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
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”

立即在混合过程后，一个振动的脚垫滚轮跟着来生产所需的密度。

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- 该压实的材料然后被分级到最终的轮廓，车顶和横坡。
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?