

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

November 1, 2022

Performed By:

*North Carolina Department of Environmental Quality
Division of Energy, Mineral and Land Resources
Land Quality Section*

Report By:

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INTRODUCTION

The Division of Energy, Mineral, and Land Resources, Land Quality Section (DEMLR-LQS) conducted a review of the delegated North Carolina Department of Transportation Erosion and Sedimentation Control Program between June 8, 2022, and October 13, 2022. This review and the results reported here are in accordance with requirements of the Sedimentation Control Commission (SCC) delegation to the North Carolina Department of Transportation (NCDOT), §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 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.

GENERAL CONDITIONS OF THE PROGRAM

The NCDOT Division of Highways Sediment and Erosion Control Program was originally delegated in 1974 with an updated delegation agreement being approved in 1991. General conditions of the delegated program include but are not limited to the following statements. The NCDOT's Standard Specifications for Roads and Structures shall provide the basic erosion and sedimentation control requirements to be implemented by the NCDOT. The NCDOT will utilize designs and design criteria for application of its erosion and sediment control program that are consistent with minimum standards promulgated by the Sedimentation Control Commission. The NCDOT shall provide adequate rights of way or easements to accommodate installation and maintenance of appropriate sediment and erosion control measures. The NCDOT will take all reasonable measures to protect all public and private property from siltation damage caused by any Departmental activities. The NCDOT will prepare, or have prepared, erosion and sediment control plans consistent with Commission standards governing all land disturbing activity it undertakes which uncovers one or more contiguous acres of erodible surface. Erosion and Sediment Control plans prepared by and for the NCDOT shall address the following basic control objectives:

1. Identification of Critical Areas,
2. Limited Time of Exposure,
3. Limit Exposed Areas,

4. Control Surface Water and Control Sedimentation, and
5. Manage Stormwater Runoff.

The NCDOT is responsible for two types of inspections on each project: weekly NPDES/SPCA self-monitoring inspections (self-inspections) and monthly Roadside Environmental Unit (REU) inspections. Self-inspections are conducted by a project inspector from the office of the Resident Engineer or their designee for active Contract Construction projects, or from the office of the County or District Engineer for State Force projects. The REU inspections are conducted by one of 7 REU Field Operation Engineers (FOEs) or their staff. Generally, each FOE has an additional Field Operation Staff Engineer who assists with the project inspections and plan reviews. Each FOE and their staff cover 2 of the 14 DOT divisions across the state. All projects are to be inspected monthly by the REU. Each project is given a score from 0-10 for the following: installation of measures, maintenance of measures, effectiveness of measures, plan implementation and overall project evaluation. An overall project evaluation score of 0-6 results in the issuance of an “Immediate Corrective Action” report (ICA).

During the past fiscal year from July 2021 through June 2022, the NCDOT reports that the REU has conducted 3,958 total inspections and reviewed 246 plans across all 14 divisions. During this same period the REU has issued one (1) ICA.

PROJECT REVIEWS

Fourteen Contract Construction projects and one State Force (in-house operations) project were chosen across the state, at random, with varying stages of construction, size, budget, and significance of the project. Selected projects consist of new roadway construction and various roadway improvement work including bridge replacement, road realignments and widening. Projects reviewed were between approximately 5 and 95 percent complete. State Force projects consist of construction work the Department performs on secondary and primary roadways, including bridge management projects, which are completed using department forces and resources unless the project is contracted. State Force projects are also sometimes referred to as Operations projects. Contract Construction projects may contain traditional Bid-Build and Design-Build projects. Bid-Build projects are awarded to contractors and completed according to a set of pre-designed and approved plans. Design-Build projects are awarded to a Designer/Contractor team based on the scope of work outlined in the project proposal. The Designer/Contractor team then completes the design, and after approval begins work on the project in accordance with those plans. Contract Construction projects are let for bidding out of either the Central or Division offices depending on the project budget.

NCDOT personnel accompanied Land Quality Section personnel from the Regional Offices and Central Office on the 15 projects reviewed. Each project review consisted of reviewing the erosion control plan for adequacy, examining the project files, and an onsite inspection. Field data was collected on erosion and sediment control measure installation, maintenance, and effectiveness. Timely provision of ground cover, phasing of grading, field revisions and sedimentation damage were also evaluated. A summary of the projects reviewed follows.

PROJECTS REVIEWED

State Force/Operations Projects

Division	DEMLR-Region	County	Route	Description
5	Raleigh	Wake	Jack Mitchell Rd.	30" concrete pipe being replaced with a 66" CMP

Contract Construction Projects

Division	DEMLR-Region	County	TIP #	Route	Contract Amount	Length (miles)
1	Washington	Perquimans	R-5740	SR-1329 (Woodville Rd.) from SR-1331 (Red Name Rd.) to SR-1300 (New Hope Rd.)	\$5,078,838.75	4.4
2	Washington	Lenoir	B-5619	Bridge #52 and #152 over the Neuse River Overflow on SR-1389(Hardy Bridge Rd.)	\$7,974,094.07	4.5
3	Wilmington	Duplin	B-5641	Duplin Bridge #201 over Island Creek on SR 1946 (Northeast Rd.)	\$1,450,878.50	0.1
3	Wilmington	Duplin	B-5639	Bridge #36 over Maxwell Creek on NC-11 (Clodfelter Rd.)	\$2,975,893.50	0.3
4	Raleigh	Edgecombe	B-5671	Bridge #87 over Swift Creek on NC-97	\$1,981,374.80	0.19
5	Raleigh	Wake	R-2721B	NC-540-Triangle Expressway Southeast Extension from east of Pierce Olive Rd. to east of US-401 (Fayetteville Rd.)	\$159,983,000.00	4.9
6	Fayetteville	Cumberland	U-4405A	US-401 from Old Raeford Rd. To east of NC-162 (Bunce Rd.)	\$35,761,000.79	2.1
7	Winston-Salem	Guilford	R-4707	US-29 and SR-4771 Reedy Fork Parkway Interchange Improvements	\$46,382,713.04	1.33
8	Fayetteville	Moore	BR-0035	Bridge #24 over Nick's Creek on NC-22	\$3,488,269.05	0.33
9	Winston-Salem	Forsyth	R-2247EB	Winston-Salem Northern Beltway interchange at US-52 (Future I-74)	\$134,150,000.00	2.6
10	Mooreville	Cabarrus	U-3440	NC-3 from proposed West Side Bypass to SR-1691 (Loop Rd.) in Kannapolis	\$28,561,337.70	2.6
12	Mooreville	Cleveland	R-2707C	US-74 (Shelby Bypass) from east of NC-226 to east of NC-150	\$59,284,543.24	4.8
13	Asheville	McDowell	U-5818	SR-1001 from I-40 WB ramps to 0.3 miles west of I-40 EB ramps	\$12,358,341.47	0.53
14	Asheville	Jackson	R-4753	NC-107 from north of SR-1002 to NC-281	\$34,867,171.45	3.8

PROJECT REVIEW SUMMARIES

State Force Projects:

Pipe Replacement on Jack Mitchell Road

NCDOT Division: 5, Wake County
Type of Project: State Force/Operations
Date of Review: 8/23/2022
Sedimentation Damage: No

Comments/Summary:

This is a State Force project which consists of replacing the existing 30” concrete pipe on a secondary route in Wake County. This project had begun construction the day prior to our review. During our review, impervious dikes had been installed and the existing pipe had been removed. Pumps and a special stilling basin (silt bag) for the pump-around and work area dewatering operations were installed. At the time, there was no flow in the stream, so pumping was not active. Silt fence had been installed surrounding the area disturbed by storage of the pipes. When questioned, NCDOT staff indicated that once the new pipe was installed and backfilled, the area would be stabilized and that REU staff would continue to conduct regular inspections until permanent vegetation was established. This project was scheduled to be completed within a week from the day of our review. No sedimentation loss was noted. All permit documentation, NPDES records and a rain gauge were present onsite.



Photo- Silt Bag for work area dewatering



Photo- Area disturbed for pipe storage



Photo- Upstream impervious dike



Photo- Downstream impervious dike

Contract Construction Projects

TIP R-5740: SR-1329(Woodville Rd) from SR-1331(Red Banks Rd) to SR-1300(New Hope Rd)

NCDOT Division: 1, Perquimans County

Type of Project: Contract

Date of Review: 7/19/2022

Sedimentation Damage: No

Recent Project History:

Rainfall: 0.1" (7/15/22), 0.9" (7/13/22), 0.8" (7/11/22)

DOT Inspection Scores: 8 (7/13/22), 9 (6/28/22), 9 (5/19/22), 9 (4/27/22)

Comments/Summary:

This is a 4.4-mile-long project with a budget of \$5,078,838.75 that was let out of the Central Office. Construction on this project began on 5/17/2021 and was approximately 75% complete at the time of our review. This project had received no ICAs prior to our review. Self-inspection records and monthly REU inspection reports were reviewed. Self-inspection records appeared to be adequate and properly filled out. During our review, grading had been completed and paving was underway. Some ditches throughout the project needed to be stabilized. NCDOT staff stated that some ditches had previously been stabilized but overspray from the adjacent farming operations had killed off vegetation in the ditch. It was noted that the more recently completed sections of the project had been seeded and mulched with straw and tackifier. Tackifier did not appear to be applied at an adequate rate. This project contained two waste sites. Silt fence had been installed around the perimeter of both sites and signs of seed and straw were noted on inactive piles. Some wattles and check dams throughout the site needed to be repaired or replaced. The culvert replacement site had been completed and stabilized.



Photo- Ditch slopes needing stabilization



Photo- Wattle and check dam recently replaced



Photo- Wattles needing repair or replacement



Photo- Ditch mulched with straw and sparse tackifier

TIP B-5619: Bridge #52 and #152 over the Neuse River overflow on SR-1389(Hardy Bridge Rd.)

NCDOT Division: 2, Lenoir County

Type of Project: Bridge Replacement, Contract

Date of Review: 9/20/2022

Sedimentation Damage: No

Recent Project History:

Rainfall: 0.25" (9/11/22), 1.5" (9/7/22), 0.5" (9/6/22), 0.1" (9/4/22)

DOT Inspection Scores: 9 (9/13/22), 9 (8/18/22), 9 (7/20/22), 9 (6/14/22)

Comments/Summary:

This is a 4.5-mile-long project with a budget of \$7,974,094.07 that was let out of the Central Office. Construction on this project began on 7/21/2021 and was approximately 70% complete at the time of our review. This project had received no ICAs prior to our review. Self-inspection records and monthly REU inspection reports were reviewed and appeared adequate. This project contained Environmental Sensitive Areas (ESAs) which had been delineated on the plans and marked in the field with orange safety fence per NCDOT policy. This project consisted of two bridge replacements and resurfacing of the roadway. During our review of the project the larger bridge had been removed and the new bridge was nearing completion. The smaller existing bridge had been removed and the installation of the new structure had begun. The areas below the larger bridge had been completed and were being stabilized. Silt fence and wattles remained in place along the riverbanks. DOT staff stated that additional slope drains and rock check dams had been installed along the approaches after noticing an increased flow concentration in these areas. Some sections of silt fence needed to be repaired where materials had been placed on top of the fence. Turbidity curtains had been installed around the work area for the smaller bridge installation. The southern end bent had been completed and the area below had been seeded and mulched with straw. Coir fiber wattles had also been installed per the approved plan.



Photo- Materials lying on top of silt fence



Photo- Rock checks added to control runoff



Photo- Active bridge construction and turbidity curtain installed



Photo- Completed areas being stabilized

TIP B-5641: Duplin Bridge 201 over Island Creek on SR 1946 (Northeast Rd.)

NCDOT Division 3, Duplin County

Type of Project: Bridge Replacement, Contract

Date of Review: 8/30/2022

Sedimentation Damage: No

Recent Project History:

Rainfall: 0.6" (8/25/22), 3.3" (8/21/22), 0.2" (8/15/22), 0.8" (8/12/22)

DOT Inspection Scores: 9 (8/1/22), 9 (7/12/22), 9 (6/9/22), 9 (5/3/22)

Comments/Summary:

This is a 0.1-mile-long project with a budget of \$1,450,878.50 that was let out of the Division Office. Construction on this project began on 4/18/2022 and was approximately 55% complete at the time of our review. This project had received no ICAs prior to our review. Self-inspection records and monthly REU inspections were reviewed and appeared adequate. NCDOT staff indicated that they had added additional measures in some areas to control runoff and reduce velocity. These revisions were approved by REU staff in the field. The set of ESC plans kept onsite had not been marked up when measures were installed, repaired, or removed per NCDOT policy. This project contained ESAs which were properly marked on the plans and in the field. During our review, the existing bridge had been removed and construction of the new bridge was underway. The end bent on one side had been completed and the areas along the bank had been stabilized with coir fiber matting and wattles. Construction of the other end bent was underway and a floating turbidity curtain had been installed along the disturbed stream bank per the requirements of the 404/401 water quality permits. Perimeter silt fence and wattles had been installed and appeared to be maintained. The completed slopes and ditches had been seeded and mulched with straw.



Photo- Wattles and turbidity curtain installed



Photo- Completed ditch and slope mulched with straw



Photo-Wattles and coir fiber matting installed above stream bank

TIP B-5639: Bridge #36 over Maxwell Creek on NC-11 (Clodfelter Rd.)

NCDOT Division 3, Duplin County

Type of Project: Bridge Replacement, Contract

Date of Review: 8/30/2022

Sedimentation Damage: No

Recent Project History:

Rainfall: 0.75" (8/25/22), 0.50" (8/23/22), (0.75" (8/22/22)

DOT Inspection Scores: 9 (8/1/22), 9 (7/12/22), 9 (6/6/22), 9 (5/2/22)

Comments/Summary:

This is a 0.3-mile-long project with a budget of \$2,975,893.50 that was let out of the Central Office. Construction on this project began on 7/1/2021 and was approximately 95% complete at the time of our review. This project had received no ICAs prior to our review. Self-inspection records and REU monthly inspections were reviewed and appeared adequate. This project consisted of a bridge replacement and an onsite detour. During our review, the new bridge construction had been completed and the onsite detour bridge had been removed. The areas of fill for the detour bridge were still being removed. Coir fiber matting had been installed below the new bridge. Sections of silt fence which had been repaired were noted; however, some new sections of silt fence had been installed but not tied into the existing fence. The silt fence below the bridge did not extend all the way along the existing vertical embankment per the ESC plan. The finished slopes had been seeded and mulched with straw.



Photo-Section of silt fence missing along stream bank



Photo- Completed areas stabilized with matting and straw



Photo- slopes complete and areas mulched with straw

TIP B-5671: Bridge #87 over Swift Creek on NC-97

NCDOT Division 4, Edgecombe County
Type of Project: Bridge Replacement, Contract
Date of Review: 6/8/2022
Sedimentation Damage: No

Recent Project History:

Rainfall: 0.02" (6/4/22), 0.3" (5/28/22), 0.1" (5/25/22), 1.20" (5/24/22)
DOT Inspection Scores: 8 (5/8/22), 8 (4/6/22), 8 (3/7/22)

Comments/Summary:

This is a 0.19-mile-long project with a budget of \$1,981,374.80 that was let out of the Central Office. Construction on this project began on 7/19/2021 and was approximately 25% complete at the time of our review. This project had received no ICAs prior to our review. Self-inspection records dating back to late April and monthly REU inspection reports were reviewed and appeared consistent. NCDOT staff stated that the self-inspections records and other documentation had been stolen in mid-April. This project consisted of a bridge replacement and was idle during or review. This project contained ESAs which had been properly delineated on the plans and in the field. NCDOT staff stated that the site had remained idle over the past few months due to the contractor being removed from the contract and grading of the site had yet to be completed. While the site remained idle, NCDOT forces were mobilized to establish temporary stabilization and provide maintenance. Perimeter measures were installed, and disturbed areas had been stabilized with groundcover as the site was inactive. Recent NCDOT self-inspection records noted areas along the slope and one silt fence wattle break which needed to be repaired. The slope had been repaired and matted. An additional row of silt fence had been installed above the silt fence wattle break and a new wattle had been added. Geotextile fabric had been placed on some slopes to prevent erosion.



Photo- Slope repaired and matted



Photo- Geotextile liner on slope



Photo- Additional silt fence row and wattle break repaired

TIP R-2721B: NC – 540 – Triangle Expressway Southeast Extension from east of Pierce Olive Rd. to east of US-401 (Fayetteville Rd.)

NC DOT Division 5, Wake County

Type of Project: Contract, Design-Build, Turnpike Authority

Date of Review: 10/13/2022

Sedimentation Damage: Minor Sediment loss noted

Recent Project History:

Rainfall: 0.07” (10/3/22), 4.49” (9/30/22), 0.09” (9/23/22), 0.33” (9/13/22)

DOT Inspection Scores: 8 (9/28/22), 7 (8/5/22), 8 (6/23/22), 7 (5/26/22)

Comments/Summary:

This is a 4.9-mile-long project with a total budget of \$159,983,000.00 that was let out of the Central Office. Construction on this project began in November of 2019 and was approximately 70% complete at the time of our review. Self-inspection records and monthly REU reports were reviewed. Inconsistencies on the self-inspection records regarding the documentation of corrective actions needed were noted. This was also noted during a recent REU monthly inspection. REU staff indicated that these inconsistencies were recently discussed, and the contractor had taken steps to address this moving forward. We also reviewed the required Vegetation Management Plan (VMP) which was outlined in the erosion control scope of work section of the project proposal. The VMP is meant to be updated monthly to outline the areas which are to receive stabilization and when. Periodically in their monthly inspections, REU staff had noted recommendations for the NCDOT Resident Engineer on the project to shut down work until erosion and sediment control corrective actions had been completed. REU staff made these recommendations in lieu of issuing an ICA at the time. NCDOT staff indicated that in one case work on the project was shutdown following this recommendation to ensure that all corrective actions were completed promptly. In all other cases, corrective actions were completed promptly following recommendations from REU staff and a shutdown was not warranted. Revisions to measures and the addition of an intermediate grading phase to be followed during the installation of noise walls which were added to the scope of work after the project began had been made. NCDOT staff stated that all significant revisions to the plans had been reviewed and approved by the REU. This project contained ESAs which had been properly delineated on the plan and in the field. During our review, various phases of construction were underway throughout the project. Some sections had been paved or were being prepared for paving while noise wall and bridge construction was still underway in others. All culvert work on the project had been completed. NCDOT staff were informed that the construction sequences for culverts on this project should conclude with steps for providing site cleanup and groundcover. Minor losses adjacent to one culvert was noted during our review. Previous losses had occurred in this area and signs of recent repairs to measures could be seen. This project consisted of the drainage of multiple ponds which appeared to be completed and stabilized per the approved plans. NCDOT staff stated that the skimmer of one basin had been removed to prevent drainage while sediment was cleaned from the downstream ditch. This sediment had flowed into the ditch as a result of a breach in the stormwater drainpipe that had been installed. Staff indicated that the skimmer was removed to reduce the amount of water which would need to be pumped out of the work area while repairs and cleanup was completed, and that the skimmer would be reattached to ensure proper function

of the basin as soon as repairs were completed. Other basins and inlet protection measures throughout the site appeared to be well maintained and functioning. Areas behind completed noise walls had been permanently stabilized and recently completed slopes had been matted or mulched with straw.



Photo- Silt Basin Type-B



Photo- Inlet Protection measures



Photo- Stabilized ditch with rock check dams



Photo- Minor sediment loss noted



Photo- Area previously repaired



Photo- Signs of minor losses

TIP U-4405A: US-401 from Old Raeford Rd. to east of NC-162 (Bunce Rd.)

NC DOT Division 6, Cumberland County

Type of Project: Contract

Date of Inspection: 7/13/2022

Sedimentation Damage: No

Recent Project History:

Rainfall: 1.5" (7/10/22), 0.52" (7/9/22), 0.58" (7/8/22), 1.5" (7/7/22)

DOT Inspection Scores: 9 (6/23/22)

Comments/Summary:

This is a 2.1-mile-long project with a budget of \$35,761,000.79 that was let out of the Central Office. Construction on this project began on 4/6/2022 and was approximately 10% complete at the time of our review. This project had received no ICAs prior to our review. Self-inspection records and monthly REU inspection reports were reviewed and appeared adequate. REU staff had only conducted one inspection prior to our review. NCDOT staff indicated that minor revisions to the plan had been made with the addition and reconfiguration of silt fence and wattles during directional boring operations. These revisions had been approved by REU staff in the field and shown on the As-Built plan set. During our review, work on a few Y-lines was nearing completion and work on the main L-line was just beginning. Areas of the Y-lines that had been completed had been seeded and mulched with straw. Staff stated that one ditch area which had been disturbed and remained uncovered would be completed within the week once the pipe section was delivered and installed. It was discussed that if materials delivery was delayed, temporary stabilization would need to be provided in these areas to meet the stabilization timeframe requirements. One culvert along the main L-line had been completed and stabilized. Asphalt tackifier had been applied sparsely in areas which had been mulched with straw. Wattles, silt fence and drop inlet protection measures had been installed and appeared well maintained throughout the site.



Photo- Completed Areas mulched with straw



Photo- Culvert construction complete



Photo- Ditches stabilized



Photo- Inlet Protection Measures

TIP R-4707: US-29 and SR-4771 Reedy Fork Parkway Interchange Improvements

NCDOT Division 7, Guilford County

Type of Project: Contract

Date of Review: 9/8/2022

Sedimentation Damage: No

Recent Project History:

Rainfall: 1.2" (9/4/22), 0.57" (8/26/22), 2.28" (8/22/22)

DOT Inspection Scores: 8 (8/12/22), 8 (7/19/22), 8 (6/21/22), 8 (5/17/22)

Comments/Summary:

This is a 1.33-mile-long project with a budget of \$46,382,713.04 that was let out of the Central Office. Construction on this project began on 6/7/2021 and was approximately 35% complete at the time of our review. This project had received no ICAs prior to our review. Self-inspection records and monthly REU inspection reports were onsite and reviewed. Previous monthly REU inspection reports had noted inconsistencies with the self-inspection records. REU staff had provided further guidance to the inspector conducting the self-inspections and recent reports appeared to be adequate and consistent. This project contained ESAs which had been properly delineated on the plans. However, not all the ESAs were properly marked and maintained in the field. During our review, the large culvert and extensions running through the middle of the project were being installed. The stream diversion was in place and functioning and dewatering of the work area was active. The dewatering of the culvert work area consisted of pumping into various skimmer basins located adjacent to the culvert. NCDOT staff stated that work would soon transition to pumping through silt bags as the project transitioned to the final grade phase and these basins were removed. One of the pump outlets needed to be moved from the skimmer cell to the first cell of the basin to allow the pumped water to flow the full length of the basin as intended. This project contained a borrow pit which land disturbance had only recently begun on. The construction entrance and perimeter silt fence had been installed and appeared to be functioning. The skimmer basin had not been installed yet. Slopes throughout the project had been seeded and mulched or matted. Inlet protection measures and basins throughout the project appeared to be maintained and functioning.



Photo- Borrow Site perimeter measures



Photo- Temporary Rock Sediment Dam, Type B with trap area



Photo- Tiered Skimmer Basin construction



Photo- Completed slopes and channel stabilization



Photo- Skimmer Basin receiving water from culvert work area being dewatered



Photo- Slope being stabilized

TIP BR-0035: Bridge #24 over Nick's Creek on NC-22

NCDOT Division: 8, Moore County

Type of Project: Contract

Date of Review: 6/30/2022

Sedimentation Damage: No

Recent Project History:

Rainfall: 0.12" (6/27/22), 0.25" (6/23/22), 0.5" (6/16/22)

DOT Inspection Scores: 7 (6/16/22)

Comments/Summary:

This is a 0.33-mile-long bridge replacement project with a budget of \$3,488,269.05 that was let out of the Central Office. Construction on this project began on 3/3/2022 and was approximately 5% complete at the time of our review. This project had received no ICAs prior to our review. Self-inspection records and monthly REU inspection reports were onsite and reviewed. Only 1 REU monthly inspection had been conducted. NCDOT staff stated that utilities relocation and installation by others had only recently been completed. Deficiencies in self-inspection reports were noted during the REU inspection on 6/16/22 and the following self-inspection records appeared to be adequate. During our review, clearing was underway and areas which had been disturbed during the utilities relocation and installation had been seeded and mulched with straw. Staff stated that sediment loss had recently occurred during boring operations. The silt fence outlet in this location appeared to have been repaired. Sediment beyond the limits of construction had been removed and disturbed areas seeded and mulched with straw. No signs of further sediment loss were noted.



Photo- Previous minor losses cleaned up and area mulched with straw



Photo- Clearing complete, areas mulched with straw

TIP R-2247EB: Winston-Salem Northern Beltway Interchange at US-52 (Future I-74)

NCDOT Division: 9, Forsyth County
Type of Project: Contract, Design-Build
Date of Review: 10/4/2022
Sedimentation Damage: No

Recent Project History:

Rainfall: 1.73" (10/1/22), 0.02" (9/30/22), 0.18" (9/26/22), 0.02" (9/13/22)
DOT Inspection Scores: 8 (9/26/22), 8 (8/24/22), 8 (7/25/22), No Score Given (7/7/22)

Comments/Summary:

This is a 2.6-mile-long project with a budget of \$134,150,000 that was let out of the Central Office. Construction on this project began on 10/1/2018 and was approximately 80% complete at the time of our review. Self-inspection records and monthly REU reports were reviewed. REU staff indicated that no score was given during the inspection conducted on 7/7/2022 as NCDOT staff had reported sediment losses and cleanup was underway. This project had previously been issued an ICA on 6/1/2020 which was lifted on 6/8/2020. Revisions to this plan had been made throughout the project and had been reviewed and approved by REU staff. The As-Built plan set onsite included the field revisions and the date which measures had been removed. The date that measures were installed was not being documented on these plans. Some inconsistencies between self-inspection records and monthly REU reports were noted, including discrepancies in sediment loss amounts. This project did not contain any ESAs; however, safety fence and jurisdictional flagging similar to that required for ESAs were delineated on the plans in areas of work around jurisdictional streams and wetlands. Safety fence and flagging had been installed and appeared to be maintained in all areas per the plan. The proposal and contract for this Design-Build project specified that a Vegetation Management Plan be developed and frequently updated throughout the project life. No said plan was available for review; NCDOT staff indicated that actions such as seeding, and mulching are documented in the project diary once complete and the stabilization timeframes of the NCG01 permit are being followed. During our review, the project had completed the clearing and grubbing phase and was moving to the final grading phase. All culvert work had been completed. Bridge construction and active grading was underway. Stream channel changes and permanent ditches had been completed and vegetation had been established. One silt fence outlet directly below a skimmer basin outlet pipe had begun to undermine. No signs of sediment loss were noted in this area. NCDOT staff had reported a recent slope failure at one culvert site which led to approximately 50 gallons of sediment into the stream. Staff indicated that there was no live flow through the culvert at the time. The slope in this area had been repaired, the skimmer basin cleaned out and sediment losses had been removed. At another location, the skimmer in a tiered basin had been installed at the improper elevation to where the basin could not drain and leaving its outfall cantilevered. NCDEQ staff stated that it needed to be reinstalled per the construction detail and specifications. Recently completed slopes had been matted and check dams throughout the site appeared well maintained.

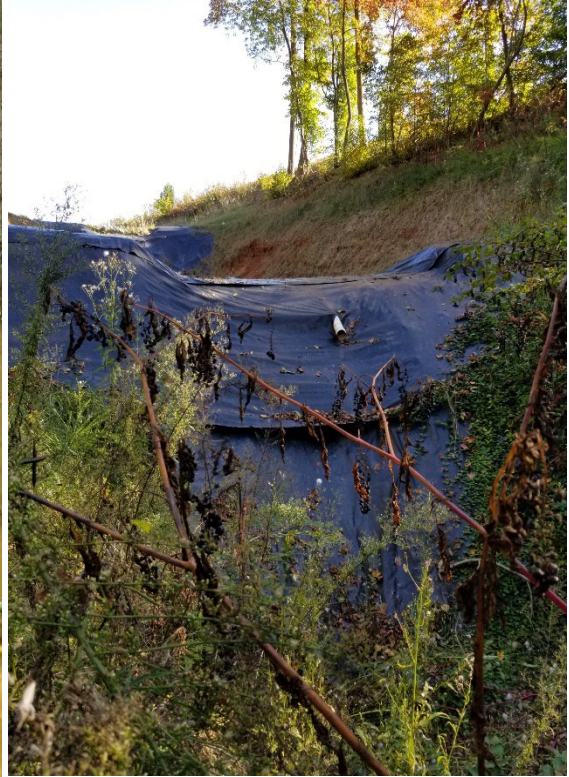


Photo- Tiered Skimmer Basin, skimmer not installed at proper elevation



Photo- Silt fence outlet at basin outlet undermining



Photo- Previously taken photo from slope failure and sediment loss (NCDOT staff provided)



Photo- Slope repaired and matted



Photo- Signs of sediment loss and repairs in stream



Photo- Skimmer basin and channel stabilization

TIP U-3440: NC-3 from proposed Westside Bypass to SR-1671 (Loop Rd.) in Kannapolis

NCDOT Division: 10, Cabarrus County

Type of Project: Contract

Date of Review: 9/1/2022

Sedimentation Damage: No

Recent Project History:

Rainfall: 0.01" (8/27/22), 0.1" (8/16/22), 0.29" (8/16/22), 1.47" (8/15/22)

DOT Inspection Scores: 8 (8/4/22), 8 (7/6/22), 8 (6/1/22), 8 (4/25/22)

Comments/Summary:

This is a 2.6-mile-long project with a budget of \$28,561,337.70 that was let out of the Central Office. Construction on this project began on 8/31/2017 and was approximately 90% complete at the time of our review. No ICAs had been issued to this project prior to our review. Self-inspection records and monthly REU reports were reviewed. Corrective actions noted on self-inspection records did not include the date they were completed. The plans for this project had undergone revisions to add basins and revise a stream relocation due to field conditions. This revision had been approved by both REU staff and water quality permitting agencies. The As-Built plan set onsite included the field revisions, but the installation and removal date of measures were not being documented on the plans. During our review, the project had transitioned to the final grading phase and completed areas were being stabilized. The channel changes and culverts had been completed and vegetation had been established. Active grading was underway on small sections of the Y-lines and perimeter measures appeared to be maintained in these areas. Drop inlet protection measures needed to be maintained throughout the site. DOT staff indicated that there have been sediment losses reported periodically throughout the life of the project. Staff stated that DWR had been notified of all losses into wetlands and streams. One recent slope failure had been repaired and restabilized. The concrete washout was located too close to a storm drain inlet and did not have an impermeable liner installed. This project contained a borrow/waste site. NCDOT staff indicated that they did not plan to have any further borrow or waste from this site. The basin onsite did not appear to be functioning. The skimmer was not attached to the outlet pipe and the basin was full of sediment.



Photo- Slope mulched with straw and tackifier



Photo- Previous slope failure repaired and stabilized



Photo- Concrete washout pit



Photo- Skimmer not attached at Borrow Pit site

TIP R-2707C: US-74 (Shelby Bypass) from east of NC-226 to east of NC-150

NCDOT Division: 12, Cleveland County
Type of Project: Contract
Date of Review: 8/24/2022
Sedimentation Damage: Sediment loss noted

Recent Project History:

Rainfall: 1.13" (8/20/22), 0.375" (8/17/2022), 0.25" (8/15/2022), 1.75" (8/10/2022)
DOT Inspection Scores: 7 (8/16/2022), 8 (7/25/2022), 9 (6/15/2022)

Comments/Summary:

This is a 4.8-mile-long project with a budget of \$59,284,543.24 that was let out of the Central Office. Construction on this project began on 6/26/2017 and was approximately 70% complete at the time of our review. This project had previously been issued an ICA on 5/16/2019 which was lifted on 5/29/2019. Self-inspection records and monthly REU reports were reviewed and appeared adequate. The plan for this project underwent revisions to add and adjust basins due to field conditions. These revisions had been reviewed and approved by REU staff. This project contained ESAs which had been properly delineated on the plans. No evidence of proper marking in the field could be seen. During our review, active grading was underway throughout the project and one section was being prepared for paving. Slopes that had been completed were being matted. The skimmer basin at one end of the project needed to be maintained and repaired. The slope above the basin had not been stabilized and rills had formed. Dissipator pads had not been installed at slope drain outlets and the silt fence and outlet below the skimmer outlet needed to be repaired. Sediment beyond the construction limits was noted in this area. Sediment deposited beyond the construction limits needed to be cleaned up and the disturbed areas immediately stabilized. Repairs to the basin and perimeter measures were needed to ensure no future losses occurred. Signs of previous losses were also noted below another basin. The silt fence outlet in this location had been repaired and appeared to be maintained. No signs of further losses were noted. Hydroseeding crews were onsite and stabilizing the ditch and slopes that had been recently completed. Check dams had been installed and appeared maintained throughout the site. This project contained a waste site which had been completed. Slope drains and inlet protection measures had been installed and slopes were matted.



Photos- Sediment loss



Photo- Skimmer basin above sediment loss needing maintenance



Photo- Waste Site being stabilized



Photo- Skimmer Basin maintained



Photo- Completed areas being stabilized

TIP U-5818: SR 10001 from I-40 WB Ramps to 0.3 miles west of I-40 EB Ramps

NCDOT Division 13, McDowell County

Type of Project: Contract

Date of Review: 9/29/2022

Sedimentation Damage: No

Recent Project History:

Rainfall: 1.6" (9/10/22), 4.0" (9/5/22), 0.4" (8/27/22), 0.75" (8/26/22)

DOT Inspection Scores: 8 (9/19/22), 8 (8/10), 9 (7/21/22), 9 (6/30/22)

Comments/Summary:

This is a 0.53-mile-long project with a budget of \$12,358,341.47 that was let out of the Central Office. Construction on this project began on 7/31/2019 and was approximately 60% complete at the time of our review. This project had received no ICAs prior to our review. Self-inspection records and monthly REU inspection reports were reviewed and appeared to be adequate. NCDOT staff stated that the primary contractor had previously defaulted, and the project remained idle for approximately a year. DOT staff continued to conduct weekly and rain event self-inspections and REU staff continued to conduct monthly inspections during this period. DOT maintenance forces were mobilized to stabilize the site and make any repairs while this project remained idle. In recent months a new contractor was brought on and construction of the project resumed. During our review, work on the overpass was active. Sections of the ramps had been completed and disturbed areas had been matted. Wattles and check dams had been installed in the ditches per the approved plan. The skimmer basin and sediment dam appeared to be installed properly. This project contained a laydown yard and waste site. The laydown yard reclamation plan needed to be revised to add a skimmer basin. The inactive areas of the waste site had been stabilized and the skimmer basin appeared to be functioning.



Photo- Recently completed ditch matted



Photo- Recently installed Skimmer Basin



Photo- Skimmer Basin removed and area stabilized



Photo- Skimmer Basin at Waste Site

TIP R-4753: NC-107 from north of SR-1002 to NC-281

NCDOT Division 14, Jackson County

Type of Project: Contract

Date of Review: 9/28/2022

Sedimentation Damage: No

Recent Project History:

Rainfall: 0.6" (9/12/22), 0.8" (9/5/22), 0.8" (9/3/22), 2.2" (8/27/22)

DOT Inspection Scores: 8 (9/15/22), 8 (8/11/22), 8 (7/18/22), 8 (6/23/22)

Comments/Summary:

This is a 3.8-mile-long project with a budget of \$34,867,171.45 that was let out of the Central Office. Construction on this project began on 2/21/2017 and was approximately 80% complete at the time of our review. This project had received no ICAs prior to our review. Self-inspection records and monthly REU inspection reports were reviewed and appeared adequate. This project consisted of the installation of retaining walls and widening of the road along a trout waters stream. A Trout Buffer Waiver and the appropriate water quality permits had been obtained. This project contained ESAs which had been properly delineated on the plans; however, no signs of proper delineation in the field were noted. During our review, construction of the retaining walls was being completed. Inlet protection measures and silt fence outlets throughout the site appeared to be maintained. Pallets and construction materials had been placed outside of the silt fence in one area and needed to be moved to within the construction limits. Wattles which were adjacent to one culvert outlet needed to be removed or secured down to ensure the measures are not washed away during future rain events. Finished slopes and the disturbed areas below completed retaining walls throughout the site had been matted. This project contained a waste site which had reached capacity and was now being used to stockpile a small amount of material. The completed slopes had been matted and check dams within the diversion ditch appeared to have recently been maintained. Vegetation had grown up in the skimmer basin and the skimmer device did not appear to be functioning as intended.



Photo- Materials placed outside of the silt fence



Photo- Slopes matted



Photo- Completed areas seeded and mulched with straw or matting



Photo- Perimeter measures maintained

Summary of Findings

Educational and Research Efforts

NCDOT has contracted with N.C. State University to train and certify contractors, engineers and staff in the design, installation, management, and inspection of sedimentation and erosion control practices. There are three levels of certification: Level I and Level II certifications for installers and supervisors, and Level III certifications for designers. All ESC plans must be designed by someone who has a Level III Certification and project contracts require that at least Level I certified installer, and a Level II certified foreman are onsite to facilitate all ESC work. The NCDOT is also funding research on innovative sedimentation and turbidity control measures.

DOT Internal Inspection Process

The NCDOT is responsible for two types of inspections on each project: NPDES/SPCA Self-Monitoring Inspections (Self-inspections) and monthly REU inspections. Self-inspections for all active projects are conducted at least weekly and within 24 hours of a rain event of 1.0 inch or greater. Self-inspections are to be conducted by a project inspector from the office of the resident engineer or their designee on Contract Construction projects or from the county or district engineer for maintenance on State Force/Operations projects. Self-inspections are to be conducted by personnel who have received the Level II Erosion and Sediment Control/Stormwater Certification. Field Operations staff of the REU conduct monthly inspections on all projects. Staff indicated that monthly inspections will be conducted with the personnel conducting the weekly inspections present. Records of both inspections were reviewed on all projects. Monthly REU inspections appeared consistent across all the divisions and were well maintained on all projects reviewed. Some inconsistencies on the self-inspections, such as the date corrective actions were completed, were noted on a few projects. It was also noted in some cases that conditions and corrective actions noted in the monthly reports were not reflected in the self-inspection records conducted around that time. Some of these inconsistencies had been noted and addressed in the monthly REU reports. REU staff should continue to monitor the self-inspection records and address any inconsistencies in site conditions or corrective actions noted.

Communication and Project Progression

Pre-construction meetings between the contractors and NCDOT, DEMLR and other environmental agency staff are held prior to construction for all projects. During preconstruction meetings, REU staff discuss critical areas of concern and review the ESC requirements. In addition to pre-construction meetings, monthly meetings are held between NCDOT staff and the contractor's workforce to discuss erosion control and other items that may need attention throughout the life of the project. Thorough discussions with contractors, NCDOT and REU staff, frequent meetings, and coordination beyond the monthly REU inspections are held. NCDOT retains operational control over all projects and REU staff coordinate with the NCDOT Resident and Division Engineers to ensure that any erosion control concerns, and corrective actions are addressed. The FOE may recommend that the Resident or Division Engineer shutdown work on the project if ESC corrective actions are needed. This is part of the process

when an ICA is issued in order to facilitate an immediate response. These frequent and open channels of communication help to facilitate quick responses and aid in preventing significant issues from arising.

Internal Documents and Policies

The NCDOT has created and maintains a list of approved products which are to be used for various aspects of projects including erosion and sedimentation control. The products on this list undergo a review process and may be approved for provisional or field use to be evaluated on certain projects for effectiveness and adequacy. This list, along with Special Provisions within project contracts help to ensure that products and constructed measures used meet the requirements outlined in the NCDOT Standard Specifications and Construction Details and adhere to the regulations and General Statutes. The NCDOT has developed its own *Erosion and Sediment Control Design and Construction Manual* which references the design considerations and requirements within the *DEMLR Erosion and Sediment Control Planning and Design Manual*. Both manuals are referenced throughout the scope of work proposals for contracted projects and the design procedures specified within must be adhered to. This ensures that plans meet the requirements and basic objectives to control erosion and sedimentation.

The NCDOT has designated areas surrounding certain classes of jurisdictional water bodies as Environmental Sensitive Areas (ESAs). Provisions have been developed to specify special working conditions which are required within ESAs and how they are to be delineated on the plans and in the field. Some inconsistencies were noted in the delineation of ESAs in the field. The NCDOT also has provisions in place for staking or otherwise delineating their right-of-way and permanent easements needed for work such as clearing and grubbing, drainage or bridge installation, and related stream or wetland impacts. Rights-of-way and easements are clearly shown on the plans, however, marking in the field is often not consistent with the NCDOT provision. These items were noted during last year's review as well.

The erosion control scope of work outlined in the project proposal for Design-Build projects specifies that the Design-Build (DB) team develop and maintain a project-wide Vegetative Management Procedure (VMP). This plan is to be submitted to the NCDOT Resident Engineer and REU FOE for review and approval. The DB team is to provide monthly updates to this procedure. The proposal specifies that the VMP should include at a minimum: 1) provisions for early establishment of grasses/vegetation, 2) provisions for obtaining permanent vegetation, and 3) procedure and schedule details for fertilizer topdressing, supplemental seeding, mowing and repair seeding. The DB team is also to maintain a comprehensive set of As-Built drawings that detail when and where permanent/temporary/repair seeding, and fertilizer topdressing have been performed. A VMP was available for review on 1 of the 2 Design-Build projects we reviewed this year. A VMP was not available on either of the 2 Design-Build projects reviewed last year.

Concrete Washout and Matting Specification

The NCDOT requires any project involving concrete (including those with sidewalks or curb and gutter) to have a designated concrete washout. No construction detail for a concrete washout is provided within the plans, rather, a link to an example construction detail can be found within a contract special provision. It is recommended that a construction detail for concrete washouts be included in the ESC plan set.

Matting for erosion control is included in a Soil Stabilization Summary Sheet within the ESC plan set. This table includes the location for placement and the estimated quantity of matting needed. Reference to the standard construction detail for installation is listed along with other relevant standard details, however, the type of matting to be used is not indicated anywhere on the plans. Two types of matting to be used for erosion control have been approved (straw and excelsior) and are listed in the *2018 Standard Specifications for Roads and Structures* book. It is recommended that the type of matting to be used or reference to the standard specification for matting for erosion control be included in the Soil Stabilization Summary Sheet table.

Conclusion

In general, the projects reviewed were in good condition and measures appeared to be maintained. Completed or inactive areas appeared to be stabilized appropriately. Self-inspection and monthly REU inspection records were available onsite for all projects reviewed. Overall, self-inspection records were adequately completed, and most inconsistencies were noted by REU staff and had been addressed. REU monthly inspection reports were comprehensive and appeared to capture the corrective actions needed onsite. REU staff should continue to monitor self-inspection records and ensure that they are properly filled out and accurately reflect onsite conditions. In general, instances of sediment losses were reported to environmental agencies and repairs and cleanup operations were completed quickly. NCDOT staff should continue to notify DEMLR staff when sediment losses occur and the NC Department of Water Resources if losses impact jurisdictional features. It is recommended to ensure that the provisions outlined within project contracts and NCDOT guidance documents such as field delineation of Environmentally Sensitive Areas, rights-of-way, permanent easements, and the development of a Vegetation Management Plan are consistently implemented throughout all divisions. The NCDOT has adapted to some of the recent changes to the Sedimentation Pollution Control Act of 1973, the State Construction Stormwater General Permit, and Chapter 04 of Title 15A of the North Carolina Administrative Code which affect transportation projects. However, the stabilization requirements special provision and Soil Stabilization Timeframes table provided in project contracts and the ESC plans are slightly outdated and still need to be updated. Some updates to the *NCDOT Erosion and Sediment Control Design and Construction Manual* and various guidance documents have been or are in the process of being completed since last year's review. DOT staff should continue to conduct a thorough review of all related specifications, provisions, drawings, and manuals to ensure to standards and guidance are consistent and reflect current regulatory language.

DEMLR staff recommend continuing delegation of the Erosion and Sedimentation Control Program to the NCDOT Division of Highways, pursuant to §113A-56. This report will be presented to the Sedimentation Control Commission on November 15, 2022