# HMA Production Facilities

Session 4

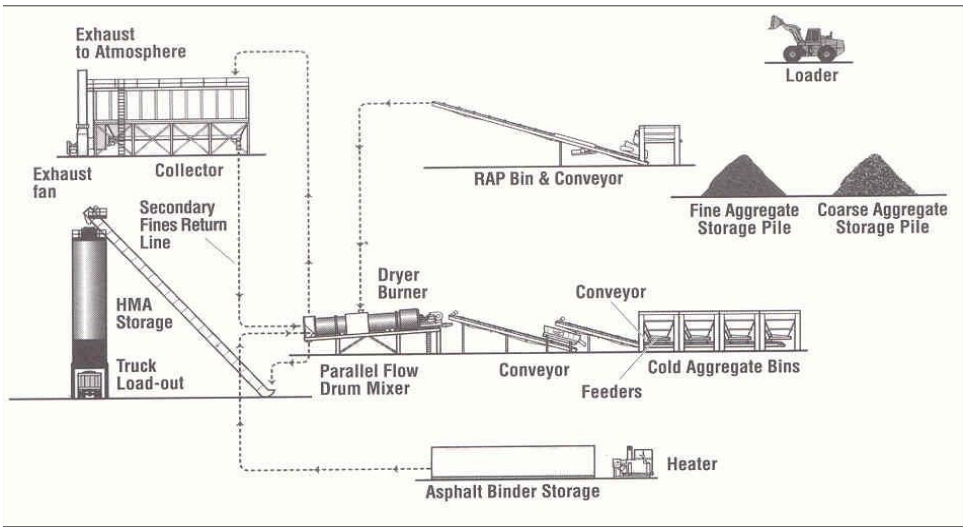
## HMA Production Facilities

- An asphalt plant is an assembly of mechanical and electronic equipment where aggregates are blended, dried, heated, and mixed with PG binder to produce hot mix asphalt (HMA) meeting specified requirements.

# Drum Mix Plant

- Fundamental Components
  - Aggregate cold feed bins
  - Conveyor and aggregate weighting system
  - Drum Mixer
  - Dust collection system
  - Hot mix conveyor
  - Storage silo
  - Control house

# Drum Mix Plant
## Basic Schematic



# Material Storage & Handling

## Asphalt

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

# Material Storage & Handling

## Aggregate

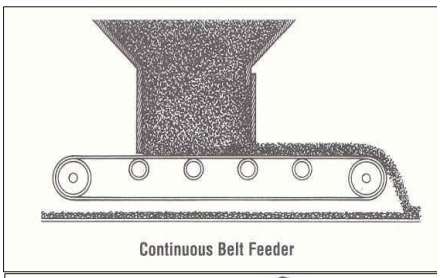
- Aggregate storage & handling concerns:
  - Contamination
  - Degradation
  - Segregation
  - Moisture Content

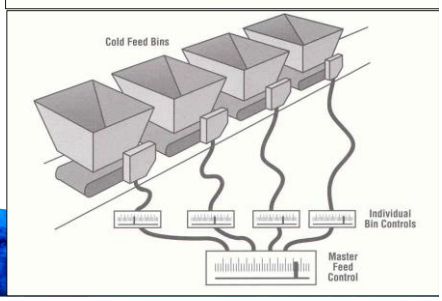
# Cold Feed Bins

- Aggregate components are supplied to the cold feed bins
  - Each component has it's own bin
  - Bins need to be kept ~full
  - 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

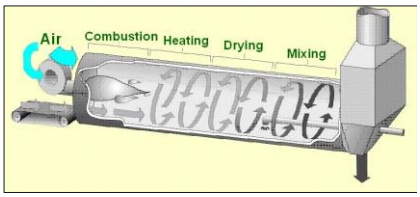


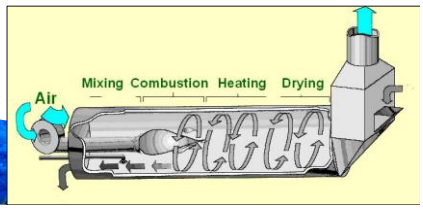



# Drum Mixer

## Types

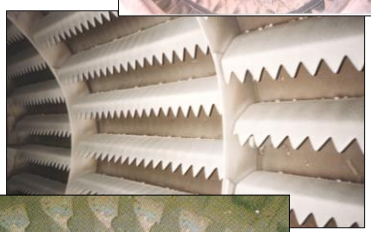

- Parallel Flow Drum Mixer
  - Aggregate and air flow in the same direction
  - Cold aggregate enters at the same end as the burner
  - HMA exists at the opposite end
- Counter Flow Drum Mixer
  - Aggregate and air flow in opposite directions counter to each other
  - Cold aggregate enters at the opposite end as the burner
  - HMA exists the same end as the burner




# Drum Mixer

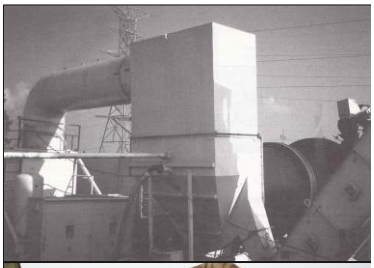
## Inside the Drum

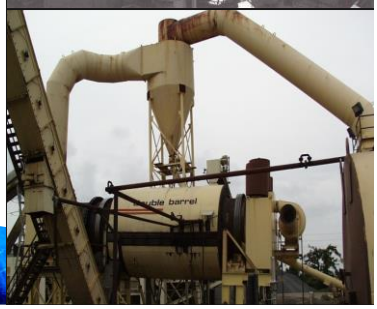


- The drum is equipped with longitudinal troughs or “flights”
  - Lift the aggregate & drop it in veils through the hot gases
  - Drum slope, rotation speed, diameter, length and arrangement & number of flights determine the time the aggregate will need to dry & heat

# Dust Collection System

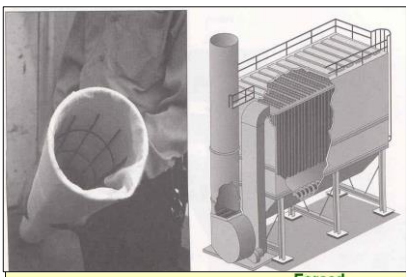
- Primary Collector
  - Collects and removes the larger dust particles contained in the exhaust gas stream
  - Types:
    - Knockout Box
    - Cyclone Dust Collector
  - Material is reused in the mixing

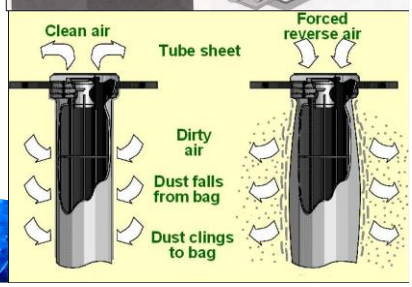




# Dust Collection System

- Secondary Collector
  - Filters out the finest dust particles
  - Type most commonly used:
    - Baghouses
  - Baghouses operate similar in principle to a vacuum cleaner
  - Baghouse material can be reused in the mixing





# Hot Mix Conveyor

- Transports the freshly mixed HMA from the drum to the storage silo
- Primary Objectives:
  - Prevent heat loss
  - Prevent mix segregation
- Drag Slats are used due to the high mix temperature and the steep incline


# Storage Silo

- Storage Silos provide temporary storage for HMA to prevent plant shutdowns due to temporary interruptions of paving or hauling
  - Insulated & heated
  - Store HMA 30+ hours
  - Capacity varies (50 – 350 tons)

# Control House

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

# WisDOT Standard Specification 450

- Plant Equipment Inspection
  - Plant Scales
  - Automatic Batching
  - Batch Weights
  - Recording Truck Loads

Field Inspection  Visual (Document Findings)