



2010

NCDOT

Erosion and Sedimentation Control Program

Annual Report



NCDOT EROSION AND SEDIMENTATION CONTROL PROGRAM 2010 ANNUAL REPORT

NCDOT EROSION AND SEDIMENTATION CONTROL PROGRAM

In 1991 the NC Sedimentation Control Commission reviewed the NC Department of Transportation's efforts to comply with the Sedimentation Pollution Control Act of 1973 and the subsequent 1974 NCDOT Delegated Erosion and Sedimentation Agreement.

Based on the review, the 1974 agreement was updated. The revised agreement was submitted to, and approved by the Sedimentation Control Commission on February 25, 1991 and functions as the core of the current NCDOT program.

Within NCDOT, the Roadside Environmental Unit monitors the delegated authorities. This includes design, review, monitoring and training for all aspects of the Erosion and Sedimentation Control Program. Improvements in technology and research have in turn improved design standards and techniques for erosion and sedimentation control.

The attached annual report outlines and highlights the work implemented and accomplished in 2010. It is important to note that this is an overview of the NCDOT Erosion and Sedimentation Control Program and provides a summarization of the programs overall content.



Linear Construction: US 70 project in Rowan county.

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PROGRAM OVERVIEW

During fiscal year 2009/2010 NCDOT remained committed to minimizing impacts to the environment while providing safe and efficient transportation venues. The Department's efforts are evident in many areas; design, research, certification and overall environmental stewardship.

The Executive Summary (page two) provides an overview of the program for the past four years.

NCDOT Certification Effort as of July 1, 2010

The following represents the number of personnel certified by N.C. State in the Department's Environmental Certification Initiative.

- Level I: 1696
- Level II: 3356
- Level IIIA: 520
- Level IIIB: 512

NCDOT EXECUTIVE SUMMARY

Fiscal	Fiscal	Fiscal	Fiscal
Year	Year	Year	Year
2007	2008	2009	2010

Design

Contract Construction

Total Field Inspections Attended	85	80	111	72
Total Clearing and Grubbing Plans	65	141	138	125
Total Intermediate/Final Plans	68	145	140	128
Percent Clearing and Grubbing of Final Plans	96%	97%	98%	98%

Maintenance/Force Account Projects

Total Bridge Maintenance Plans Prepared	119	108	85	172
Total Maintenance Plans Prepared	443	473	287	165
Total Maintenance/Bridge Plans Reviewed	360	464	372	265
Percent Reviewed	64%	80%	76%	79%

**General Services Facilities Projects

Total General Services Plans Prepared/Reviewed	NA	4	3	2
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***NC Turnpike Authority Projects

Total NC TA Plans Prepared/Reviewed	NA	0	3	3
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Disturbed Acreage

*Contract Construction (acres)	4375	3945	4211	4500
*Maintenance/Force Account (acres)	1107	1245	1015	583

Monitoring

Contract Construction

Inspections Accomplished	1719	1960	2545	2557
ICAs Issued	15	9	7	18
Number of Projects Receiving ICAs	6	4	6	9
Projects Receiving Sequential ICAs	9	2	1	4

Maintenance/Force Account Projects

Inspections Accomplished	4124	3995	3548	2589
ICAs Issued	3	5	4	2
Number of Projects Receiving ICAs	3	5	2	2
Projects Receiving Sequential ICAs	0	0	1	0

**General Services Projects

Inspections Accomplished		9	34	47
ICAs Issued		0	0	0

Total NOV's Received	0	0	0	0
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Certification (Number Certified as of 7/1/2010)

Level I: Erosion & Sediment Control/Storm water	836	1067	1367	1696
Inspector/Installer				
Level II: Erosion & Sediment Control/Storm water Site	1878	2172	2649	3356
Management				
Level II: Recertification			518	879
Level III A: Design of Erosion and Sediment Control	288	392	448	520
Plans				
Level III B: Design of Reclamation Plans	325	388	437	512
Level III B: Recertification				37

*estimated

** The Departments General Services Section is responsible for the construction of NCDOT office facilities. NCDOT was granted erosion and sedimentation plan approval and monitoring authority for these projects.

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DESIGN

NCDOT implements the requirements for sediment basin design as outlined in the "Erosion and Sedimentation Control Design Manual." Further efforts have been placed on reducing the amount of time an erodible surface is exposed by utilizing more rolled erosion control products to minimize subsequent repair seeding operations.

The Department is using the Revised Universal Soil Loss Equation to model soil loss from secondary road and small bridge construction projects. RUSLE2 models the detachment of soil particles during rain events.

Revisions to erosion and sediment control plans are documented by field forces and reviewed by the department's REU staff to ensure that proper design techniques are being utilized. Certification efforts are addressing the changes in plan design to both NCDOT personnel as well as private engineering firms.

Overall, the Design effort continues to minimize impacts and find the balance between erosion control and sediment capture.



Design: Erosion and Sediment Control Devices on US 25

INSPECTION



Teamwork : NCDOT relies on a series of inspectors and engineers to ensure compliance with the Delegated Agreement.

NCDOT relies on a combined effort to review and inspect projects to ensure compliance with the Sedimentation Pollution Control Act of 1973.

The REU reviews projects on a routine basis to evaluate project performance and overall compliance with the mandates set forth by the Delegation Agreement with Land Quality.

The Field Operations Section of the REU utilizes 14 certified engineers and technicians to review and monitor the progress of the Department's Erosion and Sedimentation Control program. The success of the program is dependent on the hundreds of DOT engineers, technicians, contract personnel and consultants that routinely review and make the necessary corrective actions across the state on the Department's projects.

When problems are identified, the Field Operations staff will issue an Immediate Corrective Action (ICA) which initiates a series of protocols created to ensure the corrections are made in a timely manner.

CERTIFICATION

The Biological & Agricultural Engineering and Soil Science Departments at N.C. State University are partnering with NCDOT to offer an Erosion and Sediment Control/Storm water Certification Program. The certification program provides the required personnel training to ensure compliance with erosion and sediment control/storm water provisions on NCDOT projects.

NCDOT requires all contractors and consultants to have a certified supervisor and foreman to oversee operations on NCDOT projects to ensure compliance with the Sedimentation Pollution Control Act as well as other environmental regulations.

Certification must be renewed every three years.

CERTIFICATION LEVELS

- **Level I:** Erosion & Sediment Control/Storm water Inspector /Installer
- **Level II:** Erosion & Sediment Control/Storm water Site Management.
- **Level III A:** Design of Erosion and Sediment Control Plans
- **Level III B:** Design of Reclamation Plans

Web Link:

<http://www.bae.ncsu.edu/workshops/dot/index.html>

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EFFICIENCY

RESEARCH: The Department in 2010 will be implementing two new research projects with Rich McLaughlin, PhD., that will look at soil loss modeling and basin size requirements. N.C. State University continues to monitor the impacts to water quality on the US 19 projects in Madison and Yancey County. The monitoring by researcher Dan Line, PE will aid NCDOT in evaluating the performance of the current erosion and sedimentation control practices.

NEW TECHNOLOGIES: The knowledge gained from research and monitoring has resulted in the Department utilizing devices such as fiber check dams with the addition of polyacrylamides. The combination of these two technologies has shown positive results in the improvement of sediment basin efficiency. Increased efficiency of sediment basins along with a reduction in the exposure time of erodible areas has improved the Departments ability to protect water resources and environmentally sensitive areas.



Improvements: NCDOT Senior Management reviews research efforts by Rich McLaughlin, PhD. at NC State Lake Wheeler road facility.

2010 ANNUAL REVIEW



Based on a random selection by DENR Land Quality Section 16 projects were chosen for review. Projects are reviewed jointly by NCDOT and Land Quality staff to determine the overall program performance.

The following is a list of the projects that were selected for the 2010 Annual Review.



WESTERN REVIEW:

- R-2502A – US-1 FROM SOUTH OF SR-1001 (MARSTON RD) TO EXISTING 4-LANES NORTH OF MOORE COUNTY LINE.
- R-2320G - US-52 EXT FROM THE NC-73 & NC-24/27 & NC-138 INTERSECTION TO THE SR-1785 (JOHN'S RD)
- U-3405 - NC-274 (GASTONIA HWY) FROM SR-1484 (MAINE AVE) TO NC-275 IN BESSEMER CITY. SR 1300
- B-4261 - BRIDGES OVER CATHEY'S CREEK AND FORK OF CATHEY'S CREEK & APPROACHES ON SR-1520.
- R-0505 - NC-225 FROM US-25 NEAR ZIRCONIA TO I-26 (US-25 & I-26 CONNECTOR)
- R-2911B - US-70 FROM THE IREDELL COUNTY LINE TO SR-1001
- U-4006 - SR-4126 (BRIDFORD PKWY) FROM SR-1541 (WENDOVER AVE) AT HORNADAY RD TO BURNT POPLAR RD
- R-2606B - U-311 BYPASS (FUTURE I-74) FROM NORTH OF SR-1929 (SPENCER RD) TO US-220

EASTERN REVIEW:

- B-4434 - BRIDGE OVER CASHIE RIVER AND APPROACHES ON US-17.
- R-2719A - CRESCENT ROAD FROM US-70 TO US-258 IN KINSTON.
- U-3462 - EXTENSION OF SR-1357 (SMITH AVE) FROM WEST OF US-17 BUS TO NC-130 IN SHALLOTTE.
- U-3826 - SR-1537 (DANIEL ST EXT) FROM SR-1518 (LOOP RD) TO US-258 AND NC-122
- R-2823 - ROCKY MOUNT NORTHERN CONNECTOR FROM SR-1604 (HUNTER HILL RD) TO US-301.
- U-2519E - FAYETTEVILLE OUTER LOOP FROM WEST OF NC-24 TO 1.3 MILES EAST OF NC-87/NC-210
- SR 1004 - ISLAND CREEK ROAD - JONES COUNTY
- SR 1940 - MAIL ROUTE ROAD - DUPLIN COUNTY

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NPDES INSPECTION



NPDES: NCDWQ conducted joint review with DLQ for NPDES compliance during the 2010 annual review.

The Division of Water Quality joined the 2010 Annual Review on several projects to review NPDES inspection documents. NCDOT has been working on addressing proper documentation of NPDES inspections. Additional training was conducted in October 2010 to address concerns identified on the Annual review.



US 52 in Stanly Co: Project review with NCDOT, Land

SLOPE STABILIZATION



HECPs: Pictured above is a slope which has been stabilized with hydraulic applied product.

The Department is evaluating hydraulic erosion control products (HECP). Site selection and product application remains to be critical to the success of these products that have been utilized on NCDOT projects.

The HECP's have been tested in all three regions of

the state with success. The goal is to find alternative ways to establish vegetation on slopes that have uneven and rocky surfaces that are difficult to access.



Slope Compactor: The Department field tested a commercially available slope compactor to evaluate its ability to prep slopes for seeding on projects with steep slopes..

CALIBRATION



Stabilized Shoulder: US 70 in Rowan County

The Department continues to have challenges trying to work with multiple regulatory agencies with regulations that sometimes create conflicting mandates. Calibration meetings with regulatory agencies is critical to find compromises to conflicting regulations.

NCDOT staff is holding monthly meetings on environmentally sensitive DOT projects with regulatory agencies to review the projects and discuss the next stages of construction. The process helps the in communication and understanding.

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DESIGN REVIEW



Design Review: Erosion and sediment control plan designers visit US 321 in Caldwell county to review plan implementation and effectiveness.

The Department's Roadside Environmental Unit's Soil and Water Section reviews projects on a periodic basis to evaluate design issues and discuss with project personnel on ways to improve contract special provisions.



Design Issue: Topography and site conditions sometimes results in plan implementation that was not indicated by the designer. Project personnel coordinate revisions with the Roadside Environmental Field Operations personnel.

ENVIRONMENTALLY SENSITIVE

The Department not only complies with the Sedimentation Pollution Control Act, but also with 401 and 404 permit conditions. New methods are continually devised to accommodate the challenges of roadway construction through environmentally sensitive areas. Temporary construction bridges lined with fabric are often required to avoid impacts to wetlands and other environmentally sensitive areas.

Highly visible fencing is used to designate the boundaries of environmentally sensitive areas that are to be protected and limit the type of work that can occur. This impacts the type of erosion control device that is allowed.



Causeways constructed from timber mats and temporary construction bridges are utilized to protect environmentally sensitive areas during construction.

FUTURE CHALLENGES



With tighter regulations on effluent discharge by the EPA, to varying requirements set forth by the Department of Water Quality, NCDOT faces new challenges in 2011.

The NPDES and E&SC inspection requirements are being merged to streamline and improve efficiency to our current monitoring protocols.

Further improvements to our design methods will evolve as our knowledge of the use of new technologies expand.

NCDOT is committed to meeting these challenges and providing the level of service the citizens of North Carolina have grown to expect.