



NORTH CAROLINA Department of Transportation



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RFID Asset Tracking

Materials & Tests Unit

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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

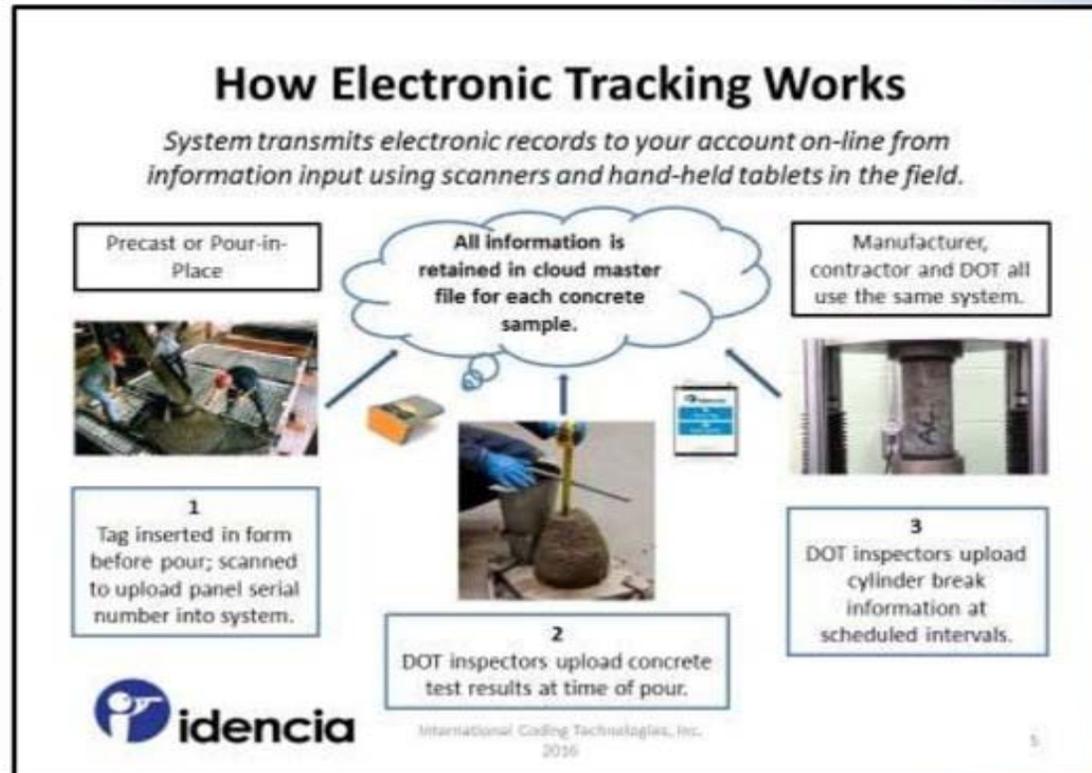
Problems with old process



- 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

