LAFARGE

# Full Depth Reclamation
# Fly Ash Stabilization

MERRILL AIRPORT

&

LANGLADE COUNTY AIRPORT

**(Antigo)**

WISCONSIN DEPARTMENT OF TRANSPORTATION

# Pulverize Asphaltic Pavement and Base Course

- Full Depth Reclamation – aka – Cold In-place Recycling [CIR]
- A reclamation technique in which the full flexible pavement section and a predetermined portion of the underlying materials are uniformly crushed, pulverized, or blended, resulting in a stabilized base course;
- Used to fix irregular cross sections, reflective/alligator cracking, heavy pothole patching, severe rutting/shoving, and insufficient base strength. Substantial savings can be realized while meeting environmental goals.

# Typical Candidates for
## Pulverize Asphaltic Pavement and Base Course

# Overview

- Cold In-place Recycling [CIR]
  - Proportioned mixture
    - Fly Ash – 10 to 12% by weight (110# per SY)
    - Aggregate (Reclaimed Asphalt Base)
    - Water – 9 to 12 % typical for optimum density
  - Mixed in-place and compacted (12” depth for sub-grade stabilizing; 8” depth for CIR)
  - Produces a strong and durable pavement base course (300 - 450 psi) for flexible pavements.
  - Typical cost ranges from $3.50 to $4.00 per SY complete – ready to pave.

# Fly Ash Storage Hopper (Silo) to Tanker

# Problems Solved by Recycling HMA Pavement & Base

- Bridges poor sub-grades and underlying soils.
- Provides medium to improve drainage.
- Provides a transitional load-bearing layer between the pavement layer and the underlying wet and unstable sub-grade soil.

# Base Stabilization – “The Process”

- Cold-in-place recycling begins with pulverizing the existing asphalt pavement and underlying base course.
- Top – Bomag [Light duty]
- Bottom – Wirtgen [Heavy duty]

# Base Stabilization – "The Process"

- Pulverized / blended material is then re-compacted and graded to proper crown and cross slope.
- In essence, a new base is created that can either serve as a stable foundation for a new asphalt surface.

- Top – Pulverize, re-grade & compact.
- Bottom – Evidence of soft & unstable sub-grade

# Base Stabilization – “The Process”

- Deliver Fly Ash and transfer to Vane Feeder
- Spread Fly Ash uniformly on the newly prepared recycled base.
- Vane feeder distributors controls concentration of ash and controls dust.
- Fly Ash is very fine and tends to blow about when windy or disturbed
  - **Top** – Tanker truck transfer to vane feeder.
  - **Bottom** - Spreading Fly Ash.

# Base Stabilization – “The Process”

- Reclaimer / Pulverizer follows water truck, mixing:
  - Fly Ash,
  - Recycled Base, and
  - Water – injected directly into the pulverizer
- Water is needed to begin the hydration process similar to cement.
- Moisture content is critical to performance

# Base Stabilization – “The Process”

Water injected directly into the pulverizer

# Base Stabilization – “The Process”

- Immediately behind the mixing process, a vibratory pad-foot roller follows to produce the desired density.
- The compacted material is then graded to final profile, crown and cross slope.

# Base Stabilization – “The Process”

- Surface is again compacted and sealed using a smooth drum or pneumatic roller
- Occasionally, the surface is re-wetted to ensure completion of the hydration process
- Hydration will be complete in 3-4 hours.
- Monitoring moisture content is critical

# Base Stabilization – “The Process”


- The new stabilized base is now ready for paving.

# Base Stabilization – “The Process”


- Bottom Asphalt Layer – 106% payment based on densities

# Base Stabilization – “The Process”

# Base Stabilization – "The Process"

- **Estimated Costs – Cold In-place Recycling**

  **(Merrill Airport)**

1. **Fly Ash application**
   - Applied at a rate of 120 lb./SY  12" average application depth.
   - Very soft areas treated w/ heavier application rate or deeper.
   - **COST - $68,000**

2. **EBS [Excavation Below Sub-grade]**
   - 18"  deep.
   - Replace EBS with CABC.
   - **COST - $132,000**

# Base Stabilization – "The Process"

- **Estimated Costs – Base Stabilization**

  **(Langlade Co. Airport)**

1. **Fly Ash application**
   - Applied at a rate of 110 lb./SY  12" average application depth.
   - Very soft areas treated w/ heavier application rate or deeper.
   - **COST - $58,000**

2. **EBS [Excavation Below Sub-grade]**
   - 2-feet deep.
   - Replace EBS w/ 1.5 ft. borrow material and 0.5' ft CABC.
   - **COST - $120,000**

# Thank You

# Questions?