TENDER DOCUMENT

NIT No.- DLI / C&E / WI-675 / 854

FOR


VOLUME- 2B

(Scope of Work & Technical Specification)

ENGINEERING PROJECTS (INDIA) LIMITED
(A GOVT. OF INDIA ENTERPRISE)
Core-3, Scope Complex, 7, Institutional Area,
Lodhi Road, New Delhi-110003
TEL NO: 011-24361666   FAX NO. 011- 24363426
Scope of Work: BELT WEIGH SCALES AND ASSOCIATED WORKS

Scope of work for Belt Weigh Scale System with signal cables (Load cell and Tacho cables) shall include (but not limited to) design, engineering, manufacture, fabrication and assembly, final painting, testing and inspection at works, packing, forwarding supply, dispatch, transportation, delivery at site, providing drawings documents for approval of BSP/MECON, completion of facilities, performance guarantee testing, Supervision of installation, testing & commissioning and handing over to Bhilai Steel Plant.

Scope of supply shall include Belt Weigh Scale System complete unit with supporting arrangement, required machined idlers sets, weigh idlers, carrying idlers with accessories, Interconnecting cables with accessories between sensors (load cell & Techo) to field Junction Box and field junction box to controller units in LTSS/Despatcher control Room cables, signal booster/amplifier unit (if required) for transmission of signals, cabinet/panel for controller units complete with power supply and display unit in control room/ electrical room, interfacing cable for interfacing with automation system, field junction boxes, Field mounting flow indication cum totalizing display unit and supply of commissioning spares, tools & tackles, initial fill etc. For detailed scope of work bidder to refer Technical part (Volume-2B).

Armoured signal cables (Tacho cables, load cell signal cables from Belt Weigh field junction box to Controller units in control room/electrical room (LTSS) shall be in the bidder’s scope. Bidder shall submit the specifications for all type of field cables (sensors to controller unit) required for operation of the system for approval of BSP/MECON. All type special cables, JBs, cabinet for mounting BWS controller units complete with power supply and electrical accessories with power distribution, signal booster/amplifier/signal conditioner (if required) for transmission of Belt Weigh signals(sensors) from field to controller unit in control room/electrical room, interfacing communication cables (approx.-30 meters in length ) with required hardware for interfacing of Belt Weigh Controllers with PLC based automation system in LTSS/Control Room shall be in the scope of bidder.

240 VAC +10%/-15% , 1Ph, 50 Hz Power supply shall be made available near to Belt Weigh Scale controller Unit/ Controller units panel at single point in LTSS (LT Sub Station) / Despatcher Control Room and also at field side (if required).Further power distribution as persystem requirement shall be in the scope of bidder. Bidder shall furnish the details during the detailed engineering.
Bidder shall submit the specifications for field armoured signal (sensors-Load Cell & Techo cables) from sensor to field Junction Box and field Junction Box to controller units of Belt Weighing system in LTSS/Despatcher control room, special cable and flow indicator cum tantalizer unit signal cable for approval of BSP/MECON prior to supply.

The scope shall also include:

001 Submission of basic engineering, detail engineering and reference category of drawings, operating software and documents, in requisite copies, for approval of BSP/MECON and submission of final basic & detailed engineering drawings, manufacturing drawings of fast wearing items and non-standard items, as built drawings, installation drawings/documents, operating software, operation and maintenance manuals etc.

002 Deputation of representatives to site for supervision of installation, testing, calibration and commissioning.

003 Applying final finish coat of paint as per approved procedure & shades before handing over, first fill of lubricant & oil, special tools & tackles, mobile equipment, handling & hoisting equipment etc.

004 Supply of all commissioning spares, tools and tackles, initial fill etc. and insurance spares. Bidder shall furnish separately price for recommended spares for two years Operation & Maintenance.

005 Training to operation and maintenance personnels
BELT WEIGH SCALE SYSTEM

01 Scope of Work

The scope of work of includes design, engineering, manufacture, fabrication, assembly, testing and inspection, packing, dispatch, transportation, delivery FOR Purchaser’s site, supervision of erection, testing, inspection, commissioning, guarantee testing and handing over to the BSP including all electrics, initial and final painting, armoured cables (sensors to field JB, and field JB to controller unit in LTSS/Despatcher control Room), signal booster/amplifier unit if required, interfacing cables for interfacing with plant automation system, machined idlers as required, field JBs, cabinets for controller units and standard accessories for 11 nos. electronic micro-processor based Belt Weigh Scales as covered under this specification. 240 VAC, 1 Ph, 50HZ Power supply at singal point shall be made available in by purchaser in LTSS(LT Sub-Station)/ Despatcher Control Room and at field side as per th requirement to be given by bidder.

The scope of the vendor shall be deemed to include all such items which although are not specifically mentioned in the specification, but are needed to make the equipment complete in all respect for its safe, reliable, efficient and trouble free operation.

- Two years maintenance spares.
- Commissioning spares as required during testing and commissioning of the equipment.
- Insurance spares.
- Required quantity of initial fill of oil, grease, lubricants, hydraulic fluid etc. and other consumables which are necessary for cleaning/flushing including erection, testing and commissioning the equipment shall be in the scope of supply.
- Necessary tools and tackles for each equipment required for maintenance, testing or inspection of the equipment.
- Flow indication cum totalizing unit

02 TECHNICAL SPECIFICATIONS

1. General
Belt Weigh scale for measurement of flow rate and total-quantity shall be provided at specified locations as per relevant requirement as indicated in data sheets. System shall be complete with flow rate indicator, tantalizer, control panel etc.

2. Codes & Standards
The design, manufacture, inspection and testing of Belt Scales shall comply with all the currently applicable statutes, regulations and safety codes in the locality where the equipment is to be installed. The Belt Scales shall conform to the latest edition of the following standards and codes. Other internationally acceptable standards/codes, which ensure equal or higher performance than those specified, shall also be accepted.

IS:11547 Electronic weighing in motion system

3. Equipment Specification
The weigh scale shall be automatic and electronic type. It should be designed for continuous automatic weighing, metering of material flow.
Each belt weigh scale shall comprise of a belt weigh scale platform with minimum 4 nos. weighing idlers. It shall have unitised construction for ease of installation and shall be fully floating type (without pivot points). Minimum 3 nos. hermetically sealed load cells of precision strain gauge type shall be applied in tension to support the weigh bridge. The load cells shall have 100% overload protection and shall be structurally safe upto to 250% of rated belt scale capacity.

Belt scale shall be electronic microprocessor based with its program stored in non-volatile memory. It shall be provided with self diagnostic features for trouble shooting of the entire belt scale system. Fully automatic zero and span calibration facility shall be provided. The electronic systems offered by the Bidder shall include all signal conditioning, power amplifiers and printed circuits etc. The printed circuits shall be encapsulated against dust and moisture.

Belt scale shall be provided with flow rate total quantity etc. Remote flow rate indicators shall also be provided in the Central Control Room (CCR).

The flow rate indicator shall have minimum 4 digits. The flow totalizer should have 8 digits display scale with reset facility.

Belt weigh scale shall be provided with interfacing facility for communication with PLC/DCS. Communication protocol may be Modbus/Profibus. Interfacing protocol of Belt weigh Scale system shall be subject to approval of BSP/MECON for interfacing with automation system. Bidder shall provide the required protocol without any price implication.

Complete belt scale system shall be suitable for 50°C ambient temperature and 100% relative humidity. It shall be suitable for outdoor installation in a dusty area. The electronic circuit enclosure, sensors housing shall be dust and watertight. The electronic printed circuits shall be encapsulated with epoxy or other suitable material for protection against dust and moisture.

Minimum three years battery backup power failure protection shall be provided.

Belt scale shall be designed for a range of 20% to 120% of rated capacity with an accuracy of at least ±0.5% throughout its range.

Supply of test weights for calibration of belt scales shall be the tenderer’s responsibility.

Local panel for belt scale shall be of sheet metal

Supply of armoured signal cables (Load Cell & Techo Cables) sensor to controller unit in LTSS(LT Sub-station) /Despatcher Control Room.

Supply of cabinet/panels for installation of Controller unit in LTSS/ Despatcher Room as required.

Other Electrical details for Belt Weigh Scale shall be as given under clause. no. 08.03 (Electrical Details ) of SAIL/MECON- GS-06 of General Technical Specification (GTS)
4. Tentative Location of Belt Weigh Controller Unit / Controller unit Panel:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Belt Weigh Scale on Conveyor</th>
<th>Control Room/ LTSS</th>
<th>Total No Belt Weigh Scale</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Y11-207</td>
<td>LTSS- 1/Existing Despatcher-2</td>
<td>1No.</td>
<td>CHP Area</td>
</tr>
<tr>
<td>2.</td>
<td>K11-6A, K11-7, K11-8, K11-10C, K11-10D</td>
<td>LTSS- 3/ New Despatcher Control Room</td>
<td>5 Nos.</td>
<td>CSP Area</td>
</tr>
<tr>
<td>3.</td>
<td>KA-5, K11-21, K11-22, K11-18, C3A-C2</td>
<td>LTSS – 3/ New Despatcher Control Room</td>
<td>5 Nos.</td>
<td>CSP Area</td>
</tr>
</tbody>
</table>

5. Tentative Distances between control room building/LTSS and conveyors (Driving End):

<table>
<thead>
<tr>
<th>S.No</th>
<th>Belt Weigh Scale on Conveyor</th>
<th>Cable Route Distance from Control Room/LTSS (in meters)</th>
<th>Distance Control Panel Location</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Y11-207</td>
<td>600</td>
<td>LTSS- 1/Existing Despatcher-2</td>
<td>Bidder to check the length of cable and supply the cable as per requirement</td>
</tr>
<tr>
<td>2.</td>
<td>K11-6A</td>
<td>600</td>
<td>LTSS- 3/ New Despatcher C/R</td>
<td>-Do-</td>
</tr>
<tr>
<td>3.</td>
<td>K11-7</td>
<td>500</td>
<td>LTSS- 3/ New Despatcher C/R</td>
<td>-Do-</td>
</tr>
<tr>
<td>4.</td>
<td>K11-8</td>
<td>500</td>
<td>LTSS- 3/ New Despatcher C/R</td>
<td>-Do-</td>
</tr>
<tr>
<td>5.</td>
<td>K11-10C</td>
<td>700</td>
<td>LTSS-3/ New Despatcher C/R</td>
<td>-Do-</td>
</tr>
<tr>
<td>6.</td>
<td>K11-10D</td>
<td>600</td>
<td>LTSS- 3/ New Despatcher C/R</td>
<td>-Do-</td>
</tr>
<tr>
<td>7.</td>
<td>KA-5</td>
<td>400</td>
<td>LTSS- 3/ New Despatcher C/R</td>
<td>-Do-</td>
</tr>
<tr>
<td>8.</td>
<td>C3A-C2</td>
<td>300</td>
<td>LTSS – 3/ New Despatcher C/R</td>
<td>-Do-</td>
</tr>
<tr>
<td>9.</td>
<td>K11-18</td>
<td>300</td>
<td>LTSS – 3/ New Despatcher C/R</td>
<td>-Do-</td>
</tr>
<tr>
<td>10.</td>
<td>K11-21</td>
<td>250</td>
<td>LTSS- 3/ New Despatcher C/R</td>
<td>-Do-</td>
</tr>
<tr>
<td></td>
<td>K11-22</td>
<td>250</td>
<td>LTSS- 3/ New Despatcher C/R</td>
<td>-Do-</td>
</tr>
</tbody>
</table>

6. Conveyor Data:

As per enclosed Annexure -A
7. DOCUMENTATION

(I). **List of drawings /data to be submitted along with tender**
   a. General arrangement drawing with bill of material of equipment showing overall dimensions.
   b. Supplier’s name for components & catalogues for these items shall be furnished.
   c. List of commissioning spares.
   d. List of recommended spares for two years maintenance of plant and equipment.
   e. List of tools and tackles to be supplied with the plant and equipment.
   f. Block diagram showing cable connectivity with main equipment.
   g. Duly signed and stamped copy of unpriced copy of price bid submitted.
   h. No deviation declaration to NIT technical and commercial terms and conditions and duly
   signed with date and stamped copy of NIT Vol-1, Vol-2 (2A, 2B & 2C) and Vol-3.

(II). **List of drawing/documents to be furnished by the Successful vendor for approval**

/ reference
   The following drawing/ document are to be submitted by the Successful Tenderer within one
   month of placement of order:
   a. General arrangement drawing of equipment showing full details of BWS.
   b. Quality assurance plan for inspection.
   c. Requirement of tools and tackles for erection.
   d. Part list, bill of materials and material specification.
   e. Major sub assembly drgs, safety features etc.
   f. List of spares, special tools and tackles.
   g. Operating and maintenance manuals.
   h. Type of cable and cables specifications (Power cable, load cell cable, techo cable, field cables
   (field JB to Controller unit) etc.
   i. Design Basis

(III). **List of drawings/ documents to be submitted for reference and to be furnished**
   alongwith equipment by the successful vendor.

   a) All approved GA drawings, complete assembly and sub assembly drawings of the equipment.
   b) Drawing of all equipment/ component received from sub suppliers.
   c) Engineering and design calculations.
   d) Test reports and inspection reports.
   e) Instruction manuals for testing and commissioning.
   f) Operation, maintenance and safety manuals in ten copies.
   g) Requirement of special tools and tackles, if any, for subsequent maintenance.
   h) Detail drawing and specifications of all wearing out parts and parts subject to breakage during
   normal operating conditions.
   i) List of spare parts with drawings, sketches, specifications and manufacturer’s catalogues.
   j) Type of cable and cables specifications (Power cable, load cell cable, techo cable, field cables
   (field JB to Controller unit) etc.
Clause no. 08.03 (Electrical Details) of SAIL/MECON- GS-06 of General Technical Specification (GTS)

The system shall be provided with the following features given below in sub-clauses of clause no. 08.03 (Electrical Details) GS-06 of GTS of SAIL/MECON as applicable for Belt Weigh Scale.

GENERAL:

1.1 Microprocessor based Individual Weighing Controller (IWCs) with digital display and keyboards – for Belt weigh feeders/ Loss in weigh feeders.

1.2 VFD drive for speed control of AC motors of belt weigh feeders with necessary switchgears, incoming choke, output reactors if required, protective devices, communication links with IWC, input/output for remote start/stop, interlocking, indication lamps, controls, metering, potential free contacts for remote status indication like ON/OFF/TRIP/ converter fault (to be wired to PLCs), motor protective devices at field etc. Technical features of VFD drive shall be as per General specification for electrical system.

1.3 Individual Belt Weigh feeder panels housing IWC (Intelligent weighing controllers) controller & VFD drive, DOL starters for vibrating hoppers interlocked with belt weigh feeders.

1.4 Microprocessor based Bin weight measuring panels with digital display and keyboards with auto taring and auto calibration facility. Bin Measurement panels housing IWC controller (IWC Controllers for more than one Bin can be combined in one panel.

1.5 Belt weigh scale panels housing microprocessor based measuring indicator with digital display and keyboards with auto taring and auto calibration facility.

1.6 Provisions for Communication with DCS/PLC, Belt Weight feeder IWC, Bin weigh measuring controller & Belt Weigh Scale IWC shall be able to communicate 100% with purchaser’s PLC/DCS on the plant communication bus as selected (like Profibus DP/Mosbus) by Tenderer.

1.7 Load cells, techogenerators, field junction boxes, limit switches etc. for Belt weigh feeders, Bin level measuring systems, Belt weigh scales.

1.8 Common local control station for Belt weigh feeders & Vibrating hoppers (as applicable) housing Local/Off/Auto selector switches, Start/stop push buttons, speed increase/decrease, TPH indicators etc.

1.9 Local Indicator panels for Bin weighing control & Belt weigh scales.

1.10 LT AC motors for belt weigh feeders & vibrating hoppers.

1.11 Calibration weights for belt weigh feeders.

1.12 Supply of dummy load cells for various Bunkers (BLMS system).

1.13 Features for Belt slip detection in case of weigh feeders, like tail end tacho or other suitable measures shall be provided by tenderer.
2.1 DESIGN BASIS FOR BELT WEIGH FEEDER/LOSS IN WEIGH FEEDER

The consistency of the feed rate shall be guaranteed within +/- 0.5% of the set value within the operating range of 10% to 100% of rated capacity.

The weighing control shall be totally automatic with close loop control. The feed rates of different materials shall be calculated by the computer and set points of Belt weigh feeder shall be set by the computer through PLC. In case of computer failure manual setting (remote manual) and operation of feeders shall be possible.

2.2 CONTROLLER PANELS OF BELT WEIGH FEEDERS/LOSS IN WEIGH FEEDER

PANEL

The IWCs for control of Belt weigh feeders/ LIWs shall be microprocessor based having automatic weighing and calibration facilities. The system shall be complete with protection against overloading. Accuracy of Belt weigh feeders shall be +/-0.5% or better of preset feed rate.

It shall be possible to operate the Belt weigh feeders under the following modes:
- Local - Volumetric
- Local - Gravimetric
- Remote - Gravimetric (remote manual/PLC automatic)

Under remote mode of operation, following control shall be possible.

Remote - From IWC panel
Remote- From HMI station at BF control room.

Microprocessor shall be provided with each IWC as per standard design/ system requirement. IWC shall generate signal for material feed rate in t/hours. The IWC shall compare the actual feed rate with the set point feed rate and generate a suitable correction for the VVVF converter of belt drive. The signal shall change the belt speed and accordingly provide the desired feed rate. It will be complete with auto calibration, auto tare, auto belt slip/ drift monitoring facilities etc. The stored values after calibration shall not change due to power failure.

Belt Weigh feeder panel housing above IWC & VFD drive shall also be provided with following control equipment /facilities.

Main incoming MPCB/MCCB (50kA) for incoming power supply
Control transformer (415/110V) with MPCB (50kA) at primary, MCBs at secondary.
MPCB, Power contactor (min. 25A), thermal overload relay, necessary auxiliary contactors, ON/OFF/TRIP indication lamps for each motor of bin vibrating hoppers.
Necessary Power supply units, conversion equipment.
DP MCBs for incoming UPS power supply and its distribution to all panels.
Panel illumination lamps (fluorescent tubular).
Start/stop push button, selector switches as required.
Power ON indication.
Power and control terminals.

The IWC shall have following features (minimum)
- Actual flow rate indicator.
- Set rate feed indicator.
- Totalised amount indicator.
- Belt load indicator.
- Belt speed indicator.
Deviation indicator.
Fault messages (separate lamps).
Operational mode selector switch for gravimetric/volumetric/calibration mode selection.
Auto taring & calibration.

Following displays and messages shall be possible for all the operating and calibrating functions:
Set point.
Normal/Maintenance/Calibration modes.
Actual feed rate.
Belt load (Platform load).
Belt speed.
Totaliser value.
Deviation error between set and actual feed rate.
Service data such as measured value, controller output, control signal level etc.
Event messages/fault messages.

The above shall be available on each IWC on digital display unit in central control room. Display and messages listed above shall also be made available on VDU of PLC/DCS.

Panel Construction features.
Floor mounted, free standing.
Dust and vermin proof.
CRCA sheet steel clad.
Minimum 2.0 mm thick for panels.
Suitable to withstand vibrations to be encountered in steel plant applications.

Cubicles with illumination lamps door switches, space heaters and adequate sockets for soldering.
All control blocks plug-in-type with necessary test sockets.
Units shall be self contained and serviceable.

Power wiring - Min 2.5 sq.mm. Cu
Control wiring – Min 1.5 sq.mm. Cu

The panel door shall be provided with toughened glass in front of controllers for viewing of display units without opening the panel door. All control devices and indicators shall be mounted on the front. Two numbers earthing studs shall be provided with the panel for external earthing. All power, control, and signal terminals of different voltages shall be spare terminals shall be provided in the panel.

3.1 BIN/WEIGH HOPPER LOAD CELLS AND LEVEL MEASURING SYSTEM:

Design Basis for Bin Level Measuring System
Load cells shall be of high precision strain gauge type, hermetically sealed, robust in design, shock proof and insensitive to overload, temperature, vibration, electrical noise etc.
Enclosure class shall be IP 67
Load cell shall be provided with ambient temperature compensating device upto55 deg. C.
Provision shall be kept to neutralise the error caused due to application of transverse forces. Max. Measurement error permitted is +/- 1%

3.2 CONTROL PANEL FOR BIN LEVEL MEASUREMENT (BLM) HOUSING IWC

Bin level measurement system shall be microprocessor based having automatic weighing, taring and necessary calibration facilities. The system shall be complete with protection against overloading. Accuracy of weighing +/-0.1% or better.

The controller shall have digital display and keyboards, indication, alarm, annunciation etc. It will be complete with auto calibration, auto tare facilities etc. The stored values after calibration shall not change due to power failure.

The controller shall be complete with built in power supply unit, CPU, program memory, A/D & D/A converters, etc. The above will be of modular design using standard PCBs and connectors. It should communicate actual weight/level, conditions for bin empty, level low, level high etc to Automation system.

4.1 BELT WEIGH SCALES

The IWPs for control of belt weigh scales shall be microprocessor based having automatic weighing and necessary calibration facilities. The system shall be complete with protection against overloading. Accuracy of belt weigh scale shall be +/-0.25% or better of flow rate.

Microprocessor as per standard design/ system requirement shall be provided each IWC. Microprocessor shall multiply load cells and conveyor speed signal in digital form to generate signal for material conveying rate in T/Hours. It will be complete with auto calibration, auto tare etc. The stored values after calibration shall not change due to power failure.

The following displays and messages shall be available for all the operating and calibrating functions:

- Conveying rate in TPH.
- Belt load (Platform load)
- Belt speed.
- Totaliser value.
- Service data such as measured value, controller output, control signal level etc.
- Event messages/fault messages.
- Auto taring & Error corrections.

The above shall be available on each IWC on digital display unit. Display and messages listed above will be made available on VDU of in central control room.

Panel Constructional feature

Shall be same as for Weigh feeder panels.

5.0 DIGITAL TECHGENERATORS

It will be of robust construction and designed to give guaranteed accuracy of feed rate. It shall generate consistent output pulses of positive or negative polarity as applicable by accepting shaft rotation. The output pulses shall be suitable for feeding into high impedance electronic circuit/instrument for digital measurement and control. The enclosure class shall be IP 67. It will be provided with ambient temperature compensating device.
Arrangement of mounting of technogenerators and its coupling with AC motor shall be decided considering ease of maintenance.

6.0 LOCAL CONTROL BOX (LCB) FOR BELT WEIGH FEEDERS/LOSS IN WEIGH FEEDER & LOCAL INDICATION BOXES FOR BLMS & BELT WEIGHERS.

Each belt Belt weigh feeder/Loss in weigh feeder shall be supplied with a local box with following features.
Sheet steel (2.0mm thick) construction.
Wall/ structure mounted type.
Hinged door, dead front type.
Enclosure class IP-55.
To be painted as per standard procedure agreed.
Internal wiring with 1.5 sq.mm copper conductor.
The box shall be wall/structure mounted type and be complete with cable glands and lugs.
The LCB shall be provided with the following:
Local – Off – Remote selector switch.
Start/Stop push buttons
Emergency stop push button (press to lock turn to release type)
Increase/decrease PB for speed setting
Feed rate actual (TPH meter – digital type).
Start/stop push button for bin vibrator
Indication lamps.
Any other device required for satisfactory operation of BWFs to be decided during detailed engineering.
Each local indication box for BLMS/Weigh Scales shall have digital indication of Bunker level/feed rate.

7.0 LOAD CELLS

Compression type suitable for weigh hoppers and material presence detectors on BF charging conveyor.
Enclosure class IP 67
Strain gauge/pressductor type
300% over load capacity.
Suitable for maximum 70ºC.
Temperature compensation up to 50 deg C.
Capacity of the Load cell for BLMS system shall be as per details given under mechanical part. However, final rating of load cells shall have safety margin of minimum 150% of the rating calculated. Load cell accuracy 0.04%
Complete with excitation source, transmitter, amplifier, junction boxes, special cables, etc.
## Conveyor Name

<table>
<thead>
<tr>
<th>Conveyor Name</th>
<th>Y11-207</th>
<th>K11-6A</th>
<th>K11-7</th>
<th>K11-8</th>
<th>K11-10C</th>
<th>K11-10D</th>
<th>KA-5</th>
<th>C3A-C2</th>
<th>K11-18</th>
<th>K11-21</th>
<th>K11-22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispatcher Control grouping</td>
<td>D2</td>
<td>New Dispatcher</td>
<td>New Dispatcher</td>
<td>New Dispatcher</td>
<td>New Dispatcher</td>
<td>New Dispatcher</td>
<td>New Dispatcher</td>
<td>New Dispatcher</td>
<td>New Dispatcher</td>
<td>New Dispatcher</td>
<td>New Dispatcher</td>
</tr>
</tbody>
</table>

### Material Details

1. Material Name
   - Coal
   - Coke

2. Bulk Density (kg/m³)
   - 800

3. Max Particle Size (mm)
   - -50
   - -80
   - -250
   - -250
   - -250
   - 500

4. Temperature
   - Ambient Temperature

### Conveyor Data

1. Flow Rate (Rated Capacity) (T.P.H.)
   - 600
   - 300
   - 300
   - 300
   - 80
   - 150
   - 100
   - 200
   - 200

2. Belt Loading (Uniform/Erratic)
   - Uniform

3. Approx. length of the cable from dispatcher room where display unit are to be fixed (in meters)
   - 600
   - 600
   - 500
   - 700
   - 600
   - 400
   - 300
   - 250
   - 250

### General Arrangement

1. Belt Width (mm)
   - 1400
   - 1400
   - 1400
   - 1400
   - 1400
   - 1400
   - 800
   - 800
   - 1200
   - 1200
   - 1200

2. Belt Speed (m/s)
   - 1.8
   - 1.8
   - 1.8
   - 1.8
   - 1.8
   - 1.8
   - 1.8
   - 1.8
   - 1.8
   - 1.8
   - 1.8

3. Does Speed vary
   - NO

4. Conveyor Length (m)
   - 150.174
   - 249
   - 110.99
   - 110.99
   - 131.2
   - 122.5
   - 14.08
   - 74.23
   - 143.418
   - 109.874
   - 109.874

5. Conveyor Inclination
   - Refer GA Drawings for respective Conveyors

6. Does Inclination Change
   - Refer GA Drawings for respective Conveyors

7. Idler Spacing
   - 1 m

### Belt Specification

1. Type of Belt
   - Nylon

### Dimensions

1. Idler Troughing Angle
   - 35 deg

2. Roller Dia (mm)
   - 159

3. Roller Length (mm)
   - 530
   - 530
   - 530
   - 530
   - 600
   - 315
   - 315
   - 465
   - 465
   - 465

4. Idler Weight (kg)
   - 41.83
   - 41.83
   - 41.83
   - 41.83
   - 41.83
   - 41.83
   - 46.59
   - 24.13
   - 24.13
   - 33.58
   - 33.58
   - 33.58

### Other Information

1. Is Conveyor a New Installation or an existing one
   - new conveyor

2. Belt Weight /meter (kg/m)
   - 23.24
   - 20.16
   - 20.16
   - 20.16
   - 20.16
   - 26.08
   - 11.52
   - 13.04
   - 17.28
   - 19.92
   - 19.92

Refer GA Drawings for respective Conveyors

Conveyor & Idlers Details for the Installation of Belt Weigh Scales - Annexure - A