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The NCDOT Environmental Newsletter

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NCDOT Technical Services Project Management Unit

By: Virginia Mabry, PE, NCDOT Technical Services Project Management Unit Head

View Point

When approached to provide a viewpoint article about the Project Management Unit, I gave considerable thought to what is the most important thing I wanted to convey to everyone about our unit. I landed on the importance in providing great customer service.

PMU is designed to manage the development of assigned projects throughout a project's life. In addition to project management, we have a Priority Projects Team dedicated to innovative contract development for project delivery methods outside the conventional Design-Bid-Build method. The Project Management Unit's main task is to coordinate and collaborate with divisions, technical branches and units, construction staff and private engineering firms to provide products and services to accomplish delivery of projects on time, within established scope and budget. Each of our partners are important and critical to project delivery.

The cartoon made me smile because good customer service begins with being courteous but ultimately great customer service is actively listening and understanding the needs and requirements of all project delivery partners and meeting them. This will enable us to convey decisions or direction in a clear and concise manner to all project team members and to inform the development of construction contracts. Accomplishing this goal begins with narrowing our focus on the services we provide to all our customers.

We desire to be viewed as a resource not only for project management. We are available to assist in finding and providing information, aiding with processes that are new or unfamiliar to our partners across the state, training, facilitating connections with NCDOT staff or private engineering firms that have a certain expertise in given areas that

(Continued on page 4)

Wilmington Bypass - An Award-Winning Project

By*: Mason Herndon, Division 3 Environmental Officer*

Division Spotlight

The last segment of the Wilmington Bypass (R-2633B) which connects US 74/76 to US 421 in Brunswick and New Hanover counties was completed and opened for traffic on December 19, 2018. The project and general contractor (Balfour Beatty) for the BB section were awarded the Engineering News-Record's Southeast 2018 Best Bridge/Highway Project and the Carolina Associated General Contractors' 2018 Pinnacle Award for Best Highway-Heavy Project. This was a remarkable accomplishment given the challenges that had to be overcome in this segment of the Wilmington Bypass project. The centerpiece for this project was the massive twin 7,200 ft-long main bridges over the Cape Fear River, Toomer's Creek, and the adjacent wetlands.

It took a lot of teamwork and collaboration for this to become an

(Continued on page 5)

Growing into a Professional: Hydraulics Edition

By: Deborah Walker, NCDOT Communication Office Intern

This summer the Hydraulics Unit welcomed a diverse group of interns, each with different perspectives and experiences.

Hadi Khoury is a recent graduate from North Carolina Agricultural and Technical State University, with a bachelor's degree in civil engineering. He came to the Hydraulics Unit through an internship from NCDOT's Office of Historically Black Colleges and Universities (HBCU) Outreach and was introduced to this internship by a professor. Hadi was able to implement methods that he learned while in school to his internship. His favorite part about his internship has been having the opportunity to work closely with engineers and directors and to expand his professional network. Throughout this internship, he has developed skills to delineate the drainage areas accurately and effectively, completed preliminary design reports and provided pipe replacement recommendations. Hadi's biggest challenge has been working virtually; more hands on work and field experience would benefit an emerging hydraulics engineer. Despite this challenge, Hadi has gained a newfound appreciation for hydraulics and can see himself in a career working in hydraulics.

Hadi Khoury

Raven McLaurin is a senior at North Carolina State University pursuing a bachelor's degree in environmental engineering with a double minor in journalism and business administration. She discovered this internship through her school, and previously interned with the NCDOT during her freshman year. She has been working with the Stormwater Management Program and has enjoyed all of her experiences, especially working in the field. Her favorite project has been completing site assements for potential stormwater control measure retrofits at the Century Center campus. She enjoys working with a group of interns who are learning with her, not feeling alone in her experience. Her most memorable experience was completing field work in the Asheville area to support BridgeWatch, a web-based monitoring software to help with preparation, management, and response to potentially destructive events. She has learned great communication skills, built her networking pool and learned how to operate programs effectively and accurately throughout the course of her internship. Raven is under consideration for NC State University's "4+1" master's program, where she will be able to obtain a master's degree in one year. This internship has motivated her to study hydraulics, where she hopes to pursue a career working with the NCDOT.

Gavin Mouat is also a senior at North Carolina State University pursuing his bachelor degree in environmental engineering. He discovered this internship through LinkedIn while searching for internships in his respective field. Gavin was unsure about what the internship would fully entail, but was excited to learn as much as he could. He is thrilled he didn't let his apprehension get in the way, as he has learned exactly what an environmental engineer does and the importance of the Hydraulics Unit's work. He has enjoyed working with the BridgeWatch program, as he has been challenged to be a leader and tackle projects with no prior experience. His favorite experience has been traveling to Asheville to collect data that will be used to help analyze and predict flooding. He has learned the importance of communication skills and believes this internship has allowed him to grow as a professional. Gavin is unsure about having a career in hydraulics, but is thankful and appreciative of the lessons he learned through the NCDOT.

Jewel Manuel-Nelson is a senior at North Carolina Agricultural and Technical State University pursuing a bachelor's degree in civil engineering. She found out about the internship through the Office of HBCU Outreach and was familiar with the NCDOT as representatives from the department attended job fairs at her school. She has enjoyed her internship, as everyone has been helpful, making sure she gets the most out of it. Although she has been working from home, her favorite part has been the strong collaboration with the department. This internship has taught Jewel that she prefers to be in person, as she misses the opportunity to work in a profesional setting and engage with people. Her favorite experience has been working with MicroStation. Jewel believes this internship allowed her to gain a better perspective of the Hydraulics Unit and how vital it is for North Carolina. She is most excited about taking skills like analyzing precipitation with her. After graduation, Jewel plans on pursuing a career in hydraulics as she has been postively affected by this internship.

Gavin Mouat & Joseph Hanks @ NCSU Research Facility

(Continued on page 3)

(continued from page 2)

The Hydraulics Unit allowed growth and gave meaningful experience to all of the interns. They were able to participate in the Alternative Swale Linings project, partnering with North Carolina State University. This project consisted of removing sod from existing research swales and replacing with either native grass vegetation or rip rap. North Carolina State University's Department of Biological and Agricultural Engineering will run water quality tests through the swales and determine the effectiveness of each for stormwater treatment.

They learned skills that can be carried not only through school, but also as they develop their profesional careers. The experiences that they shared allowed them to gain a new perspective into the Hydraulics Unit, teaching them the importance of the industry as it pertains to the growth and success of the state. With full appreciation, the hydraulics interns will take these new skills wherever their future career path leads them.

Jordan Gaither, Raven McLaurin, Joseph Hanks and Gavin Mouat

Coming Soon! Merger Process Updates

By: Ken Gilland, HNTB and NCDOT Environmental Policy Unit staff

NCDOT's Environmental Policy (EPU), Environmental Analysis (EAU), and Project Management (PMU) Units are working with the Federal Highway Administration (FHWA), the US Army Corps of Engineers (USACE), and the North Carolina Division of Water Resources (NCDWR) to update the Merger Process Memorandum of Understanding (MOU). The Merger Process is overseen by representatives of these agencies (known as the Merger Management Team [MMT]) to coordinate the requirements of the National Environmental Policy Act (NEPA) and Section 404 of the Clean Water Act (CWA). Merger is a collaborative process that enables NCDOT to consider all relevant environmental factors prior to applying for a permit to impact jurisdictional Waters of the United States. The Merger Process has been in use in North Carolina since May 1997.

The updated agreement simplifies the MOU, provides a framework to allow the MMT to easily update guidance documents as requirements change, and allows for a flexible project-specific approach to Merger.

The updated process begins with an NCDOT **Merger Pre-screening**. This simple form will allow projects to be quickly reviewed using NCDOT's ATLAS datasets to determine if a project has conflicting environmental resources or other issues and would benefit from the Merger Process. For most projects, this pre-screening will finalize Merger documentation; the completed form will be stored on the ATLAS Workbench during Stage 1 of the Project Delivery Network (PDN).

For those projects that may benefit from Merger, **Merger Screening** will be coordinated with FHWA, USACE, and NCDWR representatives and EPU as part of the Project Scoping Report completed in Stage 1 of the PDN. If it is determined the project would benefit from Merger, this meeting may also be used for getting for Merger Concurrence Point (CP) 1 (Study Area/ Purpose and Need).

Another new element of the Merger Process is the **Merger Plan**. In lieu of the former rigid Process I/II/III requirements, NCDOT staff (mainly Project Managers and EPU) will develop a project-specific Merger Plan with FHWA, USACE, and NCDWR representatives providing guidance and support. The plan is designed to be a living document that can flex to the project team's needs. The Merger Plan includes:

- Required Merger Team members,
- Identified studies expected prior to each CP,
- Criteria for Evaluating Alternatives (if needed), and
- Anticipated schedule and meeting format.

The agreement standardizes **Public Involvement Requirements** for projects in Merger. USACE requires public engagement prior to agreement on the Least Environmental Damaging Practicable Alternative (LEDPA) at CP 3. By following the revised guidance for public involvement, which includes disclosing specific information and including standard language,

NCDOT and USACE will eliminate the requirement for a Merger Permit Application.NCDOT is working with the MMT to finalize the agreement and is developing virtual training modules. It is anticipated that the initial trainings will be held in the Fall of 2021. The trainings will be uploaded to the NCDOT Connect site after the original trainings are held. Please send any questions or comments to John Jamison (EPU@ncdot.gov).

(View Point continued from page 1)

can offer expert assistance, and lastly advising and directing for multiple delivery methods.

"When you know better, you do better." I believe this catch phrase is at the heart of project management. As our partners identify issues, needs and concerns experienced on projects their insight gives us priceless experience to apply to future projects. This knowledge transfer is critical to the success of our project managers. I would like to thank all partners for the valued input and training you provide on a regular basis to our staff. I am hopeful that you will see this knowledge applied to our involvement on any future projects or processes.

Employee Spotlight

Known for bringing the bacon, there is more to Brian Overton than what he leaves on our dessert table. Brian is as local as it gets, telling anyone with ears that he walked to three neighborhood schools and worked at three jobs just up the road, "no more than six minutes away on a ten-speed bike." That is seriously local, all within a mile or two of NCDOT's Century Center. He has worked in the Environmental Analysis Unit in its various incarnations since 1999 and considers himself as the Official Archaeology Mascot.

For education, his diploma from Enloe High School up the road in 1992 is most notable according to Brian. He was voted as "most amiable" by his peers, but not "best looking" even though he requested a recount, but they said, "no, you just talk a lot to anybody." At Enloe, Brian was elected Emperor of the Sci-Fi/Fantasy Gaming Guild which was proudly listed on his application to college leading to his acceptance at NCSU. He truly values being in the magnet school wave when it began in Wake County, bragging nonstop about unbelievable opportunities offered.

Pushed on education, he mentions attending North Carolina State University (NCSU), matriculating in engineering and meeting an amazing person, Bonnie, in a dorm elevator where she told him, "I am good at all things except judging personalities." Transferring, blue days were spent outside of Raleigh at University of North Carolina—Chapel Hill. He reports wearing an NCSU hat everyday while residing in a dorm beside the Old Well and studying anthropology, graduating with a Bachelors of Art in 1995. He often returned to Raleigh to see Bonnie or work at Crabtree Valley Mall selling Star Trek t-shirts to fellow Trek fans.

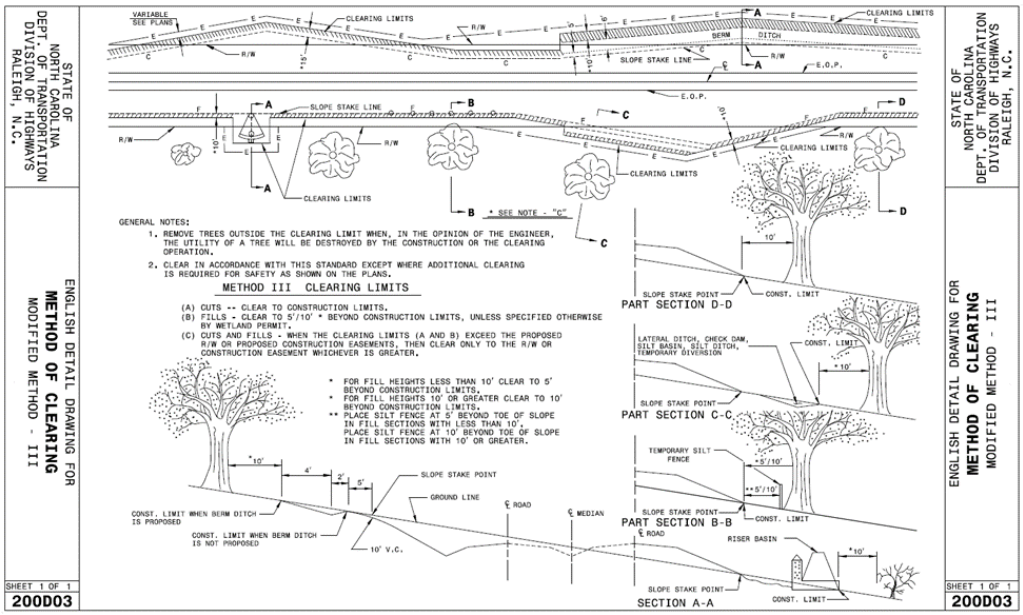
After two extended excavations on the Red Sea, Brian got a taste of NCDOT work in 1996 as an archaeological contract technician at a colonial site for a new US 17 Bridge (also starring Shane C. Petersen!!). He went to work under the tutelage of NCDOT Archaeology Supervisor Tom Padgett at the Highway Building in 1999 and a year of undocumented probation later was hired as an archaeologist with NCDOT's Project Development and Environmental Analysis Unit. He works with highly tolerable coworkers, a professional and productive staff with over 150 years of combined experience.

While Brian may suffer from mild neurocognitive impairment from an unfortunately long stretch of untreated Lyme disease in 2000-2001 he has never let that let him stray from working hard. After his recovery in 2001 he stacked up work on archaeological sites of all sorts, those with stone tools, involving Global Positioning System/ Geographical Information System (GIS) mapping, farmsteads, and many cemeteries, mills and ice houses around the state before a geospatial emphasis turning point in his research.

He has contributed to multiple collaborative initiatives with partnering agencies. He is one of two Environmental Analysis Unit safety wardens and helps with vehicle maintenance. He revels in problem solving and finds joy in maps. Historic maps and old aerials partner well with GIS data, enhancing our knowledge and project context which leads to informed decisions and saves time.

Brian lives in Cary, the town where he first saw an entire aisle of bottle water and where he drinks lots of black coffee. Bonnie, from the elevator, did say yes to marrying him after first crying for ten minutes following his proposal. They live with two happy daughters that she named, thankfully, and not Brian's suggestion which was Bacon and Sizzlean.

(Division Spotlight continued from page 1)



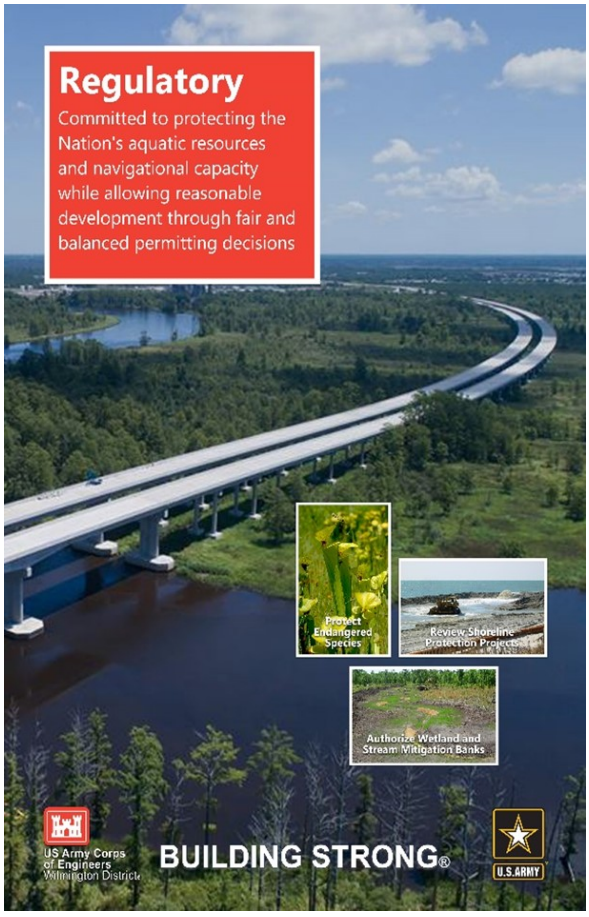
award-winning project. Project review meetings were held monthly with NCDOT, its contractor, and the regulatory agencies. This provided an excellent opportunity to discuss permit compliance, constructability concerns, and erosion control challenges with all vested parties. These monthly meetings helped to build a strong and cohesive working relationship that enables all parties to work together to overcome challenges and complete an outstanding project on schedule.

One of the biggest accomplishments on this project was the innovative design of the work trestle that reduced temporary wetland impacts by 50%. The project was originally permitted to have work trestles installed on the outside of the twin 7,200 ft-long main bridges. The project team was able to modify the trestle design to go between the twin structures, minimizing the overall clearing width required to construct these bridges in this pristine riverine cypress floodplain. The contractor also developed an innovative process to minimize the length of trestle required to be installed at one time by utilizing a "leapfrog technique." By scheduling concurrent operations, the project team was able to remove and advance a section of the trestle as they completed a section of the bridge, utilizing the constructed bridge deck to deliver supplies and materials. This technique substantially reduced the amount of time of shading created by the work trestle, which allowed the vegetation to reestablish quicker and thicker when compared to the effects of shading where a trestle has been in place for an extended period.

This project was also constructed during a period of record rainfall events in the southern coastal plain. With fill heights exceeding twenty feet in many locations, erosion control measures were often overwhelmed, resulting in sediment releases into jurisdictional resources. The project team got together to assess the issue and developed a plan to address it. The project team determined that, with the silt fence being placed only a couple of feet from the toe of slope as shown on the erosion control plans, there was inadequate storage for sediment at the toe. A new method of clearing was developed which would allow additional sediment storage by allowing erosion control measures to be set further off the toe of slope and minimize additional impacts to the maximum extent practicable. The new method of clearing was named Modified Method III.

Modified Method III authorizes mechanized clearing five feet beyond the construction limits where fill heights are less than ten feet, and mechanized clearing ten feet beyond the construction limits where fill heights are ten feet or greater. This allows erosion control measures to be placed just inside the mechanized clearing limits, allowing five to ten feet of sediment storage beyond the toe of fill. With the regulatory agencies on board with this plan, a permit modification was acquired, and Modified Method III was implemented on the project. Immediately after the plan was implemented and completed, the number and sizes of sediment releases reduced dramatically. Modified Method III was deemed successful by the entire project team. It reduced substantial impacts to jurisdictional resources from sediment releases and recovery and produced a time and cost savings to the contractor for erosion control maintenance. Modified Method III has been implemented on several other projects within the Division with great success.

The Wilmington Bypass project is an excellent example of what can be accomplished when NCDOT, contractors, and regulatory agencies work together for a common goal: to produce an award-winning and environmentally friendly project.

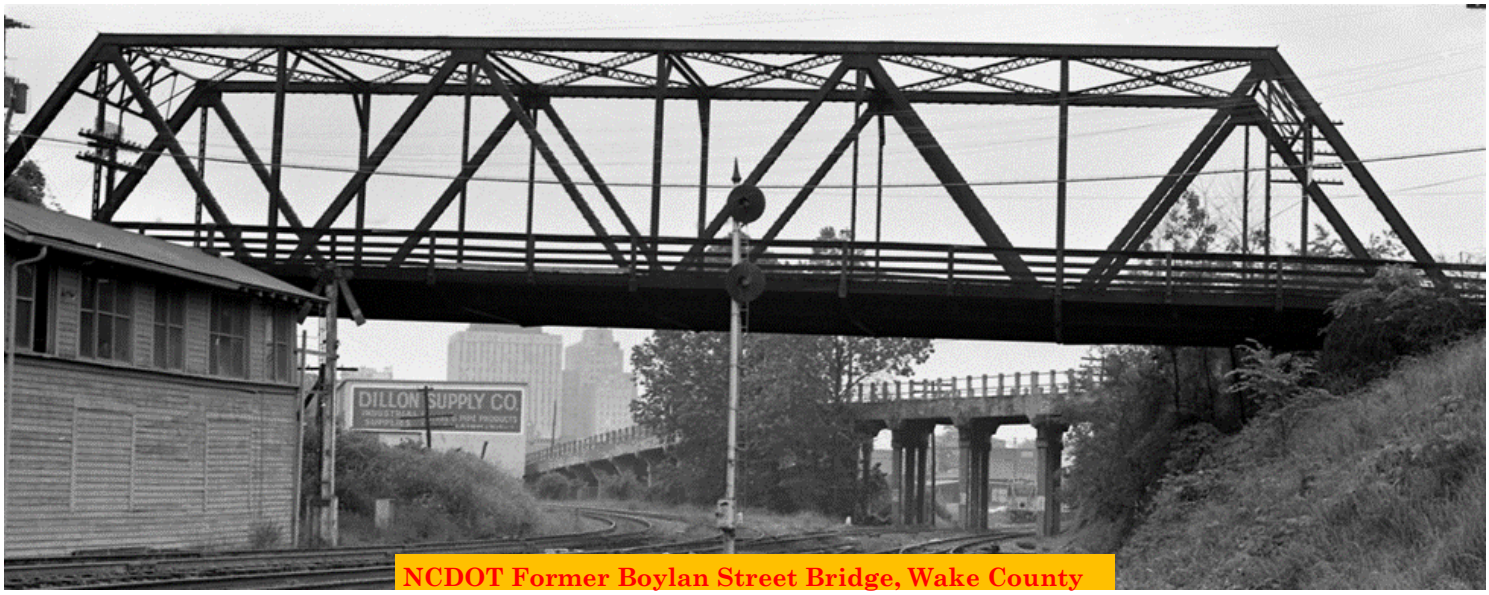


Historic Bridge Surveys to be Updated

By: Shelby Reap, NCDOT EAU Historic Architecture Group

Technical Article

In 2005, the Historic Architecture Team contracted Liechtenstein, Inc. to document the historic bridges in NC. They documented over 5000 bridges built before 1965. More than 200 of those bridges were determined eligible for the National Register, either individually or as a contributing resource to an existing Historic District. That data set has been invaluable to our work complying with Section 106 of the National Historic Preservation Act of 1966, as amended. When screening bridge replacements and some other projects we can quickly reference the data to see if the bridge has already been evaluated, which helps projects move along more quickly.



NCDOT Former Boylan Street Bridge, Wake County

Not to freak anyone out, but 2005 was 15 years ago! The existing Historic Bridge Survey is getting old. So the Historic Architecture Team can keep up with the times, we have contracted Mead & Hunt to update the survey. The firm will be looking for eligible bridges between the years 1966 and 1985. While Mead & Hunt are sorting the data, they will identify bridges that were eligible but have been replaced. A few of the bridge replacements resulted in the historic bridge being adopted and sometimes moved by towns or special groups. For example, Lake Lure adopted Rutherford County Bridge Number 52 and transformed it into The Flowering Bridge. Another example, the Green Street Bridge, or Pitt County Bridge Number 411, was adopted by the city of Greenville for use as a pedestrian bridge and dramatic entrance into Tar River Park.

The Flowering Bridge

Mead & Hunt completed Historic Bridge Surveys for many states including Georgia, Louisiana, and Texas. They will incorporate interviews with NCDOT staff who have experience with bridge building, as well as some of our consultant firms. In addition to documenting and evaluating our bridges, Mead & Hunt will provide a historic context that will distill the evolution of bridge construction, engineering, and innovations during the time period; detail what types of bridges are significant and what makes them significant; and provide information on the kinds of materials that were used.

The project is slated for completion in November 2023. The Historic Architecture Team is looking forward to learning which bridges are rare and distinguished examples through the state. If you would like to contribute your experience, please contact me at slreap@ncdot.gov

(Continued on page 7)

(Technical Article continued from page 6)

**Did you know we have a searchable website for our eligible bridges? Filled with fascinating information about the history of bridge construction in NC, descriptions of bridge types, and of course, great photographs of the bridges. The Historic Bridge Survey is also a great resource for school kids who may be looking for a subject for a report.

Green Street Bridge, Pitt County

Cape Fear Memorial Bridge, New Hanover County

Newest Wake County Noise Walls

By: Missy Pair, PE, NCDOT EAU Traffic Noise & Air Quality Group

Project Spotlight

I'm very enthusiastic about the noise walls currently under construction along the I-40 widening project in Wake and Johnston counties (I-5111 and I-4739) for several reasons. First, they are the first noise walls to be constructed that were approved since

Sunnybrook Road

I've been in this position, and it's always thrilling to see the paperwork become infrastructure. Second, some of the walls are a mere stone's throw from Century Center, so it's easy to observe construction frequently. And third, it is one of the first projects in the state to use an absorptive noise wall product. The product is Durisol (a similar, competing product is made by Faddis) and while it has been used widely on other states, it is new to us. We were in need of a product like this, so I'm eager to see how it looks and performs.

This is a large noise wall job, with 10 noise walls totaling 420,189 square feet over the two projects. They are found along:

- Westbound I-40, west of the I-440 interchange near Belafonte Drive
- Eastbound I-40, west of the I-440 interchange near Southgate Drive
- Westbound I-440 just west of Sunnybrook Road, near Briarmont Court (combined earth berm/noise wall)
- Westbound I-40 to westbound I-440 ramp near Sunbright Lane
- Eastbound I-40 south of Rock Quarry Road
- Westbound I-40 south of Rock Quarry
- Eastbound I-40 just south of US 70 (near Abberly Place Apartments)
- Eastbound I-40 just south of White Oak Road (near Battle Field Drive)
- Westbound I-40 just south of Cleveland Road
- Eastbound I-40 north of Cornwallis Road.

These walls will benefit a total of 451 homes (single family houses, apartments, and townhomes), one pool, and one park. A wall "benefits" a noise sensitive land use if it provides a 5 decibel reduction for that location under design-year loudest hourly traffic conditions.

The importance of absorptive noise wall materials. Most modern NCDOT noise walls are made of concrete – precast concrete piles and precast concrete panels that are slid in. Noise walls (or retaining walls) made of standard concrete reflect sound waves instead of absorbing them. This can cause a problem in certain situations. When two noise walls (or a noise wall and a retaining wall) are across from each other at a fairly close distance relative to their height, reflected sound waves can reach homes behind one or both noise walls and degrade the acoustic performance of one or both walls. Or when there is a noise wall across the highway from a neighborhood that didn't qualify for a noise wall, sound reflections off the noise wall may generate noise complaints due to the perception that the reflected sound makes it louder for the non-abated community. Research shows that in a case like this, noise levels due to reflection aren't noticeably louder, although the nature of the sound may change in a way that might be bothersome.

The way to solve problems caused by sound reflection is to use an absorptive noise wall material. Absorptive products preserve – and can even enhance – the acoustic performance of opposing noise walls. Durisol and the similar Faddis product are both concrete panels, but with wood pulp or chips mixed in to create a rougher-textured surface that interferes with sound wave reflection.

(Project Spotlight continued from page 7)

Congratulations Jason Dilday

Congratulations to Jason Dilday for his recent promotion to the Environmental Program Consultant position within the Environmental Analysis Unit's Environmental Coordination & Permitting (ECAP) Group. Jason has been with ECAP for 15 years and has over 25 years of State service. Jason is a skilled biologist, yet also consistently juggles the environmental coordination for some of our most complicated projects. This position will be shared between the Eastern and Western Regional teams of ECAP to assist with state-wide projects and regional project balancing.

ATLAS Receives National Recognition

Advancing Transportation through Linkages, Automation, and Screening (ATLAS) was selected by the Urban and Regional Information Systems Association for the Exemplary Systems in Government award as a Distinguished Enterprise System. ATLAS was one of only two selected in the nation. Systems in this category are outstanding and working examples of using information systems technology in a multi-department environment as part of an integrated process. These systems exemplify effective use of technology yielding widespread improvements in the processes and/or services involved and/or cost savings to the organization.

The award will be officially recognized at the 2021 GIS-Pro Conference in Baltimore, MD in October.