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No. RW-24011/2/89-RMP *Dated the 29th September, 1989*

To

All Chief Engineers of the States & Union Territories - dealing with National Highways; Director General (Works), C.P.W.D.; Director General (Border Roads).

Subject: Technical Requirement of Drum-Mix-Plants for use on National Highway Works.

You are aware that this Ministry is keen on introduction of Modern Road Construction Methodology and New-Generation Machines for the construction of National Highways. Keeping this in view Drum-Mix-Plants are now being used for bituminous works in addition to conventional Hot Mix Plants. Few indigenous manufacturers have already started manufacturing and marketing such machines in the country.

2. Drum-Mix-Plants are more economical to use for the production of quality bituminous mix. The technology of Drum-Mix-Plants incorporates certain essential arrangements to ensure continuous production of designed mix. It is, therefore, felt that the plants being introduced on N.H. works should be of standard type satisfying the minimum desirable requirements as adopted in advanced countries.

3. Upto now no IS specification is available to indicate the broad minimum requirement of essential components of Drum-Mix-Plants so as to ensure quality of mix expected from a modern machine. To avoid sub-standard machines being introduced on N.H. works, it is requested that only those Drum-Mix Plants which comply with the technical requirements as indicated in Appendix 'A' to this letter may only be permitted for use on N.H. works. This stipulation may also be incorporated in the contract document for all future works.

4. It is further requested that these instructions may be circulated to all concerned officers.

Appendix 'A' to letter No. RW-24011/2/89-RMP. dated the 29-9-89

TECHNICAL REQUIREMENT OF DRUM-MIX-PLANTS TO BE USED ON NATIONAL HIGHWAY WORKS.

GENERAL

The drum-mix-plant should be of reputed make and proven design, sturdy in structure and capable of producing desired quality of mix as per specification for laying bituminous road surface and should have following essential arrangements:

1. COLD AGGREGATE FEEDER

The cold aggregate feeder arrangement should have minimum 3 bins of sufficient capacity capable of storing different sizes of aggregates and fines to ensure continuous uninterrupted supply of aggregate matching the capacity of the plant. Each bin should have independent belt feeder system driven by a variable speed motor and a control gate to ensure accurate aggregate feed to meet design mix formula. It is pre-requisite that only properly screened and graded materials are fed to the bins.

There should be a gathering conveyor to receive and transport material discharged from bins with separate drive arrangement.

There should be a screen or a suitable arrangement like baffle plate at the discharge end of gathering conveyor for rejection of any oversize metal above the permissible limit. The conveyor should be fitted with suitable electronic weigh bridge device for weighing quantity of cold aggregate being fed to dryer drum.

The plant should have a mineral filler arrangement with suitable control device to accurately proportion the flow of filler material into dryer drum at appropriate stage.

2. DRYER DRUM

It should be thermo drum type with smooth rotation arrangement to give rated output and capable of reducing the moisture content of the aggregate to desirable limit of 2% to 6% and achieving hot mix temperature (upto 160°C as per requirement) with such design that no blue smoke is emitted from the exhaust. The drum may have optional arrangement for feeding reclaimed material. There should be arrangement to restrict burner flame upto certain length in the drum before bitumen is injected.

It should be fitted with positive displacement bitumen pump driven by variable speed motor automatically controlled from control cabin, capable of feeding desired quantity of bitumen syndronised with aggregate feed system. Thermic fluid system or hot oil circulation system should be an in-built feature to keep bitumen pump and pipes sufficiently hot to avoid clogging of pipes.

3. BURNER

The burner used should be capable of burning the fuel efficiently and develop the required temperature. It should be fitted with remote control system to detect flame failure, and also electric spark ignition system or some other suitable arrangement. Burner operation should have thermostatic control of flame within the specified temperature range.

4. BITUMEN HEATER

It should consist of an insulated tank of adequate capacity fitted with effective and positive control of temperature for allowing continuous circulation of bitumen between Bitumen Heater and proportioning units. Suitable arrangements should be provided for recording the temperature at the tank and in circulating system.

5. FUEL SYSTEM

Fuel tanks should be of sufficient capacity and fitted with suitable type of fuel pump to receive the fuel from storage tank and supply to line heater and burner.

6. CYCLONE SYSTEM

Cyclone unit is required to control dust discharge within the admissible standard of pollution level.

7. OPERATING CONTROL UNIT

The drum-mix-plant must have centralised control system with operation from a control cabin located adjacent to the drum-mix-plant. The control system should be capable of following:

(i) Automatic control of speed of each bin feeder conveyor and gate so as to control and regulate the flow of various grades of material to ensure constant and accurate proportion of aggregates.

(ii) Pre-set and control the percentage of flow of aggregate and asphalt required as per design mix.

(iii) Automatic detection of plant operation, failure, display of aggregate temperature, asphalt and mix temperature aggregate flow etc. Fully automatic aggregate blending, bitumen/aggregate ratio control and burner control system.

(iv) Control for presetting the moisture content of aggregate displayed digitally.

(v) Entire control system should be such that if desired it would be operated manually also.

8. SURGE SILO

The plant may have optional arrangement to store hot mix material for at least equivalent to 30% of rated capacity to cater for any delay in loading the tippers. Temporary storage silo should have adequate automotive hydraulic unloading arrangement operated either from the control cabin or manually with necessary safety control.