Prime Factors for Successful Preservation Treatments

Arizona Pavements / Materials Conference

Larry Galehouse, P.E., P.S.
National Center for Pavement Preservation
# Preservation Treatments

<table>
<thead>
<tr>
<th>Asphalt Treatments</th>
<th>Concrete Treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fog Seal</td>
<td>Crack Treatment</td>
</tr>
<tr>
<td>Chip Seal</td>
<td>Joint &amp; Crack Sealing</td>
</tr>
<tr>
<td>Slurry Seal</td>
<td>Diamond Grinding</td>
</tr>
<tr>
<td>Cape Seal</td>
<td>Diamond Grooving</td>
</tr>
<tr>
<td>Ultrathin HMA Overlay</td>
<td>Dowel-Bar Retrofit</td>
</tr>
<tr>
<td>Thin HMA Overlay (1½”)</td>
<td>Partial Depth Repair</td>
</tr>
<tr>
<td>Ultrathin Bonded Wearing Course</td>
<td>Full Depth Repair</td>
</tr>
<tr>
<td></td>
<td>Cross-Stitching</td>
</tr>
<tr>
<td></td>
<td>Slab Stabilization</td>
</tr>
<tr>
<td></td>
<td><strong>High Friction Surface Treatments</strong></td>
</tr>
</tbody>
</table>
Successful Preservation Treatment Examples

Chip Seal

Micro Surfacing

Dowel Bar Retrofit
So what are the prime factors for successful preservation treatments?
Factor 1 – Qualified Personnel

• Training is essential for successful pavement preservation projects.
Qualified Personnel

- Contractor and agency employees need to acquire knowledge about how to build a pavement preservation treatment.
Qualified Personnel

- Technicians conducting material sampling and testing for quality acceptance or quality control activities need to be certified by a nationally recognized organization.
Qualified Personnel

• Certain contractor employees need to be certified for the treatment(s) they construct.

• These employees should include:
  – Superintendents
  – Foreman
  – Operators of major equipment
Certification is confirmation that a person has the necessary knowledge of a specific pavement preservation treatment by examination from a recognized independent third party specializing in the field.
Accredited laboratories conducting tests used in mix design or acceptance have trained personnel knowledgeable on specific test methods.
Accredited laboratories must undergo an on-site third party assessment. This includes a scheduled review of:

- Technician training and competency records
- Equipment calibration and check records
- Each test method demonstrated by lab staff
- The proficiency sample program
Many laboratory accreditation programs are available:
Factor 3 – Quality Materials

Quality materials are essential for quality results.
Specifications address quality materials through:

- Certificate of Compliance or Certificate of Analysis
- Prequalified Aggregate Suppliers
- Qualified Products List (QPL)
- Approved Products List (APL)
- Tested Stock Suppliers
Fiscal constraints and pressure from legislators and administrators force agencies to work on pavements too far down the deterioration curve.
Project Selection

• Pavement Management Systems
  – Pavement Inventories
    > Type, Age, Location, etc.
  – Ride Quality Measurements
  – Distress
    > Functional and Structural
  – Rutting
  – Faulting
Project Selection

• Field Review (Windshield Survey)
  – Asphalt Pavements
    > Oxidation
    > Early Raveling
    > Bleeding
    > Drainage Issues
  – Concrete Pavements
    > Joint Seals
    > Pop-outs
Project Selection

Poor choices for pavement preservation.
Causes of Poor Pavement Performance in USA

- Workmanship - 66%
- Design Deficiency - 21%
- Material Failure - 9%
- Natural Disaster - 4%
Factor 5 - Quality Control

The system used by a Contractor party to monitor, assess and adjust their production or placement processes to ensure that the final product will meet the specified level of quality.
Acceptable Quality Control Plan

1. Scope and Reference Documents
2. Definitions
3. Quality Control Personnel
4. Quality Control Testing Facilities and Equipment
5. Materials Control
6. Quality Control Sampling and Testing
7. Production Equipment
8. Treatment Placement and Workmanship
9. Documentation
10. Non-Conformance and Corrective Action
Quality Control Plan Parts

1. SCOPE and REFERENCE DOCUMENTS

• ASTM Standards
• AASHTO Standards
• Guidelines and Technical Bulletins
• Standard Specifications and Project Special Provisions
Quality Control Plan Parts

2. DEFINITIONS

• Making Terms Used in QC Plan Clear and Distinct
3. QUALITY CONTROL PERSONNEL

- Company Personnel Responsible for QC
- Subcontractors Responsible for QC
- Material Suppliers Meeting Testing Requirements
4. QUALITY CONTROL TESTING FACILITIES and EQUIPMENT

- Laboratory Used for Material Sampling and Testing
- Laboratory Used for Mix Designs
  > Must be Accredited Laboratories
5. MATERIALS CONTROL

- All Materials Used in Treatment are Identified
- List of Approved Material Sources
- Storage Requirements and Stockpiling Provisions
Quality Control Plan Parts

6. QUALITY CONTROL SAMPLING and TESTING

- Lot Size Defined for Sampling
- Sampling Identification System
- Storage and Retention Procedures for Samples
- Sampling Methods, Test Procedures and Frequency
Quality Control Plan Parts

7. PRODUCTION EQUIPMENT

- Identify All Equipment Used During Construction
- Provide Spec Sheets for Major Equipment
Quality Control Plan Parts

8. PLACEMENT and WORKMANSHP

- Calibration Procedure for Equipment
- Equipment Checks, Inspection Methods and Frequency
- Pavement Surface Preparation Procedures
- Pre-Production Quality Control Checks
- Related Production Activities
  - Traffic Control
  - Tack Coat, etc.
Quality Control Plan Parts

8. PLACEMENT and WORKMANSHIP - continued

- Critical Factors That Can Affect Production Results
- Identify Protocols for Proper Workmanship
- Production QC Activities, Test Frequencies, and Inspection Methods
- Cleanup
  - Daily
  - End of Project
9. DOCUMENTATION

- Examples of Reporting Forms
- Production Quality Control Reporting
  - Sampling and Testing Results
  - Daily Production Records
  - Non-Conformance Report
  - Document Retention Details
Quality Control Plan Parts

10. NON-CONFORMANCE and CORRECTIVE ACTION

- Corrective Actions Described for:
  - Materials Not Meeting Specifications
  - All Potential Defects in Workmanship
Quality Control Plan Parts

APPENDICES – Supporting Documents

- Company Organization Chart
- Resumes of QC Personnel
- Employee Certifications
- Equipment Specifications
- Examples of Report Forms
Acceptance is the process which the Agency, Owner, or Designated Agent determines whether the quality of the product meets the contract requirements.
Agency / Owner - Acceptance

- The Agency, Owner, or Designated Agent will verify the degree of compliance by independently performing:
  - Random Material Sampling and Testing
  - Inspection of Workmanship
Agency / Owner - Acceptance

The objectives of acceptance are to:

- Perform sampling and testing for key quality characteristics.
- Inspect to identify visually deficient work.
- Measure the quality of all materials produced and placed by the contractor.
- Determine the corresponding payment the contractor should receive.
Quality Assurance

1. Quality is critical for the contractor to achieve customer satisfaction and retain future pavement preservation work.
2. Quality pavement preservation treatments make an important contribution to long-term revenue and profitability.
Questions