

August 18, 2023

Henderson County
Attn: Marcus Jones, PE
1 Historic Courthouse Square
Hendersonville, NC 28792



RE: Henderson County Ecusta Rail-Trail Letter of Interest

Dear Mr. Jones,

One of the parts of my job I love is the ability to collaborate with communities in the development of region-changing projects. The Ecusta-Trail has the ability to transform the communities it is connecting while also generating economic development. Bringing people together with nature and promoting outdoor activity are some of the great benefits of trail networks. **STEWART** is hopeful for the opportunity to work with Henderson County and its stakeholders with the implementation of the next phase of the Ecusta Trail.

Firm's Interest

Stewart's interest in this project is based on our experience successfully delivering planning and design projects to our clients statewide, available manpower to undertake this project, and our desire to provide quality services to Henderson County. The depth of services and experience that Stewart brings to each project that we work on makes project delivery easier and faster.

Most Recent Private Engineering Firm Qualification / Register

We are on register, and the dates of our most recent pre-qualifications are:

Stewart April 2023 HUB	VHB July 2023	Terracon May 2023
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No Conflict of Interest

Upon review of the requirements for performing the services necessary for this project, no member of the Stewart team has found any personal or financial conflicts of interest on the part of any officers or employees.

Summation of Information

Several factors combine to make the Stewart team the best choice for your project:

- **Focus on Quality and Delivery** – The Stewart team prioritizes delivery of our client's needs with high quality deliverables ahead of schedule. We regularly received evaluations of 8+ to 9+ on a scale of 1 to 10 before NCDOT revamped the evaluation process. Now, with the new scale, Stewart continues to receive high marks from our various NCDOT clients. Our highest marks are usually in the meeting schedule and responsiveness categories.
- **Experienced Project Leadership** – Stewart has a wide variety of projects we have managed throughout the years. I will serve as Principal in Charge. I have more than 20 years in the Transportation Industry collaborating with various municipalities and private partners. Our project manager, Michael Burns, has 10 years of experience coordinating similar projects at Stewart.
- **Strong Experienced Team** – The Stewart team brings many years of experience working together on multifaceted projects to deliver assignments. The experience of Stewart's staff allows us to create a team that will bring new ideas and "out of the box" thinking.

Stewart is very excited for the opportunity to provide services to Henderson County for the Ecusta Rail-Trail. Please do not hesitate to call me at **919.866.4803** or email me at **ayoung@stewartinc.com** if you have any questions or comments. We look forward to your favorable consideration.

Sincerely,
STEWART

Andy Young, PE
Associate Vice President | Practice Leader, Transportation

Firm's Contact Person:
Andy Young, PE
919.866.4803 • ayoung@stewartinc.com
223 S. West St. Suite 1100
Raleigh, NC 27603

CRABTREE CREEK WEST GREENWAY
CITY OF RALEIGH



LOCATION
Raleigh, NC

CLIENT/OWNER
City of Raleigh
Parks and Recreation Dept
Lisa Schiffbauer
Capital Projects Sr. Supervisor
PO Box 590
Raleigh, NC 27602
919.996.4785
lisa.schiffbauer@raleighnc.gov

DATES
Start: 2014
Completion: Design Complete

DISCIPLINES
Public Involvement
Surveying, Hydrology
Greenway Planning & Design
Civil Engineering
Geotechnical Engineering
Construction Materials Testing
Structural Engineering

PROJECT OVERVIEW

Stewart provided planning and design services for the project. The proximity to residential neighborhoods required a proactive approach to public involvement including two public meetings, social media, and a corridor walk-through with residents to provide a better perspective on the relationship between the greenway and proximity to their homes. This up-front transparent approach garnered much support for the project. Other services included GIS and field planning to establish a preliminary alignment, surveying, property acquisition support, NCDOT encroachment agreements, permitting, constructibility review, drainage, structure design, and construction access design.

Stewart created a design for the westernmost extension of the Crabtree Creek Greenway, which connects the Umstead State Park to the existing western trail terminus. Upon completion of this segment, the trail now extends 16 miles from Umstead State Park to the Neuse River.

FRENCH BROAD RIVER WEST GREENWAY
CITY OF ASHEVILLE



LOCATION
Asheville, NC

CLIENT/OWNER
City of Asheville
Dustin Clemens
70 Court Plaza P.O. Box 7148
Asheville, NC 28802
828.232.4580
dcllemens@ashevillenc.gov

DATES
Start: 2019
Completion: 2020

DISCIPLINES
Greenway Planning
Public Involvement, Surveying
Greenway Design
Flood Modeling
Environmental Resources
Landscape Architecture
Utility Coordination
Geotechnical Engineering

PROJECT OVERVIEW

The French Broad River Greenway connects French Broad River Park to an existing section of privately built greenway fronting the New Belgium Brewing Company at Haywood Road along a Duke Energy transmission corridor. This was the most challenging section of the greenway as there is a delicate balance between a no-rise result on the French Broad River flood model and maintaining access to transmission lines. The project required several rounds of public involvement, stakeholder facilitation, as well as extensive coordination with Duke Energy and New Belgium Brewing Company. The trail seamlessly integrates into the existing park and creates new public views of the River Arts District and Downtown.

SMITH CREEK GREENWAY PHASE 2
TOWN OF WAKE FOREST



LOCATION
Wake Forest, NC

CLIENT/OWNER
Town of Wake Forest
Suzette Morales
301 S. Brooks Street
Wake Forest, NC 27587
smorales@wakeforestnc.gov

DATES
Start (design): 2016
Completion (design): 2018
Start (construction): 2020
Completion (construction): 2026

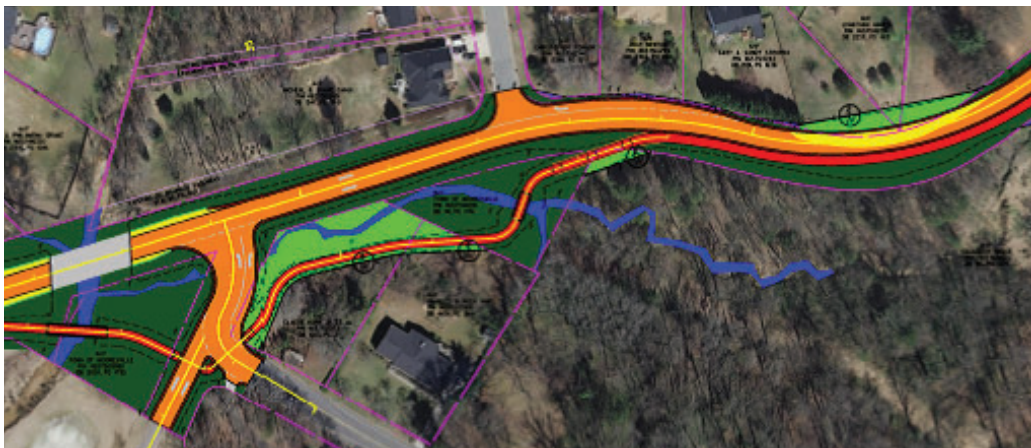
DISCIPLINES
Municipal Planning
Public Involvement
Geotechnical Engineering
Geomatics
Structural Engineering

PROJECT OVERVIEW

Stewart was selected to prepare construction documents for both phases of Smith Creek Greenway in Wake Forest. Combined, this 2.7-mile 10'-wide asphalt greenway corridor included two bridge structures, 1,300 linear feet of timber boardwalk and a parking lot trailhead.

This phase consists of 1.1 miles of greenway trail and trailhead with parking to provide connection between existing trails. This segment will provide a connection from Ligon Mill Road, south, to Burlington Mills Road. This trail will connect to the southern portion of the existing Smith Creek Greenway and ultimately to Raleigh's Neuse River Greenway via the Wake Forest Connector bridge. The trailhead will also be developed with parking on Ligon Mill Road near Song Sparrow Drive.

W. WILSON/W. MCLELLAND STREET IMPROVEMENTS
TOWN OF MOORESVILLE



LOCATION
Mooresville, NC

CLIENT/OWNER
Town of Mooresville
Jonathan Young
413 North Main St.
Mooresville, NC 28115
704.799.4065
jyoung@ci.mooresville.nc.us

DATES
Start: 2016
Completion: 2020

DISCIPLINE
Roadway and Hydraulic Design
Geotechnical Investigations
Traffic Control
Erosion Control
Pedestrian Structure Design
Survey

PROJECT OVERVIEW

This project included upgrades to two streets in the Town of Mooresville to provide complete street gateway entrances going into the Town. The designs had to be context sensitive to the area while providing pedestrian connectivity and an aesthetic design within the existing right of way constraints. Stewart served as the prime consultant on these projects that include surveys, roadway and hydraulic design, geotechnical investigations, traffic control, erosion control and pedestrian structures.

ORGANIZATIONAL CHART

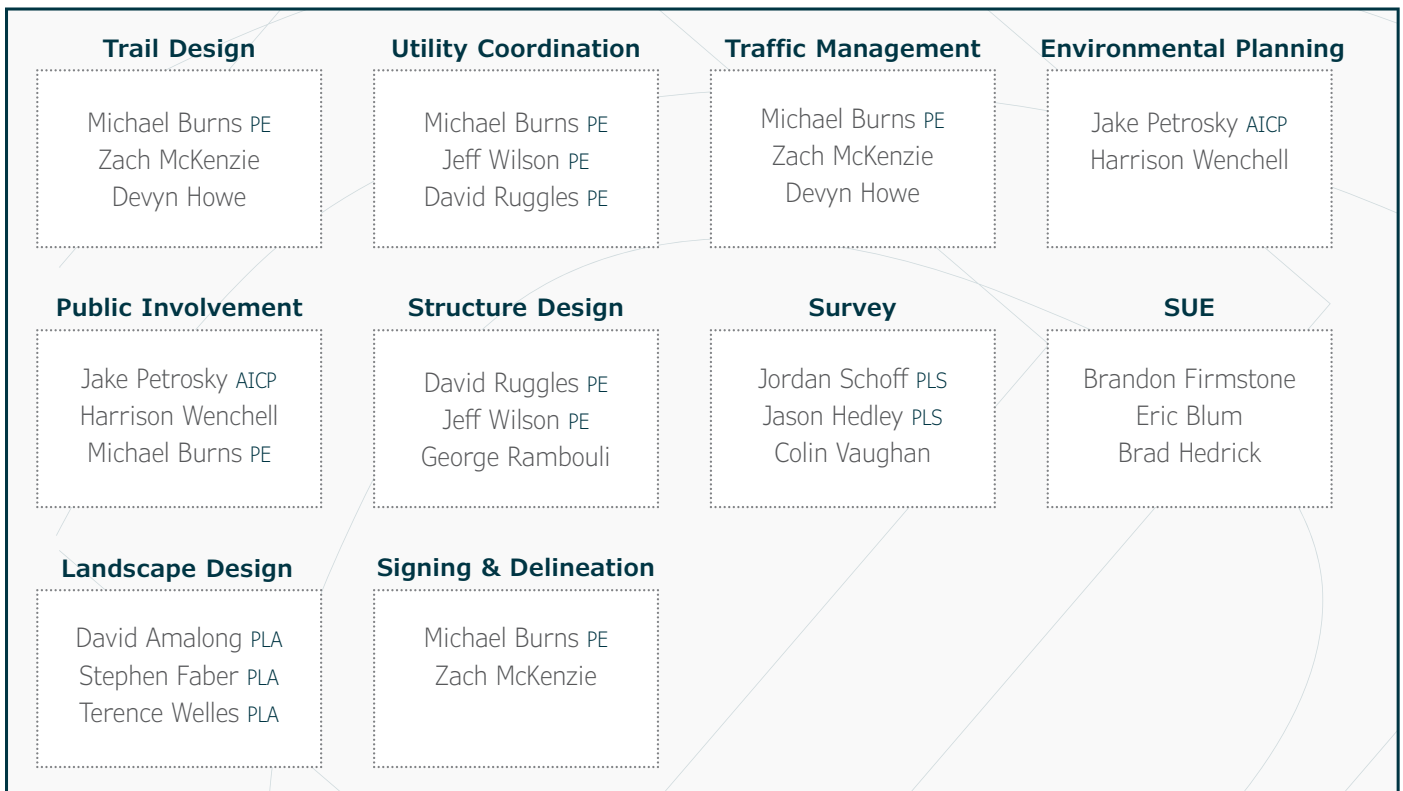


ANDY YOUNG PE
PRINCIPAL-IN-CHARGE



MICHAEL BURNS PE
PROJECT MANAGER

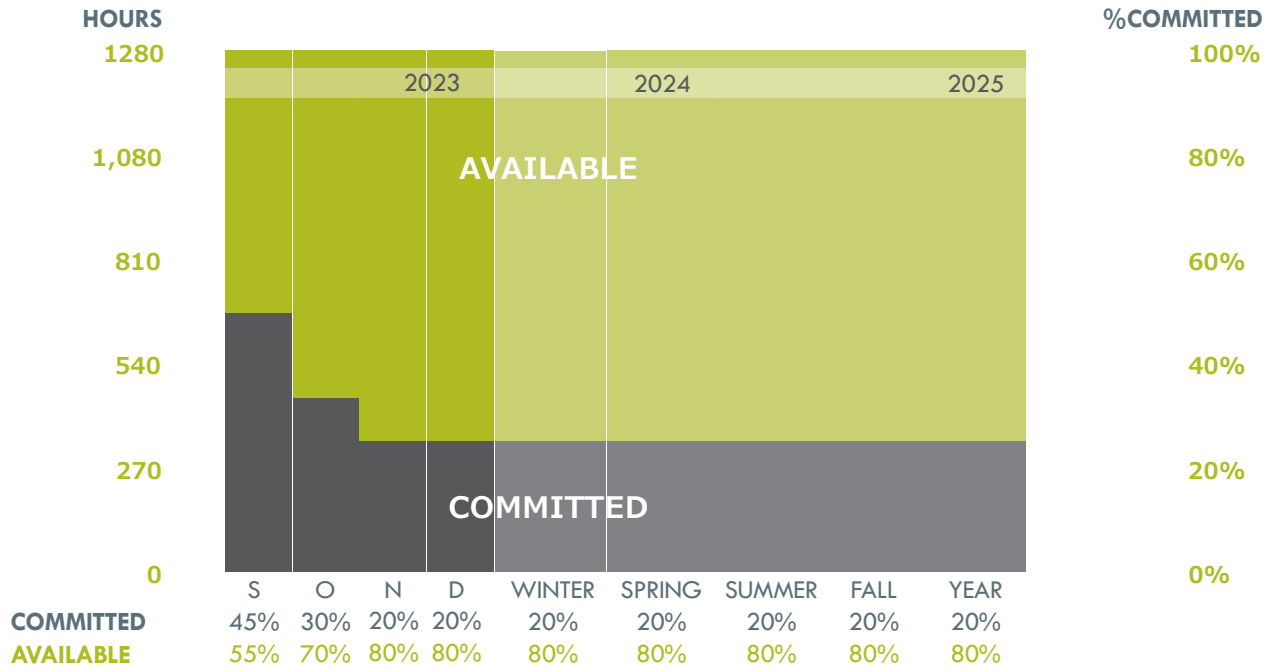
STEWART



SUB-CONSULTANTS



CAPACITY CHART



Andy Young, PE (Principal in Charge) has extensive experience working with NCDOT.

Andy has more than 20 years in the Transportation Industry collaborating with DOT, Municipalities and Private partners. His responsibilities include overseeing the Transportation Practice at Stewart which provides Environmental Planning (Human, NEPA / SEPA), Roadway Design, Traffic Management, Greenways, Signing & Delineation (Pavement Markings), and Structures (Bridge, Culvert, Boardwalks, Retaining Walls). With his knowledge, experience, and expertise, he assists staff with technical resources, problem solving, project management and quality control & assurance. He encourages designs that are value engineered along with context sensitive solutions. He is well-versed in AASHTO Guidelines, Complete Streets Guidelines, NCDOT Standards, NCDOT Policy and Procedures, and Bentley Programs.

KEY PERSONNEL

Personnel	Location	Classification/role	Resources to be Assigned
Andy Young, PE	Stewart - Raleigh, NC	Principal-in-charge	
Michael Burns, PE	Stewart - Raleigh, NC	Project Manager / Trail Design / Traffic Management, Signing & Delineation	155, 247, 269, 316
Devyn Howe	Stewart - Charlotte, NC	Trail Design / Traffic Management	247, 269, 316
Zach McKenzie	Stewart - Raleigh, NC	Trail Design / Traffic Management, Signing & Delineation	155, 247, 269, 316
George Rambouli	Stewart - Raleigh, NC	Structure Design	23, 24
Harrison Wenchell	Stewart - Raleigh, NC	Environmental Planning / Public Involvement	32, 63, 171
David Ruggles, PE	Stewart - Raleigh, NC	Structure Design / Utility Coordination	23, 24, 270
Jeff Wilson, PE	Stewart - Raleigh, NC	Structure Design / Utility Coordination	23, 24, 270
Jake Petrosky, AICP	Stewart - Raleigh, NC	Environmental Planning	32, 63, 171
Jordan Schoff, PLS	Stewart - Raleigh, NC	Survey	199, 316
Jason Hedley, PLS	Stewart - Raleigh, NC	Survey	199, 316
Colin Vaughan	Stewart - Raleigh, NC	Survey	199, 316
Brandon Firmstone	Stewart - Raleigh, NC	SUE	235
Eric Blum	Stewart - Raleigh, NC	SUE	235
Brad Hedrick	Stewart - Raleigh, NC	SUE	235
David Amalong, PLA	Stewart - Charlotte, NC	Landscape & Streetscape Design	132
Stephen Faber, PLA	Stewart - Durham, NC	Landscape & Streetscape Design	132
Terence Welles, PLA	Stewart - Durham, NC	Landscape & Streetscape Design	132
Jeremy Dierking, PE	Terracon - Asheville, NC	Geotechnical Engineer	294, 295, 296, 297
David Corley, PE	Terracon - Charlotte, NC	Geotechnical Engineer	294, 295, 296, 297
Frank Fleming, PE	VHB - Raleigh, NC	Hydro/EC	70, 433, 434
Brandon Barham, PE, CFM	VHB - Raleigh, NC	Hydro/EC	70, 433, 434
Miranda Salzler, PE, CFM	VHB - Raleigh, NC	Hydro/EC	70, 433, 434
Lane Sauls	VHB - Raleigh, NC	Natural Resources	243, 280
Heather Smith, LSS	VHB - Raleigh, NC	Natural Resources	243, 280
Jody Lewis, PE	VHB - Raleigh, NC	Signal Design	207
Matt Stygles, PE	VHB - Raleigh, NC	Signal Design	207
Kevin Fisher, PE	VHB - Raleigh, NC	Bridge Inspection	143
Kyle Smiach, PE	VHB - Raleigh, NC	Bridge Inspection	143
Erin Murphy	VHB - Atlanta, GA	Historic Architecture	106
Derek Anderson	VHB - Atlanta, GA	Historic Architecture	106

* Per email from the County, Codes 289, 332 and 338 have been removed.

TECHNICAL APPROACH

PROJECT UNDERSTANDING AND APPROACH

PROJECT UNDERSTANDING

The Ecusta Rail-Trail is an approximately 19-mile abandoned rail corridor that has been purchased with the intent of converting this to a Greenway or Trail from Brevard to Hendersonville. The project has been divided into sections with this project being contained from the Transylvania / Henderson County Line to Horse Shoe.

This project was recently awarded a federal grant of \$21.4 million and \$24.5 million (Brevard & Henderson Counties to share). The project will receive oversight from NCDOT due to the project funding.

Our typical section for the greenway would consist of a 12-foot and 14-foot wide asphalt path with 2-foot turf shoulders on each side. Along the area of the First Broad River, we would propose a split rail fence to provide safety and depending on Geotechnical Investigations, 1.5:1 slopes with rock plating for stability.



Stewart recently completed a project very similar to the Ecusta Rail-Trail for the City of Asheville, French Broad Greenway. This project had the French Broad River in close proximity and the need to obtain a No-Rise MOA from the Army Corp. The use of retaining walls was also utilized due to the existing topography in the area.

The goal of this project is to provide a pedestrian link between Brevard and Hendersonville which will allow for future parks and additional greenway sections along the Trail while remaining context-sensitive for both the Human and Natural environments.

PROJECT APPROACH

Stewart believes in a true partnership with its clients. We look to be an extension of Henderson County Staff and work as a Team to obtain a final product that users will love and all can be proud of. Our work would start

with a meeting with Henderson County to help identify project needs, wants and stakeholders. From this point we would move into concurrent work of reviewing topographic surveys and SUE information. We would start the Data Gathering for Planning Environmental Document, Survey of Natural Resources, and wetland / stream delineation. This front-end work will be used to help better understand both the Human and Natural Environment concerns along the project corridor.

Greenway trails require a rigorous balancing of a multitude of factors to develop a design that can be permitted, is within the right of way that is or will be acquired, is safe for users, respects the natural environment, avoids or relocates utilities, and is within the budget identified at the outset of the project.

Following an initial kickoff meeting where project stakeholders meet to discuss the design process, schedules, and expectations, we will begin the process of data gathering. This is when our team of greenway planners starts the front-end work. Stewart will assemble existing GIS data to perform a preliminary analysis of topography, environmental constraints, utilities, and access. We will develop a mapping for the environmental document that includes natural and human environmental resources/constraints that have been identified during data collection or utilizing available GIS data. Our alternative analysis will be limited due to the limited space, but our documentation and recommendations will allow stakeholders to fully evaluate the options we present and make the best alternative decision to carry forward. With federal-aid funding through NCDOT being used, we have the experience with NCDOT to understand the environmental documentation needs for this project.

From this point, we would start the project design layout. Our initial design would follow the typical section previously discussed and run this along the entire project limits. From here, we would be able to determine where boardwalks/pedestrian bridges may be needed and/or if horizontal shifts would be needed to help reduce impacts. Typically, boardwalks/pedestrian bridges are required to traverse wetlands and small creeks or drainage features. The structures engineer will coordinate very closely with the hydraulics engineer to ensure that the opening provided by the boardwalk satisfies hydraulic requirements and work with the environmental designer to ensure that wetlands are not impacted.

Boardwalk spans are typically from ten to twenty feet long depending on the size of the feature being crossed. The boardwalk can be provided with a wood, composite, or concrete deck. A concrete deck, although more expensive to construct, requires the least maintenance. A composite deck requires less maintenance than a wood deck although it will not support the standard live load vehicle load. A wood deck offers the least expensive option.

In addition, we would investigate areas where a Retaining Wall could be placed to allow for a regular earth embankment while keeping the slopes contained within the current right of way. Any proposed retaining walls would be placed to allow a minimum height of wall thus reducing the construction cost for the project.

For sites where a pedestrian bridge is required, the structure engineer will coordinate closely with the hydraulics engineer, greenway trail designer, and environmental designer to establish the required span length and profile. Once bridge ends are established, the geotechnical engineer will drill borings at abutment locations to establish soil profiles. The geotechnical engineer will analyze soil profiles at the site and provide recommendations for the foundation type required. With this information, the structure engineer will design and detail abutments and construction plans for the bridge. Quantities, cost estimates, and specifications will be generated as required. Bridge design and plans will be developed in accordance with stakeholder requirements and applicable codes and standards. Once acceptance is received on the design layout of the project we would start into the hydraulic design for the project.

In regard to the utilities, the potential areas for conflicts should be limited to the proposed trail crossings along existing roadways. Stewart would coordinate with the utility owners to determine if any conflicts with the proposed design exist and determine how to resolve the conflicts. Most likely the utilities are within the existing NCDOT Right of Way by encroachment. Because of this, the utility owner would need to relocate their facilities at their expense.

Since work will occur within NCDOT's Right of Way, an encroachment agreement with NCDOT will need to be obtained. Stewart has experience with local NCDOT, Division 14 Staff to assist with this procedure. On our past projects similar to this we worked with NCDOT early in the project to obtain concurrence, so the encroachment agreement approval ran smoothly.

After the permits for the project and NCDOT encroachment agreements have been received, the utility owners will be released to complete their relocation of facilities. During this time, the plans will be finalized, and sealed and the bidding document will be prepared. The PS&E Package will be developed during the utility relocations and scheduled so the Bid Opening or the Date of Availability will align with the conclusion of the utilities being relocated.

Some items Stewart can provide but were not included in the Request for Qualifications would be the following:

- Signing
- Structure Design

DISCIPLINE SPECIFIC SCOPE

SURVEY / SUE

Survey Standards and Specifications

All survey services performed by Stewart will be completed based on the Standards of Practice for Land Surveying in North Carolina. Standards for the provision of baselines will follow the North Carolina DOT's Location and Surveys Baseline Guidelines. The survey will be horizontally tied to the North Carolina State Plane Coordinate System under the North American Datum of 1983 (NAD83). Vertically, the project will be tied to the North American Vertical Datum of 1988 (NAVD88). Coordinates can be presented as either grid or localized coordinates. The project's unit will be the U.S. Survey Foot.

Stewart provides scanning and remote sensing as needed which can be utilized for refining ground data for subsequent digital terrain modeling, collecting hydrographic information, and for verifying horizontal and vertical positioning on hard surfaces (pavement, curb points, etc.). Other planimetric features can be collected and/or verified using these remote sensing methods.

Research

Stewart will conduct property research and will collaborate and coordinate with the client and partners to collect and use all documentation provided as it pertains to deeds and easements of record. Once deeds, easements, and plans have been researched and identified, processes for property owner contacts and outreach will be determined.

Control Survey

At least two control points will be set and tied to the North Carolina Grid System via the use of GPS survey grade receivers. These points will be located on or near the project site. Control points will be designated on all mapping and plans to allow for future retracement and to ease inclusion into the City of Hendersonville's GIS geodatabase if desired. When appropriate, control points for aerial photography or other remote sensing methods will be observed with GPS to facilitate mapping using photogrammetric and aerial acquisition methods.

Design Survey

Stewart will survey the property boundaries of the subject parcels as well as for adjacent roadway rights-of-way and adjacent parcels to accurately depict existing property lines within the project limits. These measurements will be used to find property field boundary monumentation positions. Using this field data, the existing property record data acquired above will be analyzed with consideration for associated field positions to determine property boundary and right-of-way locations throughout the project area. Record data will be acquired from sources to include the County Register of Deeds, the Owner, and other available sources that describe the Owner's parcel as well as adjacent parcels throughout the survey area. These documents will then be analyzed and where appropriate compared accordingly to illustrate property dimensions, descriptions, and "called for" monumentation.

Stewart will perform an existing conditions survey to include existing improvements and surface features that will be located by the survey including but not limited to buildings, parking areas, sidewalks, concrete pads, curb/gutter, paving, pavement markings in parking lots and streets, driveways, street signage, walls, fences, ditches and visible improvements within the project area. The exterior of buildings within the project area will be dimensioned. Edges of wooded areas will be field located. Individual trees within wooded/natural areas will not be field located and are specifically excluded from this proposal.

Visible above-ground evidence of utilities including power poles, fire hydrants, traffic control, valves, etc. will be located by the survey. Corresponding top, bottom, and inverted elevations of storm and sanitary structures that are accessible and without the need for confined space entry will also be recorded. Pipe sizes entering and exiting these structures will also be noted where accurately attainable. Storm drainage and sanitary systems will be traced and located to one structure beyond the survey limits of the project.

To locate non-gravity utilities in the project area, Stewart will perform a Subsurface Utility Engineering (SUE) investigation to include Quality Level B (utility designation) services. Radio-frequency electromagnetic technology will be used to designate the approximate horizontal location of underground utility lines within the project area. These locations will be painted, field sketched, and surveyed. All work will be performed in close coordination with utility owners, and available utility maps from these owners will be used for this project if available. Although SUE methods provide a high level of assurance for the location of subsurface utilities, the possibility exists that not all features can be identified. Therefore, due caution should be used when performing subsurface excavations where potential conflicts exist, and Stewart will not be liable for any damages that may occur.

PLANNING – ENVIRONMENTAL PLANNING DOCUMENT**Data Collection**

The following information will be reviewed and updated if needed:

- The existing and proposed land use in the vicinity of the project
- Project history, Rural Planning Organization, purpose and need, related studies, etc.
- GIS data from various sources including NCDOT and Cleveland County to support project studies.

Project Mapping

The CONSULTANT will update the following mapping as needed:

- Vicinity Map for the proposed highway improvement project. This map should illustrate the project location, other transportation facilities in the project area, and other projects in the vicinity. The map will be provided in pdf format.
- Study Area Map for the proposed highway improvement project showing the study area boundary overlaid on aerial photography. This map will be provided in PDF format.
- USGS Quad Map to account for the revised study area limits. This map will be provided in PDF format.
- Environmental Features Map overlaid on aerial photography which identifies the updated project study area and natural and human environmental resources/constraints in the project study area that have been identified during data collection or utilizing available GIS data. The map will be provided in pdf format.

Start of Study Letter

Stewart will prepare updated individual Start of Study letters for distribution with the expanded study area mapping to federal, state, and local agencies, and other project stakeholders about the start of the project development phase. The letter will serve to solicit comments and collect pertinent project information for the restart of the project development process.

Data Requests

Stewart will prepare and submit the following updated data requests based on the study area to the Project Manager:

- Cultural Resources: Supporting documentation for the County to make a request in ETRACS for an initial screening of historic architecture and archaeology in the project area.

Environmental Document

1. Historic Effects - If any parcel is identified as being historic, the Consultant will work to minimize any impacts and complete the needed information to obtain a No Effect decision.
2. Draft Environmental Document
 - a. Prepare draft environmental document, including mapping and appendices.
 - b. Revise and submit draft environmental documents to disciplines/units for review.
3. Final Environmental Document
 - a. Prepare and submit final environmental document for signatures.
 - b. Distribute signed environmental document per EPU guidance.

GREENWAY DESIGN

30% Plan Submittal

Stewart will complete 30% Greenway Plans for the project and submit a copy of the plans in PDF Format. The Plans will be produced with the following criteria:

- Title Sheet
- Typical Sections required for the construction
- Preliminary Earthwork Summary Sheet
- Plan Sheets with Horizontal Design for all Alignments
 - Proposed design for the greenway
 - Horizontal curve data contained on the plan sheets
 - Preliminary slope stake lines
 - Superelevation with arrows shown and increment dimension
 - Delineation of wetlands and jurisdictional streams
- Profile Sheets with Vertical Design for all Alignments
 - Existing and Proposed profiles for the greenway
 - Vertical curve data contained on the profile sheets
- Cross Sections
 - Preliminary cross sections shall be shown for all proposed construction
 - Station label shall be provided below cross section template
 - Superelevation shall be labeled on all cross-section templates
 - Cross sections shall contain grid lines at (5 or 10) foot intervals
 - Cross sections will be completed at a 25-foot interval



Quantities will be tabulated for the 30% Greenway Plans to generate a probable construction cost. This shall only be produced after the acceptance of the 30% Plans.

Stewart will address any comments from Henderson County Water and provide a written explanation of how the comments were addressed. Once Stewart has received notification the 30% Plans have been accepted, the design will be released for Hydraulic Design.

60% Plan Submittal

Prior to submission of the 60% Plans, the drainage design shall be approved for the project. The Engineer shall prepare 60% Greenway Plans to include but not limited to the following:

- The location and size of all drainage structures and systems required for complete drainage of the project
- The location of slope stake limits and construction limits including berm or lateral ditches and channel changes shall be shown
- Details for all drainage ditches shall be included
- The existing right-of-way lines of public roads within the project limits
- Geotechnical Recommendations shall be incorporated into the plans
- Earthwork Summaries

NCDOT Encroachment Agreement

Stewart will submit/coordinate with NCDOT to obtain an encroachment agreement for the project. We will utilize NCDOT’s portal to complete this task and receive authorization.

100% / Final Roadway Plans

Stewart shall prepare 100% Greenway Plans to include but not limited to the following:

- Index of Sheets, List of General Notes, List of Standard Details, List of Special Provisions
- Summary of Drainage Items, Guardrail, Pavement Removal & Earthwork
- Seal Plans

HYDRAULICS / PERMITTING (VHB)

VHB is experienced with the policies and procedures related to the development of drainage plans for shared-use path projects. Once all field surveys are complete, we will prepare the drainage design plans in accordance with the latest NCDOT “Guidelines for Drainage Design,” and the County’s stormwater requirements. VHB understands the importance of protecting our surface waters to the maximum extent possible and the proposed drainage design will follow the State of North Carolina “Manual of Stormwater Best Management Practices” for the development of stormwater best management practices (BMPs). A significant portion of the project is adjacent to the French Broad River and located within the regulated floodplain. Implementation of the Ecusta Trail will require a floodplain development permit. VHB will prepare a Stormwater Management Plan (SMP) in accordance with current Henderson County and North Carolina Division of Water Resources (NCDWR) guidelines. In addition, VHB will complete the NCDWR Stormwater Permit application in order to obtain the necessary State water quality certifications.

VHB is well versed in environmental permitting and has submitted numerous applications. Pending design and construction drawing approval, VHB will develop and complete a set of environmentally-related permit drawings and required forms if required.

EROSION & SEDIMENT CONTROL (VHB)

VHB is keenly aware of the importance of protecting our waters and wetlands from sedimentation. With this understanding, we will develop erosion and sedimentation control plans to prevent, as much as practicable, the escape of sediment from the construction site. These plans will include perimeter devices designed to divert clean water around the construction area and to intercept “dirty” water and direct it to sediment basins, removing as much of the suspended sediments as possible. The plan will also include inlet protection, temporary slope drains, and other devices deemed necessary to prevent the escape of sediment from the site. VHB will follow the NC Department of Environmental Quality’s Land Quality process.

GEOTECHNICAL (TERRACON)

- Perform selective clearing of trees/vegetation in test areas for drill rig entry
- Mobilize drilling equipment and crew
- Advance soil test borings as follows:
 - Retaining walls - every 100-200± feet along the road shoulder, as field conditions allow (six borings anticipated)
 - Trail - every 500± feet along the road shoulder, beyond the limits of the retaining walls, as field conditions allow (five to six borings anticipated)
 - Bridge (if needed) - at each end bent (two borings anticipated)
 - Borings will be advanced using hollow-stem augers with standard penetration testing (SPT).
- We expect typical boring depths of 10 feet each along the trail, 20 feet for retaining walls, and 35 feet for the bridge
- Rock coring will also be needed to assess the rock quality if a bridge is needed
 - In areas that are deemed inaccessible to drilling equipment, an SPT boring may be substituted with a hand auger boring advanced to a depth of 5-6 feet below the existing grade
- Perform laboratory classification tests on select soil samples (assume four tests)
- Prepare a subsurface exploration report covering services rendered, conditions, encountered, and geotechnical recommendations related to the greenway’s design and construction
 - If a bridge is required, foundation recommendations will be provided in NCDOT GEU format.

UTILITY COORDINATION**Utility Contacts / Provide Plans to Utility Owners**

The Utilities Coordinator provides a PDF and DGN set of the Design Recommendation Plan Set and the Utility Project Outline to the utility companies and their designated design representatives. The Utilities Coordinator requests that the utility companies:

- Review the plans for accuracy in the surveyed depiction of their facilities.
- Notify the Utilities Coordinator of facilities that are omitted or are inaccurately depicted.
- Analyze their facilities for conflicts with the project as designed.

Preliminary Utility Relocation Plans (UBO)

To complete this task, the Utilities Coordinator is to:

- Receive preliminary relocation plans from the utility companies and from the Utilities Design Engineer.

The design is to be complete enough to determine easement requirements and environmental impacts from the proposed alignment and construction.

Final Utility Relocation Plans

The Utilities Coordinator submits the Final Utilities Coordination Working Plans, showing the alignments to be authorized for all utilities and the current Utilities Relocation Schedule with a description of important design decisions.

Utilities Agreement

The Utilities Coordinator receives the utility agreements and plans from the utility company. From there, the Utilities Coordinator:

- Reviews the plans for conformity with the Utilities Accommodation Manual.
- Reviews the estimates, if needed for the agreement.

TRAFFIC MANAGEMENT**50% Plans**

Title Sheet

Project Notes Sheet

Phasing

Include a written description of how traffic will be maintained during each phase and step of construction. Refer to the proper Roadway Standard Drawing as applicable to describe how traffic will be maintained during construction at that time.

- Refer to the traffic control details and cross section view sheet numbers.
- Step out traffic shifts.
- Describe installation of temporary and final traffic signal(s).
- Identify any Intermediate Contract Times (ICT's) needed throughout the project's duration.

Final Plans

The TMP submitted at this time should be complete and include the following:

- Completed Transportation Management Plan with all revisions incorporated as requested from the 50% submittal as well as any changes from Field Inspection meetings.
- Final Traffic Control quantity estimate. (Submit all final calculations and/or worksheets providing the basis for the estimate quantities submitted).

BRIDGE INSPECTION (VHB)

VHB maintains a staff of highly qualified and certified bridge inspectors who regularly inspect and load rate roadway and railroad bridges, including an NBIS-certified inspector in our Raleigh, NC office. VHB is performing bridge inspection and load rating services for NHDOT, MaineDOT, Maine Turnpike Authority, MASSDOT, RIDOT, CTDOT and has performed Bridge Inspections for private clients in North Carolina. Our NBIS certified team leaders and inspectors have inspected single- and multiple-span highway and railroad structures over waterways, railroads, local roads, and highways. We are well-versed in inspecting Fracture Critical Member (FCM) structures and have experience providing inspections via bucket trucks, manlifts, and under-bridge inspection vehicles.

VHB has also performed drone inspection services for other DOTs providing unique advantages, such as pre-screens so our inspectors can focus in or monitor specific areas prior to doing a hands-on inspection. VHB has also performed a case study for RIDOT that included using a drone equipped with infrared thermal imagery to detect delaminations in the bridge deck to advise repairs.

SIGNALS (VHB)

VHB staff have extensive experience preparing traffic signal designs across the state for private and public clients (local municipalities and NCDOT). Signal designs prepared by VHB in North Carolina adhere to NCDOT requirements and specifications. Our project experience includes preparing signal layouts, electrical programming details, and plans associated with traffic signal communications, such as conduit and cable routing plans, fiber optic splicing detail plans, utility make-ready plans, conduit routing, and wireless radio plans. We are also accustomed to preparing plans that include typical in-pavement vehicle detection and out-of-pavement vehicle detection and preparing plans for interim conditions during construction and designs for final conditions following completed roadway construction.

VHB works closely with the local municipalities, our clients, and the NCDOT to deliver constructible designs on schedule and budget. We are proficient with the most advanced data gathering, signal timing analysis tools, and software (TruTraffic, Translink, Synchro Version 9, CORSIM, TransModeler, and VISSIM). We have developed specialized programs to improve efficiency. We also have expertise in new traffic signal management and design applications such as Signal Phase and Timing (SPaT) deployments and Automated Traffic Signal Performance measures (ATSPM).

HISTORIC ARCHITECTURE – SECTION 106 (VHB)

VHB will review background information relating to the proposed project, including but not limited to: HPOWeb 2.0, North Carolina State Historic Preservation Office (NC-HPO) designation rosters, county surveys, National Register of Historic Places (NRHP) files, works of local history, tax assessor records, deed records, historic aerial photography, Google Streetview imagery, historic mapping, and topographic maps.

Based on background research and the determination of survey recommendations, VHB will conduct a field survey in order to identify historic resources within the project corridor. This will start with the establishment of a project Area of Potential Effects (APE) in a Geographic Information System (GIS) shapefile format. While conducting the survey, photographs will be taken from the right-of-way of all properties 50 years old or older.

Based on the preliminary eligibility recommendations for any properties 50 years old or older within the APE, VHB will either issue a “No Historic Properties Present or Affect” memo for approval or make a recommendation for further evaluation of potentially eligible resources. In addition, VHB will meet with NCDOT to discuss NRHP eligibility recommendations for the historic resources within the APE. The results of this meeting will inform the need for further reports.

If required, VHB will prepare a subsequent NRHP Eligibility Evaluation Report for any potentially eligible historic resources within the APE, as recommended by NCDOT. The Eligibility Evaluation Report will include additional field survey of the potentially eligible resources documenting all elevations of the primary structure, interior photographs (if access is available), associated secondary structures, and viewshed and landscape photographs.

VHB will prepare a NC-HPO Survey Site Form for any properties evaluated in the Eligibility Evaluation Report. This task includes updating existing database entries, as well as creating new records for newly identified properties.

VHB will prepare an Assessment of Effects Form documenting the effects that each project alternative will have on any eligible historic resource within the APE. In addition, this form will record Section 4(f) de minimis impacts. Preparation of this form will occur after NCDOT, NC-HPO, and the lead federal agency have concurred on eligibility and effects in an Assessment of Effects Meeting.

If the project results in an Adverse Effect to a NRHP eligible historic resources, a Finding of Adverse Effect document will be prepared and distributed to the Advisory Council on Historic Preservation (ACHP). After the Finding of Adverse Effect document has been distributed, the ACHP has responded, and a meeting with the consulting parties has occurred, VHB will prepare a Memorandum of Agreement (MOA) to resolve adverse effects by prescribing appropriate mitigation measures. VHB will assist in guiding the MOA through execution by the relevant parties.

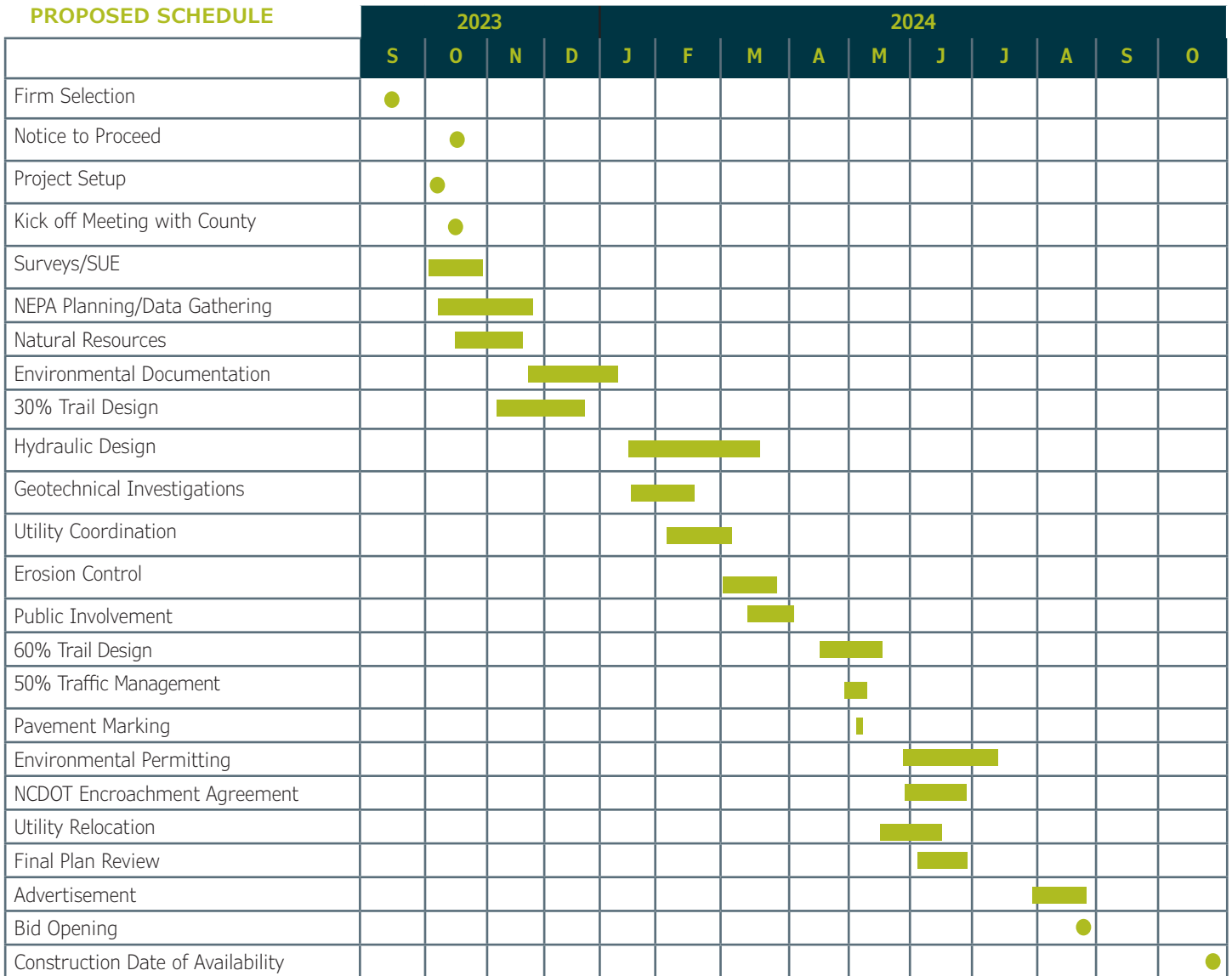
VHB will prepare updated architectural studies in support of plan changes as they occur during project progression. This task could potentially result in additional survey due to an expansion of the APE, or simply to reevaluation of effects to existing documented resources as project plans evolve within the existing APE.

NATURAL SYSTEMS / PERMITTING (VHB)

VHB’s Professional Wetland Scientists (PWS) and Licensed Soil Scientists (LSS) will perform a site reconnaissance throughout the entire study area to evaluate and document existing natural resources. As part of the field reconnaissance, stream, and wetland, determinations will be made based on current delineation criteria. Following these initial steps, a preliminary jurisdictional determination request will be made on behalf of the County to the U.S. Army Corps of Engineers and the Division of Water Resources.

INNOVATIONS**Historic Architecture**

Use of technologically innovative solutions when undertaking mitigation work for historic resources. On two instances recently when projects were going to result in Adverse Effects to historic resources, VHB designed GIS based ArcGIS StoryMaps to bring the history of these resources to life. This has made this history accessible to the public, which would have previously been much more difficult to accomplish. In one of these examples, a historically significant public housing development was being Adverse Effected and VHB supported the client by compiling the important history of the resource, undertaking oral history interviews with residents, and then presenting this fascinating history in an online format that is accessible by the public via smartphone or computer at their convenience.



Task	Start Date	End Date
Firm Selection	9.20.23	9.20.23
Notice to Proceed	10.2.23	10.2.23
Project Setup	10.2.23	10.5.23
Kick-off Meeting	10.5.23	10.5.23
Survey/SUE	10.9.23	10.30.23
Natural Resources	10.17.23	11.16.23
Environmental Doc.	11.27.23	1.11.24
30% Trail Design	11.6.23	12.21.23
Hydraulic Design	1.15.24	3.15.24
Geotech Invest.	1.15.24	2.14.24
Utility Coordination	2.5.24	3.6.24
Erosion Control	3.18.24	4.8.24

Task	Start Date	End Date
Public Involvement	3.18.24	4.1.24
60% Trail Design	4.15.24	5.13.24
50% Traffic Mgmt	4.29.24	5.9.24
Pavement Marking	5.6.24	5.11.24
Environmental Permitting	5.28.24	7.12.24
NCDOT Encroachment Agreement	5.28.24	6.27.24
Utility Relocation	5.28.24	6.27.24
Final Plan Review	6.3.24	6.24.24
Advertisement	7.30.24	8.27.24
Bid Opening	8.27.24	8.27.24
Construction Date	10.24.24	10.24.24

* From Notice to Proceed to Bid Opening is 330 Calendar Days

