2011

N C D O T

Erosion and Sedimentation Control Program

Annual Report

NCDOT
EROSION AND SEDIMENTATION CONTROL PROGRAM
2011 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 2011. 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: *Wilmington Bypass*

INSIDE THE REPORT

PROGRAM OVERVIEW

During fiscal year 2010/2011 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, 2011

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

- Level I: 2012
- Level II: 4260
- Level IIIA: 617
- Level IIIB: 580

NCDOT EXECUTIVE SUMMARY

	Fiscal Year 2008	Fiscal Year 2009	Fiscal Year 2010	Fiscal Year 2011
Design				
Contract Construction				
Total Field Inspections Attended	80	111	72	77
Total Clearing and Grubbing Plans	141	138	125	96
Total Intermediate/Final Plans	145	140	128	100
Percent Clearing and Grubbing of Final Plans	97%	98%	98%	96%
Maintenance/Force Account Projects				
Total Bridge Maintenance Plans Prepared	108	85	172	135
Total Maintenance Plans Prepared	473	287	165	258
Total Maintenance/Bridge Plans Reviewed	464	372	265	361
Percent Reviewed	80%	76%	79%	92%
**Additional Delegated Programs				
Total General Services Plans Prepared/Reviewed	4	3	2	2
Total NC Turnpike Authority Plans Prepared/Reviewed	0	3	3	10
Total NC Rail Division Plans Prepared/Reviewed	0	0	0	5
Disturbed Acreage				
*Contract Construction (acres)	3945	4211	4500	4250
*Maintenance/Force Account (acres)	1245	1015	583	950
Monitoring				
Contract Construction (TIP, NCTA, Bridge Management)				
Inspections Accomplished	1960	2545	2557	3883
ICAs Issued	9	7	18	14
Number of Projects Receiving ICAs	4	6	9	12
Projects Receiving Sequential ICAs	2	1	4	0
Maintenance/Force Account Projects (SR, Major Maint, Bridge Maint.)				
Inspections Accomplished	3995	3548	2589	2328
ICAs Issued	5	4	2	5
Number of Projects Receiving ICAs	5	2	2	5
Projects Receiving Sequential ICAs	0	1	0	0
**General Services Projects				
Inspections Accomplished	9	34	47	46
ICAs Issued	0	0	0	0
Total NOVs Received	0	0	0	2
Certification (Number Certified as of 7/1/2011)				
Level I: Erosion & Sediment Control/Storm water Inspector/Installer	1067	1367	1696	2012
Level II: Erosion & Sediment Control/Storm water Site Management	2172	2649	3356	4260
Level III A: Design of Erosion and Sediment Control Plans	392	448	520	617
Level III B: Design of Reclamation Plans	388	437	512	580

*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.

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 NC 17*

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

EFFICIENCY

RESEARCH: The Department in 2011 continued research projects with Rich McLaughlin, PhD., that analyzed soil loss modeling and basin size requirements. Research also continues on hydraulically applied erosion control products to determine their benefit and use.

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.

2011 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 2011 Annual

EASTERN REVIEW:

- R-3403AB - US-17 FROM NORFOLK & SOUTHERN RR TO NORTH OF SR-1433 (ANTIOCH RD).
- U-2928B - RAILROAD LINE FROM THE NCRR TO THE GLOBAL TRANSPARK.
- R-2633AA - WILMINGTON BYPASS (FUTURE I-140) FROM NC-87 TO US-74/76.
- U-3804 - SR-1321 (HILLANDALE RD) FROM I-85 TO NORTH OF SR-1407 (CARVER AVE).
- B-4138 - BRIDGE OVER THE CAPE FEAR RIVER WITH APPROACHES ON US 401
- X-0002BC -I-295 (FAYETTEVILLE OUTER LOOP) FROM NC-87/210 (MURCHISON RD) TO WEST OF US-401.
- SR 1214 FISH POND ROAD, PITT COUNTY
- SR 1123 CREEKSVILLE CHURCH ROAD, HARNETT COUNTY

WESTERN REVIEW:

- R-2612A -US-421 AT SR-3389 (WOODY MILL RD) SOUTH OF GREENSBORO.
- R-2606B -U-311 BYPASS (FUTURE I-74) FROM NORTH OF SR-1929 (SPENCER RD) TO US-220.
- B-3677 -BRIDGE OVER IRVINS CREEK AND APPROACHES ON SR-3135 (LEBANON RD).
- R-2100B -NC-16 FROM SOUTHEAST OF SR-1158 TO SOUTHEAST OF NC-88.
- R-2233AA -US-221 FROM SOUTH CAROLINA LINE TO SOUTH OF FLOYD'S CREEK
- B-4286 -BRIDGE OVER NANTAHALA RIVER AND APPROACHES ON US-19/74.
- SR 1134 HAROLD ROAD, ALLEGANY COUNTY
- SR 1521-A, MOUNTAIN GROVE ROAD, MACON COUNTY

NPDES INSPECTION

NPDES: *The further reduction in turbidity at Stormwater Discharge Points was a primary focus in 2010-2011.*

The Department is working to insure that current practices and procedures will be ready to comply with the new NPDES Stormwater General Permit NCG010000. Revisions in contract special provisions and turbidity reduction techniques will be further implemented across all NCDOT projects in 2011-2012.

Stormwater Inspections: *Inspectors continue to focus on stabilization efforts.*

STABILIZATION

Straw: *The Department is evaluating how well straw mulch works with turbidity reduction.*

The Department continues to evaluate products and techniques that will help stabilize erodible slopes that will be disturbed at a later date. Reduction in soil loss from these areas will aid in reducing turbidity levels at Stormwater Discharge outlets located throughout construction projects.

Rill Erosion: The Department is looking at other alternatives to stabilizing erodible slopes other then temporary mulch.

CALIBRATION

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 in communication and understanding.

DESIGN REVIEW

Design Review: *Erosion and sediment control plan design is continuously monitored and designers are informed of changes needed.*

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 AREAS

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.

Turbidity Curtains are used to help protect adjacent water resources from turbidity.

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 2011-2012.

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

New products will continue to be tested and monitored to see if they prove to be a value to the Department.

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