

Certified HMA Producer Program



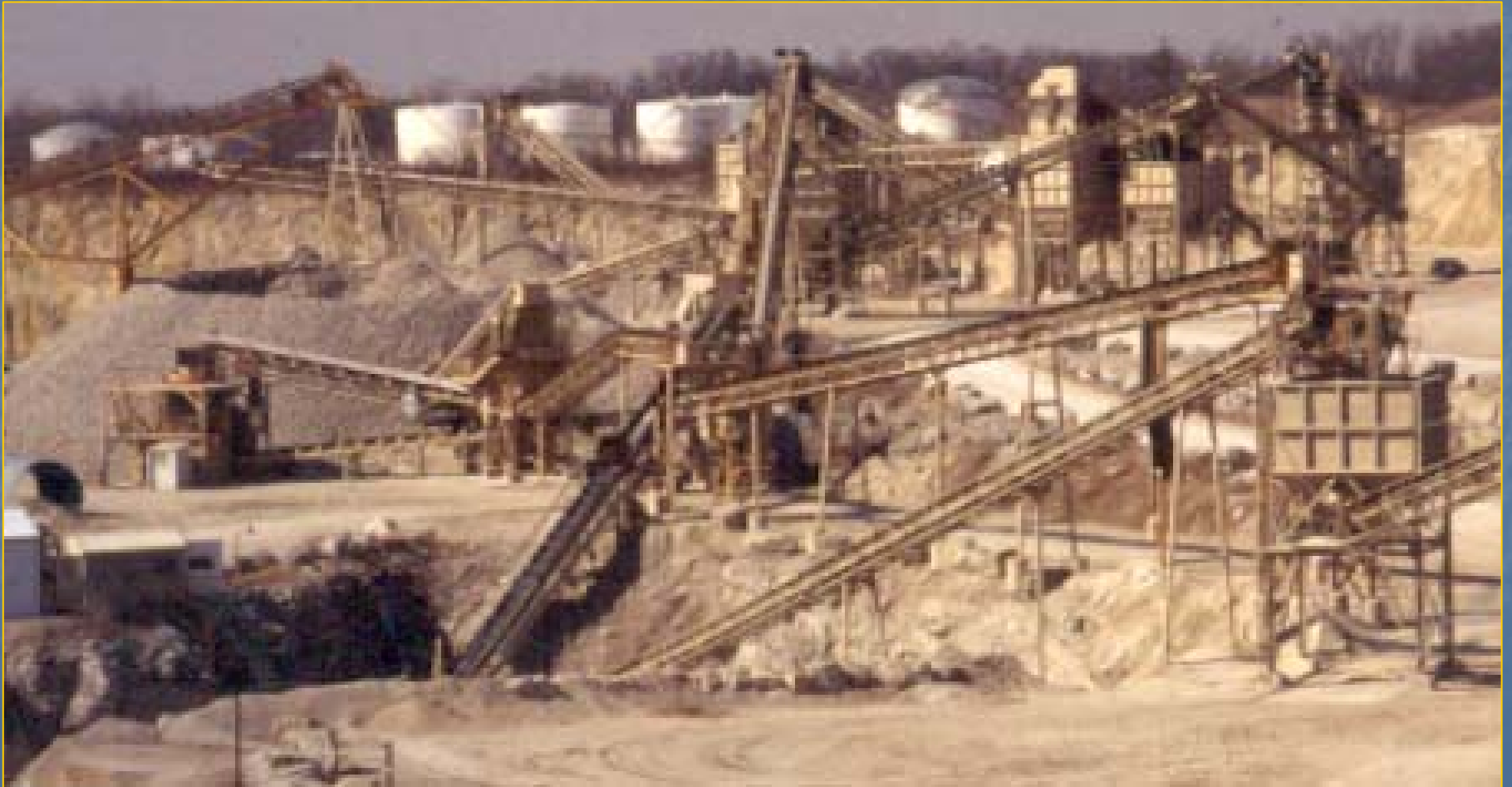
Quality Control - Plant

- **Materials**
- **Laboratory**
- **Plant Production**
- **Sampling**
- **Testing**
- **Documentation**

MATERIALS

- **Aggregates -- Certified
Aggregate Producer Program**
- **Binder -- Approved Supplier
Certification Program**

Certified Aggregate Producer Program



Personnel - Aggregates

- **Management Representative**
 - Handling
 - Production
 - Control
- **Certified Technician**
 - Gradation, Decant, Deleterious, & Crushed Content
 - Control Charts
 - Documentation
 - Certify Test Results

Gradation

- **Start of Production -**
 - **1/1000t for 5000t**
with max of 2/day
- **Normal Production -**
 - **1/2000t**
- **Load-Out – 1/8000t**



Decant

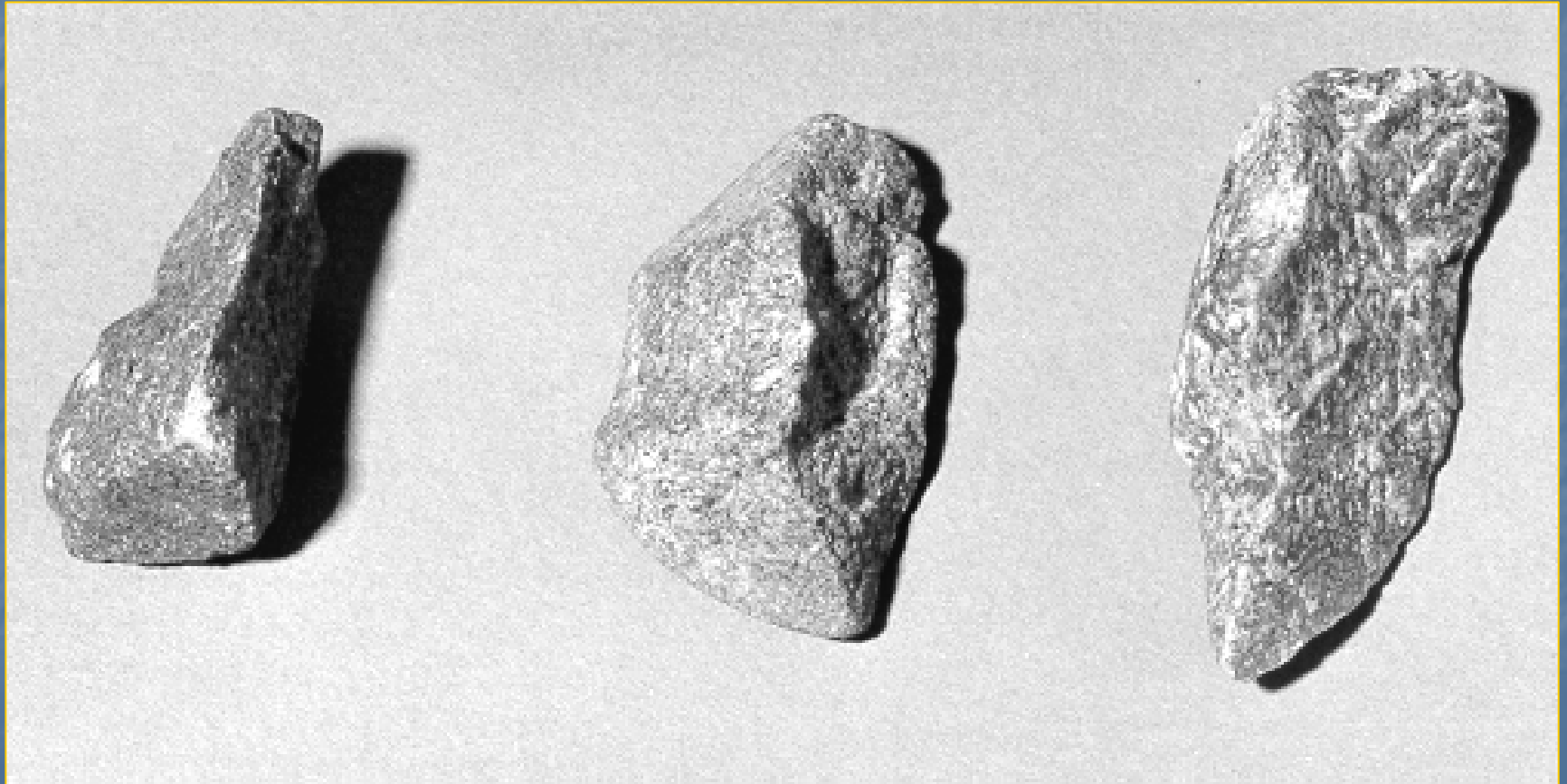
Each load-out sample



Deleterious 1/week for each size



Crushed Content 1/week for each size



Additional Tests

FA Specific Gravity



CA Specific Gravity



Additional Tests -- FAA

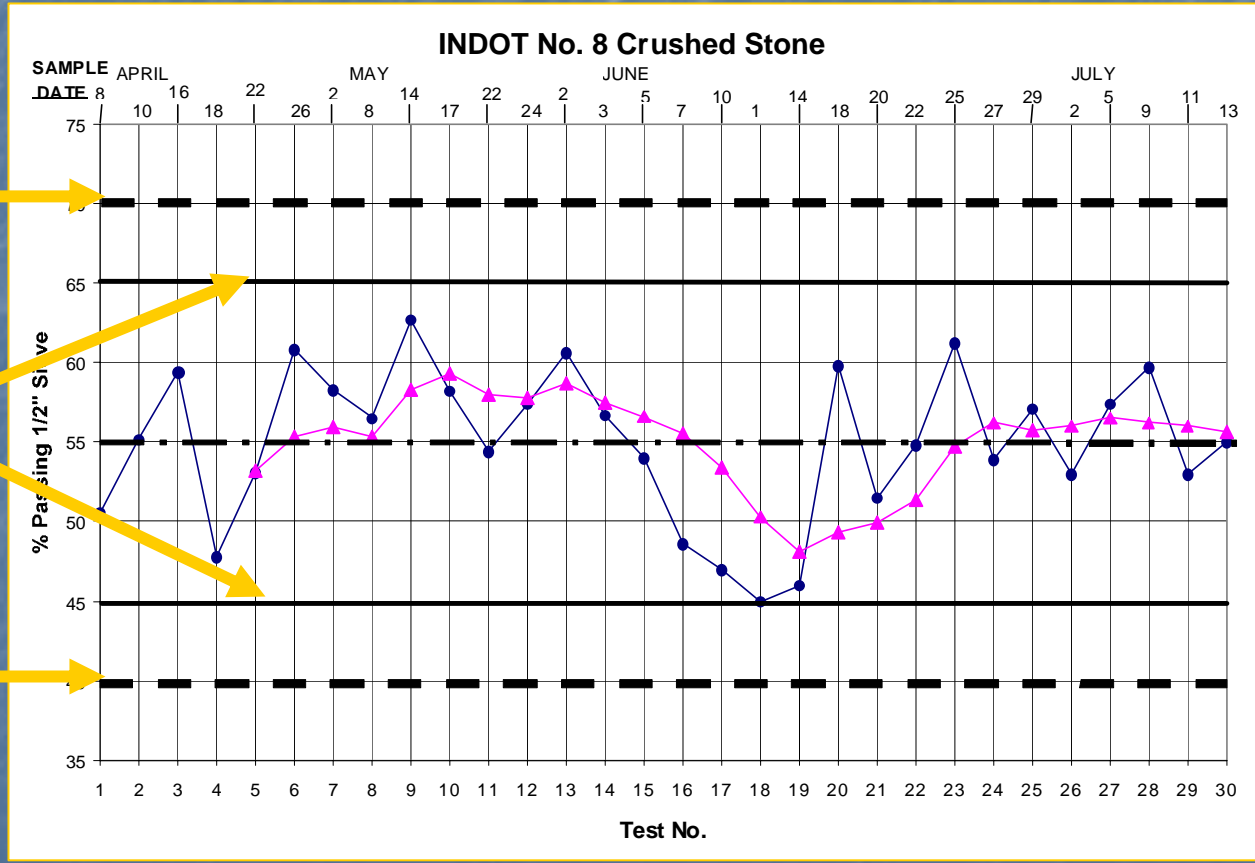


Control Charts

Specification Limit

Control Limits (2σ)

Specification Limit



PG Binder Approved Supplier Certification Program

- **Approved Lab -- AMRL inspection and proficiency sample programs**
- **Quality Control Plan**
 - **Testing**
 - **Inspection**
 - **Each PG Grade**
- **Monthly summary report of QC tests and inspections**

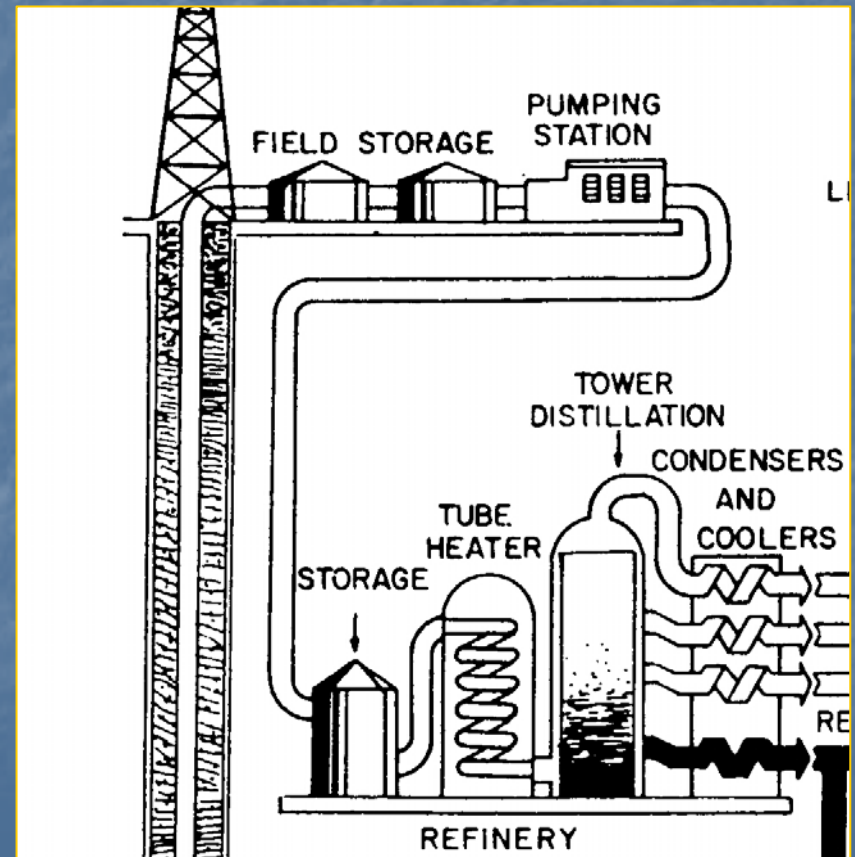
Binder - Storage

**Storage and
Handling of
Materials**



Binder Acceptance HMA Plant

- **ASC Supplier**
 - Certifies material -- bill of lading
 - Provides appeal test results



Quality Control - Plant

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HMA Laboratory

- HMA Plant
- Other Locations
- Equipment Calibration



Test Equipment

Equipment	Requirement	Minimum Frequency	Procedure
Balances	Verification	12 mo.	ITM 910
Gyratory Compactor	Verification	1 mo.	ITM 908
Gyratory Compactor Internal Angle	Verification	12 mo.	AASHTO PP 48
Ignition Oven	Conduct Lift Test	Weekly	Operators Manual

Gyratory – Internal Angle $1.16 \pm 0.02^\circ$

RAM/DAV II

- Pine
- Troxler
- Gilson
- Test Quip
- Interlaken



Gyratory – Internal Angle

$1.16 \pm 0.02^\circ$

DAV

- Pine
- Troxler
- Gilson
- Test Quip
- Interlaken



Gyratory Molds

- Internal Diameter
149.90 – 150.00 mm



Test Equipment

Equipment	Requirement	Min.Frequency	Procedure
Mechanical Shakers	Verify Sieving Thoroughness	12 mo.	ITM 906
Ovens	Verify Temp. Settings	6 mo.	ITM 903
Sieves	Verify Physical Condition	6 mo.	ITM 902
Thermometers	Verification	6 mo.	ITM 909
Vacuum Pump	Verify Pressure	12 mo.	ITM 905
Volumetric Flask	Calibrate	1 mo.	AASHTO T 209

Quality Control - Plant

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HMA Plant Production

- Plant calibration
- Aggregates
- Binder
- Baghouse fines
- Fibers
- Trucks
- Surge bins



Plant Calibration

- Required for each mix design
- Plant scales & meters -- annual



Aggregate Stockpiles

- **Drainage**
- **Stockpile construction**
- **Signage**
- **Separate stockpiles**
- **Loading out of the stockpile**
- **Loading cold bins**

Stockpile Construction



Stockpile Construction



Stockpile Identification











Separate Stockpiles





Stockpile Load-Out

- Working across the face of the stockpile
- Mixing in sides of the stockpile



Loading Cold Bins



Cold Bins



Cold Bins



Binder Tank Identification



Binder Tanks

- Use of more than one grade in a tank
- Storage temperature
- Extended storage



Baghouse Fines

- Uniform return of the fines
- Calibration of fines vs rate of return



Baghouse Fines

- **Bins - low level indicator**
- **No return of Fines**
- **Adjust volumetric properties**



Stabilizing Additives

- **Certification**
- **Instructions from manufacturer for storage & handling**
- **Uniform addition of material**
- **SMA -- fibers**



Anti-Adhesive Agents

- **Approved material**
- **Uniform application**



Drain Excessive Amounts

- Uneven truck beds



Anti-Adhesive Agents



Surge Bins

- **Approved for extended storage**
- **Procedure for sealing**



Surge Bins

- **Discharge when mix falls below top of cone**
 - Mix segregation
 - Alarm system



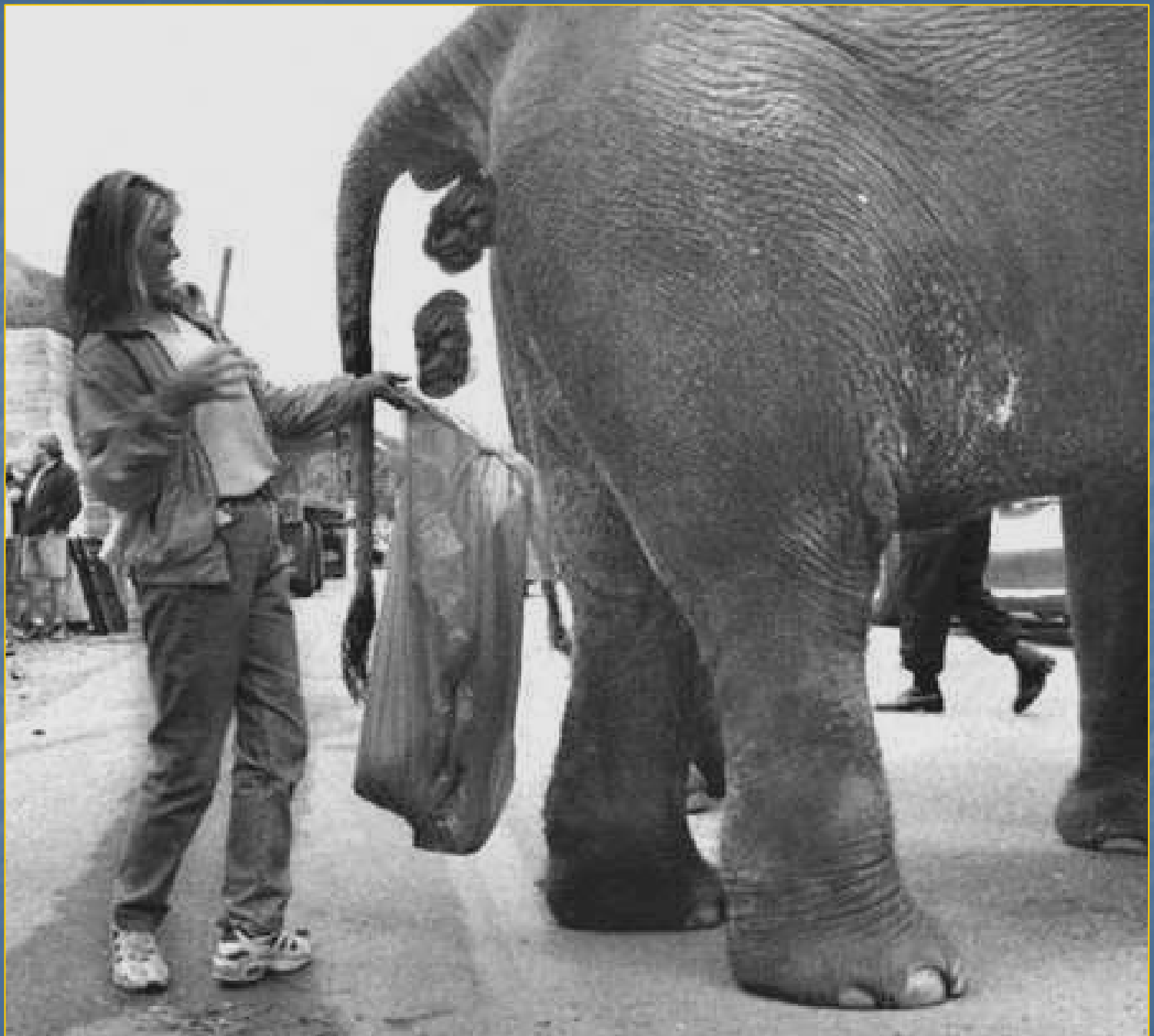
Truck Loading

- **Multiple drops to prevent segregation**



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Aggregate Sampling



Blended Aggregate Sampling

- **Verify consistency of gradation in each cold bin**
- **Verify cold bin calibration**



Blended Aggregate Sampling







Blended Aggregate Sampling













Binder Sampling

- **Location of the sampling valve**
- **Procedure for Sampling**



HMA – Truck Sampling

- Quicker check on mix properties than pavement sampling
- Check on segregation from loading truck
- ITM 580 procedure



HMA – Plate Sampling

- **Truck unloading**
- **Processing of mixture through paver**
- **INDOT acceptance location -- ITM 580**



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Testing – QCP Requirements

- **Aggregates**
 - Stockpile
 - Blended Aggregate
- **Recycled Materials**
 - Binder Content
 - Gradation
 - Moisture Content
 - CAA
- **Binder**

Aggregates

- **Verification of stockpile gradation**
 - Stockpiling
- **Verification of blended aggregate**
 - Cold bin loading
 - Plant calibration
- **Moisture content**
 - Plant calibration



Reclaimed Asphalt Pavement

- **Binder content, gradation, & CAA**
 - Verify mix design
- **Moisture content**
 - Plant calibration



Testing

- **Mixture at HMA Plant**
 - **Binder Content**
 - **Gradation (SMA)**
 - **Moisture Content**
 - **Temperature**
 - **Draindown (OG & SMA)**

Testing

- **Mixture from Pavement**
 - **Binder Content**
 - **Gradation (SMA)**
 - **Moisture Content (Surface Mixture)**
 - **Bulk Specific Gravity**
 - **Maximum Specific Gravity**

Binder Content

- **Ignition Oven**
 - Actual binder content
 - Time savings
- **Extraction**
 - High Mg content (dolomites)
- **Mass flow meter**
 - Printout
 - Designate time (10 min.)

Gyratory Specimens

- **INDOT Acceptance**
 - 1/1000t - Base & Inter
 - 1/600t - Surface
- **HMA (Certification)**
 - First 250t & each 1000t for Base & Inter
 - First 250t & each 600t for Surface



HMA Bulk Specific Gravity AASHTO T 166



Maximum Specific Gravity AASHTO T 209



Mixture Temperature

- **Verify plant mix temperatures are consistent**



Draindown AASHTO T 305

- **Open graded mixtures & SMA**
- **1/4000t for Base & Inter**
- **1/2400t for Surface**
- **Maximum of 0.50%**



Crushed Particles

- **Verify crushed content for gravel**
 - Volumetric properties



Aggregate Bulk Specific Gravity

Fine Aggregate



Coarse Aggregate



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Daily Diary

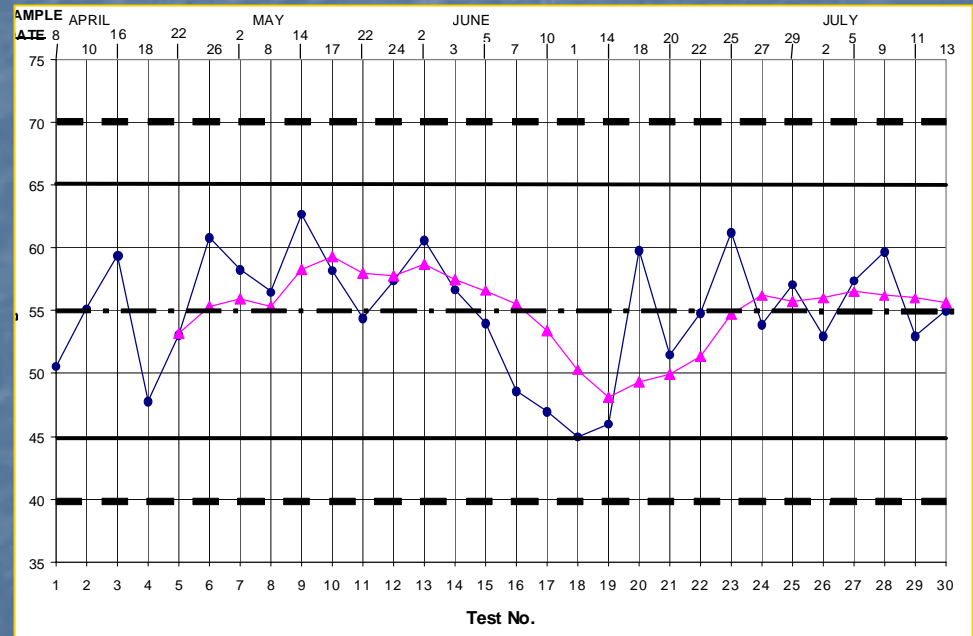
- **Quantity of mixture produced**
- **Contract number**
- **When samples taken & tested**
- **Non-conforming tests and resulting corrective action**
- **Any significant events or problems**

Corrective Action

- **Control limits of control charts are exceeded – QC/QA HMA or SMA**
- **Specification limits are exceeded for HMA**
- **Moisture content**
 - **Exceeds 0.30 % at plant**
 - **Exceeds 0.10 % from pavement**

Control Charts

- Per mixture not contract
- Binder Content
- Air Voids
- VMA





Documents – 3 Years

- **Diary**
- **Control Charts**
- **Test Results**

INDOT

- **Certified Aggregate Producer Audits**
- **Certified Asphalt Supplier Audits**
- **Certified Asphalt Technician Training Program**
- **Certified HMA Plant Audits**
- **QCP -- Pavement for each contract**

HMA Audits

- **Quality Control Plan**
- **Sampling & Testing Proficiencies**
- **Split Samples**



Quality Control - Plant

- **Aggregates/RAP -- Uniform Material**
 - **Certified Aggregate Producer**
 - **Stockpiling**
 - **Signing**
 - **Loading Cold Bins**
 - **Sampling & Testing of Stockpiles & Blended Aggregates**

Quality Control - Plant

- **Binder -- Uniform Material**
 - Asphalt Supplier Certification
 - Tank usage for more than one grade
 - Signing
 - Sampling for verification

Quality Control - Plant

- **Mixture -- Uniform Material**
 - Plant calibration
 - Return of baghouse fines
 - Uniform addition of fibers
 - Surge bins
 - Anti-adhesive agents
 - Trucks

Quality Control - Plant

- **Mixture -- Sampling & Testing**
 - Testing Equipment Calibration
 - Binder content
 - Mixture gradation
 - Crushed content
 - Volumetric properties

Certified HMA Plants

- **Manufactured product**
- **Improved quality of product**
 - **React quickly to changes**
- **Cities/Counties use**
- **Contractor acceptance**