

PROJECT No. 121

401.04 Mixing Plants—

The requirements for bituminous concrete mixing plants are modified herein to permit the use of drum mix plants. In addition to the applicable requirements of Supplement 1001, drum mix plants shall conform to the following requirements and shall be subject to inspection and approval by the Director.

1. **Aggregate Storage and Handling.** Aggregates of the sizes required for the production of mix shall be stored in separate stockpiles and shall be controlled in such a manner that maintenance of uniform gradation will be assured. For each aggregate size, a separate cold feed bin shall be provided of sufficient size to maintain a continuous flow of aggregate. Proper proportioning of each aggregate size shall be accomplished by mechanical means to provide a uniform flow sufficient for the production rate of the plant. A sensor installed in each bin shall detect any interruption of proper bin flow and shall interrupt all feed systems simultaneously.
2. **Bituminous Storage and Handling.** Storage tanks, pumps, meters, and pipe lines shall be capable of maintaining bituminous materials at a uniform temperature. The delivery system shall be capable of metering the proper proportion of the bituminous material to the drum mixer. The delivery system shall be coupled to the aggregate flow rate in such a manner as to maintain the proper proportion of bituminous material to dry aggregate.
3. **Charging Belt Conveyor.** The belt charging the drum mixer shall be capable of measuring the rate of feed of combined aggregates. Means shall be provided to permit a check of the accuracy of this measuring system. The charging belt and measuring system shall be capable of maintaining continuous accuracy unaffected by variation of such factors as belt tension, residual material, and wind.
4. **Drum Mixer.** The drum mixer used for drying and mixing shall be of the parallel-flow type, and shall be capable of drying the aggregate and mixing with asphalt cement to result in a uniformly coated mixture of the correct temperature. The burner shall be automatically controlled by means of a temperature sensing device.
5. **Surge Bin.** A surge bin shall be provided capable of accepting the steady production of the drum mixer, providing temporary storage, and providing a means for loading the mix into trucks while maintaining uniform composition including aggregate gradation, asphalt content, and uniform temperature.
6. **Sensors, Controls, and Indicators.** The plant shall be designed to have all display readouts and indicators in a central location to permit the plant operator to monitor continuously all aspects of the mixing process and to maintain proper process control. Variables monitored and displayed shall include the following:
 - a. Aggregate cold feed rates from bins, for each aggregate size.
 - b. Total aggregate feed rate on charging belt.
 - c. Moisture compensation for aggregate feed on charging belt.
 - d. Bituminous material delivery rate.
 - e. Temperature of mixture at drum mixer discharge point.
 - f. Accumulated total aggregate weight.
 - g. Accumulated total bituminous material delivered.
7. **Plant Calibration.** Calibration of the plant shall be performed by the contractor for each aggregate combination and asphalt content for the mixtures to be produced.
8. **Accuracy of Delivery Systems.** Before the start of production of any mixture, the accuracy of the indicators and controls used in the calibration of the plant shall be demonstrated by the contractor. Included in the accuracy checks shall be a test of the aggregate delivery rate and asphalt delivery rate. Aggregate on the charging belt shall be diverted and delivered into a truck, loader, or other container for weighing. The weight indicated by instrumentation shall agree with actual weight of aggregate delivered within plus or minus two percent. Bituminous material delivered during the test shall be diverted into a distributor or other suitable container for measurement of the quantity of the bituminous material delivered. The actual amount of asphalt delivered will be compared with that required by the aggregate delivered and shall be within plus or minus two percent of the correct amount. The contractor may apply a dummy load for aggregate delivery for this accuracy check.
9. **Plant Operation and Process Control.** The plant shall be capable of maintaining proper cold feed aggregate proportions and shall permit positive adjustment of the asphalt feed rate to compensate for moisture content of the wet aggregates. The compensation for moisture shall be based on periodic moisture tests or on variations in moisture content of the aggregates as indicated by a moisture sensor. Adjustment shall be made for any variation of two percent or more in moisture content of the aggregates. It is the responsibility of the contractor to operate the plant in such a manner that a uniform mixture of the specified proportions and of the proper mix temperature will be produced regardless of variations of feed rate or aggregate moisture.