LABORATORY INFORMATION MANAGEMENT SYSTEM
The Solution We Are Looking For?

Dan V. Ridolfi, PE MSCE
“Efficiencies afforded us by QESTLab has allowed us to reduce or eliminate temporary and summer staff without loss in quality.”

James Parsons, Director of Laboratory Operations
NTH Consultants, Ltd.
Consultant (Kleinfelder)
7 years in materials engineering roles
Managed materials testing for one of busiest offices (Las Vegas, NV)
Implemented one of America’s first fully functional CMT LIMS

Quality Manager (Granite Construction)
Almost 10 years managing materials quality
Both from materials producer view point, and
From construction company perspective

Regional Vice President (Spectra QEST)
Responsible for fastest growing region of globally leading LIMS vendor

Diverse experience with LIMS: both from user and vendor perspectives
AGENDA

Construction Testing LIMS: Current State of Practice
Adaptable Quality Platform: The Immediate Future
FHWA’s EDC-3: e-Construction
DFW Connector: A Case Study
Open Discussion
Information Received in An Organized Manner
   Data collection process should change based on point of collection.

Information Validated
   Through work flow, approvals, hold points, or other functionality.

Data in a Rational Organized Manner for Construction
   Unique information needs to be retrievable by each stakeholder, according to their individual needs.

Data is Secure
   Information is presented on a need to know basis.
LIMS FEATURES – DATA ENTRY

Hundreds of test methods
   Comprehensive forms for data input

Encourages best test practice
   Forms designed for use “on the bench”
   Calculation of results in real time
   User feedback as per the test method

Integrated with the rest of the LIMS
   Specifications, calibrations, user access

Flexible and extendable
   System can provide simple entry forms too
   Bulk entry capability for multiple tests that are done together
   Additional tests can be configured using MS Excel
LIMS FEATURES: MANAGEMENT

Equipment Management
Ensure equipment is calibrated and in good working order.

Specifications
Specifications are correct, and available for use by all.

Workflows
What do I do next?
Who is doing what?

Technician Competencies
Ensure people performing work are qualified.

Quality System Foundation
Ensures overall data integrity.
LIMS FEATURES: CENTRAL DATABASE

Data in once
  All test measurements, for all test results, all observations
    Whether from job site; or
    From laboratory
    Ideally: at point of measure

Ability to track everything
  Samples, whether in field or lab
  All laboratory assets/functions
    People, specifications, equipment, clients, projects, prices, productivity, etc.

Data available to all (appropriate) stakeholders instantly
  Information is available at appropriate stages of the workflow...
  ...to appropriate people
LIMS FEATURES: REPORTING

User Configurable
- Filters
- Tabular reports
- Charts
  - Control Charts
  - Cusums
- On virtually all database fields

Statistical Analysis
- Reports automatically calculate
- Exception reporting

Flexibility
- Results can be exported to MS Excel
- Open database allows further mining
Cloud Based
 Allows for multiple stakeholders to perform pre-predefined analysis based on authorities

On Verified Data
 Laboratory only issues reports to the cloud after internal checks and verifications have been applied
Complex Reports Possible
Trend analysis
Scatter interpretations
Statistics on calculations
LABORATORY & TECHNICIAN ACCREDITATION

TEST REQUEST

FIELD WORK ALLOCATION

FIELD SAMPLING & TESTING

LABORATORY TESTING

TEST REPORTING

REPORT DISTRIBUTION

ANALYTICAL REPORTING

CONSTRUCTION MATERIAL PRODUCERS

TESTING & INSPECTION CONSULTANTS

INFRASTRUCTURE CONSTRUCTION

AGENCIES OWNERS
A FHWA ‘Every Day Counts 3’ Initiative

Currently systems in construction are
- Disjointed
- Paper-based, labour intensive
- Disconnected
- Prone to errors as information is entered multiple times

E-Construction to provide a platform to digitise process

Construction quality
- Complex, technical tests and observations are required
  - In the construction site
  - In the laboratory
- Resulting information generated and consumed by multiple parties

Not a trivial task to manage people, access, data, information, systems
E-CONSTRUCTION: EXAMPLE PLATFORM

Job Site
- Receive Material
- Place Material
- Schedule Inspection / Test
- Field Inspection / Test
- Prepare Sample
- Laboratory Test
- Quality Review
- Report

Laboratory
- qestlab™
- Laboratory Test
- Quality Review
- Report

Office
- Construction Hive™
- Review
- Analyze

Contractor

Testing Services

Owner (DOT)
PLATFORM BENEFITS: BY STAKEHOLDER

DOT Information Technology
- Stable, professional software vendor; corporate-grade system
- Product popular with major industry players who invest heavily in it

Project Resident Engineer
- Fast notification of failures
- Ability to access raw data and test results, and follow up on re-work

DOT Materials Engineer
- Excellent overview of quality process with ability to forensically analyze
- Quickly get to why data did not validate

DOT Director of Materials
- Ability to benchmark suppliers, materials, performance
- Efficient and thorough project close-out
CASE STUDY: DFW CONNECTOR

DFW Connector

- US$1 billion
- 2 major highway interchanges
- 5 bridges
- 24 lanes at widest point
QEST SOLUTION FOR THE DFW CONNECTOR

Work Request

Field Testing

Field Inspection

Lab Testing

Review/Approve

QESTField

Construction Hive

Publish/Store

Review/Audit

Search/Analyze

Integrate

QESTLab

QP

DOT: I2MS

Head Contractor: Centric
BENEFITS REALIZED AT DFW CONNECTOR

Efficiency and quality
In the field, the laboratory and the project office. Data in once, faster report turnaround and simpler auditing.

Quality data management
Long term storage of quality data, ordered and searchable. Assists with future quality investigations and claims.

Compliance
- TxDOT test methods
- FHWA
- TxDOT System (I2MS)
Project Stakeholders
- Materials supplier
- Head contractor
- Testing agency
- Department of Transport

One Platform
All stakeholders are utilizing platform
Not because they have to; because they want to

Case Study: QLD DOT
Currently implementing system
Materials producers, testing agencies
and major contractors also on QEST systems
Possibilities are endless and very exciting
FUTURE VISION

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