ROCKY MOUNTAIN PAVEMENT PRESERVATION PARTNERSHIP

MICRO SURFACING

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Holly Asphalt Company
Albuquerque, New Mexico

PRESENTATION INDEX

- *Introduction and Definition of Micro Surface*
- *Micro Surface System*
- *Components*
- *Aggregate*
- *Lab Design*
- *Stock Pile Site*
- *Job Site*
- *Corrective Maintenance*
- *Surface Courses*
- *Cape Seals*
- *Questions*

History of Micro Surface

MICRO SURFACING
(ISSA A-143)

A mixture of Cationic polymer modified asphalt emulsion, mineral aggregate, mineral filler, water and other additives properly proportioned, mixed and spread as a surface treatment. When applied the ***Micro Surface*** *shall have a homogeneous appearance, fill cracks, adhere firmly to the surface and provide a weatherproof, high friction seal*.


IH-35 - TEXAS

MICRO SURFACING

Has two primary uses:

- **PRESERVATIVE**

Any activity performed, or material utilized to preserve the existing condition and extend the useful life of a pavement.

- **CORRECTIVE**

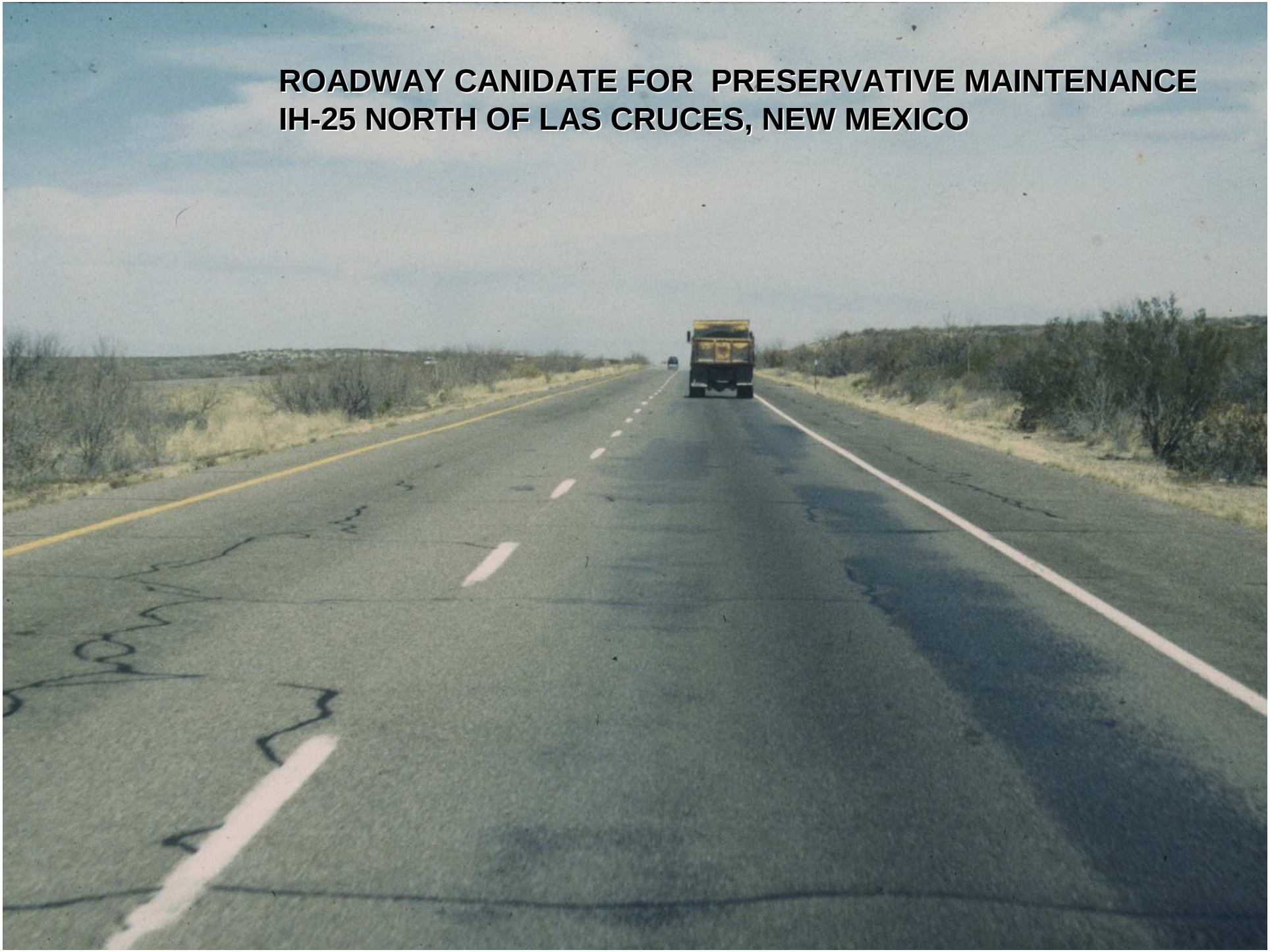
Any activity performed, or material utilized to correct a faulted pavement to an acceptable condition.

PRESERVATIVE MAINTENANCE

Micro Surface *will delay the age hardening caused by oxidation, to maximize the life of Hot-mix asphalt pavements. Normally placed in a single application called a surface course.*

CORRECTIVE MAINTENANCE

Micro Surface *is used for rut filling wheel ruts, scratch course over raveled surfaces, or a leveling course to improve cross sectional drainage. Placed prior to a finished surface course.*

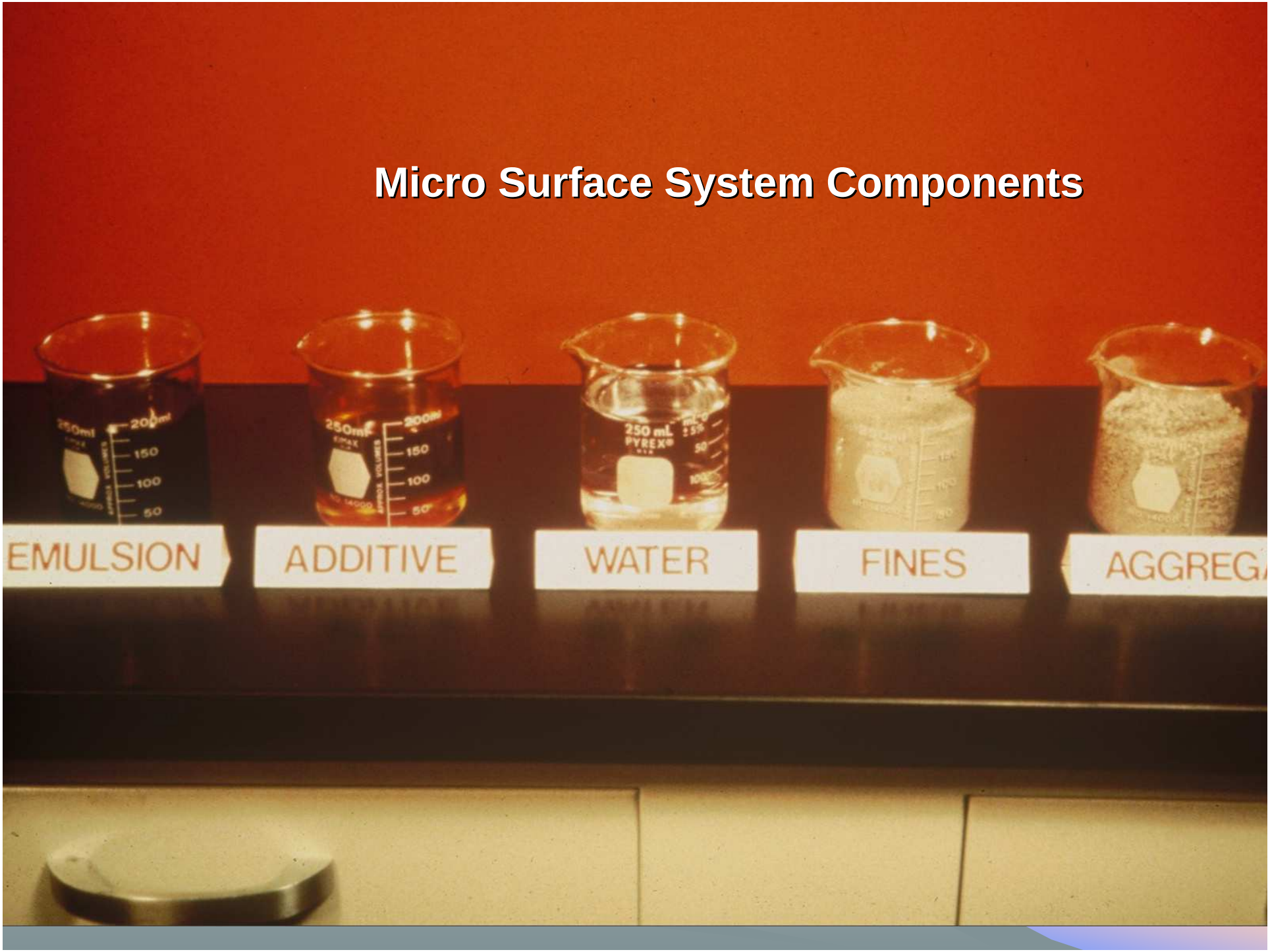

ROADWAY CANIDATE FOR PRESERVATIVE MAINTENANCE
IH-25 NORTH OF LAS CRUCES, NEW MEXICO


ROADWAY IN NEED OF CORRECTIVE
MAINTENANCE - RUTS ON STATE HIGHWAY

MICRO SURFACING

- ***Micro Surfacing*** *is a component system*
- *All components are dependant on each other for the finished micro surfaces performance*
- *If one part is altered, it could radically change the characteristics and the design performance of the system*

Micro Surface System Components



Micro Surfacing – System Components

- *Asphalt Emulsion – consists of asphalt cement, emulsifying agent(s), pH adjuster, a polymer*. Asphalt Emulsion is a cationic emulsion, designated CSS-1P. The P designates polymer modification.* **A polymer is required in Micro Surface specifications.*

- *The asphalt emulsion is the binder holding the aggregate together while adhering the **Micro Surface** mix to the surface it is applied to.*

Micro Surfacing– System Components – *Polymer Modification*

1. *REDUCES THE TEMPERATURE SUSCEPTIBILITY*
2. *THE MIX CAN BE PLACED IN THICKER LIFTS WHILE REMAING STABLE*
3. *THE MIX IS QUICK SETTING*
4. *ENHANCED DURABILITY.*

Micro Surfacing– System Components - Aggregate

- *Aggregates – the major component and most critical of the mix for long term performance.*
- *Aggregate source, gradation, and cleanliness factor in the behavior of the system.*

Aggregate Tests required for laboratory mix design:

- *Gradation*
- *Hardness*
- *Soundness*
- *Sand Equivalent*
- *Methylene Blue*

AGGREGATE SIEVE SPLIT

BASIC GRADATIONS OF MICRO SURFACING

TYPE II *10 – 20 pounds per square yard.*

Urban, residential streets, airport runways.

TYPE III *15 – 30 pounds per square yard.*

*Primary and Interstate routes and corrective rut filling. *Rut filling may require additional pounds per sq. yard.*

Residual Asphalt Content - *typically between 5.5 to 10.5 %.*

Micro Surface – System Components – Mineral Fillers

- *Mineral Filler – Portland Cement, Hydrated Lime, or Aluminum Sulfate are used*
- *The mineral filler contributes the desired mixing and setting characteristics of the system*
- *Improves the consistency of the Micro Surface mix*

Micro Surface – Other System Components

- ***Water*** *– should be a potable resource free of contaminates that could affect the system mix*
- ***Chemical additives*** *– used to retard or accelerate the break of the system mix*
- *Application* ***equipment*** *and* ***practices***
- ***Environmental*** *conditions*
- ***Road*** *conditions*
- ***Weather***

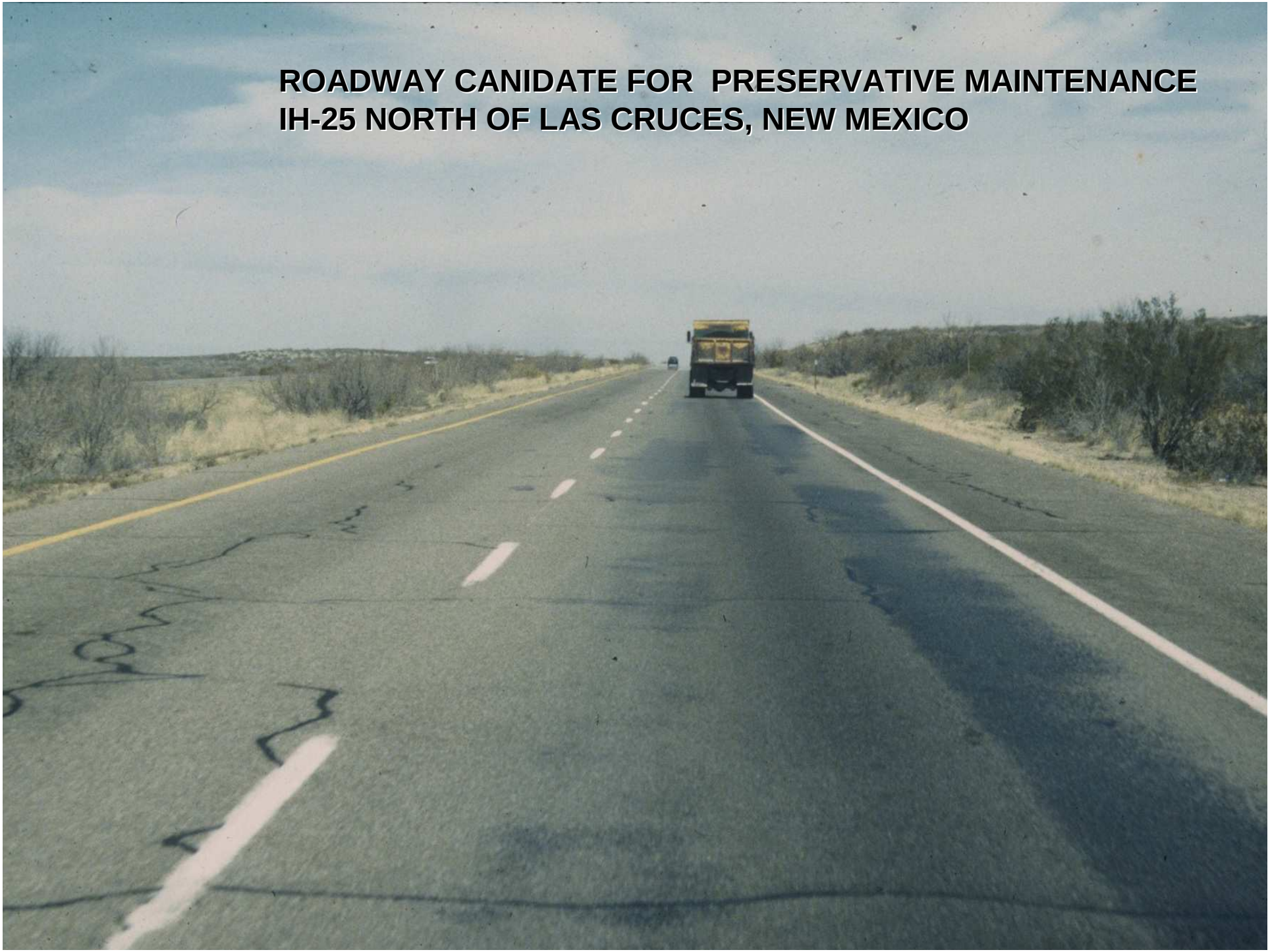
MICRO SURFACING DESIGN PROCEDURES

- *Pavement description, condition, ADT, climate*
- *Objective – life expectancy and texture requirements*
- *Selection of Materials – aggregate, emulsion, mineral filler.*

- **Laboratory Design**

1. *Determines theoretical asphalt content*
2. *Determines theoretical water and filler contents*
3. *Run Compatibility cup test and Adhesion test*
4. *Subject trial mixes to physical testing*

- ***Translate optimum design to contractor/buyer***


ROADWAY CANIDATE FOR PRESERVATIVE MAINTENANCE
IH-25 NORTH OF LAS CRUCES, NEW MEXICO


ROADWAY IN NEED OF CORRECTIVE
MAINTENANCE - RUTS ON STATE HIGHWAY


30 - 120 SECONDS FOR PUGMILL MIXING


2 TO 5 MINUTES AFTER PUGMILL MIXING
AND MIX THROUGH THE LAY DOWN BOX


ROLLING TRAFFIC READY NORMALLY UNDER 1 HOUR

MICRO SURFACING - EQUIPMENT

1. **STOCKPILE SITE**
   - *EMULSION STORAGE*
   - *AGGREGATE STOCKPILE*
   - *AGGREGATE SCREEN AND BELT SCALE*
   - *MINERAL FILLER*
   - *WATER SOURCE/TRAILER*
   - *FRONT END LOADER*
   - *NURSE TRUCKS*
   - ***QUALITY EMPLOYEES***


STOCKPILE SITE FOR
MICRO SURFACING

MICRO SURFACING - EQUIPMENT

JOB SITE

MICRO PAVER

4+ NURSE VEHICLES

ASSORTED TRAFFIC CONTROL VEHICLES

BROOM OR VACCUM SWEEPER

QUALITY EMPLOYEES

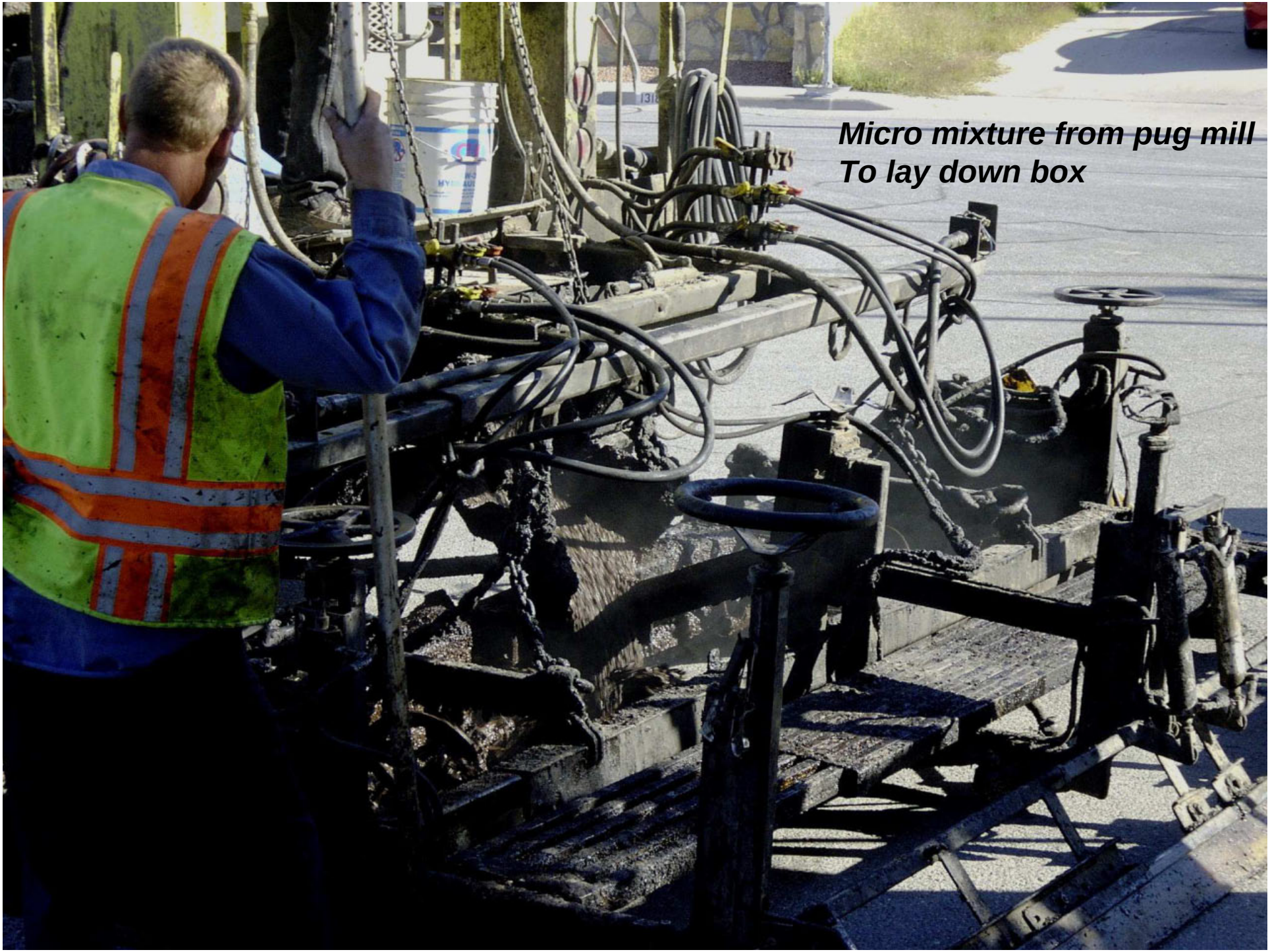

CONTINOUS MICRO PAVER
AND NURSE TRUCK
BALLOU
CONSTRUCTION CO., INC.

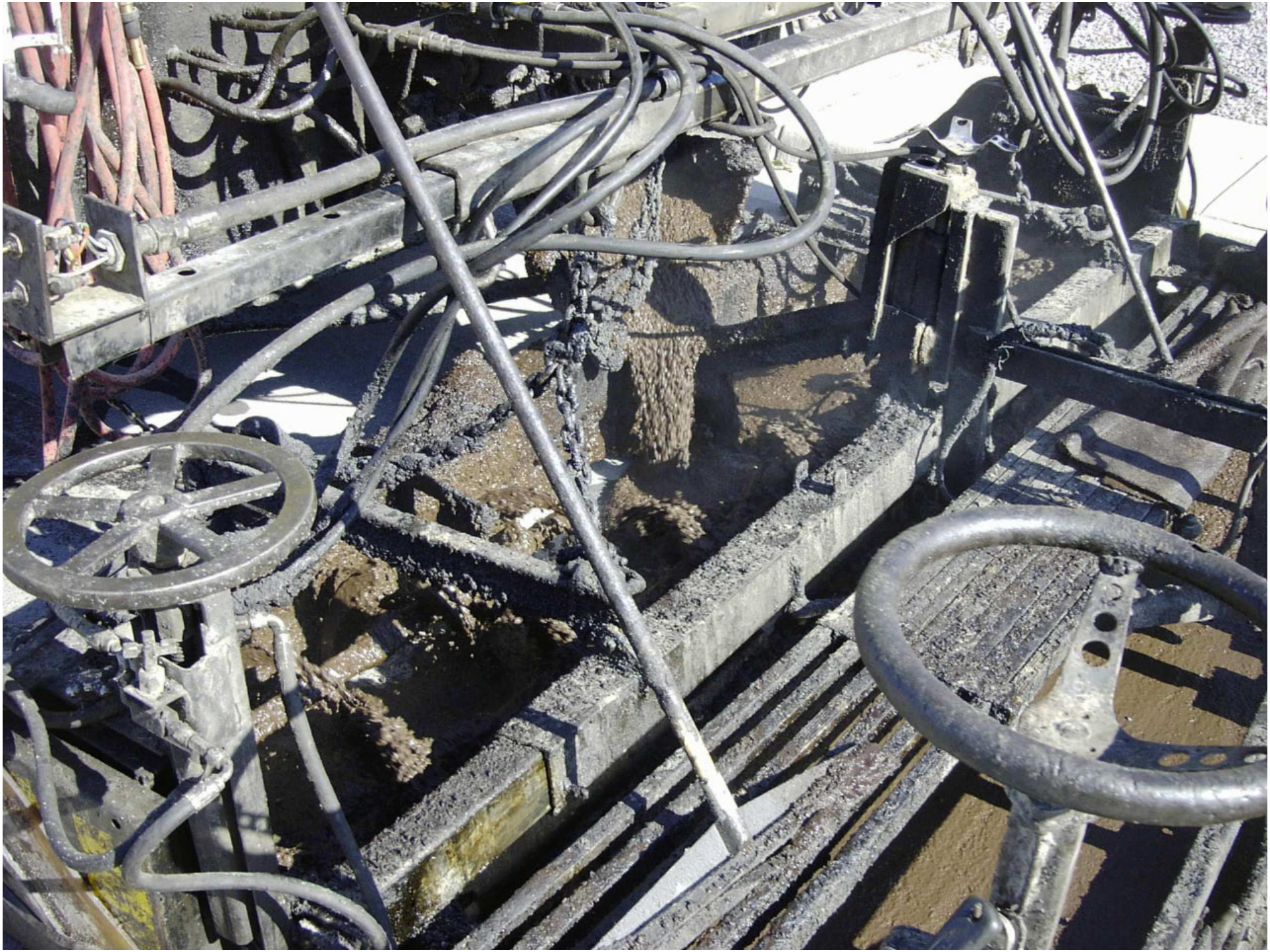

WARNING
CAUTION
MOVING
PARTS
AGGREGATE TRANSFER

AGGREGATE ELEVATOR TO STORAGE BIN


WARNING
AVISO


MICRO PAVER PUGMILL


Micro mixture from pug mill
To lay down box




BALLOU

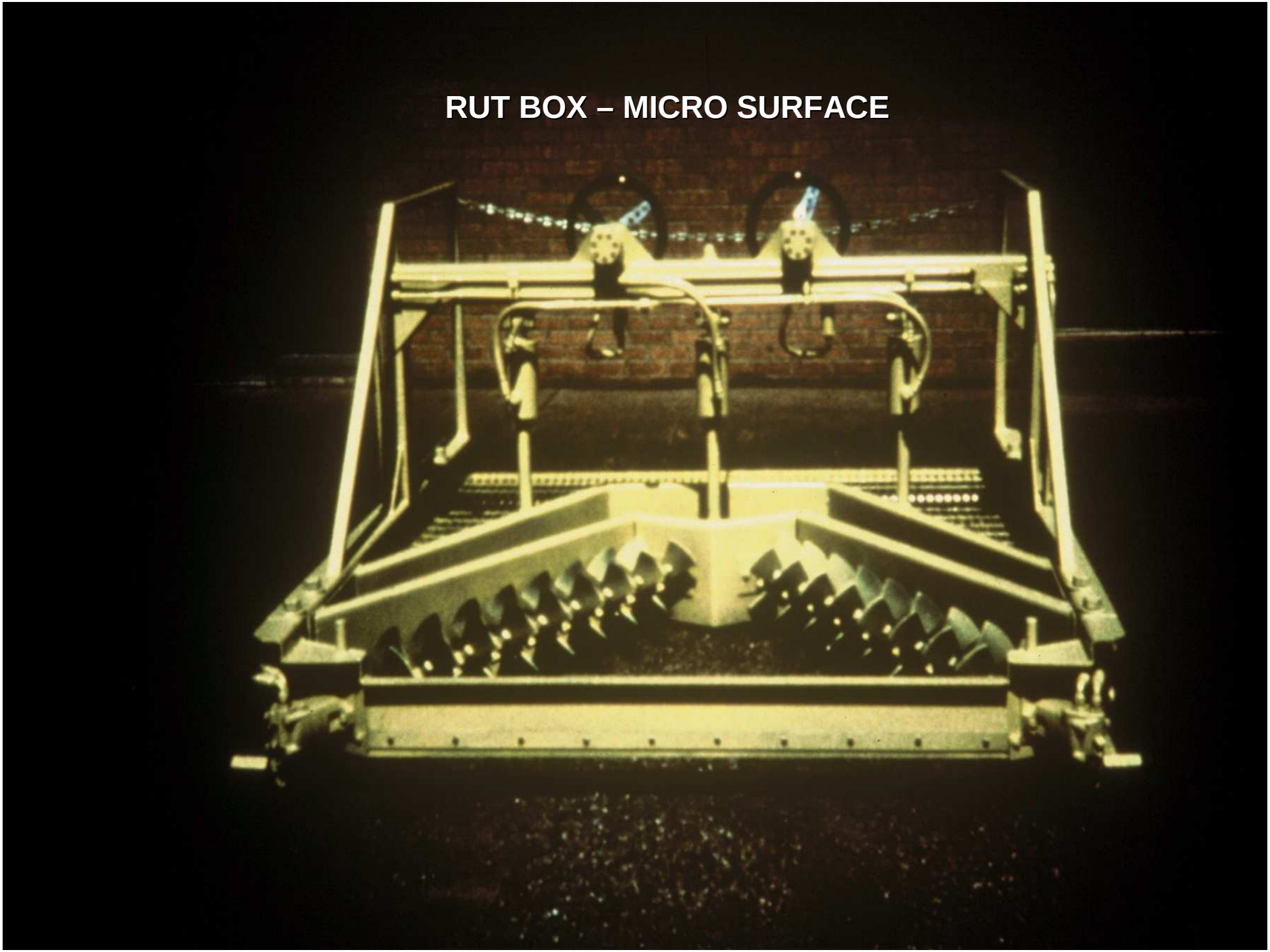
MICRO SURFACE CORRECTIVE MAINTENANCE

RUT FILLING

SCRATCH COURSE

LEVELING COURSE

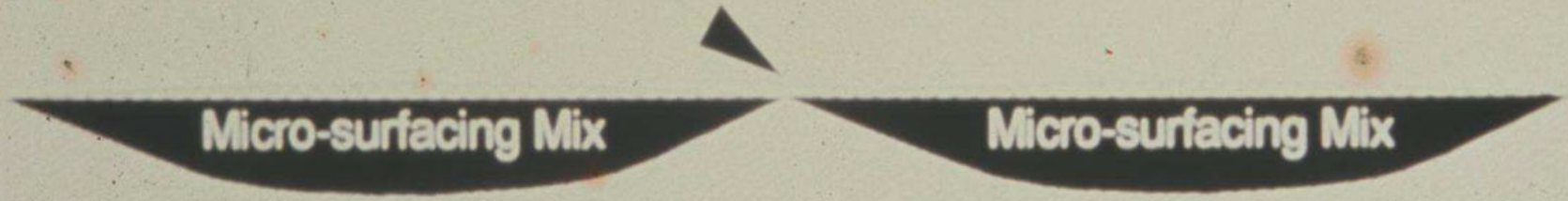
RUT BOX – MICRO SURFACE



REPROFILING RUTTED WHEELPATHS WITH MICRO-SURFACING

For each inch of applied micro-surface mix
add 1/8" to 1/4" crown to each rutfill
to compensate for return traffic compaction.

Original Pavement Cross Section



Ruts in Wheelpaths

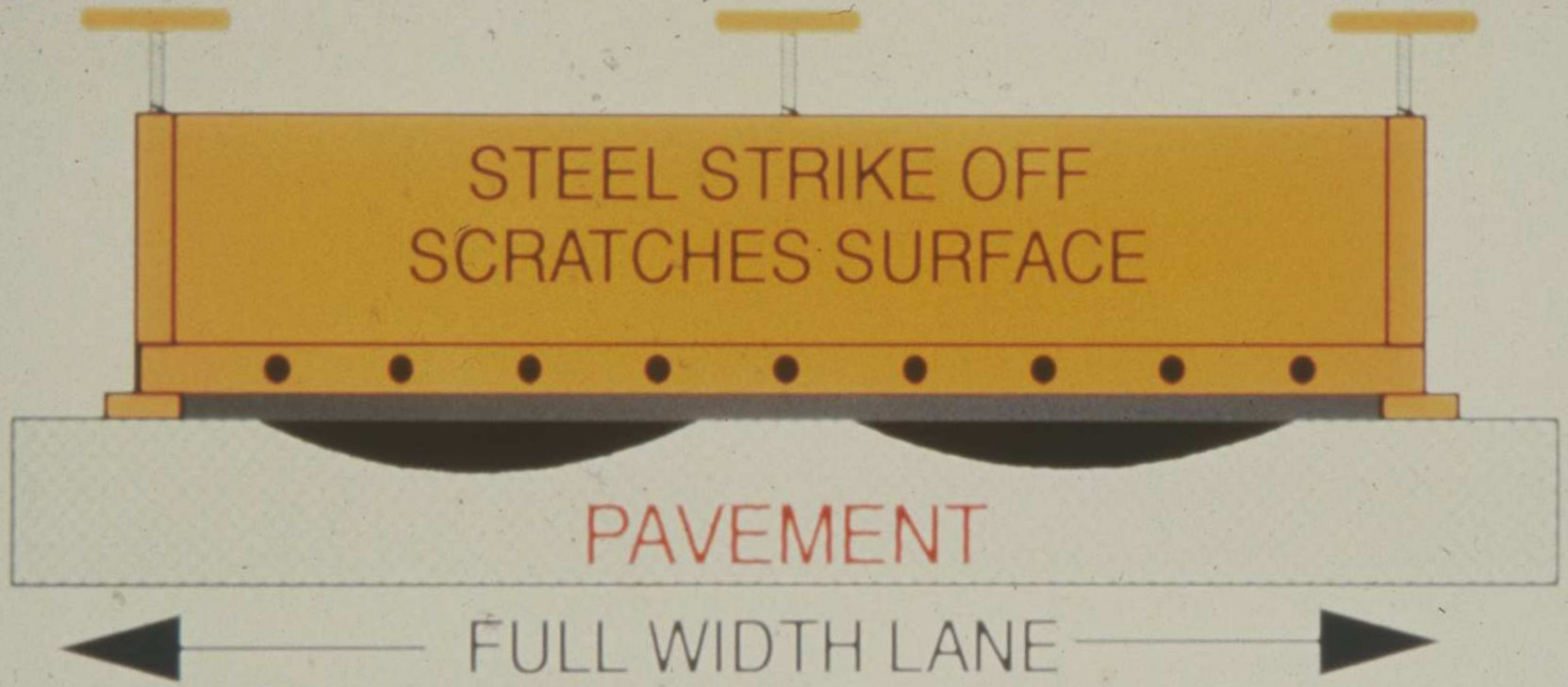
RUTS 1/2" & OVER MUST USE THE RUT BOX


RUT FILL ON IH-10 WEST
OF DEMING, NEW MEXICO
0198
Colonial


RUT FILL CROSS SECTIONAL VIEW
IH -10 NEAR DEMING, NEW MEXICO

RUTS LESS THAN 1/2"

MAY BE FILLED WITH SCRATCH COURSE



THE SCRATCH COAT IS GENERALLY
6" LESS THAN THE WIDTH OF THE LANE.

IRREGULARLY DEFORMED SURFACES MAY REQUIRE A LEVELING COURSE

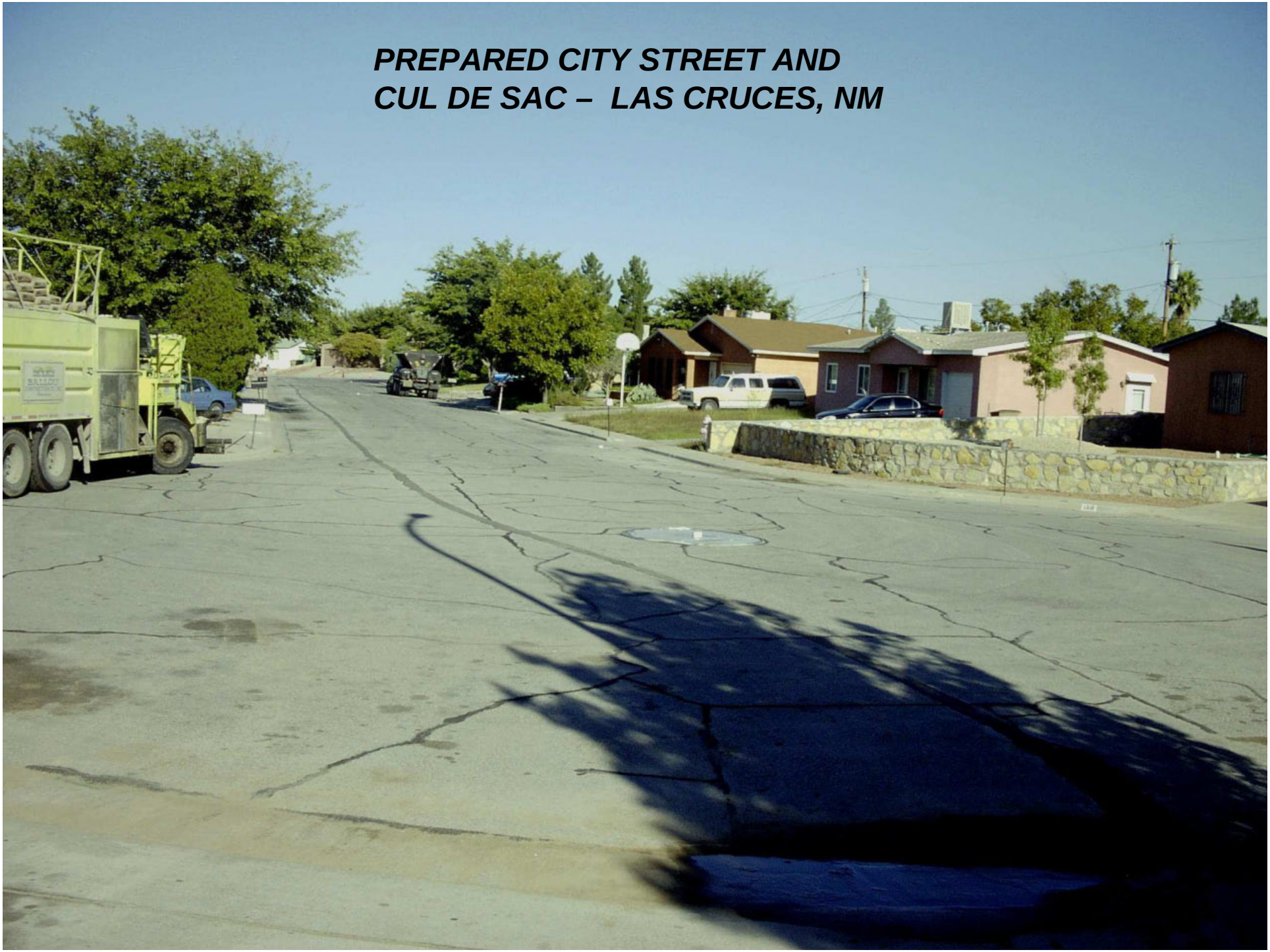
PAVEMENT SHOULDER

FULL WIDTH LANE

THE LEVELING COURSE MAY BE AS WIDE AS THE WEARING COURSE

LEVELING COURSE ON
IH – 70 IN KANSAS

MICRO SURFACE WEARING COURSES


PREPARED CITY STREET AND
CUL DE SAC – LAS CRUCES, NM


MICRO SURFACE IN
LAS CRUCES, NM


FINISHED SURFACE
LAS CRUCES, NM
25


CONTINOUS MICRO PAVER
AND NURSE TRUCK
BALLOU
CONSTRUCTION CO., INC.

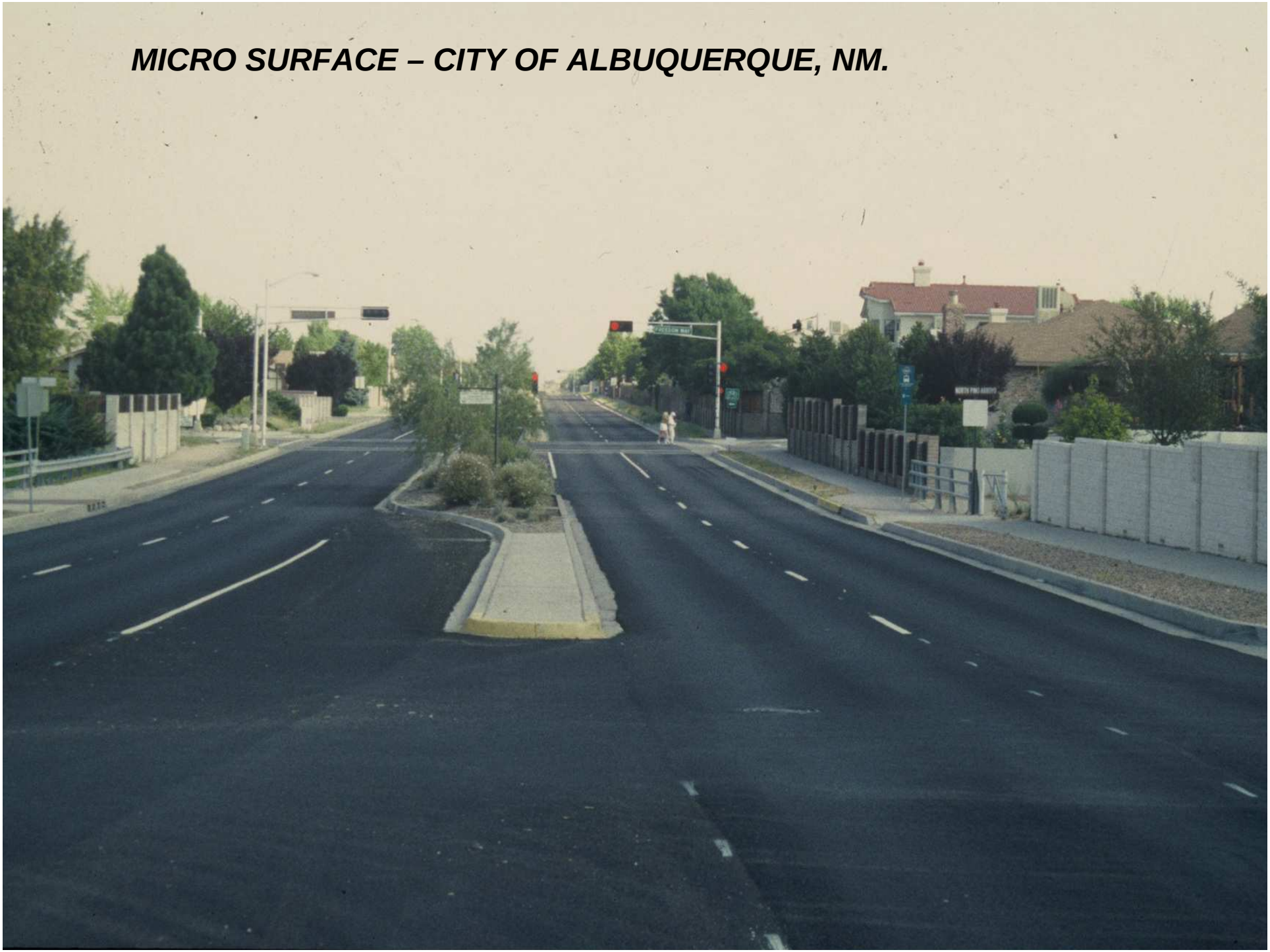

SURFACE COURSE – NMDOT # 3
STATE ROAD 47


MICRO SURFACE IN
ALBUQUERQUE, NM
STOP

MICRO SURFACE – CITY OF ALBUQUERQUE - SUMMER OF 2008

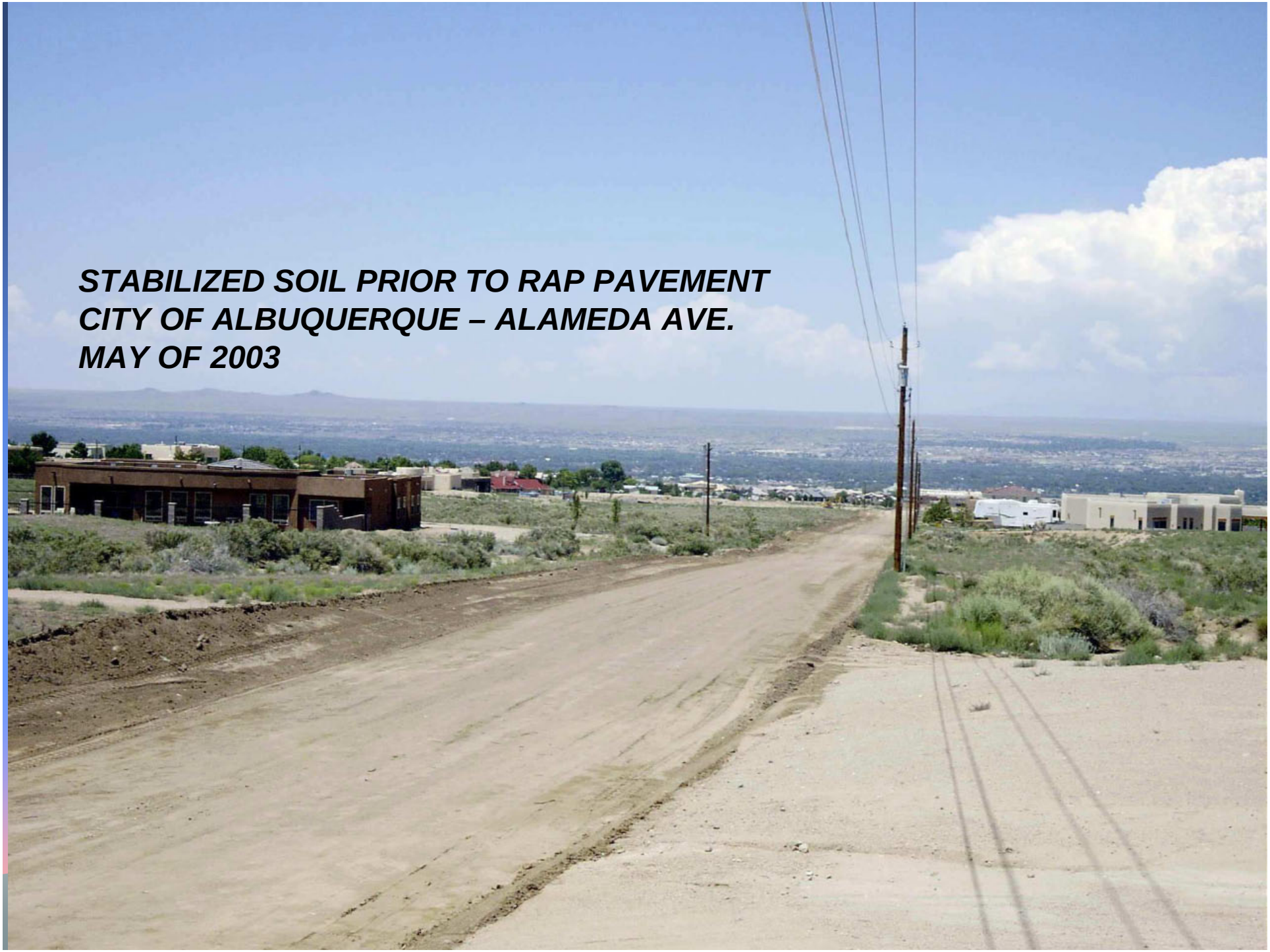
MICRO SURFACE - SUMMER 2008
CITY OF ALBUQUERQUE

MICRO SURFACE – CITY OF ALBUQUERQUE, NM.

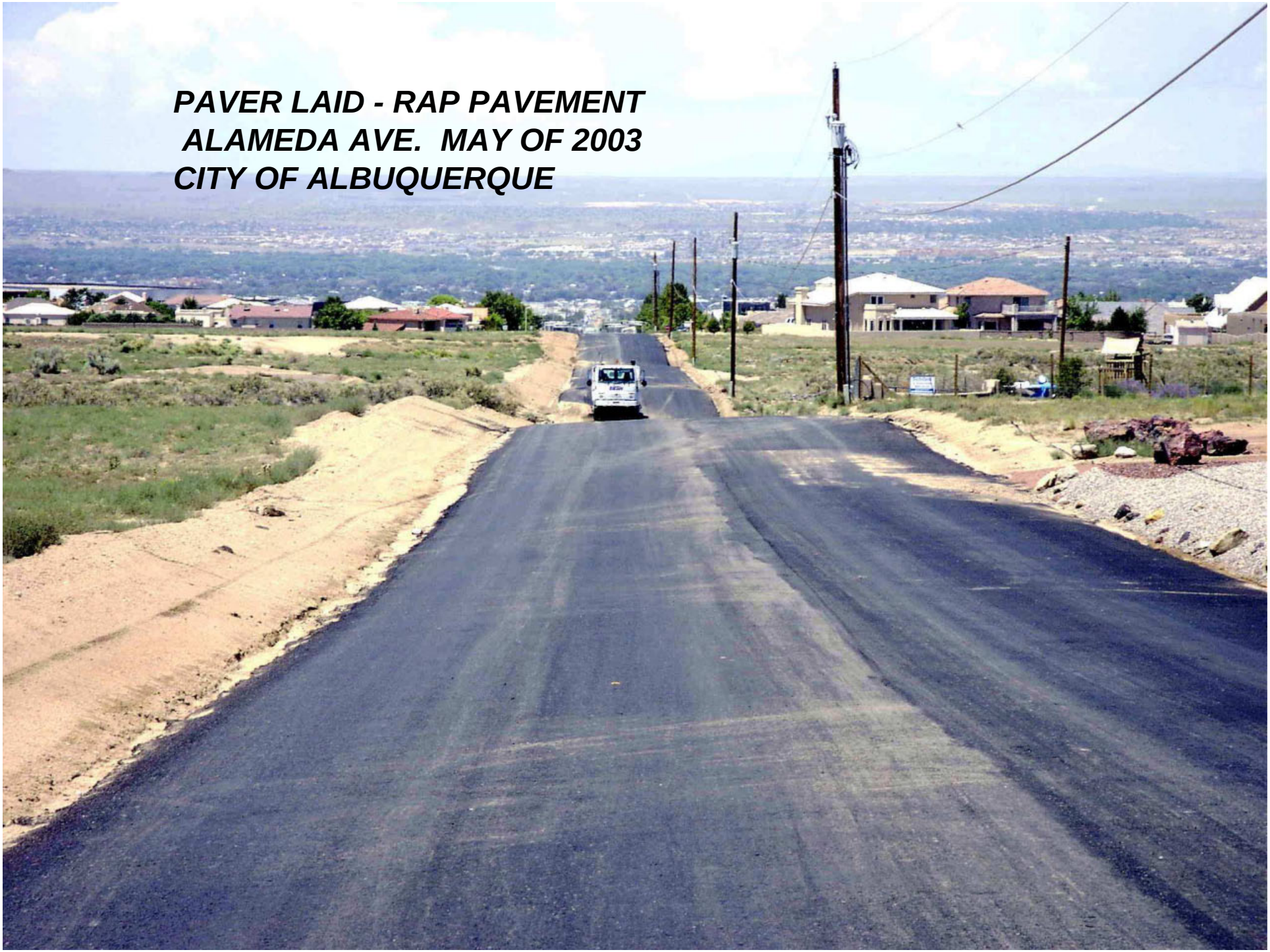


UNSER BLVD. NM 345
NMDOT # 3 ALBUQUERQUE
2006


MICRO SURFACE CITY
OF LAS CRUCES, NM 2007



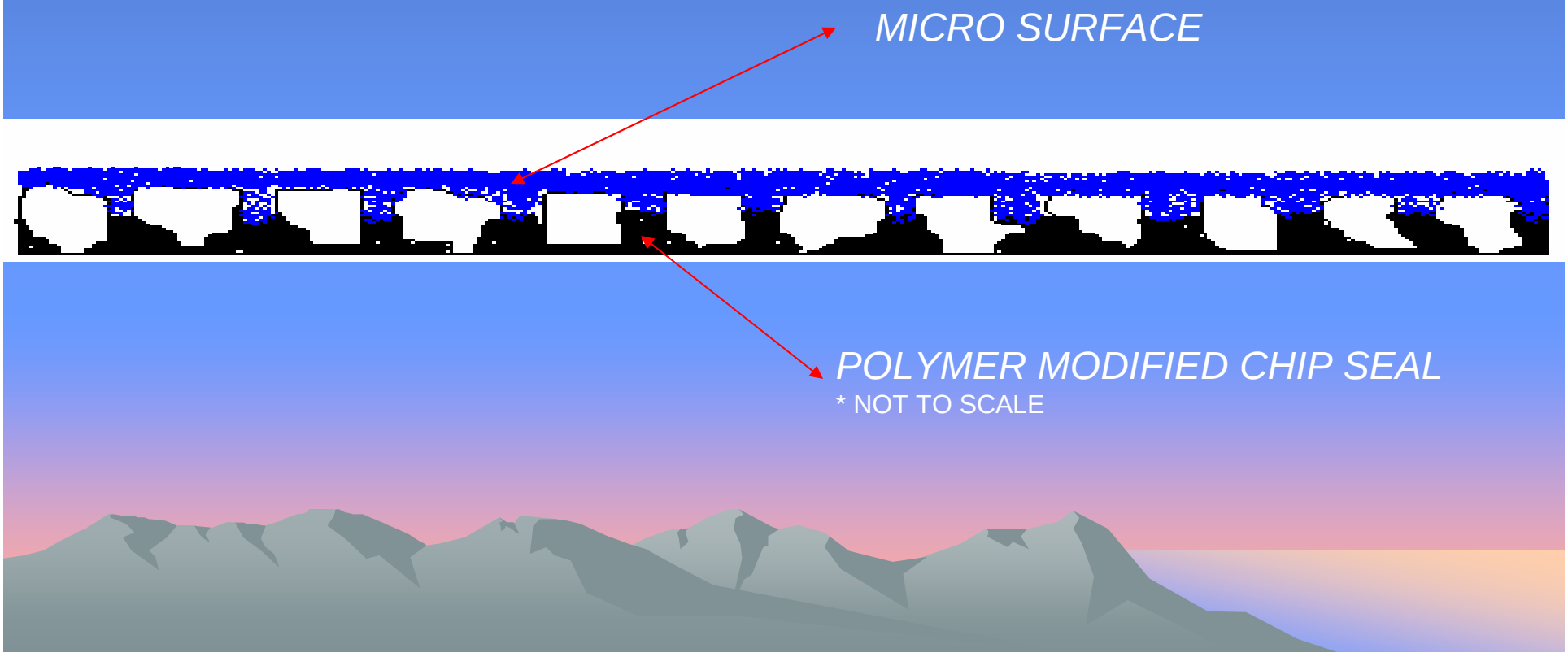
STABILIZED SOIL PRIOR TO RAP PAVEMENT
CITY OF ALBUQUERQUE – ALAMEDA AVE.
MAY OF 2003


PAVER LAID - RAP PAVEMENT
ALAMEDA AVE. MAY OF 2003
CITY OF ALBUQUERQUE


ALAMEDA AVE. WITH MICRO SURFACE
FALL OF 2007


GLENDALE AVE. MICRO SURFACE
OVER RAP PAVEMENT FALL 2007

CAPE SEAL – *POLYMER MODIFIED ASPHALT EMULSION CHIP SEAL FOLLOWED BY A MICRO SURFACE COURSE OR SLURRY SEAL.*




NMDOT # 1 CHIPSEAL – NEAR
DEMING, NEW MEXICO


CAPE SEAL - STATE HIGHWAY
536 - SANDIA CREST, NM


CAPE SEAL ON NM 536
NMDOT # 3 - ALBUQUERQUE


CAPE SEAL – DONA ANA
COUNTY – LAS CRUCES, NM

For more information, brochures, recommendations and specifications please contact:

International Slurry Surfacing Association
3 Church Circle PMB-250
Annapolis, Maryland 21401
Phone # 410.267.0023
www.slurry.org/

Micro Surface Brochures – Available from International Slurry Surfacing Association

Recommended Performance Guidelines for Micro Surfacing A143(Revised 01/2001)

Micro Surfacing – Quality Control

A guide to Quality Construction

2009 Slurry Systems Workshop

Hands on program for engineers, inspectors and Industry Personnel.

January 27 – 30, 2009

Palace Station Hotel
Las Vegas, Nevada

website: www.slurry.org


TYPICAL PROJECT INSPECTORS
NEW MEXICO ?
HOOTERS
WAITRESS
NO DRINKS BEYOND THIS POINT
THANKS FOR DESIGNATING A DRIVER!!!
WILDCATS
LAS CRUCES, NM

QUESTIONS?

SLURRY SEAL
(ASTM D-3910) (ISSA A-105)

A mixture of continuously graded fine aggregate, mineral filler, emulsified asphalt, and water properly proportioned, mixed and spread as a surface treatment. When applied the ***Slurry Seal*** *shall have a homogeneous appearance, fill cracks, adhere firmly to the surface and provide a weatherproof, high friction seal*.

BASIC GRADATIONS OF SLURRY SEAL

TYPE I (fine) 6 -10 lbs. sq. yard

1/8” top size – 10 to 16 % residual AC

TYPE II 10 – 15 lbs. sq. yard

1/4” top size – 7.5 to 13.5 % residual AC

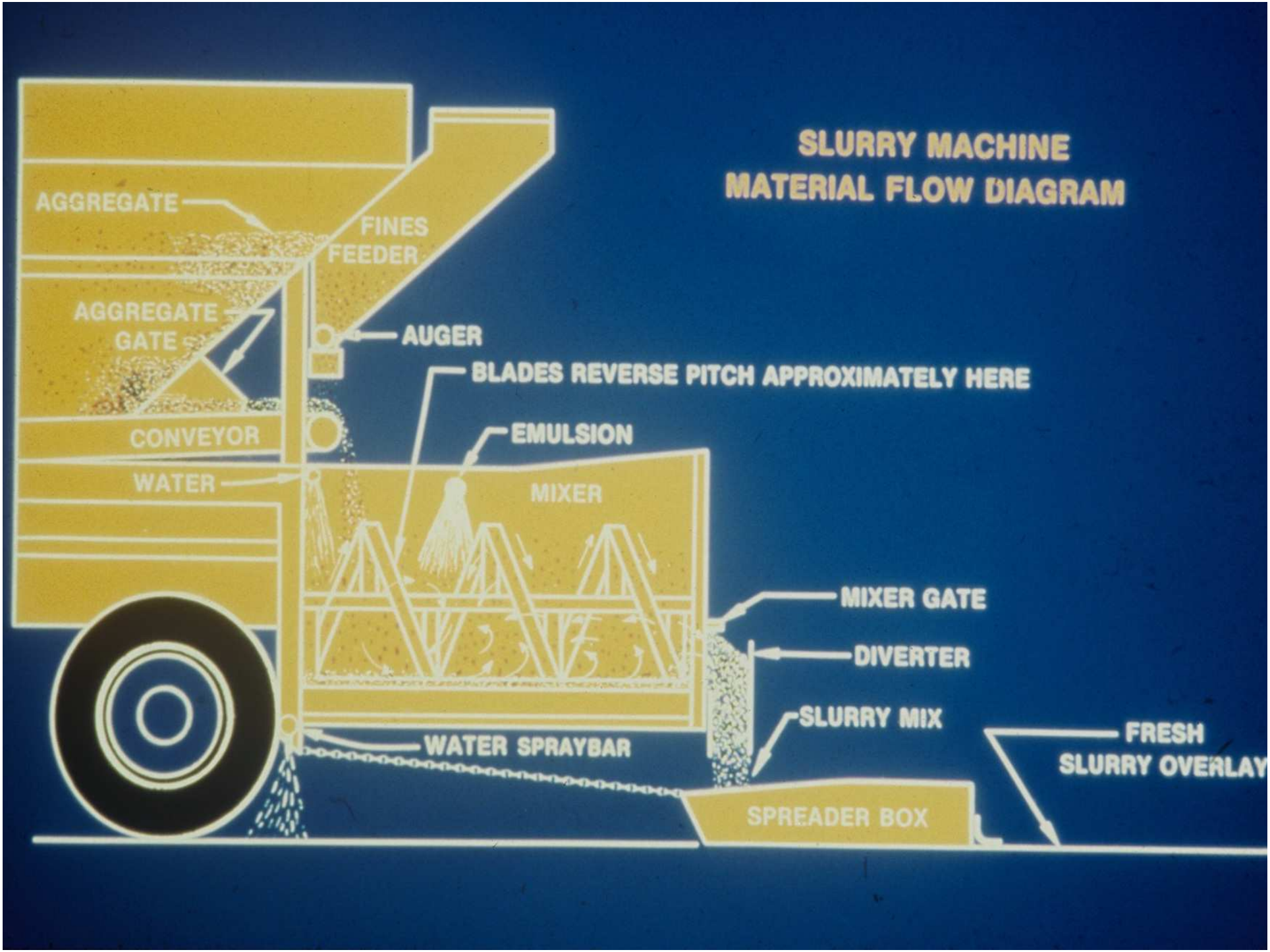
TYPE III 15 – 25 lbs. sq. yard

3/8” top size – 6.5 to 12.5 % residual AC

SLURRY SEAL EQUIPMENT

- **STOCKPILE SITE**
  - *EMULSION STORAGE TANK*
  - *AGGREGATE STORAGE*
  - *WATER RESOURCE/STORAGE TANK*
  - *FRONT END LOADER*
  - *MINERAL FILLER STORAGE*

CHARGING TRUCK MOUNT
UNIT AT STOCKPILE SITE


SLURRY MACHINE
MATERIAL FLOW DIAGRAM
AGGREGATE
FINES
FEEDER
AGGREGATE
GATE
AUGER
BLADES REVERSE PITCH APPROXIMATELY HERE
CONVEYOR
EMULSION
WATER
MIXER
MIXER GATE
DIVERTER
SLURRY MIX
WATER SPRAYBAR
FRESH
SLURRY OVERLAY
SPREADER BOX


SB-804A
ScanRoad


SLURRY PAVER
BOX AND BURLAP DRAG

SLURRY SEAL SURFACE COURSE


TRUCK MOUNTED SLURRY PASS-
SAN ANTONIO, TEXAS

PREPARED STREET RECEIVING SLURRY SEAL

CENTER PULL SLURRY SEAL - ARIZONA

FINISHED SLURRY SEAL, ARIZONA


SLURRY SEAL CITY STREET
– SAN ANTONIO, TEXAS