toilet shall be provided on each floor. Separate provision for gents and ladies toilet shall be made.
	i) Fixtures	Wash basin, W.C, urinal, mirror, towel rod etc. as per functional requirement.

B. Time & Security Office		
Requirements: The time and security office shall be designed as per functional and architectural requirement. Minimum one single user toilet shall be provided.		
Sl.	**Items**	**Brief Description**
1	**Built-up Area**	……..
2	**Type of Structure**	The building shall be a single storied building of RCC framed structure
3	**Flooring**	
a)	*Rooms*	Full body vitrified tiles
4	**Frame & Shutter**	
a)	*Doors*	i) Angle iron frame, 35 mm thick flush door shutters ii) Toilet doors shall have WPC frame and door shutters with required fittings
b)	*Cupboards*	Angle iron frame, 25 mm thick flush door shutters (one side decorative) and required fittings.
5	**Windows**	i) 2 track uPVC frame with 4 mm thick glass & required fittings, ii) uPVC fixed/casement ventilator

B. Time & Security Office		
		iii) M.S. grill with square bars Above mentioned windows shall be provided as functional & architectural requirement. Fully glazed fixed window with grills shall be provided on visitor approach counter. Necessary opening shall be provided for communication.
6	**Wall Finishing**	
a)	*POP/Putty*	1 mm thick putty on Internal walls
b)	*External*	Premium Acrylic Emulsion Exterior Paint over a coat of primer
c)	*Internal*	Premium Acrylic Emulsion Paint over a coat of primer
7	**Sanitary**	
a)	*Pipe*	CPVC pipes
b)	*Single user toilet*	Minimum one
	i) Fixtures	Wash basin, W.C., mirror with towel ring

A. Pump House		
Requirements: The pump house shall be designed as per system requirement. Minimum 1.5m wide circulation space shall be provided around the equipment for maintenance purpose.		
Sl.	**Items**	**Brief Description**
1	**Built-up Area**	Minimum ……. sqm.
2	**Type of Structure**	The building shall be a single storied building of RCC frame structure.
3	**Flooring**	
a)	*Rooms*	Cement Concrete flooring and minimum 50mm thick topping shall be done with quartzite hardener.
4	**Frame & Shutter**	
a)	*Doors*	i) Rolling shutters ii) Steel Door Above mentioned doors shall be provided with required

A. Pump House		
		fittings as per functional and architectural requirement.
5	**Windows**	i) uPVC Window with 4 mm thick glass & required fittings.
6	**Wall Finishing**	
a)	*POP/Putty*	1 mm thick putty on Internal walls
b)	*External*	Acrylic Emulsion Exterior Paint over a coat of primer
c)	*Internal*	Premium Acrylic Emulsion Paint over a coat of primer

B. Compressor House		
Requirements: The compressor house shall be designed as per system requirement. Minimum 1.5m wide circulation space shall be provided around the equipment for maintenance purpose.		
Sl.	**Items**	**Brief Description**
1	**Built-up Area**	Minimum ……. sqm.
2	**Type of Structure**	The building shall be a single storied building of RCC framed structure
3	**Flooring**	
a)	*Rooms*	Cement concrete flooring and minimum 50mm thick topping shall be done with quartzite hardener.
4	**Frame & Shutter**	
a)	*Doors*	i) Rolling shutters ii) Steel door Above mentioned doors shall be provided with required fittings as per functional and architectural requirement.
5	**Windows**	i) uPVC window with 4 mm thick glass & required fittings.
6	**Wall Finishing**	
a)	*POP/Putty*	1 mm thick putty on Internal walls
b)	*External*	Acrylic Emulsion Exterior Paint over a coat of primer
c)	*Internal*	Acrylic Emulsion Paint over a coat of primer

C. Substation

Requirements:

The electrical substations will have HT and LT switch board hall, control room, transformer room, battery room, store room, maintenance room, Engineer-in-charge room etc. with toilet facilities. The details of equipment have been mentioned in the electrical sections of the document. The layout of the cable trench will be as per system requirement. The top level of the cable trench shall be kept minimum 0.6 m above finished ground levels and the plinth of the building shall be fixed accordingly.

There will be suitable arrangement for lifting the transformer in case of breakdown/ maintenance for which suitable RCC paved platform shall be constructed at same level outside the Substation building to facilitate handling of the transformer and other equipment. The scope covers construction of complete building with cable trench and foundation of the equipment in all respect.

Pressurisation in MCC rooms of sub-station shall be done. Air-conditioning facilities shall be provided in all control/PLC rooms of sub-station. The entrance to both the MCC room, control room/PLC room shall have double doors suitably designed to prevent sudden pressure loss.

Air required for pressurization of MCC room shall be free of dust. For this, adequate arrangements for cleaning, filtering and treatment of air to maintain the desired humidity shall be included with scope of work. In case of Control and MCC rooms, the sound level within the rooms should be kept below 60dB.

Ground floor of the building shall accommodate Transformer rooms, Switchgear & Relay control panel room, Battery room, Capacitor room, Tools room, Maintenance room, Operator/Attendant room, Toilet/washroom etc. The width of wall all around the transformer rooms shall be as per IS 1646 latest edition. First floor shall be provided with PLC & Control-monitoring room, Engineer-in-charge room, Staff room, Toilet/washroom etc. One attached toilet shall be provided with the Engineer-in-charge room.

Sl.	Items	Brief Description
1	**Minimum Built-up Area**	CHP Substation will be double storied with minimum total built up area …….**m^2**. Outdoor Switch Yard at substation with minimum area ……. m2, if applicable
2	**Type of Structure**	The building shall be a double storied building of RCC frame structure
3	**Floor Height**	4500 mm for Substation portion

C. Substation		
		3300 mm for office /control room portion
4	**Flooring**	
a)	*Engineers Room, staff Room, office etc.*	Full body vitrified tiles
b)	*MCC Room & Switch gear room*	IPS with insulating rubber matting
c)	*Flooring in other areas*	As per functional requirement
5	**Frame & Shutter**	
a)	*Doors*	i) Angle iron frame, 35mm thick flush door shutters ii) Glazed door with aluminium framing iii) Rolling shutters iv) Steel Door v) Collapsible gate at main entry. Above mentioned doors shall be provided with required fittings as per functional and architectural requirement.
6	**Windows**	i) 2 track UPVC frame with 4 mm thick glass & required fittings, ii) uPVC fixed/casement ventilator Above mentioned windows shall be provided as functional & architectural requirement.
7	**Wall Finishing**	
a)	*POP/Putty*	1 mm thick putty on internal walls of offices
b)	*External*	Acrylic Emulsion Exterior Paint over a coat of primer
c)	*Internal*	Acrylic Emulsion Paint over a coat of primer
8	**Sanitary**	
a)	*Pipe*	CPVC pipes
b)	*Single user toilet*	Minimum three should be provided. Minimum one ladies toilet shall be provided at first floor
	i) Fixtures	Wash basin, W.C., Mirror with towel ring

D. LMV Parking Shed		
Requirements: Open parking shed shall be provided to park light motor vehicles.		
Sl.	**Items**	**Brief Description**
1	**Shed Area**	Minimum ……..
2	**Type of Structure**	Structural steel superstructure on RCC pedestal & foundation
3	**Flooring**	
a)	*Parking area*	Chequered Parking Tiles over minimum thick RCC and well compacted subbase. The floor shall be minimum 150 mm above adjacent road level. Necessary ramps shall be provided.
4	**Roofing**	
a)	*Parking Area*	PVC Tensile Fabric

E. Scooter/ Cycle Parking Shed		
Requirements: Open parking shed shall be provided to park scooter/ cycles.		
Sl.	**Items**	**Brief Description**
1	**Shed Area**	Minimum ……..
2	**Type of Structure**	Structural steel superstructure on RCC pedestal & foundation
3	**Flooring**	
a)	*Parking area*	Chequered Parking Tiles over minimum thick RCC and well compacted subbase. The floor shall be minimum 150 mm above adjacent road level. Necessary ramps shall be provided.
4	**Roofing**	
a)	*Parking Area*	PVC Tensile Fabric

H. Roads and Pavement

a. Roads

Whole of the proposed CHP area shall be well connected with single lane PQC roads for movement of men and materials. Scope of this tender includes

construction of road network connecting transfer houses, transfer cum drive houses, transfer cum surge bins, drive houses, drive house cum sampler houses, sampler houses, silos, truck receiving hopper complex, truck loading complex, overground bunkers, conveyor galleries, pump houses, water reservoirs, service buildings, substations etc. These units shall be well connected by single lane road with the existing road network.

These roads shall have 3.75 m wide carriage way with minimum 1.5 m wide shoulders and RCC drains of suitable dimension and specification on both sides of the road. The road shall be designed for movement of LMVs like cars, jeeps, trucks, rubber tyres mounted mobile cranes etc., considering the prevailing soil conditions. Wherever necessary, suitable culverts etc. shall be provided for proper drainage of water.

The road section shall be designed as per relevant IRC/CPWD/NBO/IS specifications. However minimum specification as detailed hereunder shall be provided.

i) Well prepared and well compacted sub-grade.

ii) Sand filling of designed thickness with proper compaction.

iii) Appropriate thickness as per design requirements (compacted and finished thickness, Minimum 200 mm) granular sub-base by providing close graded material conforming to Grade-II (size range 53 mm to 0.075 mm) having CBR Value-25 conforming to specifications

iv) Dry lean cement concrete sub-base of minimum 100 mm thickness over a prepared sub-grade with coarse and fine aggregate conforming to IS:383, the size of coarse aggregate not exceeding 25 mm, aggregate cement ration not exceeding 15:1, aggregate gradation after blending to be as per table 600-1, cement content not to be less than 150 kg/cum, optimum moisture content to be determined during trial length construction, concrete strength not be less than 10Mpa at 7 days, mixed in a batching plant, transported to site, laid with a paver with electronic sensor, compacting with 8-10 tonnes vibratory roller, finishing and curing.

v) Minimum 150 mm thick PQC of M40 grade of concrete.

The PQC road will be dowel jointed pavement over a prepared sub base with minimum cement @ 400 kg per cum, fine and coarse aggregate of 25 mm nominal size conforming to IS:383 in appropriate proportions as per approved & specified design criteria, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound, finishing to lines and grades as per drawing, complete all as per direction of Engineer-in-charge.

b. Pavement

1. Pavement around Receiving pit complex & Ramp:

Rigid pavement shall be provided over the platform and ramp. The pavement section shall be designed as per functional/design requirement/dumper load data as well as relevant IRC/CPWD/NBO/IS/MORTH specifications. However, minimum specification as detailed hereunder shall be provided.

- Appropriate thickness as per design requirements (compacted and finished thickness, minimum 200 mm) granular sub-base by providing close graded material conforming to Grade-II (size range 53 mm to 0.075 mm) having CBR Value-25 conforming to specifications.
- Minimum 300 mm thick Wet Mix Macadam (WMM) with graded stone aggregate (size range 53 mm to 0.075 mm). The WMM shall be laid in uniform layers with mechanical paver-finisher in sub- base / base course on well prepared surface and shall be compacted with vibratory roller of 8 to 10 tonne capacity to achieve the desired density.
- Minimum 100 mm thick dry lean cement concrete sub-base of designed thickness over a prepared sub-grade with coarse and fine aggregate conforming to IS:383, the size of coarse aggregate not exceeding 25 mm, aggregate cement ratio not exceeding 15:1, aggregate gradation after blending to be as per table 600-1, cement content not to be less than 150 kg/cum, optimum moisture content to be determined during trial length construction, concrete strength not be less than 10MPa at 7 days, mixed in a batching plant, transported to site, laid with a paver with electronic sensor, compacting with 8-10 tonnes vibratory roller, finishing and curing.
- Minimum 250 mm thick PQC of M40 grade of concrete.
- The PQC Road will be dowel jointed over a prepared sub base with minimum cement @ 400 kg per cum, fine and coarse aggregate of 25 mm nominal size conforming to IS:383 in appropriate proportions as per approved & specified design criteria, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation. Provision of contraction, expansion and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod etc. shall be made.

The minimum slope across the pavement shall be 1:50 for proper drainage. Drains of suitable dimensions and specifications shall also be provided around the pavement.

2. Pavement for Railway Track

At ground level, a railway track will be provided for loading train wagons for which a rigid pavement suitable for ballast less track as per norms of INDIAN RAILWAYS/its subsidiary. However, minimum specification (S1) as detailed hereunder shall be provided.

- Well compacted subgrade upto 95% proctor density.
- 200 mm thick compacted sand filling.
- 150 mm thick Plain Cement Concrete (M20)
- 300 mm thick RCC (M25)

In other areas below and around silo the minimum specification (S2) as given hereunder shall be provided.

- Well compacted subgrade.
- 230 mm thick boulder soling.
- 100 mm thick Plain Cement Concrete (M10)
- RCC (M20) 200 mm thick
- Floor finish as per functional requirement.

Proper drainage system shall be provided around the Silo to prevent stagnation of water during peak precipitation. Extent of pavement for railway track below the loading system shall be as per manufacturer's recommendations but not less than 50 meter on either side of centre line of Silo. Laying of track is not in the scope of the bidder.

3. **Pavement for Other Areas**

Pavement shall be provided at approaches of important structures like substation, office etc. or as per functional and maintenance requirement. These pavements shall be designed as per functional requirement. However minimum specification as detailed hereunder shall be provided.

- Well compacted subgrade.
- 230 mm thick boulder soling.
- 100 mm thick Plain Cement Concrete (M10)
- 200 mm thick RCC (M20)

I. Boundary Wall

2.1 m high boundary wall above formation level shall be provided. The wall shall be of brick work supported on RCC column-beam. 600 mm dia concertina coil fencing supported on angle iron posts shall be provided on the top of the boundary wall i.e above 2.1 m. Both side of the wall shall be finished with cement plaster and paint (premium acrylic exterior paint) as per direction of EIC.

Layout of boundary wall shall be as per actual site conditions and functional requirement. The final layout of boundary wall shall be decided during detail engineering.

Properly designed Gate of adequate size should be provided in the boundary wall with main and pedestrian gate as per functional requirements. Necessary rails shall be provided for easy movement of gates.

All service buildings like Substations, CHP office, Pump Houses, Store Room, Workshop Complex, etc., shall compulsorily be provided with boundary wall with gate all around keeeping in view the system requirement.

J. Fencing around Outer Switchyard:

M.S. angle iron supported chain linked fencing shall be provided. The fencing shall be supported on M.S. angle iron supports over suitably designed foundation. M.S. angle iron supports shall be provided at the interval of maximum 3 m and minimum height of fencing above the ground shall be 2.1 m. There shall be sufficient numbers of entry gates as per functional requirement.

K. Brickwork

The brick used in wall shall be of Flyash/AAC blocks bricks of required stenegth as per provisions of IS code**.**

L. Culvert

Required culverts over natural/artificial nallahs/drains are to be constructed as per system drawing/functional/operational/other requirements. The bidder has to visit the site and collect hydrological data for designing and constructing the culverts. Conveyor along with approach road as shown in the drawing is to pass over the culvert. Necessary arrangements shall be made for ensuring safety of the conveyor in high flood conditions.

M. Services

i) Industrial Water/Dust Suppresion/Fire Fighting Water

The capacities of the tanks/reservoirs shall be fixed after calculation of water requirement on the basis of relevant norms/system requirements but shall not be less than ……., ……. and …… sqm respectively. In the reservoir, a partition wall should be constructed, so that a minimum quantity of water as per TAC is ensured for fire-fighting purpose at any point of time. All reservoirs/ tanks shall be covered, with provision of necessary free board, ladders etc. Water supply lines and arrangements shall be provided for fire-fighting and dust suppression as explained elsewhere. Necessary pumping facilities shall also be provided. Separate water pipe line and arrangements shall be provided for fire-fighting, dust suppression and service water purpose. Pumping facilities shall be provided with 100% standby arrangement. Pump house shall be constructed to accommodate all the pumps adjacent to water sump/reservoir.

The sources for filling these reservoirs shall be from the main reservoir of the project as decided by the company. All piping and pumping arrangement including pump house from main reservoir to feeding points shall be in the scope of this contract. Bidder should visit the site to get first-hand information regarding the water source and the required length of the pipeline.

The capacity of the reservoir shall be fixed after calculation of water requirement on the basis of relevant norms/system requirements.

All pipe lines and pumping arrangement including pump house from water reservoir to feeding points is in the scope of this work. Bidder should visit the site to get first-hand information regarding the water source and the required length of the pipeline.

ii) Drinking Water

Individual PVC overhead tanks(6 layered food grade ISI marked suitable for external use) of required capacity but not less than 2 m^3 shall be provided over each sub-stations, offices, and other service buildings as per requirement. Necessary receiving and distribution piping and pumping arrangement is covered in the scope of the work. Adequate drinking points with PVC tank, shall be provided at all transfer houses, transfer cum drive houses, transfer cum surge hoppers, drive houses, drive house cum sampler houses, sampler houses, near truck receiving hoppers, RLS complex, Bunkers, sub-stations, pump houses etc. The distribution system for drinking water shall be done as per requirement. The facility for drinking water shall also be provided at suitable points in offices, service buildings, toilets, etc. with all necessary fittings and fixtures. A separate potable water reservoir of suitable capacity shall be constructed nearby the main ground water reservoir. The water purifier with chiller is to be provided in the substation buildings and office premises.

iii) Drainage Arrangement

Proper surface drainage facilities of adequate dimensions, specifications and slope shall be provided for the entire CHP to take care of all the storm water which is likely to be encountered considering the topography and the natural drainage of the construction sites and the adjoining area. Dimensions and specification of drains and culvert/cross drainage works shall be so engineered and constructed so as to receive and discharge all the storm water entering into the proposed plant area including run off from the area outside the proposed construction site which is likely to enter the proposed plant area. The storm water shall be disposed of to the nearest nallah or shall be taken to a suitable distance beyond the boundary of CHP without impacting mining activity and residential and industrial area, where it can be properly disposed. Drain shall be provided with pre- cast RCC covers, wherever necessary. All the drains shall be constructed with RCC as per design requirements.

iv) Sewerage/Effluent

Proper sewerage shall be provided for handling of sewage. This will include provision of septic tank, soak pit, sewer line, man hole, inspection chamber and all other fittings and fixtures needed for the same.

The industrial effluent from Plant area after collection from floor washing, dust suppression etc. shall be collected and conveyed through a separate system into the proposed effluent treatment plant (ETP). All the necessary receiving and pumping arrangement for collection and conveyance of industrial effluent from the proposed plant into ETP is covered in the scope of this tender.

Industrial effluent from the entire CHP shall be disposed of to the proposed ETP, suitably located which is in the scope of the work of this NIT. The location needs to be based on functional requirement & site condition.The ETP has to be designed from laboratory test results on samples collected from existing nearby CHPs as directed by the Project authorities. The ETP design shall be in accordance with the provisions of CPHEEO Manuals and other relevant environmental stipulations/ statutory/normative guidelines. The ETP shall have sumps, oil & grease treatment facility, clarifloculation / settling arrangement, treated effluent reservoir, recirculation arrangement for different uses like gardening, dust suppression etc., alternate disposal arrangement in the natural features etc. as per functional requirement and direction of EIC. Operation and maintanance of ETP is in the scope for a period till DLP period.

N. Other Works/Requirements

i) Collection Of Rainfall And Hydrological Data

No data regarding the above are made available in this tender document. The bidder is required to inspect and examine the site and its surroundings and satisfy himself as to the rainfall and the soil, the availability and suitability of other requirements, as required for fair bidding purposes. The successful bidder shall have to undertake detailed collection of hydrological data, rainfall data, prepare and submit a comprehensive report with recommendations for approval of the owner/consultant. Reports approved by the owner/consultant shall be finally adopted for design and engineering.

ii) Earthwork In Excavation

Excavation of earth for all types of soil for construction of all the civil structures is covered in the scope of this contract. Final dressing of ground in and around the proposed CHP area is under the scope of this contract as drainage will be done by the contractor as per technical and functional requirement. After completion of work ground will be provided in as it is condition. Excavation for proper drainage of rain/ subsoil water around the ground conveyor, service buildings, transfer houses, drive houses, Coal receiving complex, substations etc. is covered under the scope of this tender. The depth and size of the excavation will be as per approved system requirement and as per detail design drawings. All cuttings and fillings as per required level and profile including transportation/ disposal of soil within a distance of 2 km is included in the scope of this bid.

Necessary slope stability study and provisions for stability of sloped earth adjacent to all elements of CHP has to be done by the contractor.

If blasting is required, the contractors have to prepare the site and carry out blast hole drilling as per the requirement. The contractors will be responsible for drilling in all gradient/terrain as per requirement of the works. Blasting will be done departmentally by owner, However the drilling pattern and blast design parameters are to be decided mutually by the technical representative of the contractors and the project officials or their consultants on day to day basis so as to avoid any dispute on fragmentation of the rock and the powder factor.

iii) Development works such as Grading/levelling/dressing of site, etc.

Site grading/levelling shall be done by the bidder within boundary limit of the proposed CHP area under the scope of this contract based on detailed survey to be done by the bidder as per technical/functional and drainage requirement.

The HFL, Bed level, water flow, etc. of the existing water courses, sub-soil water table shall be taken into consideration while designing the structures. Bidder shall undertake various remedial measures for protection of the proposed CHP area from streams/water courses as per requirement.

iv) Architectural requirements

The structures in the whole CHP complex (under the scope of this contract) shall have appropriate industrial architectural look, with appropriate colour, shades and structural networks. All the structures should portray architectural excellence with due care to better utilisation of space, service requirements etc. and also encompass concerns as varied as contemporary design, area conservation and environmental issues. The buildings with brick work, concrete and plaster faces shall have paints in aesthetically sound shades as approved. Louvers and openings shall be provided in steel structures for ventilation and better use.

v) Landscaping and Arboriculture

The whole CHP complex (under the scope of this contract) shall be designed keeping in view its proper aesthetic appearance. The perspective view of the plant with landscaping shall be submitted. The boundary limit of the entire CHP for the purpose of development and arboriculture shall be limited up to a distance of 25 m from the edge of various infrastructures of the CHP.

To provide better environment and arrest dust around CHP, intensive close planting of Casia Siamed, fruit plants or approved variety should be done to form impervious hedges around the plants and shall be maintained by bidder for the period of five years after plantation. However minimum plantation area in the CHP shall be ……sqm. Avenue Plantations of for a minimum ….km length of the new roads shall be done.

vi) Fire Fighting

Whole of the CHP under the scope of this contract shall be protected against fire. Automatic fire fighting facilities shall be provided as per relevant IS codes and TAC norms. Main protection system against fire shall be fire Hydrant. The mains shall be laid in rings wherever necessary. The type of pipe to be used for firefighting and location of hydrants shall be as per IS 9668-1980. (latest revision). Hydrants shall be provided at suitable intervals all along the proposed CHP as per technical requirement. Water tanks and pump house shall be included in the scope of work. The capacity of the water tanks shall be fixed as per relevant norms but shall not be less than those as mentioned earlier.

Firefighting points/hydrants shall be provided for entire proposed CHP including receiving pit, transfer points, drives houses, conveyor, galleries, sub-stations and service buildings etc. Fire hydrants shall be provided at suitable intervals as per TAC norms. Necessary landing valves at all the floor of receiving pits, sub-stations and at other places wherever necessary shall be provided.

The pressure of each hydrant shall be as per relevant IS codes and norms when up to four hydrants are used simultaneously.

All the service buildings chall be provided with suitable fire fighting systems and smoke detectors as per statutory requirements.

vii) Dust Suppression

Proper water supply arrangement for dust suppression will be made at dust generating points so that all working space remain free of dust. For dust suppression water jets will have to be provided in receiving pit area and all transfer points. For proper ventilation in all the working floors, arrangements for installing exhaust fans/ventilation fans with ducting will have to be made as detailed elsewhere in the tender document. All civil works pertaining to dust suppression shall be as per system requirement. Dust suppression system should be suitable for water available at the project. The pumping sets for the dust suppression/control should have 100% stand by at each location.

viii) Plant Cleaning

Water and compressed air pipe line network along with connection/tapping points with control valves at suitable intervals shall be provided in the floors of truck receiving hopper complex, transfer house, transfer cum drive house, transfer-cum-surge bins, drive houses, drive cum sampler houses, sample houses, conveyor galleries, sub-stations, RLS complex, overground bunker complex, truck loading system complex etc. for pressure cleaning of floor chutes, walkways etc. Proper drainage arrangement will have to be made all along the plant so that water or slush accumulation is avoided. At every probable spillage point suitable arrangement shall be made for a mechanized or manual cleaning.

O. CONSTRUCTION, FABRICATION, ERECTION AND COMMISSIONING, OVERHEADS AND SUPERVISION

i) Clearance of site before start of work

Site will be handed over to the contractor in 'as it is' condition, unless otherwise indicated in this document. Any site preparation work, unless otherwise mentioned, including cleaning, cutting, filling, levelling, grading, removal, etc. before start of the actual work shall be done by the contractor to the full satisfaction of Engineer-in charge.

ii) Site Clearance after completion of work

After the completion of work the contractor shall remove scaffolding, sheds rubbish and surplus materials except which are required for rectification of defects. Contractor shall hand over the site in clean and tidy condition after cleaning the total area including floor, drains etc. fit for the use by the owner.

iii) Layout and Levels

The layout and levels of all structures, etc. shall be laid by the contractor at his own cost from the general grid of the plot and bench marks given by the Engineer-in-charge for checking the detailed layout and correctness of the layout and levels. But the contractor shall be solely responsible for correctness of layout and levels.

iv) Specifications

The specifications are intended for general description of the work, quality and workmanship. The specifications are not, however intended to cover minute details and the work shall be executed according to the relevant Indian Standard codes of practices or to the recommendations of relevant American and British Standard in cases where Indian Standard codes are not available for such works. These specifications shall have precedence in anything contrary to this stated anywhere in this document.

As such the Contractor should plan the work and items in detail. Generally, steps required towards the standardization to nearest higher rating of equipment keeping in view of energy conservation, safety of men and materials, better environment, shall be considered at any stage before or during execution with due prior approval with no extra cost to Owner.

v) Construction Method and Equipment

The Contractor shall submit drawings and write ups indicating a broad outline of how he intends to execute the work.

vi) Installation/Erection and Supervision.

It will be the contractor's responsibility to bring, receive and keep the materials in safe custody in proper condition. Responsibility of handling the materials during manufacturing, transit and handling at site rests with the contractor.

All the equipment will have to be installed and fitted with accessories as per approved drawing. Entire tools and tackles, manpower and any other material required for successful installation will be supplied by the contractor. The

contractor shall furnish the list of requirement of engineers, supervisors and other skilled personnel to carry out the job properly.

vii) Inspection and testing

Test For Material/Workmanship

All tests required for materials, quality of work and any other tests as required/desired by the Engineer-in-charge shall be at Contractor's cost. The frequency and mode of testing shall be as per latest relevant BIS codes.

viii) Perception and remedial measures

Perception and remedial measures for the entire CHP area under the scope keeping in view the adjoining natural and artificial features such as hill slopes, nallah, buildings, loading complexes etc.

ix) Other miscellaneous works/services/requirements etc.

All brick work, doors, windows, finishes including architectural treatment, plinth protection, water proofing, damp proofing, glazing etc.

All brickwork shall be carried out as per relevant IS codes and shall be plastered on both faces . All external walls shall be of minimum full brick thick.. The scope also includes providing and fixing all doors, windows, rolling shutters, finishes, damp proofing, inserts, anchor bolts, embedment, stairs nosing, railings ladders, edge protection angle, etc. Doors and windows shall be of aluminium frames and suitably glazed. Openings on external walls of the buildings shall be provided with sunshades

All equipment foundations, All inserts, anchor bolts and embedment, All railings, ladders and platforms. AII necessary wind ties, Cable trenches shall be provided with chequered plate or with pre-cast RCC covers. Cable trenches as well as pre-cast cover shall be provided with edge protection angles. All embedment/block cuts as required elsewhere in these specifications shall be provided, or cable tray can also be provided.

All external surface of underground concrete structure except receiving pit and underground tunnel in contact with earth shall be given a bitumen coat. 600 mm thick boulder packing shall be provided on the outside face of earth retaining structures. Weep holes shall be provided at suitable spacing in all earth retaining structure or as per design requirement. All corners and edges in openings shall be protected with angle of minimum size 75mm x 75 mm x 8 mm with suitable lugs embedded in concrete. Similarly, all edges of concrete members coming in contact with flow of coal or any other moving material shall be provided with similar edging for protection.

Floodlight towers and crossovers shall be provided wherever required. Monorail girders and fixtures shall be provided for monorails at locations required and described elsewhere in these specifications or drawings.

All RCC work to be done under this specification unless specified, otherwise, shall be of controlled concrete of grade not less than M-20 of IS 456 (Latest) and shall be made with fresh cement.

Gradient of the staircase should not exceed 40 degree and there should not be monkey ladders. Proper shed should also be provided above the staircases wherever the stairs are outside.

Any other works/services/requirements whether specifically indicated or not and found necessary to be incorporated on later date for safety and efficient operation of the plant shall also be deemed to have been covered within the scope of work of this tender.

P. GENERAL REQUIREMENTS

a) Any other requirement related to construction and operation, whether specifically indicated or not, but found necessary to be incorporated at a later date for safe and efficient operation of the plant shall also be deemed to have been covered within the scope of work of this tender.

b) Wherever required, dewatering shall be done by the contractor to avoid damage of equipment, structural, etc. and timely completion of work. This shall be carried out by contractor without any increase in the cost.

c) If any certification or approvals are to be taken from electrical inspector/statutory bodies, DGMS, the same shall be the responsibility of the contractor.

d) As per system requirement envisaged in the NIT documents, various parameters, specifications may undergo changes during detail engineering stage. This shall be carried out by the contractor without any increase in cost.

e) All safety regulations, labour laws, code of practices for power supply, manufacturer, installation, erection, commissioning etc. envisaged by the State Govt. /Central Govt. or any authorities/bodies shall be strictly complied without any increase in cost.

f) All Mines Acts and regulations will be followed during construction stage.

g) Before handing over of the CHP after DLP period, all the structural steel structures shall be painted with minimum two coats of EPOXY after prime coat. Also all the service buildings, sub stations,etc., shall be painted as a new work.

Q. SAFETY

Safety Code for Work in Silo System:

In addition to the general safety codes set out before special measures, methods of working and equipment shall be used in Silo system. In particular the Silo

system shall be kept well ventilated and protective covers shall be placed over roof openings (other than those left open for properly installed and protected hoists) wherever work is in progress inside the Silo.

Only skilled and reliable workmen connected with the internal operations shall be allowed on the Silo roof while internal work is in progress. No other personnel work whatsoever shall be allowed on the roof or the sides of the Silo system at these items.

The contractor is to prepare a safety code of practice for these operation for approval by the purchaser

Safety Code – General

Suitable scaffolds shall be provided for workmen for work that cannot safely be done from the ground or from solid construction except such short period work as can be done safely from ladders. When a ladder is used an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well, suitable foot holds and hand holds shall be provided on the ladder and the ladder shall be given an inclination not steeper than 1/4 horizontal to 1 vertical. Scaffolding or staging more than 3.25 meters above the ground or floor, slung or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached, bolted, braced and otherwise secured at least 1 meter high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structures. Working platform, gangways and stairways shall be so constructed that they do not suddenly or unequally change level, and if height of a platform or gangway or stairway is more than 1.25 meter above ground level or floor level, it shall be closely boarded, have adequate width and be suitably fenced, as described above. Every opening in floor of a building or in a working platform shall be provided with suitable means to prevent fall of persons or materials by providing suitable fencing or railing with a minimum height of 1 meter.

- Safe means of access shall be provided to all working platform and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 meters in length. Width between side rails in a rung ladder shall in no case be less than 30 cm for ladders up to and including 3 meters in length. For longer ladders this width shall be increased at least 6 mm for each additional 30 cm of length. Uniform step spacing shall not exceed 30 cm. All scaffolding, ladders and other safety devices mentioned or described herein, shall be maintained in safe condition and no scaffold, ladder or equipment shall be altered or removed while it in use.
- Adequate precautions shall be taken to prevent danger from electrical equipment. When workers are employed on electrical installations which are already energised, insulating mats, working apparel such as gloves, sleeves

and boots, as may be necessary shall be provided. Workers shall not wear any rings, watches and carry keys or other materials which are good conductors of electricity.

- No materials on any of the sites shall be so stacked or placed as to cause danger of inconvenience to any person or the public.
- The contractor shall provide all necessary fencing and lights to protect public from accident and shall be bound to bear expenses of defence of every suit action or other proceedings at law that neglect of the above precautions and so pay any damages and costs which may be awarded in any such suit, action or preceding in such persons or which may with the consent of the contractor be paid to compromise any claim by any such person.
- Excavation and Trenching - All trenches, 1.6 meters or more in depth, shall at all times be supplied with at least one ladder for each 20 meters in length or fraction thereof. Ladder shall be extended from bottom of trench to at least 1 meter above surface of the ground. Sides of a trench which is 1.5 meters or more in depth shall be stepped to give suitable slope or securely held by timber bracing, so as to avoid the danger of sides collapsing. Excavated materials shall not be placed within 1.5metre of edge of trench or half of depth of trench, whichever is more. Cutting shall be done from top to bottom. Under no circumstances shall undermining or undercutting be done.
- Demolition - Before any demolition work is commenced and also during the process of the work: All roads and open areas adjacent to the work-site shall either be closed or suitably protected. Electric cable or apparatus which is liable to be a source of danger over a cable or apparatus used by operator shall remain electrically charged. All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion, or flooding. No floor, roof or other part of a building shall be so overloaded with debris or materials as to render it unsafe.
- All necessary personnel safety equipment as considered adequate by the Engineer-in-charge shall be available for use of persons employed on the site and maintained in a condition suitable for immediate use, and the contractor shall take adequate steps to ensure proper use of equipment by these concerned.
- Workers employed on mixing asphaltic materials, cement and lime mortar / concrete shall be provided with protective gloves.
- Those engaged in handling any materials which is injurious to eyes shall be provided with protective goggles.
- Those engaged in welding works shall be provided with welder's protective eyes shield.
- When workers are employed in sewers and manholes which are in use, the

contractor shall ensure that manhole covers are opened and manholes are ventilated at least for an hour before workers are allowed to get into them. Manholes so opened are cordoned off with suitable railing and provided with warning signal or boards to prevent accident to public.

- Stone breaker shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.
- The contractor shall not employ man below the age of 18 and women on the work of painting with products containing lead in any form. Whenever men above the age of 18 are employed on the work of lead painting, the following precautions shall be taken.
- No paint containing lead or lead products shall be used except in the form of paste or readymade paint.
- Suitable face masks shall be supplied for use by workers when paint is applied in the form of spray or when a surface having lead paint is being dry rubbed and scraped.
- Overalls shall be supplied by the contractor to workmen and adequate facilities shall be provided to enable working painters to wash during and on recession of work. Use of hoisting machines and tackle including their attachments, anchorage and supports shall conform to the following:
- These shall be of good mechanical construction, sound materials and adequate strength and free from patent defects and shall be kept in good repair and in good working order. They shall be regularly tested and certified as appropriate.
- Every rope used in hoisting or lowering material or as a means of suspension shall be of durable quality and adequate strength and free from patent defects.
- Every crane driver of hoisting appliance/ operator shall be properly qualified and no person under the age of 21 years shall be in charge of any hoisting machine including any scaffold, winch or give signals to operator.
- In case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or lowering or as means of sub-tension, safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with safe working load. In case of a hoisting machine having a variable safe working load and the conditions under which it is applicable shall be clearly indicated. No part of any machine or of any gear referred to above in this paragraph shall be loaded beyond safe working load except for the purpose of testing.
- In case of departmental machine, safe working load shall be notified by Engineer-in-charge. As regards contractor's machine, the contractor shall notify safe working load of each machine to the Engineer-in-charge wherever he brings it to site of work, and shall get it verified by the Engineer-in-charge.

- Motors, gearing, transmission, electric wiring and at near dangerous parts of hoisting appliance shall be provided with efficient safeguards.
- Hoisting appliances shall be provided with such means as will reduce to the minimum risk of accidental descent of load. Adequate precautions shall be taken to reduce to the minimum risk of any part of a suspended load becoming accidentally displaced. Adequate washing facilities shall be provided at or near places of work.

Application

These safety provisions shall be brought to the notice of all concerned by display on notice board at a permanent place at the work spot. Persons responsible for ensuring compliance with the safety code shall be named by the contractor. To ensure effective enforcement of the rules and regulations relating to safety precautions, arrangements made by the contractor shall be open to inspection by the Engineer-in-charge or his representatives and the Inspecting Officers as defined in the contractor's Labor Regulations.

When work is done near any place where there is risk of drowning, all necessary safety and rescue equipment shall be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision made for prompt first aid treatment for all injuries likely to be sustained during the course of the work.

Notwithstanding the above conditions, the contractor is not exempted from the operation of any other Act or Rules in force.

4.0 GENERAL REQUIREMENTS

a) Any other requirement whether specifically indicated or not, but found necessary to be incorporated at a later date for safe and efficient operation of the plant shall also be deemed to have been covered within the scope of work of this tender.

b) Wherever required dewatering shall be done by the contractor to avoid damage of equipment, structural, etc. and timely completion of work. This shall be carried out by contractor without any increase in the cost.

c) If any certification or approvals are to be taken from electrical inspector/statutory bodies, DGMS, the same shall be the responsibility of the contractor.

d) As per system requirement envisaged in the NIT documents, various parameters, specifications may undergo changes during detail engineering stage. This shall be carried out by the contractor without any increase in cost.

e) All safety regulations, labour laws, code of practices for power supply, manufacturer, installation, erection, commissioning etc. envisaged by the State Govt. /Central Govt. or any authorities/bodies shall be strictly complied without any increase in cost.

f) All Mines Acts and regulations will be followed during construction stage.

5.0 TRAINING

The plant personnel responsible for operation & maintenance of the plant and deputed by employer shall be properly trained whether in land or overseas, so that the persons are fully conversant with the assembly and sub-assembly of the equipment, detail circuit of the electrical control system including, hydraulic system & operation and maintenance etc. The plant personnel shall be in a position to rectify any defects of the equipment developed during operation of the plant for efficient running with minimum down time.

Annexure-III.1

LIST OF MECHANICAL EQUIPMENT AND ACCESSORIES
A: LIST OF EQUIPMENT

Sl. No.	Description	Capacity	Quantity in No.
1			
2			
3			
4			
5			
6			

B: LIST OF ACCESSORIES AND FACILITIES

	Nomenclature	**Quantity**
a)	Continuous bin level indicator	
b)	Portable compressor for plant cleaning ____ cfm capacity _____ kg/cm² Pressure	
c)	Special tools and tackles	
d)	Noise abatement measures to reduce noise level	
e)	Measures to control vibration so as to keep its level within ISO limits	
f)	Items/accessories not specifically mentioned but needed for successful commissioning/operation of the plant.	

Annexure-III.2

LIST OF ELECTRICAL EQUIPMENT, ACCESSORIES AND TESTING EQUIPMENT

LIST OF ELECTRICAL EQUIPMENT AND ACCESSORIES

Sl. No.	**Equipment**	**Quantity**	**Location**

Appendix - A

Sl. No.	Particulars		
1	Length (Horizontal) (m)		
2	Belt Width, (mm)		
3	Belt Speed, (m/sec), approx.		
4	Capacity (Rated), TPH		
5	Lifts, m		
6	Quantity		
7	Each Conveyor Drive Power, kW		
8	Type of Drive		
9	Material to be carried		
10	Bulk density of material, Te/cum		
11	Trough Angle in degree		
12	Lump size (mm)		
13	No of loading points at each Conveyor		
14	Type of take-up		
15	Anti-roll lock devices		
16	Type of coupling		
17	Drum diameter		
	A. Drive/Head pulleys(mm)		
	B. Snub, Tail pulleys, take up (mm)		
	C. Bend pulley (mm)		
18	Placing of drive unit (Right/Left)		

Note:

1) Conveyor length, lift to be checked and may undergo minor changes during detail design stage.
2) Drive powers and pulley diameters given are minimum. If required, these may be increased during detail design stage.
3) Conveyor calculation as per Indian standard, IS 11592 (latest), to be followed.
4) Allowable maximum inclination for all conveyors shall be 1:5 (in general).
5) The data sheet for the conveyors (Appendix-A) will not be the only basis for designing the conveyors. Considerations have also to be made for any other

requirements arising out of the conditions stipulated in any part of the contract agreement.

Appendix - B
Schedule of Belting

Sl. No.	Belt width (mm)	Type of Belting	Belt Rating/Min. Working Tension (kN/M)	Top Cover Thickness (mm)	Bottom Cover Thickness (mm)	Type of Joint	Cover Grade	Quantity (m) (Approx.)	Conveyor Designation
1							FRAS		
2							FRAS		

Note:

1) Ratings/length given are minimum. If required, these may be increased during detail design stage.
2) The tenderer shall have to submit calculation for selection of belting for approval.

Appendix - C

LOCATION FOR INSTALLATION OF ELECTRIC HOIST AND CHAIN PULLEY BLOCKS

Sl. No.	Location	Electric Hoist	Chain Pulley Block
1			
2			
3			
4			
5			
6			
7			
8			

9			

Note: The above quantity, if required, to be increased/decreased during detail design stage, to suit the system requirement. The capacity of Electric Hoist/ Chain Pulley Block shall be at least 25% more than the heaviest assembly/ component to be lifted. At the same time, the rating of Electric Hoist/ Chain Pulley Block shall be standardized to minimize inventory for maintenance and interchangeability.

CHAPTER – IV
TECHNICAL SPECIFICATIONS
(MECHANICAL)

Sl. no.	Equipment	Page No.
1	Gyratory crusher	
2	Semi mobile crushing plant (Skid mounted)	
3	Double roll crusher	
4	Apron feeder	
5	EOT crane	
6	Electro mechanical vibratory feeder	
7	Rock breaker	
8	Belt conveyor	
9	Conveyor belting (Nylon-Nylon)	
10	Conveyor belting (Steel cord)	
11	Secondary sizer	
12	Rotary plough feeder	
13	Magnetic separator	
14	Metal detector	
15	Belt weigher	
16	Rapid loading system with two pre-weigh hoppers	
17	Freight cum passenger lift	
18	Sampling system	
19	Fire detection and fighting system	
20	Dust suppression and extraction system	
21	Belt vulcanizer	

22	Condition monitoring system	
23	Miscellaneous equipment	

CHAPTER – V
TECHNICAL SPECIFICATIONS
(ELECTRICAL)

Detailed Technical specification of Electrical P&M & systems are to be described.

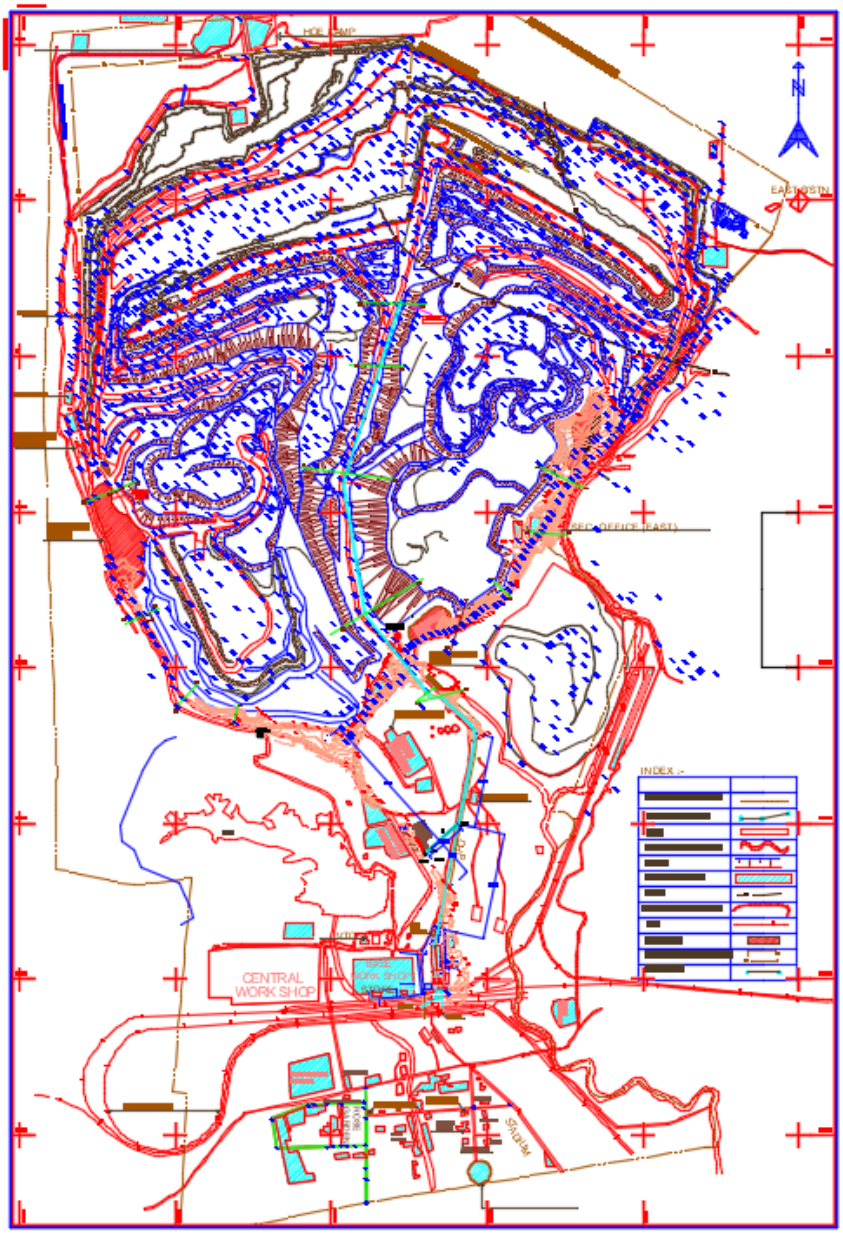
Sl. no.	Equipment	Page No.
1	6/3 kV Surge Type Lightning Arrestors	
2	6.6/3.3 kV Off Load Isolator with and without Earth Switch	
3	6.6/3.3 KV Indoor metal enclosed Vacuum Circuit Breaker & Vacuum Contactor	
4	6.6/3.3 kV Switch Board	
5	6.6 kV/415 V and 3.3kV /415 V Oil Immersed Power Transformers	
6	33/6.6/3.3 kV/230 V(L-L) Oil Immersed Lighting Transformers	
7	415 V Motor Control Centres and Distribution Boards	
8	Micro-Processor based Control System (PLC System)	
9	Control Panels for PLC & Other System Requirement	
10	Close Circuit Television System (CCTV)	
11	415 V, 3.3 kV & 6.6 kV Induction Motors continuous Rating and Duty type	
12	415 V, 3..3 kV & 6.6 kV Capacitor Banks	
13	Earthing & Lightning Protection System	
14	Local Control Station	
15	Main Lighting Distribution Boards (M.L.D.B.) and Lighting Distribution Boards (L.D.B.),MCCB,MCB	
16	Cables	
17	Masts for Lighting	

18	LED Lamp & Luminaire	
19	LED Acid Battery and Battery Charging Set	
20	Diesel Generator Set	
21	SCADA and IIoT-Enabled Substation Automation	
22	3.3 KV, 6.6 kV AND 415 V VARIABLE VOLTAGE VARIABLE FREQUENCY DRIVE (VVVFD) UNIT	

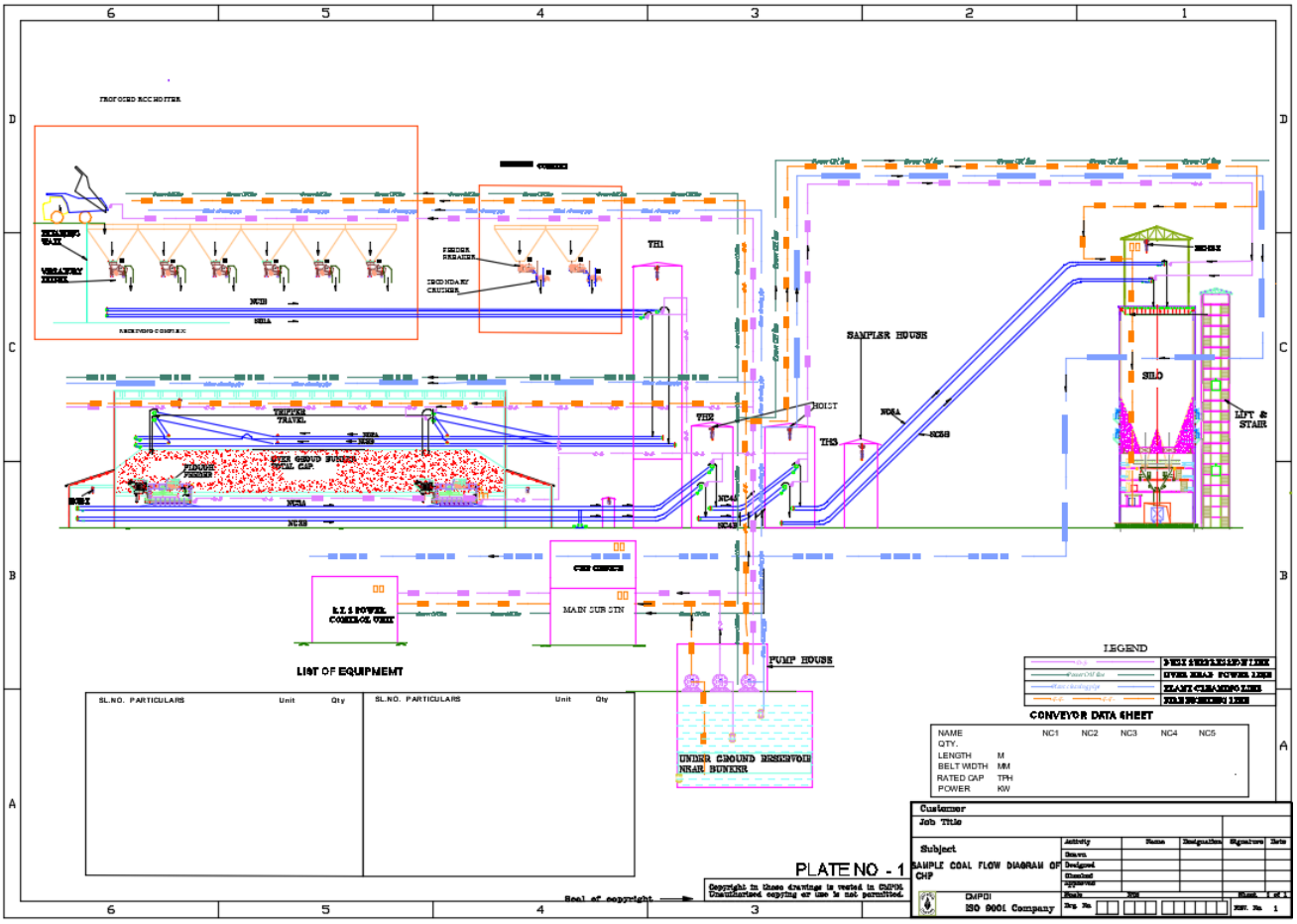
DRAWINGS

Drawings related to Plan, Coal Flow Diagram, System Drawings, if any and Single Line Diagrams are to be furnished here

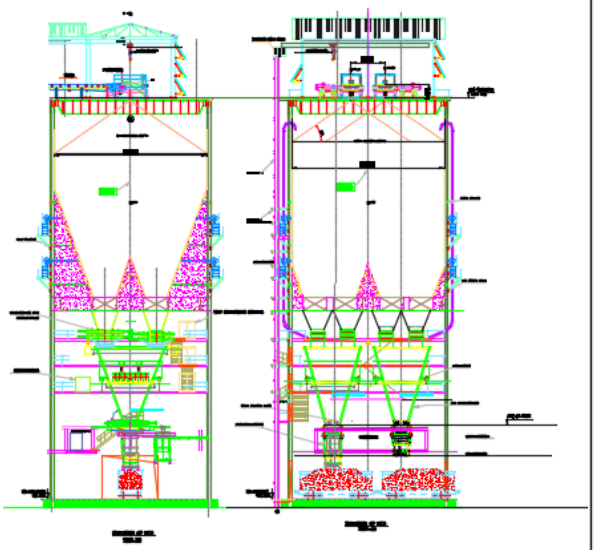
SAMPLE KEY PLAN

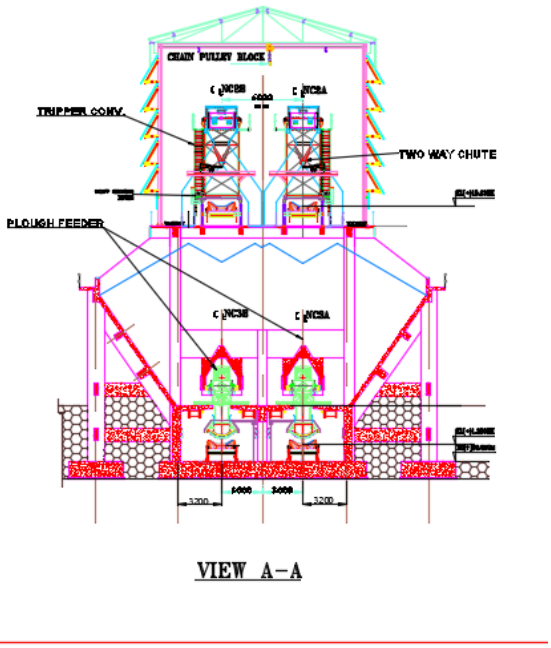


SAMPLE COAL FLOW DIAGRAM

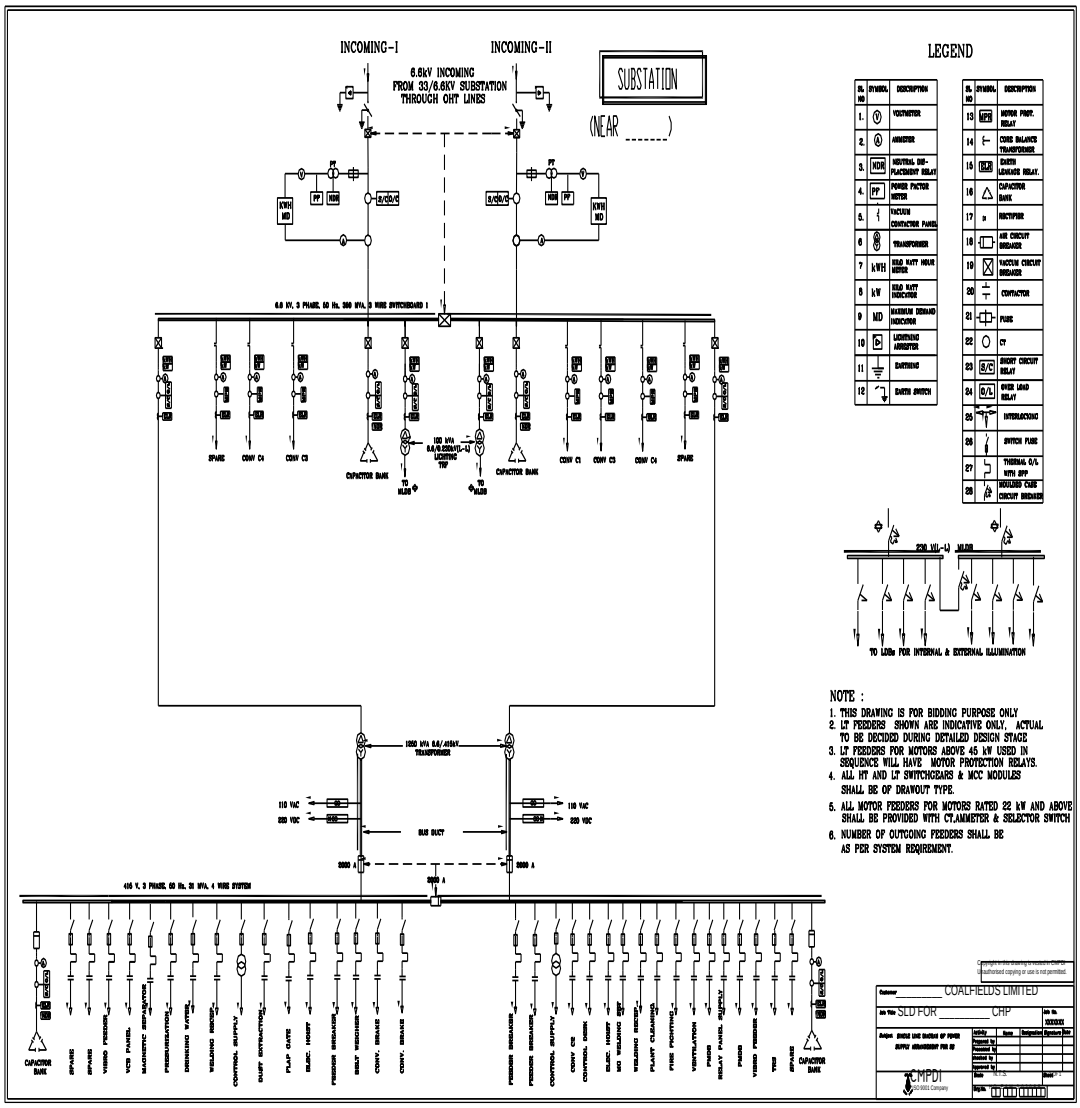


SAMPLESYSTEM DRAWINGS





SLD


INCOMING-I
INCOMING-II
6.6kV INCOMING
FROM 33/6.6KV SUBSTATION
THROUGH OHT LINES
SUBSTATION
(NEAR _____)
LEGEND
NOTE :
1. THIS DRAWING IS FOR BIDDING PURPOSE ONLY
2. LT FEEDERS SHOWN ARE INDICATIVE ONLY. ACTUAL TO BE DECIDED DURING DETAILED DESIGN STAGE
3. LT FEEDERS FOR MOTORS ABOVE 45 kW USED IN SEQUENCE WILL HAVE MOTOR PROTECTION RELAYS.
4. ALL HT AND LT SWITCHGEARS & MCC MODULES SHALL BE OF DRAWOUT TYPE.
5. ALL MOTOR FEEDERS FOR MOTORS RATED 22 kW AND ABOVE SHALL BE PROVIDED WITH CT,AMMETER & SELECTOR SWITCH
6. NUMBER OF OUTGOING FEEDERS SHALL BE AS PER SYSTEM REQUIREMENT.
TO LDBs FOR INTERNAL & EXTERNAL ILLUMINATION
COALFIELDS LIMITED
SLD FOR _____ CHP
CMPDI

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Annexure-I (not to be part of Tender Document)

Input Data required from Production Subsidiary for preparation of Tender Document

S. N.	List of information/ input data	Remarks
1	Capacity of Coal Handling Plant (CHP) in Mty	…… Mty
2	Surface Contour of Proposed site (along conveyor route), preferably at one-meter vertical interval along with grid showing all existing structures/surface features such as buildings, poles, nallah, culvert etc.	Plan shall be provided in Hard copy, duly certified by area/CCL, as well as soft copy in Auto CAD format
3	Coordinates of truck receiving station, over ground bunker along with conveyor corridor and silo co-ordinates with Top of Rail clearly marked on the mine/surface plan	Plan shall be provided in Hard copy, duly certified by area/CCL, as well as soft copy in Auto CAD format
4	The conveyor corridor, truck receiving station, over ground bunker & silo locations shall be free of any Hindrance, this may please be confirmed.	Yes/ No, it may please be confirmed by L&R and other concerned departments
5	The Silo location and over ground bunker location must be on stable virgin soil, this may please be confirmed. If location of Silo or Bunker is proposed upon filled up area/ OB dump, the depth of virgin ground below the existing ground level may be mentioned.	Yes/ No
6	Location of the existing approach road, haul road marked on plan which shall be connected to proposed site along with the spot level of road.	It shall be indicated on the same plan as provided for Sl. No. 2&3
7	Any road diversion to be kept in the scope of contractor, please specify.	Yes/No, It shall be indicated on the same plan as provided for Sl. No. 2&3
8	Any Nala Diversion or embankment required for the project, please specify	Yes/No, It shall be indicated on the same plan as provided for Sl. No. 2&3
9	Please specify the existing drainage and sewage treatment facilities in the proposed CHP plant layout (for domestic and industrial sewage) including requirement of its dovetailing with the new system required for proposed CHP	Details to be provided and it shall be indicated on the same plan as provided for Sl. No. 2&3

S. N.	List of information/ input data	Remarks
10	The client has to provide a water supply point near the proposed CHP site for potable, industrial and firefighting purposes required for running the CHP. The point of water supply may please be marked on the surface plant/ layout plan.	It shall be indicated on the same plan as provided for Sl. No. 2&3
11	A suitable location for ETP required for this project shall be marked on the surface plan and to where this effluent waste is to be drained or diverted from ETP shall be specified and marked on the surface plan.	It shall be indicated on the same plan as provided for Sl. No. 2&3
12	Whether fencing of whole CHP area is to be provided, may please specify.	Yes/No
13	The entire proposed railway track for the siding marked on surface plan.	It shall be indicated on the same plan as provided for Sl. No. 2&3
14	Clarify provisioning of Operation and maintenance required during Defect Liability Period of 05 years along with manpower requirement.	Option 1 – Only Operation Option 2 – Only Maintenance Option 3 – Operation & Maintenance both.
16	Route plan of the Over Head Line from switching station Project.	It shall be indicated on the same plan as provided for Sl. No. 2&3
17	Detailed soil investigation report to determine the general nature of the sub-surface strata at site, index & engineering properties and geotechnical parameters for foundation recommendations.	Report to be provided
18	Any other parameter which may affect the construction & operation of CHP may also be provided.	Details to be provided
19	Updated SOR of Subsidiary	Soft Copy to be provided
20	Basic material rates at site: Bricks, Sand, cement, Stone Aggregate, Timber, Mild Steel	Rate reference to be provided
21	Minimum Wages/labor rates at Site: Skilled, Semi-Skilled, & Un-Skilled	Rate reference to be provided
22	Soil Investigation Report of site	Soft Copy to be provided (**Tentative FORMAT given Below)
23	Source of Water for construction	Details to be confirmed

S. N.	List of information/ input data	Remarks
24	Hydrological data, flood level and existing drainage conditions	Data/Details to be provided
25	Any other details/ data required	To be provided.

FORMAT for Soil Investigation report

**Minimum number of boreholes for various components of CHP:

Structure	No. of Boreholes (Min)*	Remarks
Bunker	4	
Silo	1	
Receiving Pit	3	
Transfer House/ Drive House/Sampler House	1	For each.
Conveyor	1	For conveyor length greater than 500 m.
Truck Loading Station	1	
Crushing Station	1	
Substation Building	1	

*The minimum number of boreholes may be increased, if the subsurface strata are highly erratic.
The depth of investigation shall be as per Clause 5.6.3, “Depth of Investigation” of IS 1892:2021 — Subsurface Investigation for Foundations: Code of Practice (Second Revision).