CAPABILITIES OF THE PETROGRAPHIC LABORATORY

Michael Dawidczik, P.G., CST

2014 Construction, Pavements & Materials Conference
Table of Contents

1. Introduction
2. Petrographic Laboratory Equipment
3. Petrographic Forensics
4. Consulting
5. Questions
- Petrographic Lab is located at the Construction Division’s Cedar Park Campus
- Part of the Materials & Pavements – Geotechnical, Soils & Aggregates Branch
- Succession of Lab Managers
  - Tom Patty
  - John McKenna
  - Edward Morgan

Petrographic Lab
Petrographic Laboratory Equipment

- Automatic Wet Saw
- Semi-Automatic Polisher
- Stereomicroscope
- Polarized Microscopes
- AIMS Devices
- Modified Point Count Automated Table
- Epoxy Impregnator
- SEM/EDS
Petrographic Forensics

Types of Samples Analyzed

- Hardened Concrete Cores
  - Bridge Decks
  - PCC Pavements
  - Pre-stress/Precast Members
- Steel
  - Rebar
  - Lighting Posts

- Asphalt Pavement Cores
  - Pavements
  - Clay balls
  - RAP/RAS Issues

- Aggregate Samples
  - AQMP Samples
  - Aggregate Performance Issues in the Field
Identification of Distresses

- ASR / DEF
- Freeze-Thaw Damage
- Carbonation
- Cracking (Early Age, Late Age)
- Segregation of aggregate
- De-bonding Issues
- High Air Content
- Water – Cement Ratio
Modified Point Count

- Total Air Content (Entrained & Entrapped)
- Percent Coarse Aggregate
- Percent Fine Aggregate
- Spacing Factor
- Void Frequency
- Paste Content
- Paste to Air Ratio
- Average Cord Length
- Specific Surface
Petrographic Forensics – Modified Point Count

Capabilities of the Petrographic Laboratory
Petrographic Forensics – SEM / EDS

- SEM/EDS forensics
- Backscatter Image
- Elemental Dot Mapping
Petrographic Forensics

Aggregate Quality Issues

- AQMP Samples
  - Failing or Elevated Testing Results
  - Inspection of current vs. past samples

- Aggregate Performance Issues in the Field
Partnering with Districts and Aggregate Producer/Suppliers

- Quarry Visits with the District Lab
  - Inspect production, working faces, quarry operations
- Increase QC split testing between District Lab and Aggregate Supplier
  - Micro-Deval testing
- Find root cause and work together to ensure products meet the specification limits
Contact Information

Richard Izzo, P.E. – Soils & Aggregates Branch Manager
  • richard.izzo@txdot.gov
  • 512-506-5907

Edward Morgan, P.G. – Geoscientist/Petrography Lab
  • edward.morgan@txdot.gov
  • 512-506-5910

Michael Dawidczik, P.G. – Geoscientist/Aggregates Lab
  • michael.dawidczik@txdot.gov
  • 512-506-5903
Questions