Session X.1: **YieldPoint Multi-Position Borehole Extensometer (MPBX)**

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Presentation Outline

- Statement of Need
- Product Evaluation
- New Anchor Design
- Prototype Evaluation
- Project Implementation
- Verification Comparison
- Summary
Statement of Need

• Reduce Material Cost
• Reduce Installation Cost
  – Driller time ($)
  – Engineer time ($)
  – Traffic control time
• Reduce Impact to Traffic
• Meet ‘or approved equal’
  – Prototype testing
  – Comparison testing
Product Evaluation

- **d-EXTO Used for Rock (proven)**
  - 1-6 Anchor points
  - 150 mm Stroke
  - Highly accurate
  - Robust/Durable
  - Small footprint
  - Ease of installation

- **Comes Fully Assembled**

- **Author Has Similar Design Patent (MDD)**

- **Never Used Before – need to evaluate**
Product Evaluation

- Understand Method of Operation
- Verify Accuracy
- Check for Anchor Independence
- Need Different Anchor Design
New Anchor Design

- Original Anchor for Epoxy/Grout
- New Anchor for Soft/Medium Grout
- Still Provides Hand Adjustments
Prototype Evaluation

- Installed at Geocomp’s Acton, MA Office
Prototype Evaluation

- Long-term (>1 year) Stability
- Pull Test (sleeved tube)

- Generate Report of Findings for Substitution
Project Implementation

- Crenshaw/LAX LRT – 52, 3 position units
- LA Regional Connector LRT – 66, 4-6 position units
Project Implementation

- Pre-placed Directly over TBM Path, Electronics run to Side of Road
Project Implementation

- Pre-placed Directly over TBM Path(s)
Verification Comparison

- Comparison with VW MPBX (YieldPoint)
Verification Comparison

- Comparison with VW MPBX (VW MPBX)
Summary

• YieldPoint MPBX;
  – Met accuracy requirements
  – Passed laboratory evaluation
  – Anchor design for soft grout performed well
  – Passed Prototype performance testing
  – Project Implementation (as expected)
    • Easy Installation
    • Saved approximately 40% in costs
  – Passed comparison testing
  – Further design improvements made
Questions/Discussion