



Indian Institute of Technology (Indian School of Mines) Dhanbad

Expression of Interest

Indian Institute of Technology (Indian School of Mines) Dhanbad, an eminent institute of national repute registered under Institute of Technology Act 1961, is an autonomous institute under MHRD, Government of India, invites 'Expression of Interest (EOI)' from local and international organizations who are involved with and having considerable experience in design and construction of coal preparation plants. IIT(ISM) Dhanbad, requests such organizations to submit the EOI on the following;

1. Design and construction of a pilot plant for washing of coking & non-coking coals at Sudamdih Coal Washery, BCCL, Dhanbad, Jharkhand.
2. Operation and Maintenance of the plant during commission. The supplier has to run and maintain the plant for five years. Therefore, necessary spares to be considered in the scope of work.
3. The pilot plant shall be of 30-40tph throughput capacity, consisting of crushing, coal washing, dewatering and media recovery circuit.
4. The crushing circuit should possess a size reduction circuit to crush run-of-mine coal (approx. -300mm size) to a product size of -20 mm in 2-stages, in which second stage crusher to be in closed circuit.
5. The secondary crusher should have facilities to change its set from 20mm down up to 10mm and similar is with the screen deck to match crusher set.
6. The crushed coal will be de-slimed at 0.5mm size. The coarse coal (-20+0.5mm) shall be washed in either Jig (Batac Jig) or Dense Media Cyclone (DMC) or both of them simultaneously in parallel.
7. The dewatering of coarse coal will include screen with water spray arrangements, while the dewatering of fines (-0.5mm) shall include a small capacity thickener.

The details of the design, operation and control philosophy is given below:

Objectives:

The main objective of the proposed pilot-plant is to establish a process flow sheet to wash the given coal and optimize the design and operational parameters of the washing units at the targeted yield/ash%. In doing so, a relative comparison of washing performances; between the Batac Jig and a Dense Medium Cyclone for improved washing is to be made. Therefore, the plant being built should have all the facilities to change the design and operating variables along with control systems.

CRUSHING CIRCUIT

The run-of-mine coal (-300 mm) shall be crushed down to the size of -20mm (or even below up to 10mm if required for better liberation). The crushing circuit includes primary (in open circuit crushing) and secondary crushers (in closed circuit with screen). The crushed product (-20mm) shall be de-slimed at 0.5mm size using de-sliming screen to produce Coarse and Fine fractions (-20+0.5mm and -0.5mm). However, the seconder crusher and its screen selection should be made such that it should be able to produce the products of different sizes ranging from (-25mm, -20mm, -15mm, -10mm) with acceptable circulating load ratios.

WASHING CIRCUIT

The washing circuit will commence from de-sliming at 0.5mm. The de-slimed fines shall be sent to dewatering circuit. The details of the dewatering circuit is given in subsequent sections. The washing circuit will have two different circuits operating paralelly, for the same feed, as the coarse coal washing circuit. One circuit will contain Batac Jig and its ancillaries, while the second circuit will be of dense medium cyclone unit (DMC) along with media recovery facilities. The circuit is to be designed should be such that either jig circuit or cyclone circuit or both simultaneously, should be operative at any given time. When one circuit is operated, the other one may be kept standby. The jig and DMC circuits should have necessary facilities to study the effects of design and operational parameters during the experimentation.

The cyclone of DMC circuit has to be placed inclined in such a way so that the overflow and underflow products can be collected at the same level. Suitable slurry preparation tank, pump, density measurement, pressure gauge, etc. to be provided in the circuit.

MEDIA PREPARATION AND RECOVERY CIRCUIT

Fine magnetite shall be used to prepare dense media suspension for DMC. This media after coal washing is to be recycled back to the circuit through a drum magnetic separator for reuse. Therefore, a complete media recovery circuit of suitable capacity is to be designed.

DEWATERING CIRCUIT

The product of DMC is to be dewatered using a screen with water spray arrangement so that the used media slurry could be recycled back to media recovery circuit. The dewatering of de-slimed slurry shall be carried out in a thickener/high rate thickener. The thickener underflow dense slurry.

OTHER REQUIRED FACILITY

The crushing circuit should be provided with online sampling systems so that the sample of requisite amount could be collected from the belt conveyor for analysis in the laboratory. The DMC circuit and Jig circuit should also be provided with similar online sampling facilities. Appropriate junction boxes, bins, buckers, sumps, agitators, feeders, feed hoppers and conveyor belts are to be designed for storages, feeding and conveyance at intermittent stages. A total space of 100m x 100m will be made available for the plant including the space for storages, vehicle movements etc. The plant requires a concrete floor, the plant will have the steel structure, supported by columns and covered by good quality CGI sheets, both at the roof and all around its four sides. Necessary civil construction and steel structures are to be designed for the plant with safety as the utmost priority. A rail mounted crane to be provided by the designer to facilitate the erection of the equipment and maintenance / dismantling of the units.

Every unit in operation will have control systems with an access to monitor through a computer, placed in small control room which is free from vibrations and a sample analysis and storage room of appropriate size.

PROCESS FLOW DIAGRAM

A schematic/indicative process flow diagram of the plant is given below. The supplier has to design and propose their own flow sheet including suggestions, if any.

CONTACT

Interested organizations are permitted to visit the proposed plant site after obtaining prior approval to do so, to obtain information they may require for preparation of their EOI. Expressions of interest from interested parties should be addressed to **Registrar, Indian Institute of Technology (ISM) Dhanbad, PIN – 826004, Jharkhand**. The EOI should reach to the above mentioned address not later than 10.08.2017.

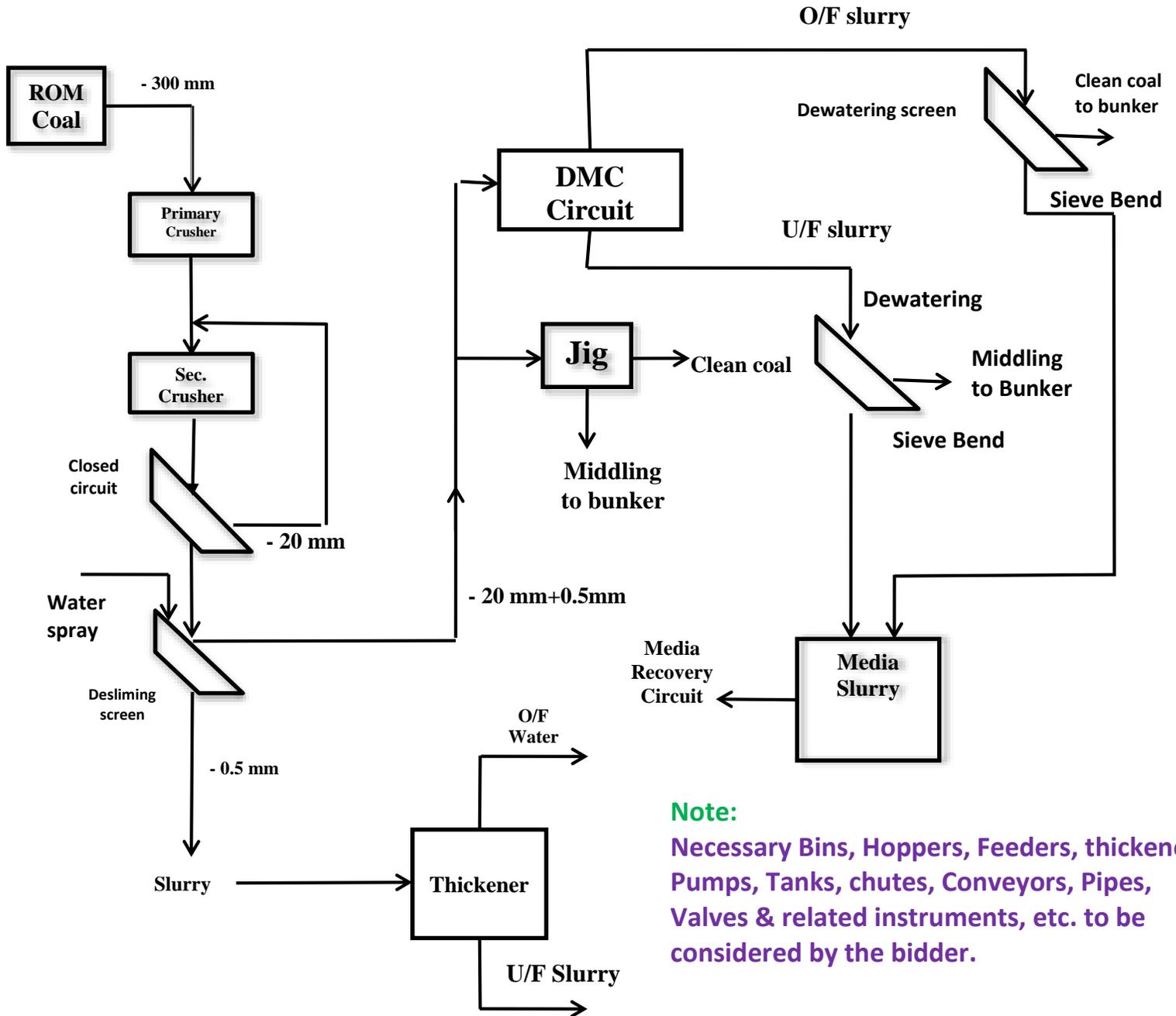
Note:

- (i) **It is proposed to hold the Pre-bid meeting on 18th of August at 10.30AM.**
- (ii) **On 17th August there will be a visit organized to Sudamdih Coal Washing plant, BCCL, Sudamdih to seek clarifications if any.**
- (iii) **Only the parties those who participate in the discussions held on 18th of August 2017 are permitted to bid for the stated task and only their quotations/tenders will be considered for the scrutiny.**

Registrar
Indian Institute of Technology (ISM) Dhanbad
PIN – 826004, Jharkhand
rg@iismdhanbad.ac.in or drps@ismdhanbad.ac.in or snikkam2014@gmail.com

PS: Schematic Diagram in the subsequent page

SCHEMATIC FLOW DIAGRAM OF THE PROCESS



Note:
 Necessary Bins, Hoppers, Feeders, thickeners, Pumps, Tanks, chutes, Conveyors, Pipes, Valves & related instruments, etc. to be considered by the bidder.