RFID Asset Tracking
Materials & Tests Unit

Christopher A. Peoples

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Problems with old process

- Poor tracking of pieces
- Misapplication of stamp
- Construction office errors
- Decrease Inspection time
- Increase efficiency
- Uninspected Materials reaching Projects
Problems with old process

- Poor Tracking of Pieces
  - Duplicate piece numbers
  - Illegible piece numbers and in some cases no piece numbers at all
  - Inaccurate paperwork such as BOL’s
Problems with old process

- Misapplication of stamp
- Product pieces being misidentified as NCDOT when in actuality the product was made for non-NCDOT use
Problems with old process

- Construction Office Errors
  - In many offices product pieces were being received incorrectly in Hicams, these mistakes had a domino effect that would carryover to multiple contracts
  - Delays in entering piece #s
  - Delayed construction awaiting confirmation of acceptance
Problems with the old process

- Materials Inspectors were being required to spend more time in completing weekly inspections
  - Time it took to stamp/paint each piece
  - Weather causing delays because could not paint wet pieces
  - Caused return trips to be necessary
Problems with old process

• Inefficiency in Construction Offices
  • Getting confirmation on illegible piece numbers
  • Entering incorrect piece numbers
  • Frustrated when pieces delivered to their projects weren’t available in the system because another office entered the wrong numbers
  • Materials transfers are then required which could take multiple days to validate availability
  • Waiting for office technicians to enter materials received reports
Problems with old process

- Uninspected Product reaching Projects
  - Product shipped to NCDOT projects prior to being inspected by M&T personnel
  - Multiple phone calls to determine solution/acceptability
  - Project visits required to deem whether product met specifications – sometimes even utilizing pipe rover/camera to try to get correct piece numbers post installation
Solution

Replace manual data entry with the Idencia electronic information platform.
The Solution

- Replace the NCDOT painting/stamping process with a 3 in 1 tag that can be read by RFID, Barcode and visually

- NCDOT requires ACPA, NPCA or PCI certified precast / prestress plants
The Solution

• Tags and software allow producer to save time entering required data and allows M&T access to additional producer data

• Bluetooth or tethered readers eliminate entering or accepting an incorrect piece number
The Solution

- Increased Productivity from M&T during inspection
  - Effectively reducing the total inspection time by as much as 90 minutes
  - Producers are now entering their own QC data increasing efficiency in authorizing Field Inspection Reports
  - Because data is accessible in real time, Inspectors can access data prior to planning inspection and identify possible issues proactively
Benefits of RFID Tracking

- Material Receipt on the projects has now been automated with the addition of Mobile Materials Received Reports.
- Project inspectors don’t have to call M&T to identify pieces anymore.
- Plans, drawings, and pictures can be added for prestressed members as well as precast pieces.
- Allows plant certification (third party) auditors and inspectors electronic access to data and reports.
Benefits of RFID Asset Tracking

• NCDOT uses HiCAMS, an in-house construction and materials tracking database, to track the receipt, acceptance and payment of highway construction materials.

• This service allows data from the producer to be securely delivered to a server.

• The data is formatted and then securely transferred to HiCAMS where Field Inspection Reports are created.

• Automated process eliminates manual entry and human error.

• Producers data is uploaded hourly and immediately available to NCDOT.
Benefits of RFID Asset Tracking

• Producers can use GPS to track pieces on their production yard
• Inventory counts can now be maintained by system software
• Products can be assigned to jobs (projects) and shipments
• Shipping errors are reduced with tools to ensure that all products for each job are NCDOT approved
• Shipments can be tracked in the system
Benefits of RFID Asset Tracking

- Since 2012, NCDOT has worked closely with the Precast/Prestress Industry to provide a product that is both beneficial and efficient.
- Input was provided by many producers during our early pilot programs that helped us identify areas of concern.
- We continue to work with industry on improvements/efficiencies as we move forward with this technology.
Benefits of RFID Asset Tracking

- Potential exists to utilize in asset management programs
- Bridge inspectors could scan tag and have access to plans, drawings and pictures
- Access to mix designs used and concrete strength results for any piece
Training and Support

- RFID Product Tracking falls under the guidance of the Manufactured Products Group within the Materials & Tests Unit
  - Cabell Garbee
    Manufactured Products Engineer
  - Jason Poppe
    Concrete Products Engineer
  - Bobby Watkins
    Section Materials Specialist
Training and Support

Support group and system provides these ongoing services:

• Explaining how the system works for the producer as well as the construction personnel

• Training was conducted statewide for all of the construction offices to ensure the field personnel was prepared for this change in the way we conduct business

• Inspection staff, municipalities, producers can search a particular piece by accessing Precast Lookup link on NCDOT website which is updated when the daily batch upload occurs
Questions

If I had an hour to solve a problem and my life depended on it, I would use the first 55 minutes determining the proper questions to ask.

Albert Einstein