



NORTH CAROLINA

Department of Transportation



AGC/NCDOT Roadways & Materials Breakout Session

Materials & Tests Unit Update - 2022

Matt Hilderbran, PE, CPM
Field Operations Manager

Topics / Outline

- **2022 Guardrail Storage Guidance**
- **RFID Product Tracking Update**
- **2021/2022 M&T Training & Certifications**





STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

January 24, 2022

MEMORANDUM TO: Division Engineers
FROM: E.B. Tharrington, PE
State Construction Engineer
SUBJECT: Guidance on Payment for Guardrail Materials

DocuSigned by:
E. Boyd Tharrington, PE
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In response to escalating steel prices, the Department anticipates an increase in Contractor requests for stored materials payments related to guardrail items. Article 109-5 of the Standard Specifications authorizes the Engineer to make partial payments for materials that are to be used in the work and that have been delivered to the project site or that are stored at the Fabricator or Contractor's facility. The Department encourages the issuance of partial payment for materials, if requested, as it reduces risk to the Contractor. This is particularly the case on longer duration, multi-year projects where prices for materials can vary greatly over the Contract Time.

The issuance of a partial payment for materials does not constitute acceptance. The material will be subject to inspection to ensure that the material is in an acceptable condition prior to a partial payment. One common issue with guardrail materials involves the formation of "white rust," a white or grey powdery deposit that can form on the galvanization. To mitigate the potential of compromised material, the Materials and Tests Unit has developed the attached "NCDOT Guardrail Guidance" document. This document provides guidance on how to avoid, mitigate, and address issues related to "white rust".

To assist the Divisions with the oversight of stored guardrail materials, the Materials and Tests Unit should be advised any time a partial payment is issued for these items. This includes materials stored on-site or at the Fabricator or Contractor's facility. The Materials and Tests Unit will then be able to monitor the material to ensure that proper storage practices are being utilized as well as assist the Divisions with any concerns regarding the material.

If the Division encounters "white rust" issues during the installation of guardrail materials, the "NCDOT Guardrail Guidance" provides alternatives for addressing the issues with methods varying based upon the severity. If questions arise regarding the acceptability of materials, the Materials and Tests Unit should be notified and asked to perform an investigation. In no case shall guardrail materials be rejected without prior consultation with the Materials and Tests Unit and the Construction Unit.

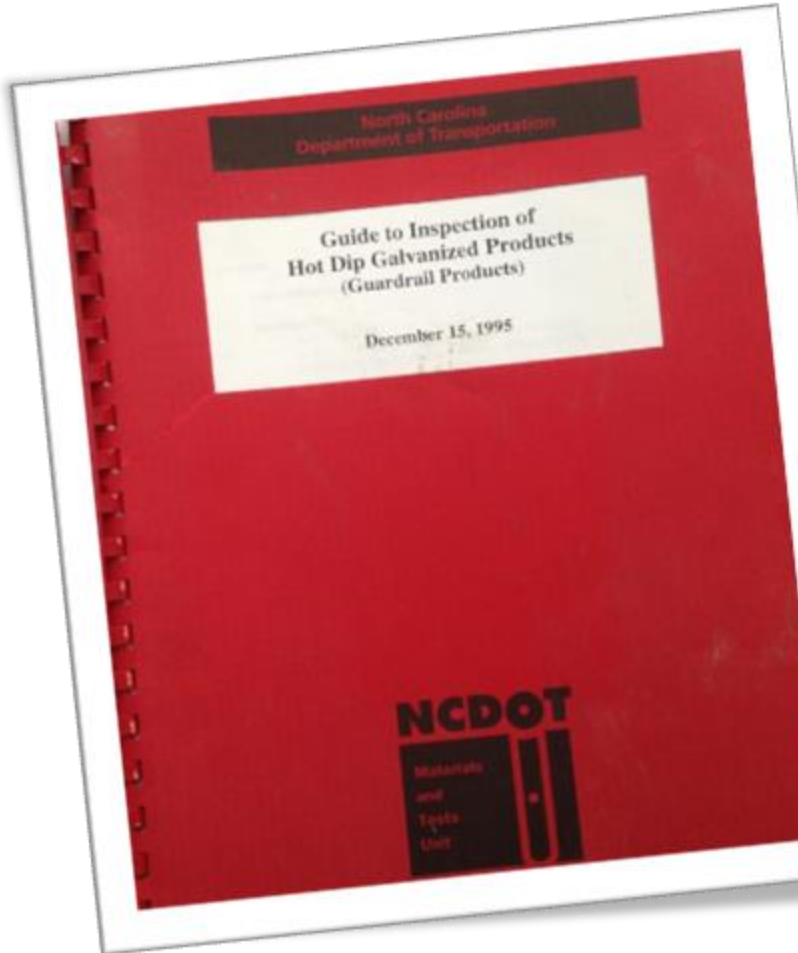
The point of contact for the Materials and Tests Unit is Cabell Garbee, PE. Cabell can be contacted at cgarbee@ncdot.gov or at 919-329-4224. Divisions should contact the Construction Unit through the Area Construction Engineer for their Division should questions of acceptability arise. Any questions regarding this guidance should be directed to Wiley Jones, PE or Brian Skeens, PE with the Construction Unit.

Attachment

cc: M.L. Sylvester, P.E.
W.W. Jones, III, P.E.
B.C. Skeens, P.E.
T.W. Whittington, PE
M.R. Hilderbran, PE
W.C. Garbee, PE
Area Construction Engineers
Division Construction Engineers



NEW Guardrail Guidance



Guardrail Guidance

December 2021

Guardrail Guidance

Payment for Material on Hand – The Resident Engineer should make partial payment for guardrail materials once the material is on hand and the contractor has requested payment for the stockpiled materials in accordance with the requirements of Section 109-5 of the *Standard Specifications*. Partial Payments may be applied to guardrail materials that are stored on the Project or at the Contractor's facilities. Partial Payment for stockpiled materials does not include shipping and labor costs, nor does it guarantee acceptance of the guardrail upon installation on the project.

Storing Guardrail Materials – When storing guardrail, follow the guidance below to help prevent wet storage stain from developing on the rail. Per the American Galvanizers Association (AGA), wet storage stain (aka "white rust") is a white or gray powdery deposit that can develop on newly galvanized guardrail. It may be found on nested or stacked products where moisture gets trapped between pieces and adequate airflow to the zinc surfaces is restricted. White rust can also occur when galvanized steel is exposed to rain, dew, or high humidity conditions. White rust is the visible formation of zinc oxide and zinc hydroxide on the surface of the galvanized steel.

The following is information on how to avoid, mitigate, and address wet storage stain on guardrail:

- Proper storage of guardrail elements is the best method to avoid white rust. This includes avoiding nesting of rail and separating each beam with dunnage to provide adequate air flow between stored pieces. Rails can be inclined for maximum drainage to prevent trapped moisture. Proper storage also prevents continuous contact with wet or damp materials (e.g., soil or grass).
- Minor white rust is mostly a cosmetic issue and not a loss of galvanization. Once the rail is completely dried, light to medium white rust can be removed with a stiff-bristled, nylon brush and a cleaning solution. The American Galvanizers Association (AGA) recommends a few commercially available cleaners, as well as white vinegar, that have been found to not damage the zinc coating. Once the treated beam is hung and the galvanization starts its natural sheeting process (self-repair) stains should start to disappear.
- Excessive white rust can create pitting of the coating which can lead to brown rust. When brown rust is seen along with white rust, there is a loss of zinc coating. Any damaged areas should be repaired according to ASTM A780, *Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings*. Care should be taken since there will likely be aesthetic or color match issues with some repair procedures.
- Some guardrail manufacturers perform a secondary chromate conversion process during the galvanization process that serves as a corrosion inhibitor. This process also provides some resistance to abrasion and light chemical attack.

Resetting Existing Guardrail

Follow the requirements of Section 864 of the *Standard Specifications* for resetting existing guardrail beam and posts.

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Division 13 – Rob Rhymer

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Division 10 – Michael “Smitty” Smith

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Division 14 – Michael “Woody” Wood

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Division 11 – Tracy Church

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Cabell Garbee

Manufactured Products Engineer

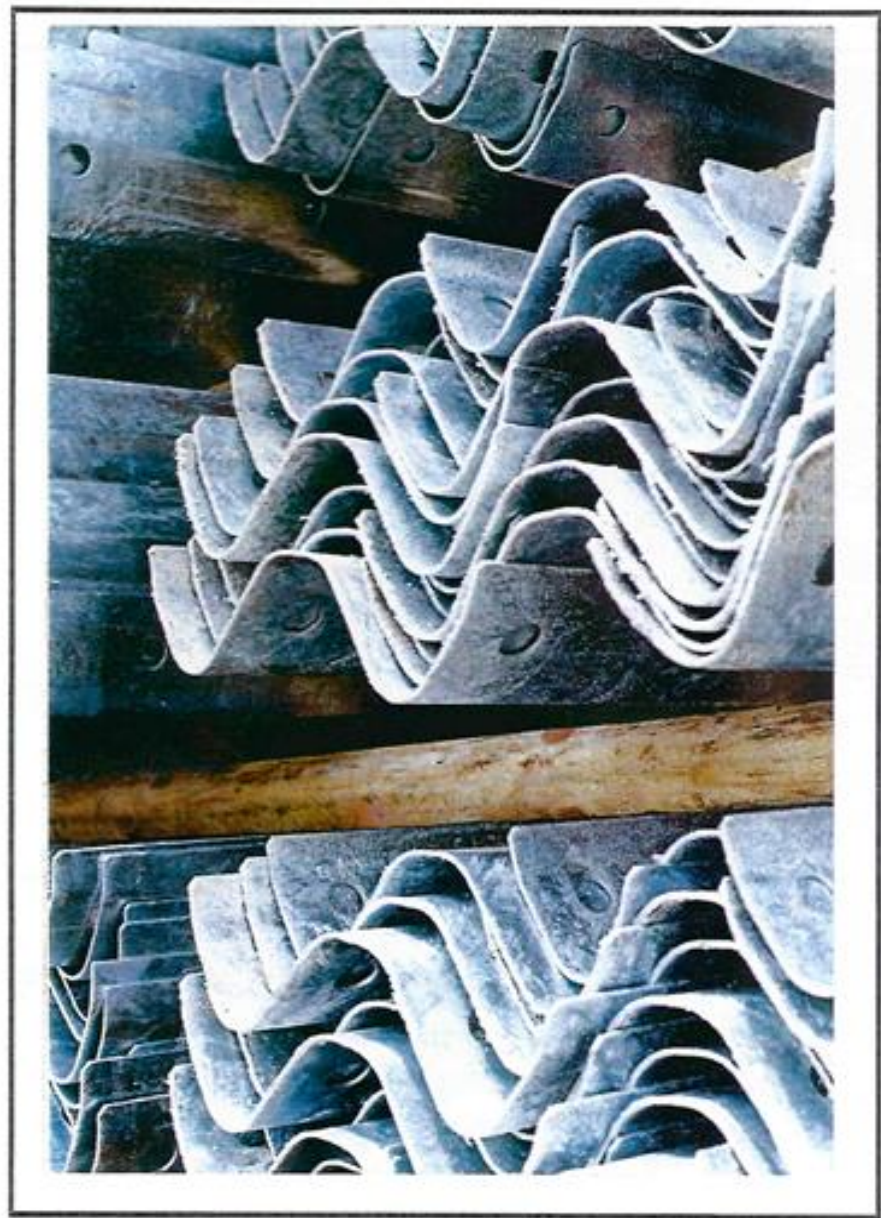
919-329-4000

cgarbee@ncdot.gov

Division 12 – Millie Adair

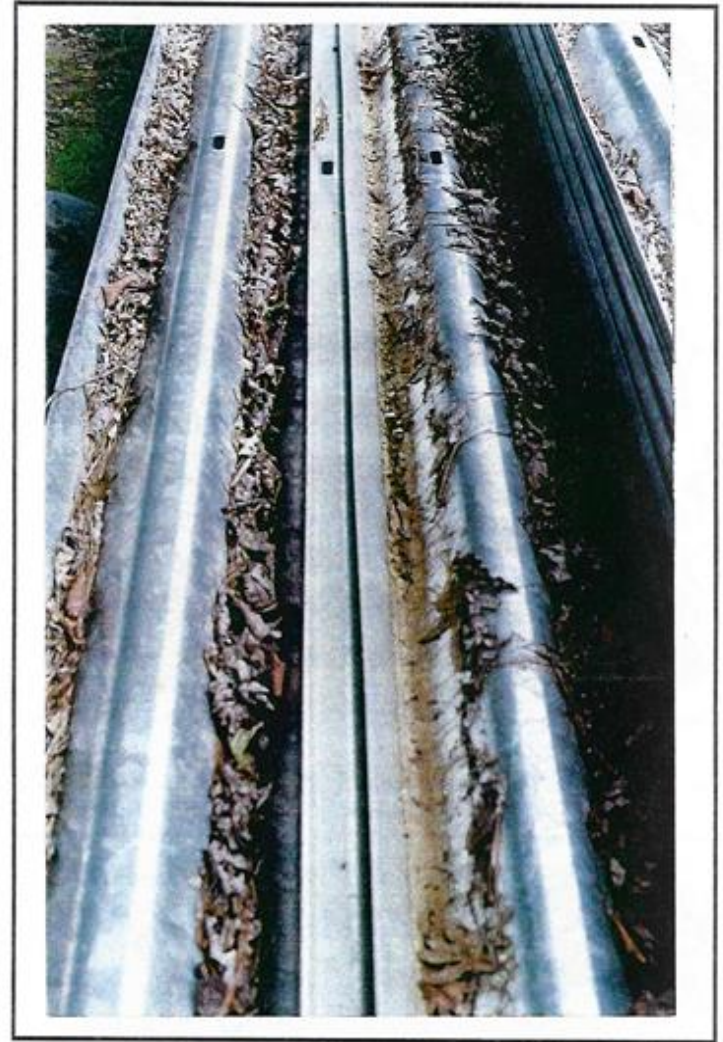
madair@ncdot.gov

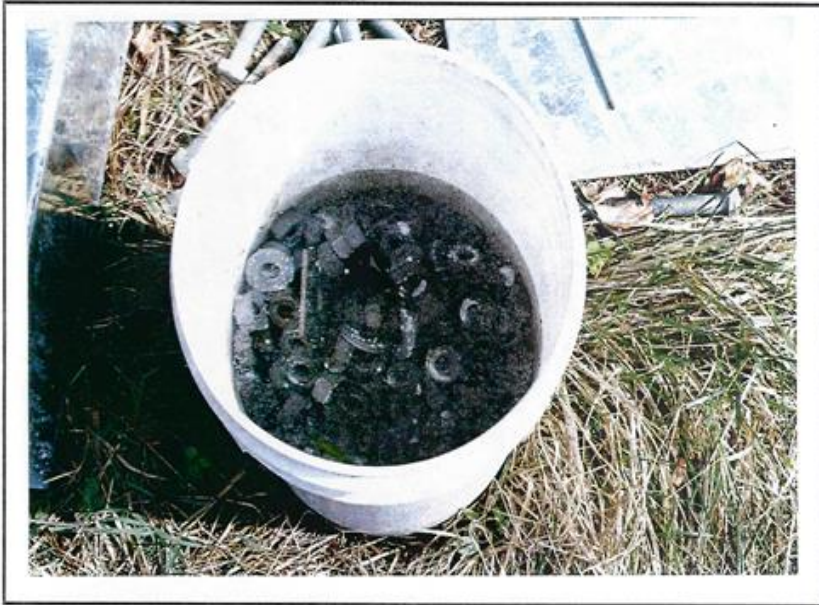
704-575-4307



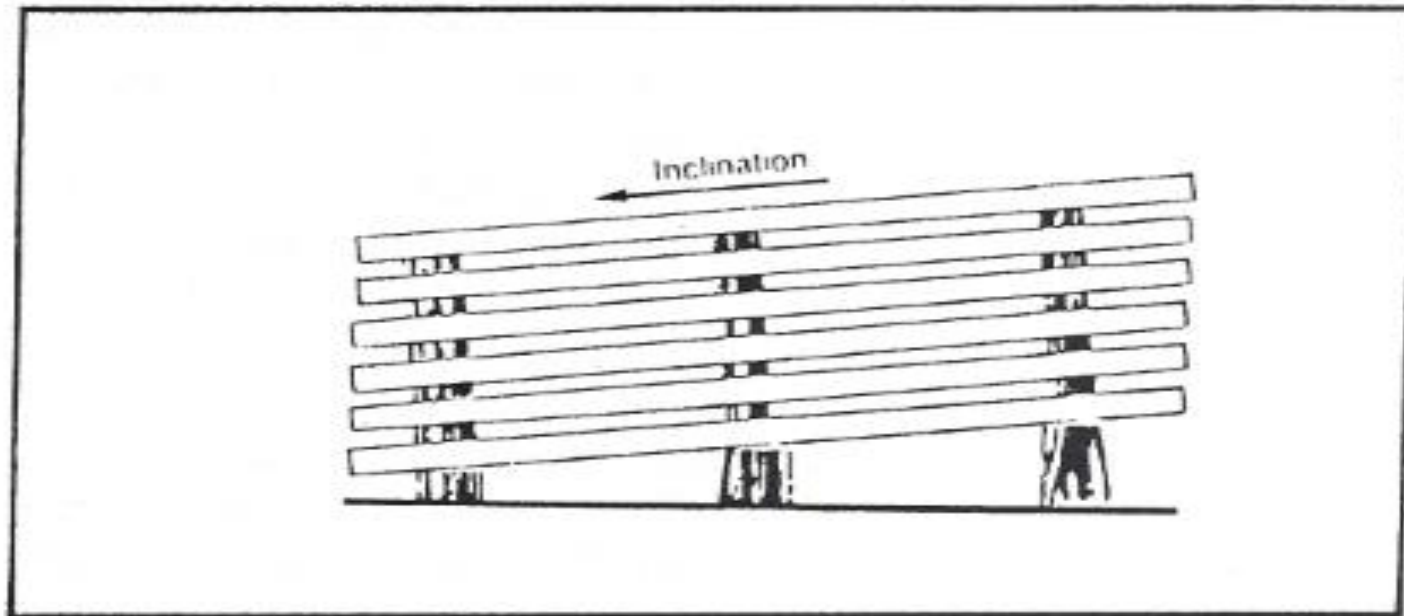
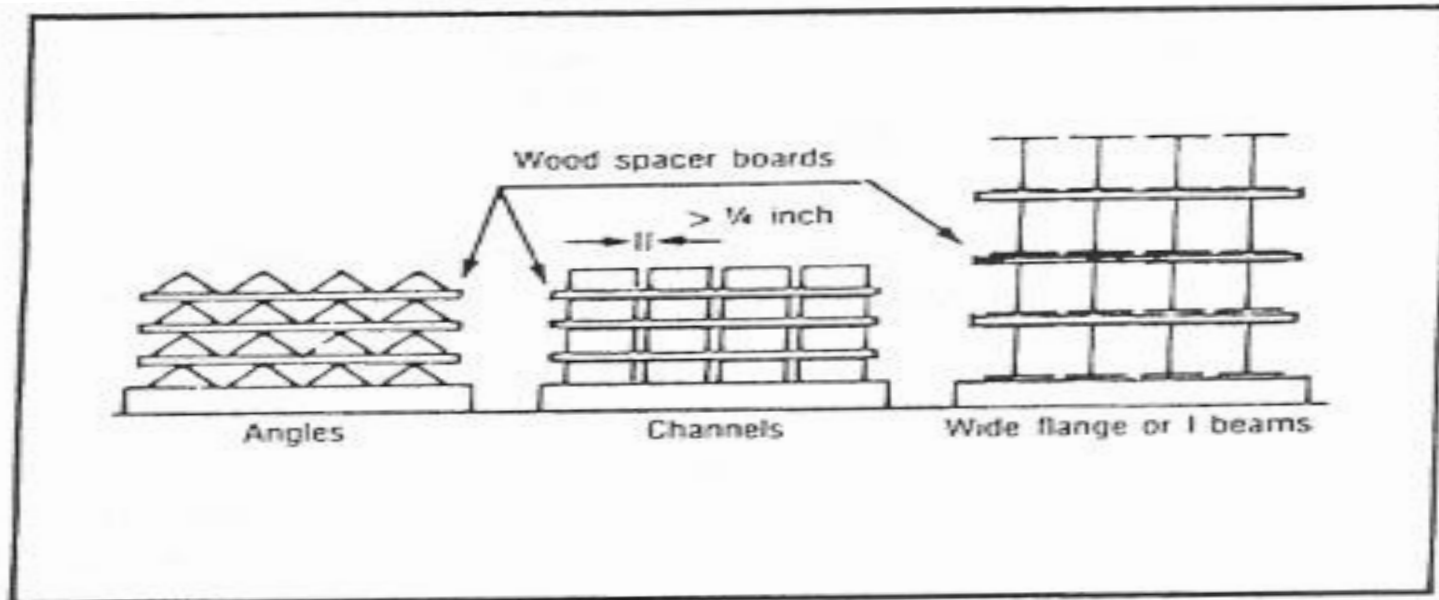












Topics / Outline

- 2022 Guardrail Storage Guidance
- RFID Product Tracking Update
- 2021/2022 M&T Training & Certifications



RFID – Background & History

Radio Frequency IDentification



RFID – Background & History

Radio Frequency IDentification



- Duplicate Alternate IDs
- Illegible Alternate IDs
- No Alternate IDs
- Poor Tracking of Pieces
- Fraud/Fake NCDOT stencils
- M&T Data Entry Errors
- Construction Office Errors
- Prolonged Inspection time
- Uninspected Materials reaching Projects

RFID – Background & History

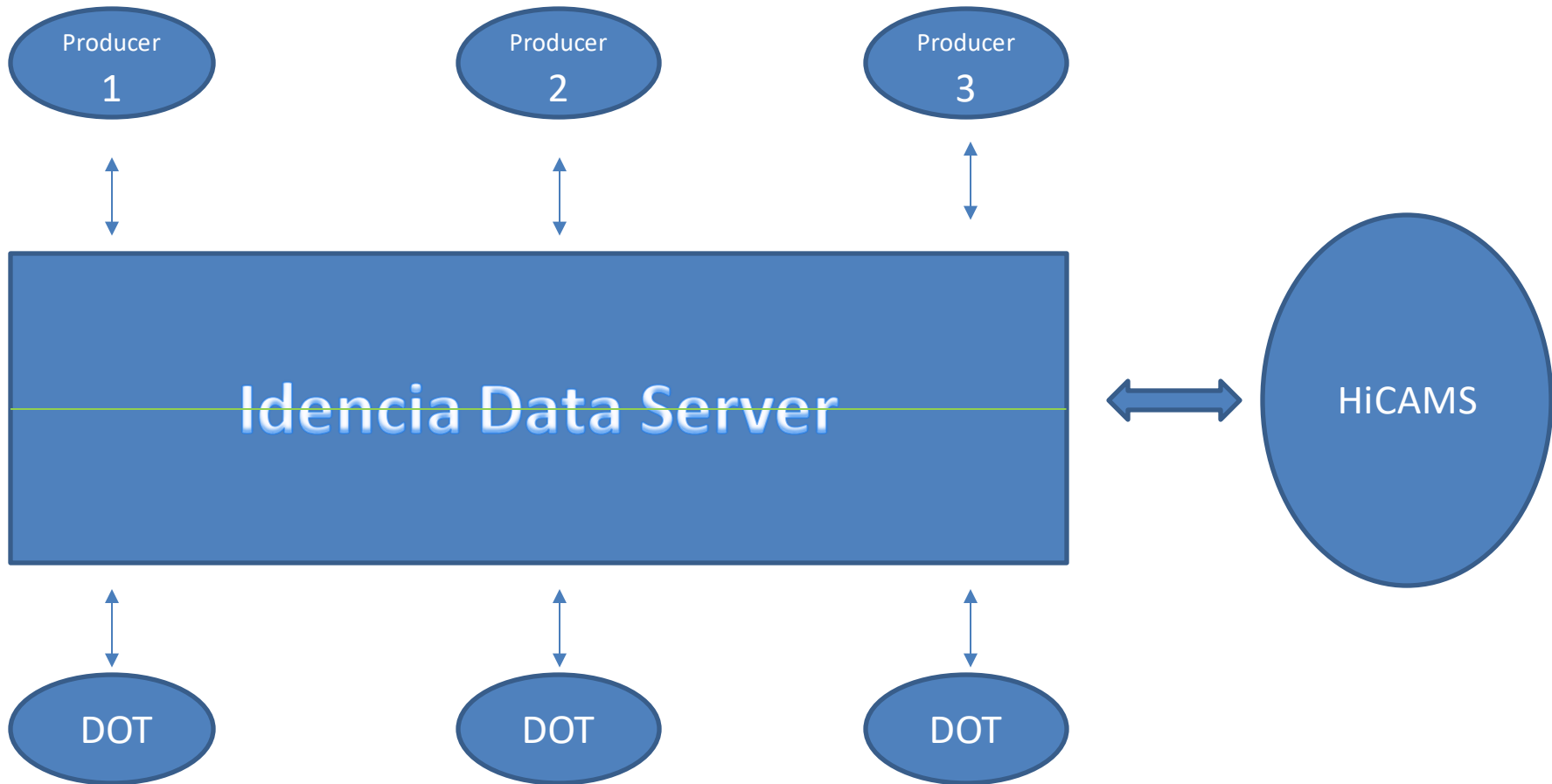
Radio Frequency IDentification



Replaces the NCDOT stamping process with a 3 in 1 tag. Tag can be read visually, via an RFID scanner, or a Barcode reader.



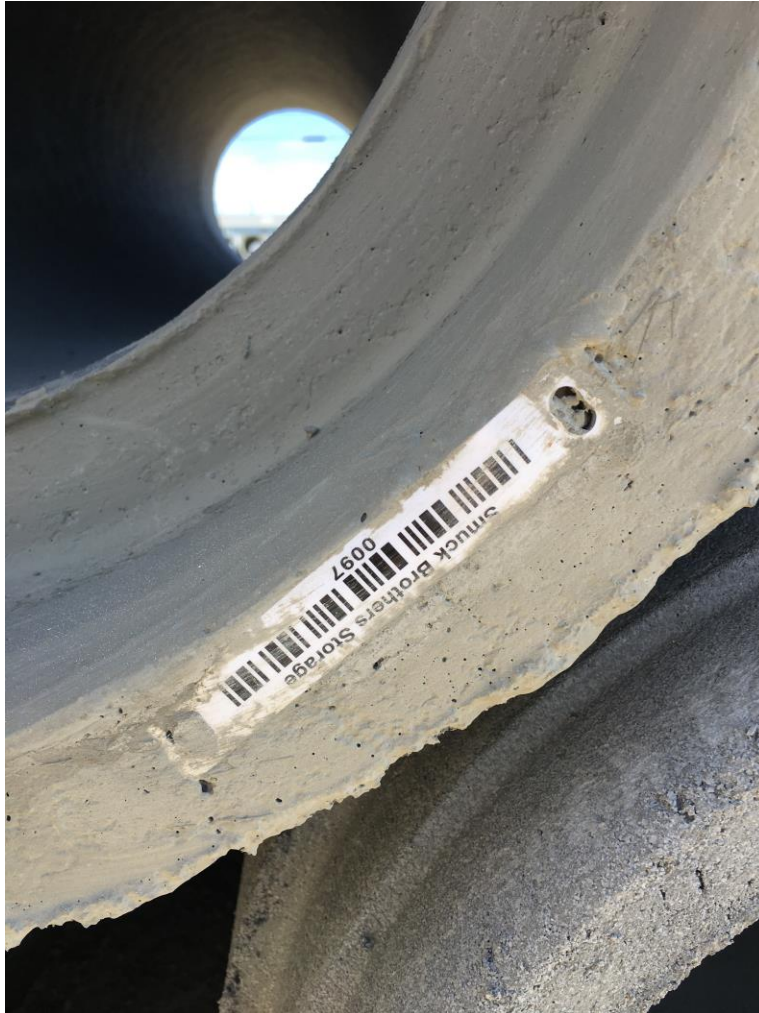
The producer enters the quality control and initial production information into the Idencia program and assigns an RFID alternate ID.



The Materials and Test's Unit technicians, inspect the produced pieces to ensure quality assurance. M&T also utilizes the Idencia software to transmit test/inspection results to HiCAMS.

RFID – Background & History

Radio Frequency IDentification



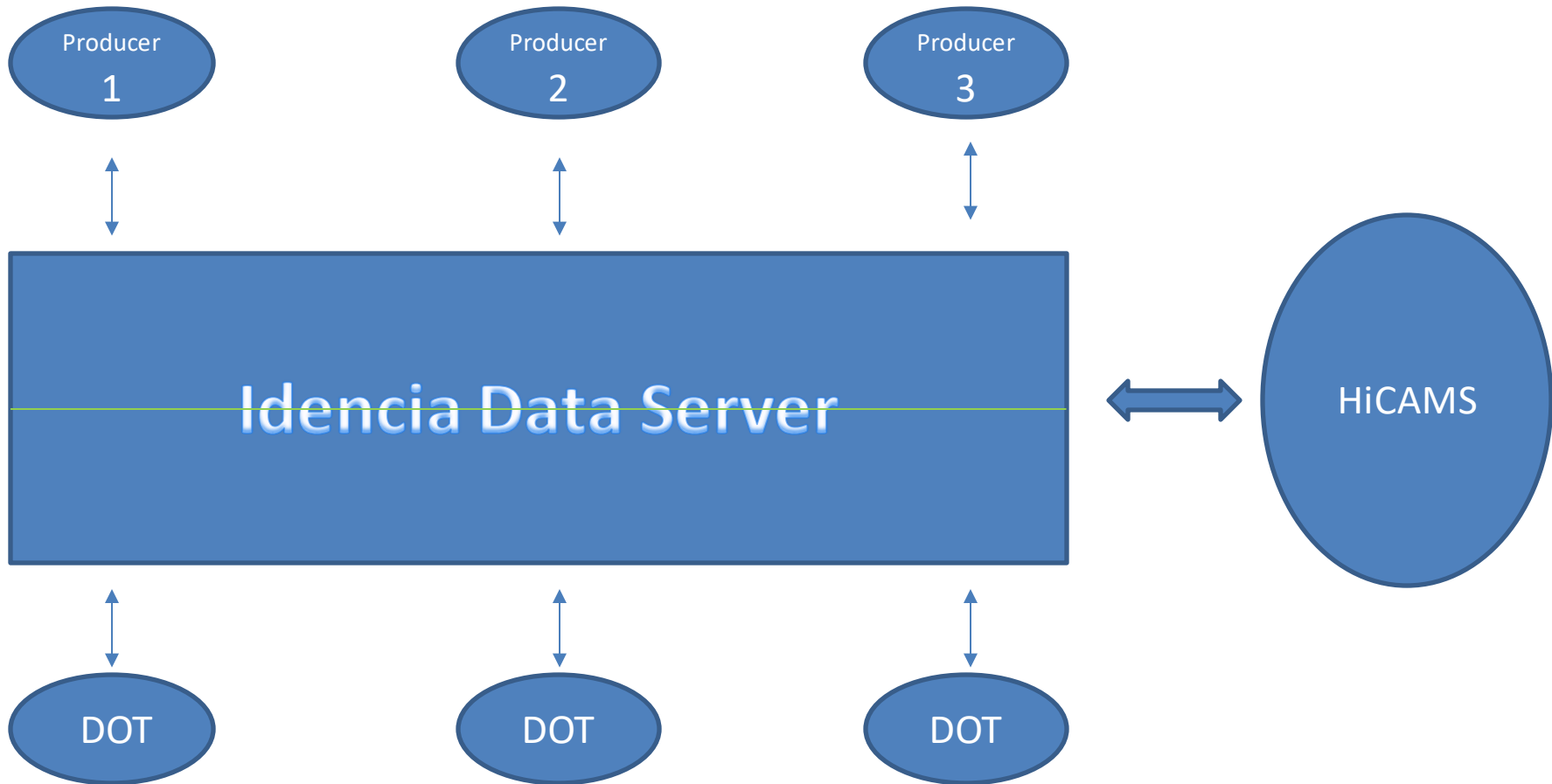
- Increased Productivity
- Accurate Traceability
- Reduction in Human Error
- Shipping Errors are reduced
- Standard Method of Tracking

RFID – What's Next?



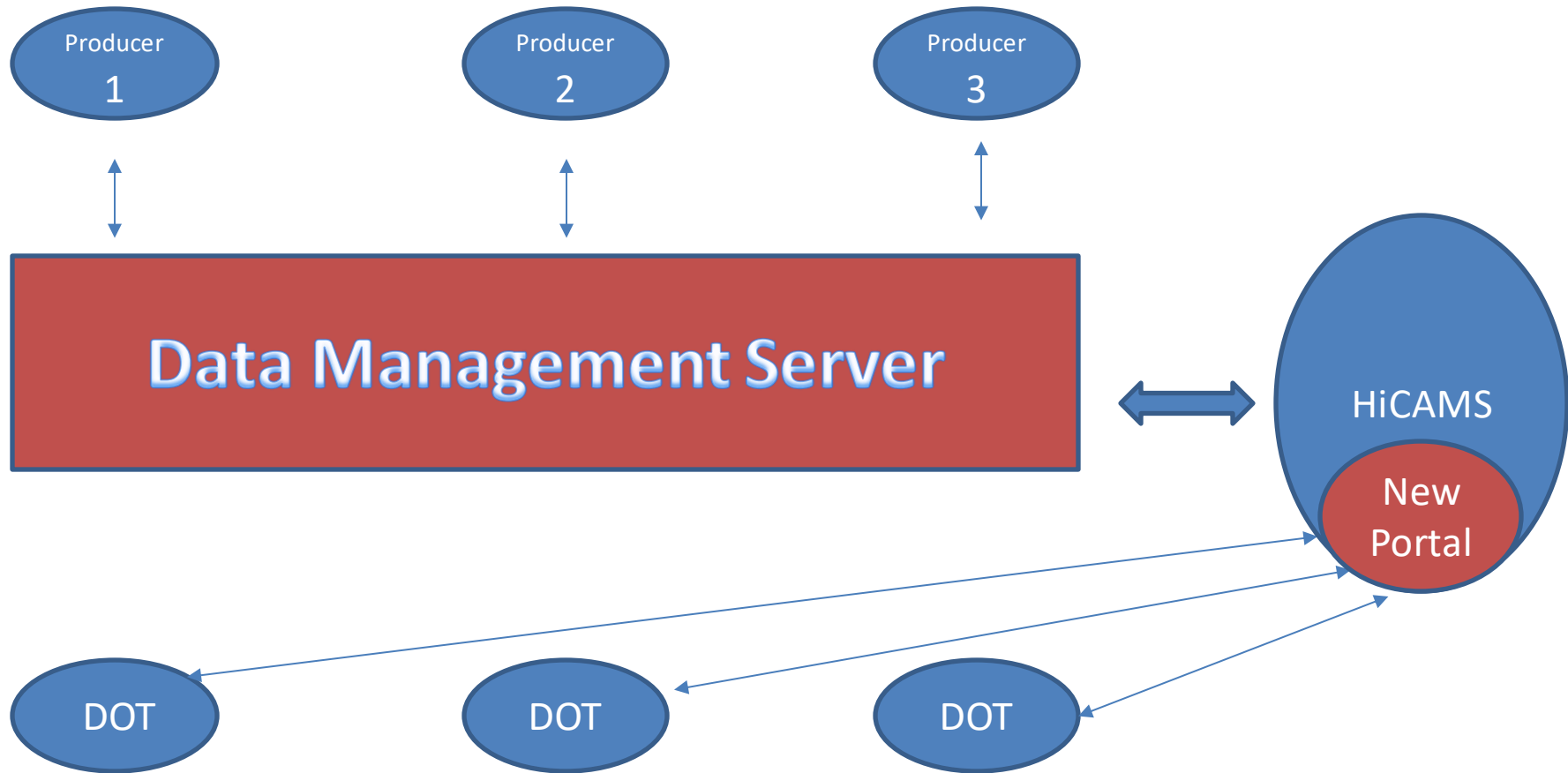
- HiCams Portal – Direct entry for DOT
- Pipe (CMP, Plastic, RCP) - To have RFID tags incorporated with a target of July 2022.
- Vendor Lookup for CMP, RCP, Plastic
- Guardrail, Signs, Structural Steel – will follow after Pipe in the future.
- Regional & Central Labs
- Additional Products to follow

The producer enters the quality control and initial production information into the Idencia program and assigns an RFID alternate ID.



The Materials and Test's Unit technicians, inspect the produced pieces to ensure quality assurance. M&T also utilizes the Idencia software to transmit test/inspection results to HiCAMS.

The producer enters the quality control and initial production information into **their Data Management Server** and assigns an RFID alternate ID.



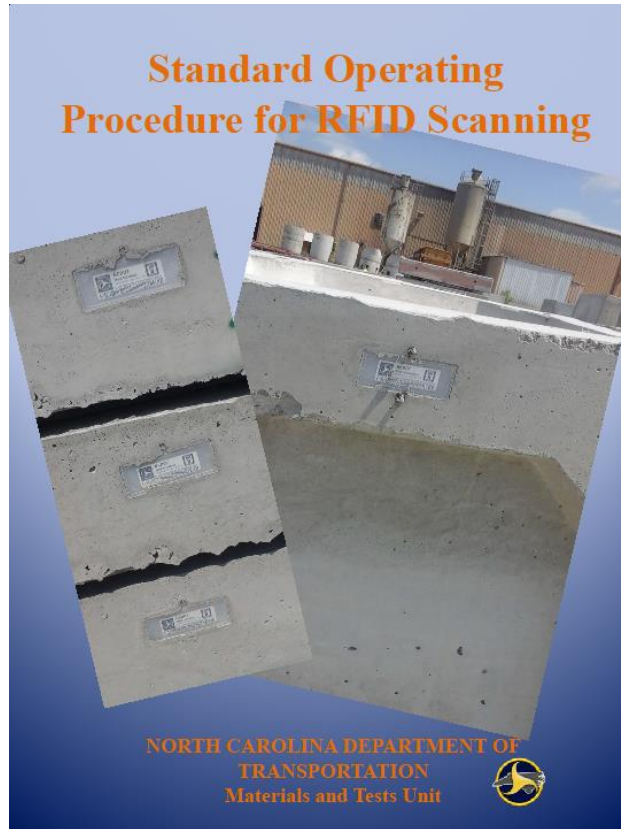
The Materials and Test's Unit technicians, inspect the produced pieces to ensure quality assurance. M&T **directly inputs test/inspection results into the new HiCAMS portal.**

RFID - Resources



- <https://apps.ncdot.gov/vendor/approvedproducts/PrecastLookup.aspx>
- The above link (in the coming months) will provide a way for users to search a pipe alternate ID to determine its approval status. No longer just PreCast or PreStressed products.

RFID – Training & Support



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Zach Leonard

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2021 Training & Certification Classes

Class	Number of classes	Total Attendees	Unused seats
QMS Level I	3	41	32
QMS Level II	3	65	8
QMS Roadway	18	333	27
QMS Density Gauge	10	184	84
QCQA Sampling	8	135	47
QCQA Testing	8	93	49
Concrete Field Tech	56	1069	321
Concrete Batch	13	236	77
PCC Pavement Tech	5	74	74
ABC Sampling	28	256	227
Nuclear Density	11	166	105
2021 Totals	163	2653	1051

2022 Training & Certification Classes

Next Year's Schedule for January, February, March 2022 will be posted on December 16, 2021 for Registration (1st Quarter)

April, May, June 2022 will be posted March 1, 2022 (2nd Quarter)

July, August, September will be posted June 1, 2022 (3rd Quarter)

October, November, December will be posted September 1, 2022 (4th Quarter)

2022 Training & Certification Classes

<https://connect.ncdot.gov/resources/Materials/Pages/default.aspx>

Yearly class schedules are shown as PDF files on Web Page but are subject to change.



2022 Training & Certification Classes

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Questions?



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