

*Review of
Erosion and Sedimentation Program
Delegation to the North Carolina Department
Of Transportation, Division of Highways*

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INTRODUCTION

The Land Quality Section reviewed the program delegation to the North Carolina Department of Transportation (NC DOT) on September 9-11 and September 17-18, 2014. The projects selected for review were a mix of contract construction, design-build and maintenance. The review and the results reported here are in accordance with requirements of the Sedimentation Control Commission (SCC) delegation to the NC DOT and § 113A-54(d)(2) and § 113A-56(b).

§ 113A-54. POWERS AND DUTIES OF THE COMMISSION

(d) In implementing the erosion and sedimentation control program, the [Sedimentation Control] Commission shall:... (2) Assist and encourage other State agencies in developing erosion and sedimentation control programs to be administered in their jurisdictions. The Commission shall approve, approve as modified, or disapprove programs submitted pursuant to G.S. 113A-56 and from time to time shall review these programs for compliance with rules adopted by the Commission and for adequate enforcement.

§ 113A-56. JURISDICTION OF THE COMMISSION

(b) The [Sedimentation Control] Commission may delegate the jurisdiction conferred by G.S. 113A-56(a), in whole or in part, to any other State agency that has submitted an erosion and sedimentation control program to be administered by it, if the program has been approved by the Commission as being in conformity with the general State program.

PROJECT REVIEWS

Fifteen contract construction or design-build projects and one maintenance/force account project were chosen based on the stage of construction and the significance of the projects. Projects were generally between 30 and 70 percent complete.

Land Quality Section personnel from the regional offices and central office accompanied NC DOT personnel to the 16 projects, which were inspected during a 5-day period. Each project review consisted of reviewing the erosion control plan for adequacy, inspecting the project for compliance, and examining the project files. Plans were available for review at all sites.

NC DOT is responsible for two types of inspections on each project. NPDES Self-Monitoring and SPCA Self-Inspections are conducted at least weekly by a project inspector from the office of the resident engineer for design-build or contract construction, or from the office of the county or district engineer for maintenance projects. There are 7 Roadside Environmental Unit Field Operations engineers, each covering 2 of the 14 divisions in the State. The engineers each have generally one technician, who inspects secondary road projects and some contract construction. REU Field Operations staff inspects all DOT projects. Projects are inspected monthly. Each project is evaluated on a scale of 1-10 for installation of measures, maintenance of measures, effectiveness of

measures, plan implementation and overall project evaluation. A score of 6 or less results in the issuance of an “Immediate Corrective Action” report (ICA). The weekly project inspections and monthly REU inspections were reviewed for each project.

Field data was collected on erosion and sediment control measure installation, maintenance and effectiveness. Timely provision of ground cover, adequacy of right-of-way, phasing of grading, field revisions and sedimentation damage were also evaluated. Each project was then given an overall rating of “Poor, Fair or Good.” A summary of the sixteen projects follows.

CONTRACT OR DESIGN-BUILD PROJECTS

Division	County	TIP #	Route	Contract Amount	Length (miles)	Overall Rating
1	Martin	B-4185	Bridge #16 over Hardison Mill Creek	\$1,801,184.53	0.223	Good
2	Pitt	BD-5102U	Bridge #69 over Middle Swamp	\$998,909.50	0.137	Good
2	Pitt	B-5418	Bridge #50 over Johnson Mill Run	\$834,000.00	0.161	Good
3	Sampson	R-2303C	NC-24 from Dowdy Rd to Mitchell Loop Rd	\$39,234,386.71	6.949	Fair
4	Nash	SR 1727	Kingston Ave. Widening from NC-97 to US-301 Bus	\$2,272,089.70	1.022	Fair+
5	Wake	SR 2368	Bridge 201 Over Little River	\$905,058.45	0.101	Fair+
5	Wake	SR 2756	Bridge 283 over Black Creek	\$647,647.00	0.101	Good
7	Orange	U-2803	Smith Level Rd (SR 1919) Widening	\$4,946,197.82	0.809	Fair
9	Forsyth	U-2925	Salem Creek Connector	\$68,925,000.00	1.094	Good
9	Davidson	P-5206A	Peeler Road Grade Separation	\$9,327,385.16	0.854	Fair
10	Mecklenburg	P-5208F	Caldwell Road Grade Separation	\$4,937,180.00	0.404	Good
13	Burke	U-2550B	NC-18 and I-40 Interchange	\$21,229,384.79	0.641	Poor
14	Haywood	K-5002	US 23/74 Southbound Rest Area	\$6,151,716.03	0.265	Good
14	Haywood	U-4412	Howell Mill Rd(SR 1184) Widening	\$11,688,234.11	1.42	Good

MAINTENANCE/FORCE ACCOUNT PROJECTS

Division	County	Route	Length	Overall Rating
8	Chatham	Zeb Ferguson Rd (SR 2169)	0.7	Good

PROJECT EVALUATIONS

Bridge #16 Over Hardison Mill Creek, NC-171, STIP B-4185

NC DOT Division 1, Martin County

This is a 0.223 mile project with a contract for \$1,801,184.53. The project scored between 7s and 9s on inspections throughout its history to date. Inspections indicated primarily minor issues which were usually completely resolved by the next inspection. The plan was adequate and properly implemented at the present stage of construction. However, some measures shown on the plan were not installed (silt fence outlets, wattles in ditch draining to slope drains, etc.). Better annotations on the field set of plans were suggested to help identify measures that were not needed and therefore never installed. Self-inspection records were effective. The site had received 7+ inches of rain in the previous 2 days, and much of the site was inundated with water. Maintenance was needed in a few areas onsite where rills and washes were developing on back slopes. A small amount of sediment was deposited beyond the silt fence at the outlet of a ditch. The ditch and area of deposition needed to be stabilized. Overall rating was Good.



Rill developing on slope, Martin County

Bridge #69 Over Middle Swamp, SR 1139, STIP BD-5102U

NC DOT Division 2, Pitt County

This is a NC DOT Bridge Replacement project that is 0.137 miles in length and has a contract for \$998,909.50. The project scored primarily 8s and 9s during recent inspections. Construction was recently completed on this project and permanent groundcover was being established. The plan was adequate and properly implemented. Sediment controls were adequate and effective. Self-inspection records were adequate. Some minor maintenance was needed in a ditch due to recent rains (5 inches over previous 2 days). Overall rating was Good.



Scour Hole, Pitt County Bridge Replacement

Bridge #50 Over Johnson Mill Run (NC 33), STIP: B-5418

NC DOT Division 2, Pitt County

This is a NC DOT Bridge Replacement project that is 0.161 miles in length and has a contract for \$834,000.00. The project scored primarily 8s and 9s during recent inspections. The plan was adequate and properly implemented. Sediment controls were adequate and effective. Self-inspection records were adequate. The use of turbidity curtains and anchored geotextile covering stockpiles provided erosion and sediment control for this site. Minor maintenance in ditch (removal of deposition and restabilization) was needed due to recent rains (6+ inches over previous 2 days). In addition, it was noted that sensitive exposed areas near the stream should be provided with temporary cover at the end of the work day. Overall rating was Good.



Bridge Replacement Work, Pitt County

NC 24 Widening from SR 1404 (Dowdy Rd) to SR 1303 (Mitchell Loop Rd), R-2303C

NC DOT Division 3, Sampson County

This is a 6.949 mile widening project with a contract amount of \$39,234,386.71. The plan was adequate but not implemented consistently. Maintenance was needed in several areas. Silt fence was undermined near basins 17.6 and 17.8, causing slight sedimentation into a natural watercourse. The site was using an IAS (Innovative Applied Solutions) skimmer with mixed results. The skimmer in basin 17.6 was unattached. Attention was needed around some slope drains to repair scoured areas and to ensure that slope drains were discharging to an appropriate area (i.e., not to silt fence). Several slopes had been tracked in the wrong direction. The stream relocation/bypass onsite looked excellent and was functioning well. The Self-inspection records were adequate. Overall rating was Fair.



Basin with IAS-Skimmer, NC 24 Widening



Kingston Avenue (SR 1727) from NC-97 to US-301 Bus

NC DOT Division 4, Nash County

This is a 1.022 mile project with a contract for \$2,272,089.70. Site received 3.5 inches of rainfall previous two days. The plan was adequate and was generally implemented well; however, maintenance was needed to silt fence and inlet protection in several areas. Additional ditches/swales were needed in two areas to drain water toward inlets. A concrete washout location had been designated for use during the project. Self-inspection records were adequate. The temporary and permanent vegetation established throughout the site is very good. Overall rating was Fair+.



Culvert and Stream Protection, Kingston Ave Widening

Bridge 201 Over Little River on SR 2368

NC DOT Division 5, Wake County

This is a 0.101 mile bridge replacement project with a contract for \$905,058.45. The plan was mostly adequate, although the site did need additional measures or stabilization before the riprap approach to the creek. Areas around the wing walls of the bridge were unstabilized. Concrete was not being washed out in a designated and contained area. Stabilization (vegetative, tarp, etc.) was needed for exposed stockpiles. Self-inspection records were adequate. The site recently received 3.75 inches of rain. Despite the issues noted, no sediment was being lost from the site. Overall rating was Fair+.



Unstabilized areas around wingwalls, Bridge 201 Over Little River

Bridge 283 Over Black Creek on SR 2756

NC DOT Division 5, Wake County

This is a 0.101 mile bridge replacement project with a contract for \$647,647.00. The project scored primarily 8's and 9's on previous inspections. The plan was adequate and properly implemented. Sediment controls were adequate and effective. Matting and additional silt fence was used to protect sensitive areas around wingwalls. Concrete washout should be done in a designated area. Self-inspection records were adequate. The site is well contained. Overall rating was Good.



Well protected area along wingwall, Wake County

Smith Level Road (SR 1919) Widening, U-2803

Division 7, Orange County

This is a 0.809 mile project with a contract for \$4,946,197.82. The project had scored 7's through 9's on previous inspections. A history of maintenance issues were noted throughout the inspections, with some items appearing on multiple inspection reports. The plan was mostly adequate with minor field adjustments. One area along the side street needed additional protection in the form of silt fence at the low end of disturbance. Areas where the sidewalk was completed were seeded, mulched, and tacked. Wattles, sandbags, or alternative needed to be used to direct water into inlets. Most inlets drained to a large skimmer basin; however, water onsite was able to bypass inlets along the slope until reaching the lowest inlet(s). Several inlets needed maintenance. Concrete washout needed to be done in designated, contained areas. Self-inspection records were adequate. Site received 0.3 inches of rain the previous day. Overall rating was Fair.



Large skimmer basin, Smith Level Road Widening

Zeb Ferguson Road Maintenance, SR 2169

Division 8, Chatham County

This is a 0.7 mile road maintenance project being undertaken on a cul-de-sac with occupied homes, requiring access to be maintained during construction. Previous inspections revealed scores of primarily 8's and 9's. The plan was adequately implemented and measures were effective. Project was phased well, with inactive areas seeded and mulched. Wattles were removed during the work day and then replaced at the end of the day. Additional silt fence and stone were suggested in two small areas along driveways. The overall project condition was Good.



Phased Construction on Road Maintenance Project, Chatham County

Salem Creek Connector, US 52, U-2925

Division 9, Forsyth County

This is a 1.094 mile design-build project with a contract for \$68,925,000.00. At the time of inspection, the project was approximately 40% completed. The plan appeared adequate overall. Measures appeared to be effective and were, in general, well maintained. Flexterra had been used on several slopes throughout the site with good success. The creek through the site was well protected. The overall project rating was Good.



Flexterra used on slope, Salem Creek Connector, Forsyth County

SR-2538 (Peeler Road), Grade Separation of Norfolk Southern Railroad, P-5206A

Division 9, Rowan County

This is a 0.854 mile project with a contract for \$9,327,385.16. At the time of inspection, the project was approximately 50% complete. Plans for the site were adequate, and self-inspection records had been well maintained. Measures onsite appeared to be functioning well with the exception of the area around a stream, where some sediment deposited into the jurisdictional area. Maintenance of upstream measures was needed along with removal/restabilization of the affected area. Deposition in ditches also needed removal and the areas restabilized. Along with the main project, an associated borrow pit was also inspected. There was significant turbidity coming from the skimmer basin. Perimeter slopes of the pit had been permanently seeded, and inactive areas were provided with temporary seed and mulch. PAMs had been used onsite, but it was suggested that the type of PAM used should be evaluated and the proper type used further upstream at the entrance of the basin. The project was rated Fair because of the maintenance issues which led to a small amount of sediment in the jurisdictional stream, as well as the turbidity issues from the skimmer basin at the borrow site.



Skimmer Basin at Borrow Pit; Below, Turbid Water at Skimmer Basin Outlet



SR 1173 (Caldwell Road) Grade Separation over Norfolk Southern, P-5208F

Division 10, Mecklenburg County

This is a 0.404 mile railroad project with a contract for \$4,937,180.00. The plan appeared adequate for the site, and self-inspection records were excellent. Maintenance was needed (and in progress) at 48 inch pipe outlet. Overall, measures were functioning and properly maintained.

The only issue of concern was temporary seed mix used on a slope which had not been worked for some time. Scheduling issues (especially with utilities) delayed work in this area, but the timeframe elapsed indicated that a longer term mix (permanent) should have been used to seed the slope(s). The overall project rating was Good.



Slope with Temporary Seed Mix, Mecklenburg County

NC-18 and I-40 Interchange, U-25550B

Division 13, Burke County

This is a 0.641 mile project with a contract for \$21,229,384.79 and was approximately 80% complete at the time of inspection. The plans and self-inspection records for the site were adequate. Previous inspections revealed a history of compliance; however, several issues were noted during this inspection. In general, inlet protection needed maintenance throughout the site. Several protections had failed, resulting in sediment in inlets. Silt fence around two culvert headwalls was being undermined – one was a minor maintenance issue, but the second was a more significant concern due to the severity of the undermining. There was a borrow area associated with this project which was not well executed or maintained. Measures had been provided for the borrow area, but rills and gullies were forming as some stormwater bypassed the trap and ditch. The site received approximately 4.5 inches of rain recently, and while the rain contributed to maintenance issues onsite, many could have been avoided with proper attention and planning. The overall project condition was Poor.



NC-18 and I-40 Interchange—Inlet in Need of Maintenance

Undermining of Silt Fence and Erosion at Ditch Outlet Near Culvert Headwall



US 23/74 Southbound Rest Area, K-5002

Division 14, Haywood County

This is a 0.265 mile vertical construction project with a contract for \$6,151,716.03. It involves construction of a new rest area and renovations of an existing northbound rest area. The plan appeared to be adequate and well implemented onsite. Self-inspection records were well-maintained. One basin onsite could use maintenance; however, it was to be converted into a bioretention area very soon and had very little drainage to it. Once concrete is being poured, a concrete washout area needs to be designated onsite. The only issue noted was that a rock/dirt pile was located at the outlet third of one skimmer basin and had not been provided stabilization. It was suggested that the pile be relocated or provided with temporary groundcover to lessen the potential of that material exiting the skimmer basin too quickly. No sediment was leaving the site. The overall project condition was Good.



Rock/Dirt Pile at Outlet of Skimmer Basin, US 23/74 Southbound Rest Area

Howell Mill Road (SR 1184) Widening from US-276 to US-23 Bus, U-4412

Division 14, Haywood County

This is a 1.42 mile secondary road widening and paving project (which was approximately 45% complete) with a contract of \$11,688,234.11. The plan for the project was adequate, and field personnel had implemented several additional measures proactively to improve containment and treatment onsite. Minor maintenance was needed for a couple of basins, and near a newly installed culvert. Work had stopped temporarily on one end of the project due to the discovery of contaminated soils. The area in question had been properly covered/stabilized with tarp; however, the area adjacent to the contaminated soil was still bare. Although the bare area was contained, rills were developing and the area should, at a minimum, have received temporary groundcover. The overall rating was Good.



Tiered Basin at Howell Mill Road Widening Project, Haywood County

ISSUES NOTED AND RECOMMENDATIONS

Concrete Washouts

Any project involving concrete (including those with sidewalks or curb and gutter) should have a designated concrete washout location identified on the approved plan, and a detail(s) provided for its construction/maintenance. Concrete washouts (and earthen material stockpiles) should be located at least 50 feet from storm drains and streams unless no reasonable alternatives are available.

Ground Cover During Construction Delays

With the delays in projects (due to utility work or other circumstances), care needs to be taken to provide appropriate stabilization of sites that are inactive for a given time. Measures still need to be maintained onsite unless drainage areas are fully stabilized. If areas will not be worked for at least 3-4 months, a permanent seeding would be more appropriate than temporary seeding.