

## Plant Overview

WisDOT/WAPA  
Asphalt Pavement  
Project Manager  
Training

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## Types of Plants

- Batch – mix individual batches
- Drum – continuous mixing process
- Both types accomplish proportioning, drying and heating of the aggregates, then mixing with binder to produce hot mix meeting specific requirements.
- Both can produce quality mix.

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## Drum-Mix Facility

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## Drum Mix Plant

### Plant Operation Overview

- Aggregates are deposited in the cold feed bins
- Automatic aggregate weighing system monitors the amount flowing into the drum mixer
- Weighing system draws appropriate amount of asphalt from storage tank into the drum mixer
- Asphalt and aggregates are thoroughly blended by the drum mixer
- A dust collection system captures excess dust
- HMA is transported by conveyor to a storage silo
- Trucks are loaded

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## Inside the Drum

- The drum is equipped with longitudinal flights
  - Direct the flow of aggregate
  - Lift the aggregate and drop it in veils through the hot gases
  - Drum slope, rotation speed; diameter; length; and arrangement and number of flights determine the time needed to dry and heat the aggregate

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## Parallel-Flow Drum-Mixer Zones

- Aggregate and air flow in the same direction
- Cold aggregate enters at the same end as the burner
- HMA exits at the opposite end

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### Counter-Flow Drum-Mixer Zones

**Hot Mix Asphalt**

- Aggregate and air flow in opposite directions
- Cold aggregate enters at the opposite end from burner
- HMA exits at the burner end

### Other Types of Drum Mixers

- Double Barrel Drum Mixer
  - Counter flow dryer “inner” drum
  - Larger diameter “outer” drum forms mixing chamber
- Double Drum Plant
  - Uses two separate drums
  - Counter flow for drying and heating aggregate
  - Smaller rotary mixer for mixing

### Material Storage & Handling

- One of the basic necessities of ensuring quality HMA production is that an adequate supply of suitable materials be available prior to and during mixing operations.
- Handle the materials properly before, during and after production.

### Asphalt Storage and Handling

- Asphalt storage and handling concerns:
  - Spillage Containment
  - Proper heating (~300-400°F)
  - Material contamination
- Storage Tanks
  - 2 tanks minimum
  - Horizontal or Vertical

### Aggregate Storage and Handling

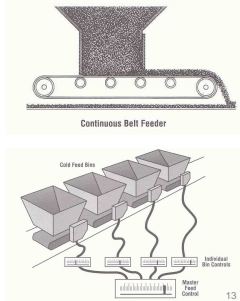
- Concerns:
  - Contamination
  - Segregation
  - Degradation
  - Moisture Content

### Cold Feed Bins

- Aggregate components are supplied to the cold feed bins
  - Each component has it’s own bin
  - Bins need to be kept ~full but do not overfill
  - Bin gates supply controlled amounts of each aggregate onto conveyor
  - Material flow is controlled by a combination of belt speed and gate opening

### Cold Feed Bins

- Accurate aggregate moisture content is measured and monitored
- Moisture content will dictate drying time and asphalt supply rate to the drum mixer



### Cold Feed Bins with vertical dividers

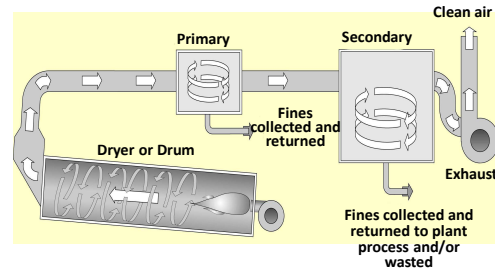


### Conveyor

- Drum mix plants are computer controlled
- Controls are linked to a weigh belt
  - A weigh bridge weighs the material on the belt
  - Belt weight and belt speed are input into the computer
  - The amount of material per unit of time is determined

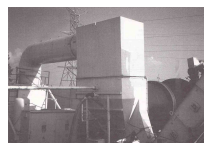


### Dust Collection Equipment



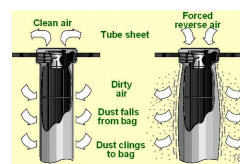
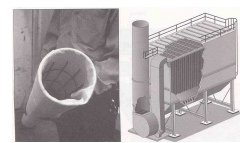
### Dust Collection System

- Primary Collector
  - Collects and removes the larger dust particles contained in the exhaust gas stream
  - Types:
    - Knockout Box
    - Cyclone Dust Collector
  - Material is reused in the mixing



### Dust Collection System

- Secondary Collector
  - Filters out the finest dust particles
  - Types:
    - Baghouses
    - Wet Scrubber
  - Baghouses operate similar in principle to a vacuum cleaner
  - Baghouse material can be reused in the mixing



### Hot Mix Conveyor to Silos



- Drag slat conveyor transports mix to storage silos
- Prevent heat loss
- Prevent segregation

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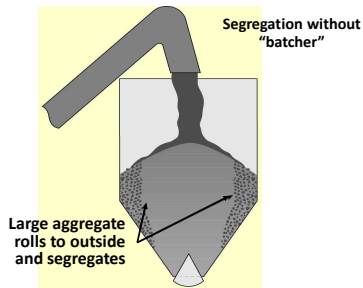
### Storage Silo

- Temporary storage for HMA
  - Insulated & heated
  - Store HMA 30+ hours
  - Capacity varies (50 – 350 tons)
  - Keep minimum 1½ truck loads
- Need to load properly to prevent segregation
- Seal to prevent heat loss and binder oxidation



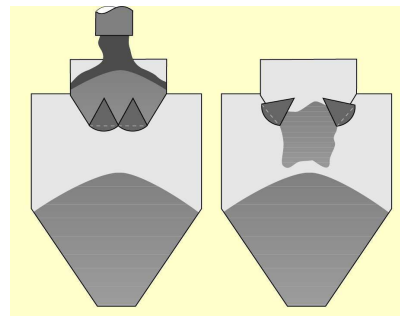
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### Segregation Occurring in Silo w/o a Batcher or Gob-Hopper



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### Center Drop Batcher



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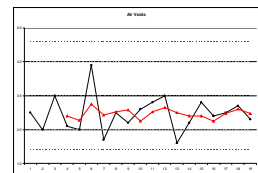
### Control House

- Plant operations are controlled and monitored from the control house
  - Computer system controlled
- Certified scale



### Quality Control Lab

- A quality control lab samples and tests HMA mixture components and the HMA mixture
  - HTCP certified personnel
  - QMP program documentation



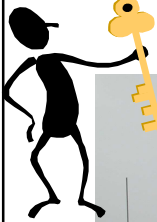

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### Manage Your Stockpiles



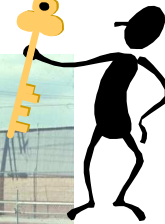

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### Operate Plant Consistently




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### Load Trucks Properly!



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### WisDOT Project Manager Perspective



- Project HMA Technician
  - HTCP Certified
- Project Manager
  - Documentation
    - QMP
    - JMF Approval
  - Diary Notes

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