Date Advertised: January 29, 2026

ADDENDUM NO. 1

SOLICITATION: ITB# 2026-23015C Ting-Park Oak Hally Greenway Connector advertised on January 20,2026

PURPOSE: This is to communicate an update to the originally posted Appendices document. The proceeding document includes all corresponding Appendices information.

INSTRUCTIONS: Respondents are required to acknowledge receipt and understanding of this addendum by submitting the signed copy with their solicitation response.

II. ACKNOWLEDGEMENT OF ADDENDUM

The undersigned acknowledges receipt and use of this Addendum in preparation of their response submission for the solicitation.

Signature: _____

Print Name: _____

Title: _____

Date: _____

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FROEHLING & ROBERTSON, INC.

Report of Subsurface Exploration and Geotechnical Engineering Evaluation

Ting-Oakhall Greenway Connector
Holly Springs, North Carolina
F&R Project No. 66C-0157

Prepared For:
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Prepared By:
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April 15, 2025

FROEHLING & ROBERTSON

Engineering Stability Since 1881

April 15, 2025

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Subject: Report of Subsurface Exploration & Geotechnical Engineering Evaluation
Ting-Oakhall Greenway Connector
Holly Springs, North Carolina
F&R Project No. 66C-0157

Dear Mr. Spalding:

Froehling & Robertson, Inc. (F&R) has completed the authorized subsurface exploration for the above-referenced project in Holly Springs, North Carolina. Our services were performed in general accordance with F&R's Proposal No. 2466-00126 (REV 2) dated June 27, 2024. The attached report presents our understanding of the project, reviews our exploration procedures, describes existing site and general subsurface conditions, and presents our geotechnical evaluations and recommendations for design and construction of the project.

We have enjoyed working with you on this project, please contact us if you have any questions regarding this report or if we may be of further service.

Sincerely,
FROEHLING & ROBERTSON, INC.

Dave Morse, E.I., M.S.
Geotechnical Staff Engineer

NORTH CAROLINA PROFESSIONAL SEAL 048123 ENGINEER CHENG WANG

Cheng Wang, Ph.D., P.E.
Geotechnical Engineer

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Key to Soil Classification
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Laboratory Test Results

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GBA Document “Important Information about This Geotechnical-Engineering Report”

1.0 PURPOSE & SCOPE OF SERVICES

The purpose of this subsurface exploration and geotechnical engineering evaluation was to explore the subsurface conditions along the proposed greenway extension and pedestrian bridge, and to provide geotechnical engineering recommendations that can be used during the design and construction phases of the project.

F&R's scope of services included the following:

- Completion of 5 Standard Penetration Test (SPT) borings (B-1 through B-5) to depths ranging from 8.7 to 16.6 feet below the existing ground surface;
- Preparation of boring logs and development of a subsurface profile;
- Performing geotechnical laboratory testing on representative soil samples;
- Performing a geotechnical engineering evaluation of the subsurface conditions with regard to their suitability for the proposed construction; and
- Preparation of this geotechnical report by professional engineers.

2.0 PROJECT INFORMATION

2.1 SITE DESCRIPTION

The project consists of a new greenway to connect from Muses Mill Court to the end of the existing greenway on the west side of the stormwater pond at Ting Park in Holly Springs, North Carolina, as shown on the Site Vicinity Map presented as Figure 1 in Appendix I. Based on observations made during our field work, the site is moderately wooded, and a tributary of Little Branch River extends across the eastern half of the project site in a generally south to north orientation. Based on Wake County GIS topographic data and the provided drawings "Ting Park – Oak Hall Greenway Connector" by benesch, dated 1/16/2025, the site slopes down from west to east, with a high elevation (EL) of about 360 feet near Muses Mill Court, and a low elevation of about EL 319 feet within the tributary.

2.2 PROPOSED CONSTRUCTION

Based on the provided drawings, approximately 1,000 feet of new greenway will be constructed from the end of Muses Mill Court connecting to the existing Ting Stadium Greenway trail. The trail will be 10-feet wide and asphalt-paved. A 60-foot single-span fiberglass pedestrian bridge will be constructed to cross the stream at the north end of the site. We understand the abutments will be supported by spread footings and steel piles.

Based on the preliminary "30% Conceptual Design Issued for Owner Review" dated 1/16/2025, and additional information provided by benesch, the pedestrian bridge will be a 60-foot, single span, FRP structure. The proposed top of deck elevation will be approximately 2 feet higher than existing grade at End Bent 1 (EB-1), with an elevation of 329.55 feet, and approximately 5 feet higher than existing grade at EB-2, with an elevation of 326.83 feet.

After discussions with F&R, benesch has proposed the following foundation options for the pedestrian bridge: at End Bent 1, a spread footing is proposed with dimensions 14'-7" wide, 5'-4" long, and 1' thick, and has a maximum bearing pressure of 2.26 kips per square foot (ksf). The average bottom of footing elevation is anticipated at elevation (EL) 324.0 feet.

At End Bent 2, shallow groundwater was encountered and the planned foundation is located within the flood plain, therefore deep foundations have been proposed. A single row of four or five HP 10x42 steel piles were proposed with an average bottom of cap elevation of EL 320.5 feet. For the 4-pile option, the factored axial pile load is 27.6 kips and the factored lateral pile load is 12.6 kips. For the 5-pile option, the factored axial pile load is 22.1 kips and the factored lateral pile load is 10.1 kips.

A scour analysis was performed by benesch which indicated 0.7 feet of contraction scour for the 100-year flood.

3.0 EXPLORATION PROCEDURES

3.1 SUBSURFACE EXPLORATION

F&R advanced five (5) total soil test borings, B-1 through B-5, to depths ranging from 8.7 to 16.6 feet below the existing ground surface. The approximate boring locations are shown on the Boring Location Plan presented as Figure 2 Appendix I. The test boring locations were established in the field by F&R using a hand-held GPS unit. Ground surface elevations at the boring locations were interpolated from the drawings provided by benesch. Given these methods of determination, the boring locations and ground surface elevations should only be considered approximate.

The test borings were advanced by a track-mounted drill rig using 2-1/4" inside diameter (I.D.) hollow stem augers for borehole stabilization. Representative soil samples were obtained using a standard two-inch outside diameter (O.D.) split-barrel sampler in general accordance with ASTM D1586, Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils. The number of blows required to drive the split-barrel sampler three consecutive 6-inch increments with an automatic hammer is recorded and the blows of the last two 6-inch increments are summed to obtain the Standard Penetration Test (SPT) N-value representing the penetration resistance of the soil. Five (5) SPT samples were collected in the top 10 feet and then at a nominal interval of 5 feet thereafter.

A representative portion of soil was obtained from each SPT sample, sealed in a glass jar, labeled, and transported to our laboratory for classification and analysis by a geotechnical engineer. The soil samples were classified in general accordance with the Unified Soil Classification System (USCS) using visual-manual identification procedures (ASTM D2488). A Boring Log for each test boring is presented in Appendix II.

Groundwater level measurements were attempted immediately after drilling, and after a stabilization period of approximately 24 hours following the completion of drilling in each of the borings. Temporary piezometers were installed in borings B-1, and B-3 through B-5 to facilitate the measurement of stabilized groundwater levels. The temporary piezometers consisted of 1-inch

diameter, hand-slotted PVC pipe installed into the completed borings. Following the collection of the stabilized groundwater readings, the temporary piezometers were removed from the borings and all of the boreholes were backfilled with soil cuttings.

3.2 LABORATORY TESTING

F&R selected three (3) soil samples and subjected them to geotechnical index testing consisting of natural moisture content, sieve analysis (% passing #200 sieve only), and Atterberg Limits determinations. The purpose of the index testing was to aid in classification of the soil samples and development of engineering recommendations. The laboratory testing was performed in general accordance with applicable ASTM standards. The results of the laboratory tests are presented in Appendix III of this report.

4.0 REGIONAL GEOLOGY & SUBSURFACE CONDITIONS

4.1 REGIONAL GEOLOGY

The project site is located in the Triassic Basin of the Piedmont Physiographic Province of North Carolina. This particular formation is a unique geologic unit, which developed 160 million years ago when differential movement occurred along the Jonesboro Fault in this area. The differential movement resulted in a long, narrow, northeast-trending basin, which gradually filled with sediments eroded from upland areas of the surrounding topography. The sediments are thought to be several thousand feet deep and have resulted in sedimentary rock formations which are often encountered within 5 to 10 feet of the ground surface. Per the *Geologic Map of North Carolina (1985)*, this area is typically underlain by the Chatham Group, which is comprised of conglomerates, fanglomerates, sandstones, and mudstones.

The soils that overlie the weathered rock and bedrock typically consist of silty clays and sandy clays within the upper portion of the soil profile, which are often highly plastic and become less plastic with depth. The surface clayey soils typically transition into fine sandy silts and silty sands to the top of partially weathered rock and rock. The boundary between soil and rock is not sharply defined. This transitional zone, termed "Partially Weathered Rock," is typically found overlying the Triassic rock formations. Partially Weathered Rock (PWR) is defined, for engineering purposes, as material exhibiting Standard Penetration Resistances in excess of 100 blows per foot (bpf). Weathering is facilitated by fractures, joints, and by the presence of less-resistant rock types. Consequently, the profile of the partially weathered rock and hard rock is quite irregular, even over short horizontal distances. The subsurface conditions encountered at this site are typical of the conditions found in the Triassic Basin. PWR and/or hard rock was encountered in each of the test borings.

4.2 SUBSURFACE CONDITIONS

4.2.1 GENERAL

The subsurface conditions discussed in the following paragraphs and those shown on the attached boring logs represent an estimate of the subsurface conditions based on interpretation of the boring data using normally-accepted geotechnical engineering judgments. Although individual soil test borings are representative of the subsurface conditions at the boring locations on the dates shown, they are not necessarily indicative of subsurface conditions at other locations or at other times. Data from the specific soil test borings are shown on the boring logs presented in Appendix II of this report.

A subsurface profile has been prepared from the boring data to graphically illustrate the subsurface conditions encountered at the site, and is presented as Figure 3 in Appendix I. Strata breaks designated on the boring logs and subsurface profile represent approximate boundaries between soil types. The transition from one soil type to another may be gradual or occur between soil samples. This section of the report provides a general discussion of subsurface conditions encountered within areas of proposed construction at the project site. More detailed descriptions of the subsurface conditions at the individual boring locations are presented on the boring logs provided in Appendix II of this report.

4.2.2 SURFICIAL MATERIALS

Surficial organic soils were encountered at the existing ground surface in each of the borings, with thicknesses ranging from about 3.5 to 4 inches. The surficial organic soil generally consisted of dark-colored soil material containing roots, fibrous matter, and/or other organic components, and is generally unsuitable for engineering purposes. F&R has not performed any laboratory testing to determine the organic content or other horticultural properties of the observed surficial organic soil materials. Therefore, the term surficial organic soil is not intended to indicate suitability for landscaping and/or other purposes. The surficial organic soil thicknesses provided in this report are based on driller observations and should be considered approximate. We note the transition from surficial organic soil to underlying materials may be gradual, and therefore the observation and measurement of surficial organic soil thicknesses are subjective and should be expected to vary.

4.2.3 ALLUVIAL SOILS

Alluvial soils include materials that have been transported or deposited by water. A layer of alluvial soil was encountered below the surficial materials in borings B-1 and B-2, and extended to approximate depths of 3.5 and 2 feet below the existing ground surface, respectively. The alluvial soils consisted of very soft to soft low-plasticity silts and clays (USCS – ML & CL) with SPT N-values ranging from 1 to 4 blows per foot (bpf), and loose clayey sands (USCS- SC) with an SPT N-value of 9 bpf.

4.2.4 RESIDUAL SOILS

Below the surficial materials and/or alluvial soils, residual soils were encountered in each boring and extended to a depth where Partially Weathered Rock was encountered. The residual soils consisted of very dense silty sands (USCS – SM) with an SPT N-value of 61 bpf, and soft to hard low-plasticity silts and clays (USCS – ML & CL) with SPT N-values ranging from 4 to 34 bpf. A layer of soft (SPT N-value ≤ 4 bpf) low-plasticity silt (USCS - ML) was encountered in boring B-5 from an approximate depth of 0.3 to 2 feet below the existing ground surface.

4.2.5 PARTIALLY WEATHERED ROCK (PWR) & AUGER REFUSAL MATERIALS

PWR is defined for engineering purposes as material that exhibits an SPT N-value of at least 100 blows per foot (bpf). PWR was encountered in each boring, at depths ranging from 2 to 9.5 feet below the existing ground surface. Once encountered, the PWR typically extended to the termination depth of the boring or to a depth where auger refusal was encountered. The SPT N-values of the PWR ranged from 50 blows with 5" of split spoon penetration (50/5") to 50/0". The sampled PWR was typically described as a fine sandy silt or silty sand with trace rock fragments. A seam of very dense sand between layers of Partially Weathered Rock was encountered in boring B-5, from an approximate depth of 6.5 to 9.5 feet below the existing ground surface.

Auger refusal is a designation applied to any material that cannot be penetrated by the soil auger and typically includes boulders, hard rock lenses/ledges, and bedrock. Auger refusal materials were encountered in borings B-1 and B-2 at depths of 16.6 and 15.9 feet below the existing ground surface, respectively. It is our opinion that the auger refusal materials encountered were bedrock.

4.3 SOIL MOISTURE AND GROUNDWATER CONDITIONS

The majority of soil samples recovered from the borings were described as moist (*i.e.*, within 3 to 5 percentage points of the estimated optimum moisture content).

Groundwater level measurements were attempted at the termination of drilling in all borings, and groundwater was not encountered immediately after drilling. After a stabilization period of approximately 24 hours following the completion of drilling, groundwater was only encountered in boring B-1 at a depth of 2.9 feet.

It should be noted that groundwater levels fluctuate depending upon seasonal factors such as precipitation and temperature. As such, soil moisture and groundwater conditions at other times may vary from those described in this report. F&R notes that due to the presence of relatively impervious silty and clayey soils and PWR noted on the project site, trapped or perched water conditions may be encountered during periods of inclement weather and during seasonally wet periods.

5.0 GEOTECHNICAL DESIGN RECOMMENDATIONS

5.1 GENERAL

The conclusions and recommendations contained in this section of the report are based upon the results of the five (5) soil test borings performed by F&R, our experience with similar projects and subsurface conditions, and the information provided to us regarding the proposed construction. From a geotechnical engineering perspective, it is our opinion the subsurface conditions encountered at the project site are suitable for the proposed construction, provided the recommendations presented in subsequent sections of this report are followed throughout the design and construction phases of this project with adequate engineering construction oversight and observation.

5.2 PEDESTRIAN BRIDGE FOUNDATIONS

5.2.1 GENERAL

We understand the pedestrian bridge crossing the stream at the northern end of the site will be a 60-foot, single span, FRP structure. The proposed top of deck elevation will be approximately 2 feet higher than existing grade at End Bent 1 (EB-1), with an elevation of 329.55 feet, and approximately 5 feet higher than existing grade at EB-2, with an elevation of 326.83 feet.

Foundation support for the pedestrian bridge has been developed based on F&R borings B-1 and B-2, and discussions with benesch. Due to the shallow rock encountered in B-2 (End Bent 1), a spread footing has been proposed. Due to End Bent 2 (boring B-1) being located within the flood plain, and shallow groundwater encountered in the relevant boring, a foundation system consisting of one single row of four to five piles has been proposed.

5.2.2 SPREAD FOOTINGS

At End Bent 1, a spread footing is proposed with dimensions 14’-7” wide, 5’-4” long, and 1’ thick, and has a maximum bearing pressure of 2.26 kips per square foot (ksf). The average bottom of footing elevation is anticipated at elevation (EL) 324.0 feet.

F&R recommends the footing for EB-1 bear on partially weathered rock (PWR) with a minimum of 1 foot of embedment into the PWR. Boring B-2 was performed in the vicinity of End Bent 1, and encountered PWR at approximate EL 325 feet. As suggested by boring B-2, it is anticipated the proposed bridge footing will bear approximately 1 foot into PWR. Though not expected, if soils are encountered at the footing bearing level, the soils are required to be undercut down to PWR and backfilled with lean concrete prior to construction of the footing. The lean concrete should have a design compressive strength of at least 2,000 psi. Spread foundations bearing on PWR or lean-concrete can be proportioned for a net allowable soil bearing capacity of 4,000 psf. Final foundation sizes and depths should be determined by the project structural engineer based on the actual design loads, building code requirements, and other structural considerations.

5.2.3 PILES

This section of the report presents a summary of F&R's pile foundation recommendations. The NCDOT LRFD Driven Pile Foundation Design Policy was generally used for the design of the piles. Based on the scour analysis performed by benesch, a contraction scour depth of 0.7 feet has been provided for our foundation analysis. Due to this negligible value, we have assumed that scour will not impact the End Bents.

At End Bent 2, a single row of 4 or 5 piles was proposed with an average bottom of cap elevation of EL 320.5 feet. Based on provided loading information and deflection tolerance, the 4-pile option was determined to provide adequate support and would therefore be more economical than the 5-pile option. Lateral load analyses were performed with the computer program LPILE version 2022.12.11 to model an H-Pile HP 10x42 under free-head conditions using the following loading information provided by benesch for a single row of 4 piles: factored axial pile load of 27.6 kips and factored lateral pile load of 12.6 kips. Subsurface conditions were modelled based on F&R's boring B-1, which was performed in the vicinity of End Bent 2. Using an HP 10x42 steel pile, the table below summarizes the lateral load analyses:

End Bent 2						
Boring No.	**Approximate Top of Pile Elevation (ft)**	**Average Bottom of Cap Elevation (ft)**	**Point of Fixity Elevation (ft)**	**Minimum Tip Elevation (ft)**	**Deflection (inches)**	**Excavation Depth through PWR (ft)**
B-1	EL 322.5	EL 320.5	EL 315.0	EL 310.5	0.19	7.5

Based on the results of the lateral analysis, a minimum tip elevation of EL 310.5 feet is recommended, which is about 10 feet below the bottom of cap. The minimum tip elevation is the minimum pile embedment required to maintain the lateral stability of the piles. The piles should achieve the required axial resistance primarily through tip bearing on PWR or rock. Based on review of the boring logs, driven piles would likely encounter refusal prior to reaching the minimum tip elevation, therefore, **"Pile Excavation" into PWR and rock will be required at End Bent #2.** Pile Excavation should be performed to EL 310.5 feet. The holes should be drilled or excavated to a diameter that will result in at least 3 inches of clearance around the entire pile (expected to be about a 16" minimum diameter). Adequate bearing capacity will be available once pile excavation has been completed and the bottom of the excavated hole verified as PWR or rock. Since the piles will bear directly on PWR or rock, driving of the piles is not required as long as the bearing surface can be visually observed to be free of loose material and standing water. Once the pile has been properly inserted into and supported in the excavated hole, the hole should be backfilled with concrete or grout.

This excavation will likely extend below the groundwater table, therefore the contractor should be prepared for dewatering and the possible need for temporary casing, should the excavation become unstable. The bottom of the excavation must be free of loose material and water prior to pile installation.

F&R recommends the structure plans include the following foundation notes:

1. For Piles, see Project Specifications.
2. Carry in spread footing at End Bent 1 at least 1 foot into PWR at approximate elevation 324.0 feet.
3. Footing excavation should be observed by a qualified geotechnical engineer or their representative to confirm bearing material and capacity.
4. Pile excavation is required to install piles at End Bent 2. Excavate holes to elevation 310.5 feet.
5. Concrete or grout is required to fill holes for pile excavation at End Bent 2.
6. Pile excavations will extend into material that deteriorates when exposed to the elements. Check field conditions for the required end bearing and place concrete immediately after the excavation is completed.

5.2.4 LATERALLY-LOADED WALLS

F&R assumes the bridge end walls and any wing-walls will be permitted to rotate at the top and therefore should be designed to resist active lateral earth pressures. Assuming the walls will be backfilled with low plasticity on-site or off-site borrow materials (USCS CL, ML, SC, or SM soils), the walls should be designed using an active earth pressure coefficient (k_a) of 0.45. Assuming a moist unit weight of 120 pounds per cubic foot (pcf), F&R recommends an active earth pressure equivalent fluid weight (EFW) of 54 pcf be used in design. For sliding resistance along the base of the foundation, a friction factor (tan δ) of 0.50 should be utilized for concrete bearing on PWR. A passive earth pressure coefficient (k_p) of 1.50 can be used in design where the foundation faces bear directly against undisturbed residual soils or PWR; this coefficient incorporates a factor of safety of 2.0 to limit the amount of movement to mobilize the passive resistance. Assuming an in-situ moist unit weight of approximately 100 pcf for native, undisturbed soils, the passive earth pressure equivalent fluid weight (EFW) would be 150 pcf. It is possible that groundwater could saturate the wall backfill; therefore, the unit weight of water should be added to the above EFW's to obtain the total stresses.

5.3 PAVEMENT DESIGN

Based on the provided site plan, a 10-foot wide asphalt trail will traverse the site, connecting Muses Mill Court to the existing Ting Stadium Greenway Trail. The pavement subgrade materials are anticipated to consist of low-plasticity residual silts and clays (ML & CL), PWR described as a sandy silt or silty sand, and approved structural fill materials. While not anticipated, if highly plastic silts or clays (MH or CH) are encountered at the pavement subgrade level, they should be undercut and replaced with approved lower plasticity soils or granular materials.

Subgrade preparation and evaluation for the proposed pavement areas should be performed as outlined in subsequent sections of this report. The design pavement section is dependent upon the anticipated soil subgrade strength, evaluation of the exposed subgrade soils beneath the proposed pavement, and completion of any necessary repairs to establish a stable subgrade prior to

pavement construction. Some subgrade repairs should be anticipated considering the low-consistency (SPT N-values ≤ 4 bpf) near-surface soils encountered in boring B-5.

F&R was informed that no traffic data was available for the proposed greenway trails, and benesch was following the Town of Holly Springs pavement standard for typical greenway sections. Based on the materials encountered in our subsurface exploration, and anticipated minimal to no traffic loading, it is acceptable for design of the pavement section to follow this standard, outlined below:

Standard Duty Pavement

Pavement Section	Thickness (Inches)
Asphalt Pavement Surface Course, Type S9.5B	2*
Aggregate Base Course (ABC stone)	6

*applied in two 1-inch lifts

In addition to the above pavement section, it is recommended that a geotextile (Mirafi 140N or equivalent) be installed on the exposed soil subgrade beneath the compacted Aggregate Base Course. The purpose of the geotextile is to separate the ABC stone from the underlying fine-grained Triassic soils, which will help prevent the migration of these soils into the ABC stone and prolong the life of the pavement.

6.0 GEOTECHNICAL CONSTRUCTION RECOMMENDATIONS

6.1 SITE PREPARATION

After clearing and grubbing, any surficial organic soils, tree roots, or other deleterious materials should be stripped from structural areas. The resulting excavations should be backfilled with compacted structural fill as recommended in a subsequent section of this report. Following the stripping of materials from planned structural areas, the exposed subgrade soils at the finished subgrade level and in fill sections should be proofrolled with a loaded tandem-axle dump truck, scraper, or other similar type of construction equipment to give an indication as to the stability of the subgrade soils. The proofroll operations should be observed by a geotechnical engineer or their representative. If proofrolling reveals unstable conditions, the method of repair should be as directed by the project geotechnical engineer. Methods of repair may include, but are not necessarily limited to: drying and re-compaction; undercutting and replacement with suitable structural fill; use of geo-textiles and/or geo-grids with select fill; use of lime stabilization; or other methods deemed appropriate by the project geotechnical engineer.

The on-site soils have sufficient silt/clay content to render them moisture sensitive. The on-site soils will become unstable (*i.e.*, pump and rut) during normal construction activities when in the presence of excess moisture. Soils with a moisture content greater than 3 percentage points above the optimum moisture content are generally considered to have excessive moisture. During earthwork and construction activities, surface water runoff must be drained away from the

construction areas to prevent water from ponding on or saturating the soils within excavations or on subgrades.

6.2 STRUCTURAL FILL PLACEMENT AND COMPACTION

It is expected the on-site low-plasticity soils (ML, CL, SM, and SC) will be suitable for use as structural fill/backfill material, provided they are at a moisture content suitable to achieve proper compaction and are stable during compaction and at final bearing grade. These low-plasticity soils are generally considered fair to good materials for use as structural earth fill. Though not encountered in any borings, highly plastic soils (CH & MH) are considered poor materials for use as structural fill because they can be difficult to properly place and compact, and have the potential to undergo volume changes (shrink/swell) with varying moisture levels. If encountered during excavation, it is generally recommended that these soils be used in the lower portions of the excavations or wasted.

Excavated, ripped, or blasted PWR and rock may also be used as structural fill material. Typically, the process of mechanical excavation, spreading with a dozer, and compacting with a large sheepsfoot roller will break down softer PWR into suitable particle sizes. Special placement and compaction procedures for the PWR and other rock materials should be provided by the project geotechnical engineer prior to earthwork operations. However, we generally recommend the maximum particle size not exceed 3 inches. It is especially important when using PWR as structural fill to ensure there are no voids, and that rock pieces are not placed on top of each other or nested.

Based on anticipated excavation depths and site conditions at the time of construction, some soils may require moisture conditioning (*e.g.*, drying of wet soils or wetting of dry soils) prior to use as structural fill. As such, it is recommended that earthwork be performed during the summer months when the weather conditions are more conducive to moisture conditioning of fill materials.

If imported soils are determined to be necessary, F&R recommends that a qualified geotechnical engineer or engineering technician working under the direction of the geotechnical engineer approve the suitability of the imported soils prior to their delivery to the site. Imported structural fill should consist of low plasticity soil (LL<35, PI<20), have a maximum dry density of at least 100 pcf, and be free of organic and other deleterious materials.

Structural earth fill should be compacted at a moisture content within +3 percentage points of the optimum moisture content and placed in loose lifts not exceeding 8 inches. All structural earth fill (*i.e.,* fill placed in roads and driveways) should be compacted to at least 95 percent of the Standard Proctor maximum dry density as determined by ASTM D698 and to 100 percent in the top 12 inches. Structural earth fill placed in non-structural/grassy areas should be compacted to at least 92 percent of the standard Proctor maximum dry density.

All structural fill material (soil/PWR/rock) should be placed and compacted under the full time control and supervision of a qualified geotechnical engineer or engineering technician working under the direction of the geotechnical engineer. The placement and compaction of all fill material should be tested at frequent intervals to confirm the recommended degree of compaction is achieved.

As previously stated, the on-site soils have sufficient silt/clay content to render them moisture sensitive. The on-site soils will become unstable (*i.e.,* pump and rut) during normal construction activities when in the presence of excess moisture. Soils with a moisture content greater than three percentage points above the optimum moisture content are generally considered to have excessive moisture. During earthwork and construction activities, surface-water runoff must be drained away from construction areas to prevent water from ponding on or saturating the soils within excavations or on subgrades.

Exposure to the environment may weaken the soils at the bearing level if excavations remain open for long periods of time. The bearing surfaces should be level or suitably-benched and free of loose soil, ponded water, and debris. If the bearing soils are softened by surface water intrusion, subsurface seepage, or exposure, the softened soils should be removed from the excavation immediately prior to placement of stone, concrete, or other pipe bedding materials.

6.3 PWR AND HARD ROCK EXCAVATION

As previously mentioned, PWR was encountered in each boring, at depths ranging from 2 to 9.5 feet below the existing ground surface. Additionally, auger refusal materials were encountered in borings B-1 and B-2 at depths of 16.6 and 15.9 feet below the existing ground surface, respectively. Based on the provided drawings, PWR excavation will be necessary during grading for the new greenway trail. It is also possible that PWR and hard rock excavation may be necessary if utility lines are to be installed within the planned construction area. If PWR is encountered during grading, heavy excavating equipment with ripping tools (*e.g.*, D-8 dozer with single shank ripper) is typically effective in removing softer PWR (*i.e.*, PWR with N-values of 50/6" to 50/3"). Removal of harder PWR (*i.e.*, PWR with N-values of 50/2" to 50/0") and hard rock during grading in open areas will not likely be possible with ripping equipment and will require hammering, chipping, or blasting.

It is possible that removal of softer PWR from confined excavations (*e.g.*, utility excavations) may be accomplished using a large track hoe (*e.g.*, CAT 330 with new rock teeth); however, excavation will likely be slow, and blasting is typically performed to pre-loosen the PWR. Removal of harder PWR in confined excavations will likely not be possible with conventional equipment and typically requires blasting. The speed and ease of PWR and rock excavation will depend upon the equipment utilized, experience of the equipment operators, and geologic structure of the materials.

General excavation should first be attempted with conventional earthwork equipment including ripping with a D-8 dozer and/or large track hoe. In areas where this equipment is not successful in removing weathered rock material, the owner and geotechnical engineer should be contacted to verify that such materials cannot be excavated with heavy construction equipment. Materials that cannot be removed economically through the use of conventional earthwork equipment and ripping will likely require blasting or use of a ram hoe attachment to the excavation equipment to loosen the rock for removal.

6.4 CUT AND FILL SLOPES

F&R recommends designing the permanent project slopes at 3:1 (H:V) or flatter for slopes less than approximately 10 feet in height. The tops of slopes should be located a minimum of 10 feet from

structural limits. It is F&R's opinion that 3H:1V slopes will be stable from a slope stability standpoint, provided the slopes are constructed in approved native soils or properly compacted and tested structural fill. However, seepage and surface runoff may cause the slopes to slough and erode resulting in shallow surface failures. The slopes should be vegetated as soon as possible to minimize surface sloughing and erosion. A swale or shallow ditch should be constructed near the tops of slopes to prevent surface water from flowing onto the slopes. We recommend that all cut and fill slopes be observed by a geotechnical engineer or their representative during construction. Additional slope drainage and protection measures may be required in certain areas depending upon conditions observed at the time of slope construction.

6.5 PEDESTRIAN BRIDGE FOUNDATION CONSTRUCTION

We recommend that footing excavations be observed by a qualified geotechnical engineer or their representative prior to placement of reinforcing steel and concrete. The purpose of the observation would be to determine that foundations bear in suitable soils at the proper embedment depths, and that unsuitable soft or loose materials are undercut and backfilled with approved structural fill material. Hand auguring and Dynamic Cone Penetrometer (DCP) testing should be performed at the direction of the project geotechnical engineer to verify the consistency of the bearing soils and underlying support soils. It is recommended that a smooth bladed backhoe bucket be used to remove the final 6 to 12 inches of soils above the foundation bearing grade to prevent disturbing soils below the bearing grade and/or prevent gouging narrow grooves in the bearing grade as may occur with a toothed-end bucket.

The footings should be properly protected from scour/erosion and/or designed with additional embedment to account for possible soil loss. Exposure to the environment may weaken the soils at the footing bearing level and in the bottom of the pile excavation holes if excavations remain open for long periods of time. The foundation bearing surfaces should be level or suitably benched and free of loose soil, ponded water, and debris. If the bearing soils are softened by surface water intrusion or exposure, the softened soils must be removed from the foundation excavation immediately prior to placement of concrete. Foundation excavations must be maintained in a drained/de-watered condition throughout the foundation construction process. If the spread foundation excavations must remain open overnight, or if rainfall becomes imminent while the bearing soils are exposed, we recommend that a 2 to 4 inch thick "mud mat" of lean concrete (2,000 psi) be placed on the bearing soils before placing the reinforcing steel. In addition, F&R stresses the need for positive perimeter surface drainage to direct all runoff water away from foundations.

As discussed in Section 5.2.2, pile excavation will be necessary at End Bent 2, and F&R recommends the excavations be observed to confirm the base of the excavation is free of loose material and water prior to pile installation. Temporary casing may be necessary if the drilled holes become unstable. Dewatering may also be required during pile excavation, which will be discussed in Section 6.7. In addition, Triassic PWR will deteriorate once exposed to the elements, so we stress the importance of placing concrete in each excavated hole as soon as possible, otherwise, additional pile excavation may be necessary to ensure removal of any softened materials.

6.6 PAVEMENT CONSTRUCTION

Pavement subgrades should be prepared as outlined in previous sections of this report. Proofrolling of the pavement subgrades, and placement of ABC base course and asphalt surface courses, should be observed, tested, and approved by the project geotechnical engineer. All base course stone beneath flexible pavement should be compacted to at least 100 percent of the modified Proctor maximum dry density (ASTM D1557). We emphasize that good base course drainage is essential for successful pavement performance. The ABC stone should be maintained in a drained condition at all times. Water build-up in the base course could result in premature pavement failures. Proper drainage may be aided by grading the site such that surface water is directed away from pavements and by the construction of swales adjacent to pavements. All pavements should be graded such that surface water is directed towards the outer limits of the paved area or to catch basins located such that surface water does not remain on the pavement.

Flexible asphalt pavements and bases should be constructed in accordance with the guidelines of the latest applicable NCDOT Standard Specifications for Roads and Structures. Materials, weather limitations, placement, and compaction are specified under appropriate sections of this publication.

6.7 DEWATERING

As previously mentioned, stabilized groundwater was encountered in boring B-1 at a depth of 2.9 feet below the existing ground surface. As such, it is expected that wet soils and/or groundwater may be encountered during pile excavation at End Bent 2, and dewatering may be necessary to maintain drained, stable excavations, and to prevent softening/loosening of the excavation subgrades. However, groundwater elevations will likely vary throughout the year, and will be elevated especially during the seasonally-wet months (October through April). If groundwater is encountered, dewatering may be possible by utilizing sump and pumping techniques. During periods of inclement weather, sump pits and pumping may not be sufficient to control both groundwater and surface water, and more extensive drainage/dewatering measures may be required. The method of surface water and groundwater control should be determined and designed by the contractor, but may require well points, sheet piling, or other means.

We emphasize the importance of dewatering during pile excavation so the bearing surface can be visually observed and confirmed to be free of loose material prior to pile installation, otherwise unpredicted settlement or instability may result. It is also possible that temporary casing may be necessary if the excavations become unstable during construction.

7.0 CONTINUATION OF SERVICES

As previously discussed, the geotechnical engineer of record should be retained to monitor and test earthwork activities and subgrade preparations for foundations, and pavements. It should be noted that actual soil conditions at the various subgrade levels and bearing grades will vary across this site and thus the presence of the geotechnical engineer and/or their representative during construction will serve to validate the subsurface conditions and recommendations presented in this report.

We recommend that F&R be retained to monitor the earthwork and foundation construction, and to report that recommendations contained in this report are completed in a satisfactory manner. Our continued involvement on the project will aid in the proper implementation of the recommendations discussed herein. The following is a recommended scope of services:

- Review of project plans and construction specifications to verify the recommendations presented in this report have been properly interpreted and implemented;
- Observe the earthwork process to document that subsurface conditions encountered during construction are consistent with the conditions anticipated in this report;
- Observe the subgrade conditions before placing structural fill, including proofroll observations;
- Observe the placement and compaction of any structural fill and backfill, and perform laboratory and field compaction testing of the fill; and
- Observe all foundation excavations and footing bearing grades for compliance with the recommended embedment depths and design soil bearing capacity.

8.0 LIMITATIONS

This report has been prepared for the exclusive use of benesch and/or their agents for specific application to the referenced project in accordance with generally-accepted soil and foundation engineering practices. No other warranty, express or implied, is made. Our evaluations and recommendations are based on design information furnished to us, the data obtained from the subsurface exploration program, and generally-accepted geotechnical engineering practices. The evaluations and recommendations do not reflect variations in subsurface conditions which could exist intermediate of the boring locations or in unexplored areas of the site. Should such variations become apparent during construction, it will be necessary to re-evaluate our recommendations based upon our on-site observations of the conditions.

There are important limitations to this and all geotechnical studies. Some of these limitations are discussed in the information prepared by GBA, which is included in Appendix IV. We ask that you please review this information.

Regardless of the thoroughness of a subsurface exploration, there is the possibility that conditions between borings will differ from those at the boring locations, that conditions are not as anticipated by the designers, or that the construction process has altered the soil conditions. Therefore, experienced geotechnical engineers should evaluate earthwork activities to observe that conditions anticipated in design actually exist. Otherwise, we assume no responsibility for construction compliance with the design concepts, specifications, or recommendations.

In the event that changes are made in the proposed construction, the recommendations presented in the report shall not be considered valid unless the changes are reviewed by our firm and conclusions of this report modified and/or verified in writing. If this report is copied or transmitted to a third party, it must be copied or transmitted in its entirety, including text, attachments, and enclosures. Interpretations based on only a part of this report may not be valid.

APPENDIX I

FIGURES

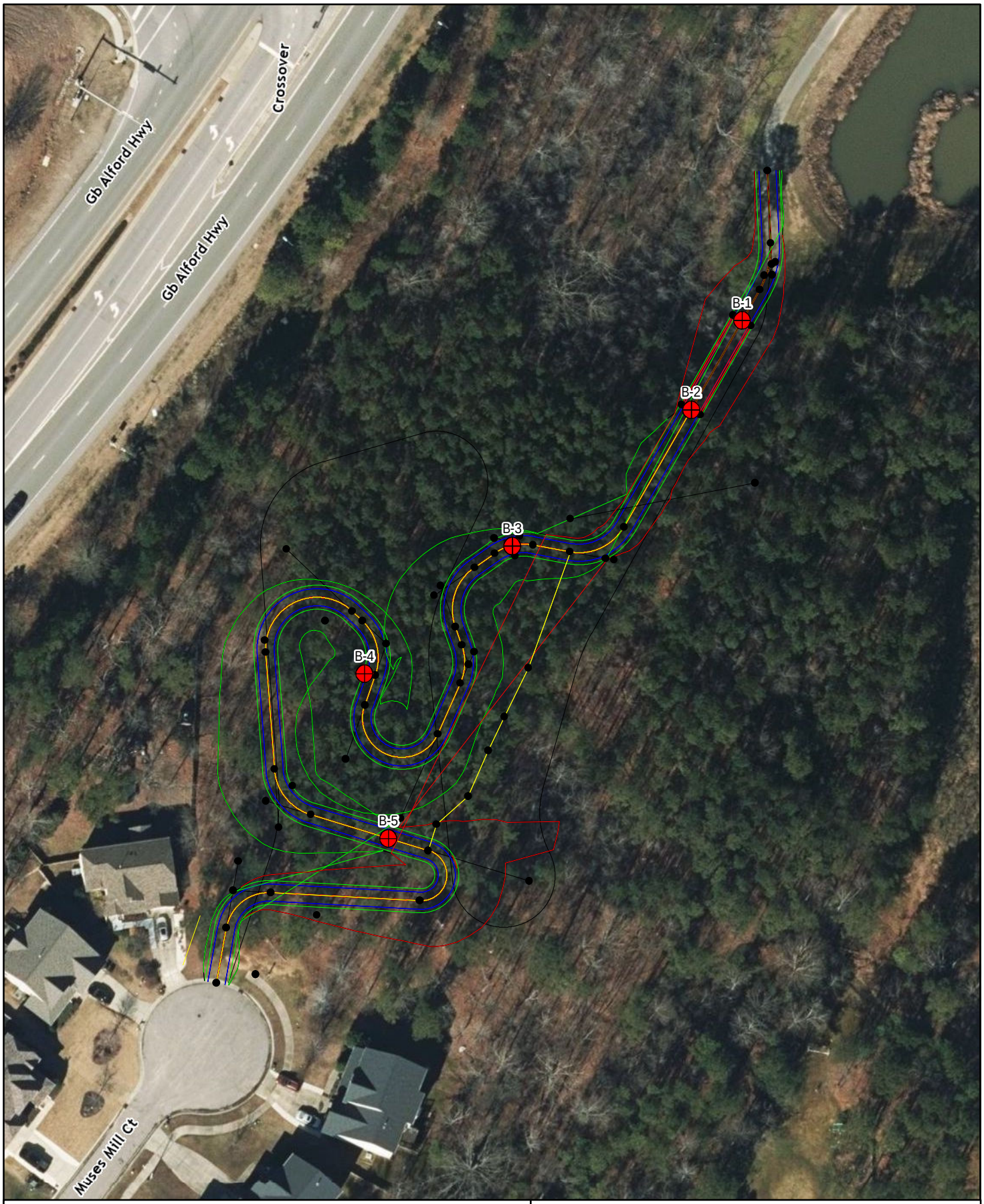
Site Vicinity Map

0 250 500 1,000 1,500 2,000 Feet

FROEHLING & ROBERTSON
Engineering Stability Since 1881
310 Hubert Street
Raleigh, North Carolina 27603
T 919.828.3441

Client:	Benesch
Project:	Ting-Oakhall Greenway Connector
Location	Holly Springs, Wake County, NC
Project Number:	66C-0157
Data:	Open Street
Date:	April 2025
Scale:	1 inch = 1,000 feet

FIGURE No.: 1



Boring Location Plan

0 15 30 60 90 120 Feet

N

FROEHLING & ROBERTSON
Engineering Stability Since 1881

310 Hubert Street
Raleigh, North Carolina 27603
T 919.828.3441

Client:	Benesch
Project:	Ting-Oakhall
Location	Holly Springs, Wake County, NC
Project Number:	66C-0157
Data:	NCOne Map Aerial 2021
Date:	April 2025
Scale:	1 inch = 75 feet

FIGURE No.: 2

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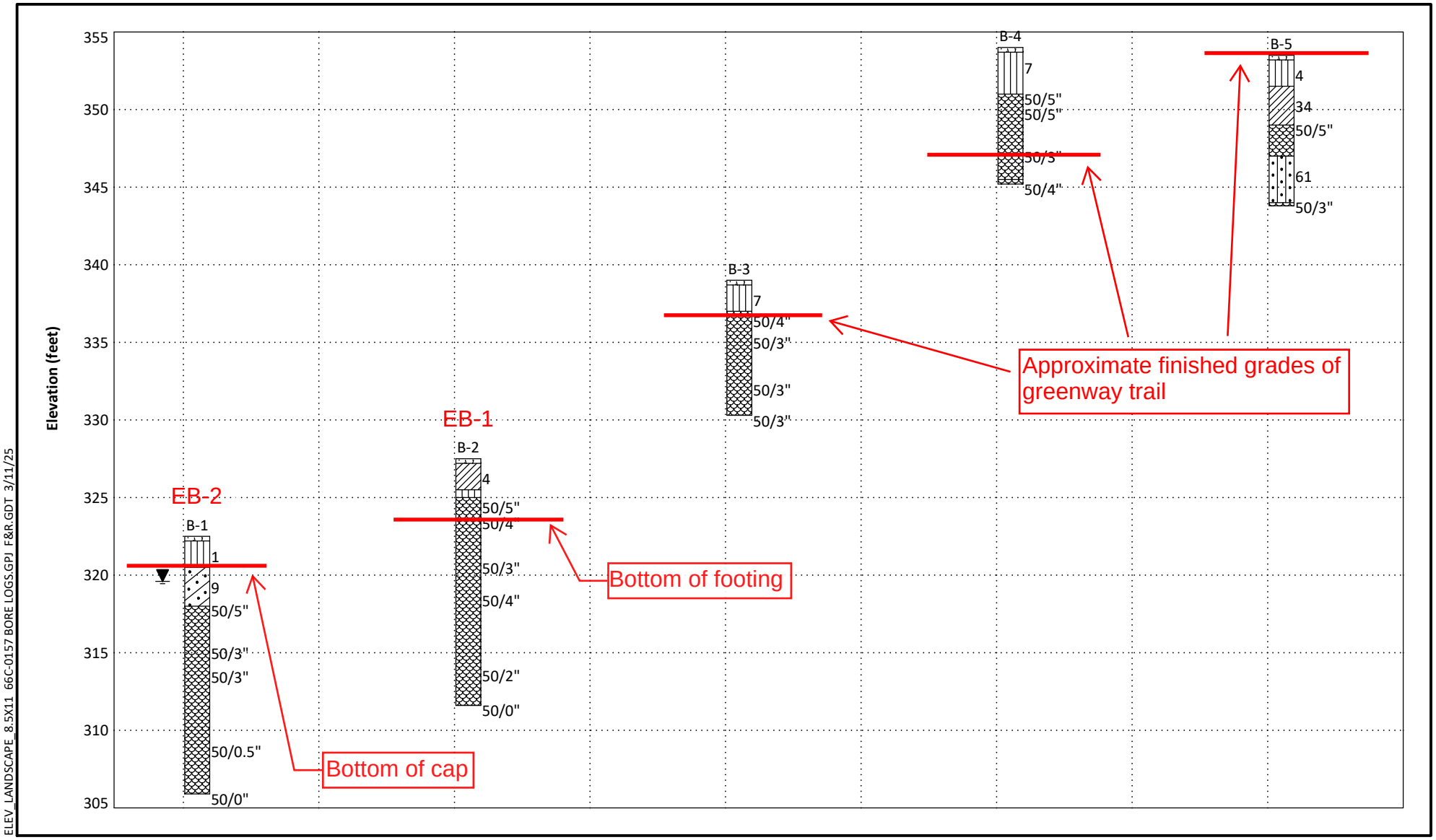
SUBSURFACE PROFILE

Plot Based on Elevation
Profile Name: Figure No. 3

Project No: 66C-0157
Client: benesch
Project: Ting-Oakhall Greenway Connector
City/State: Holly Springs, NC



ELEV_LANDSCAPE_8.5X11 66C-0157 BORE LOGS.GPJ F&R.GDT 3/11/25

APPENDIX II

BORING LOGS

KEY TO SOIL CLASSIFICATION

Correlation of Penetration Resistance with Relative Density and Consistency

Sands and Gravels

No. of Blows, N	Relative Density
0 - 4	Very loose
5 - 10	Loose
11 - 30	Medium dense
31 - 50	Dense
Over 50	Very dense

Silts and Clays

No. of Blows, N	Relative Density
0 - 2	Very soft
3 - 4	Soft
5 - 8	Firm
9 - 15	Stiff
16 - 30	Very stiff
31 - 50	Hard
Over 50	Very hard

Particle Size Identification (Unified Classification System)

Boulders:	Diameter exceeds 8 inches
Cobbles:	3 to 8 inches diameter
Gravel:	**Coarse** - 3/4 to 3 inches diameter **Fine** - 4.76 mm to 3/4 inch diameter
Sand:	**Coarse** - 2.0 mm to 4.76 mm diameter **Medium** - 0.42 mm to 2.0 mm diameter **Fine** - 0.074 mm to 0.42 mm diameter
Silt and Clay:	Less than 0.07 mm (particles cannot be seen with naked eye)

Modifiers

The modifiers provide our estimate of the amount of silt, clay or sand size particles in the soil sample.

Approximate Content	Modifiers
≤ 5%:	Trace
5% to 12%:	Slightly silty, slightly clayey, slightly sandy
12% to 30%:	Silty, clayey, sandy
30% to 50%:	Very silty, very clayey, very sandy

Field Moisture Description	
Saturated:	Usually liquid; very wet, usually from below the groundwater table
Wet:	Semisolid; requires drying to attain optimum moisture
Moist:	Solid; at or near optimum moisture
Dry:	Requires additional water to attain optimum moisture

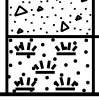
Ground Water

▽ Water Level in Bore Hole Immediately after Drilling

▼ Static Water Level after 24 Hours

SINCE F&R 1881

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISION				TYPICAL NAMES
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve	CLEAN GRAVEL (little or no fines)		GW	Well graded gravels
			GP	Poorly graded gravels
	GRAVELS with fines		GM	Silty gravels
			GC	Clayey gravels
SANDS More than 50% of coarse fraction smaller than No. 4 sieve	CLEAN SAND (little or no fines)		SW	Well graded sands
			SP	Poorly graded sands
	SAND with fines		SM	Silty sands, sand/silt mixtures
			SC	Clayey sands, sand/clay mixtures
SILTS AND CLAYS Liquid Limit is less than 50			ML	Inorganic silts, sandy and clayey silts with slightly plasticity
			CL	Sandy or silty clays of low to medium plasticity
			OL	Organic silts of low plasticity
SILTS AND CLAYS Liquid Limit is greater than 50			MH	Inorganic silts, sandy micaceous or clayey elastic silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
HIGHLY ORGANIC SOILS			PT	Peat and other highly organic soils
MISCELLANEOUS MATERIALS				PWR (Partially Weathered Rock)
				Rock
				Asphalt
				ABC Stone
				Concrete
				Surficial Organic Soil

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BORING LOG

Boring: B-1 (1 of 1)

Project No: 66C-0157
Client: benesch
Project: Ting-Oakhall Greenway Connector
City/State: Holly Springs, NC

Elevation: 322.5 ±
Total Depth: 16.6'
Boring Location: See Boring Location Plan

Drilling Method: 2.25" ID HSA
Hammer Type: Automatic
Date Drilled: 2/27/25
Driller: G. Mahon

Elevation	Depth	Description of Materials (Classification)	* Sample Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks
322.2	0.3	SURFICIAL ORGANIC SOILS	WOH-WOH-1	0.0	1	GROUNDWATER DATA: 0 Hr: Dry inside PVC 24 Hrs: 2.9' inside PVC
		ALLUVIAL: Very Soft, Tan-Brown, Moist, Fine Sandy SILT (ML) with Trace Fine Gravel and Roots		1.5		
320.5	2.0	Loose, Orange-Gray, Moist, Silty Clayey Fine to Coarse SAND (SC) with Trace Fine Gravel	3-4-5	2.0	9	
			16-26-50/5"	3.5	100+	
318.0	4.5	PARTIALLY WEATHERED ROCK: Sampled as Maroon, Fine Sandy SILT with Trace Rock Fragments		4.9		
			42-50/3"	6.5	100+	
				7.3		
			50/3"	8.5	100+	
			50/0.5"	13.5	100+	
305.9	16.6	Boring Terminated by Auger Refusal at 16.6 feet.	50/0"	16.6	100+	

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N-Value.

FROEHLING & ROBERTSON
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BORING LOG

Boring: B-2 (1 of 1)

Project No: 66C-0157
Client: benesch
Project: Ting-Oakhall Greenway Connector
City/State: Holly Springs, NC

Elevation: 327.5 ±
Total Depth: 15.9'
Boring Location: See Boring Location Plan

Drilling Method: 2.25" ID HSA
Hammer Type: Automatic
Date Drilled: 2/28/25
Driller: G. Mahon

Elevation	Depth	Description of Materials (Classification)	* Sample Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks
327.2	0.3	SURFICIAL ORGANIC SOILS	1-1-3	0.0	4	GROUNDWATER DATA: 0 Hr: Dry, Caved at 12.5' 24 Hrs: Dry, Caved at 12.5'
		ALLUVIAL: Soft, Tan-Brown, Moist, Silty CLAY (CL)		1.5		
325.5	2.0	RESIDUAL: Maroon, Fine Sandy SILT (ML) with Trace Rock Fragments	8-50/5"	2.0	100+	
325.0	2.5	PARTIALLY WEATHERED ROCK: Sampled as Maroon and Gray, Fine Sandy SILT with Trace to Some Rock Fragments		2.8		
			50/4"	3.5 3.8	100+	
			50/3"	6.5	100+	
			50/4"	8.5 8.8	100+	
			50/2"	13.5	100+	
311.6	15.9	Boring Terminated by Auger Refusal at 15.9 feet.	50/0"	15.9	100+	

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N-Value.

FROEHLING & ROBERTSON
Engineering Stability Since 1881

BORING LOG

Boring: B-3 (1 of 1)

Project No: 66C-0157
Client: benesch
Project: Ting-Oakhall Greenway Connector
City/State: Holly Springs, NC

Elevation: 339 ±
Total Depth: 8.7'
Boring Location: See Boring Location Plan

Drilling Method: 2.25" ID HSA
Hammer Type: Automatic
Date Drilled: 2/27/25
Driller: G. Mahon

Elevation	Depth	Description of Materials (Classification)	* Sample Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks
338.7	0.3	SURFICIAL ORGANIC SOILS	1-3-4	0.0	7	GROUNDWATER DATA: 0 Hr: Dry inside PVC 24 Hrs: Dry inside PVC
		RESIDUAL: Firm, Tan-Brown, Moist, Clayey Fine Sandy SILT (ML) with Trace Rock Fragments and Roots		1.5		
337.0	2.0	PARTIALLY WEATHERED ROCK: Sampled as Maroon and Gray, Fine Sandy SILT with Trace to Some Rock Fragments	50/4"	2.0 2.3	100+	
			50/3"	3.5 3.8	100+	
			50/3"	6.5 6.8	100+	
330.3	8.7	Boring Terminated at 8.7 feet.	50/3"	8.5 8.8	100+	

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N-Value.

FROEHLING & ROBERTSON
Engineering Stability Since 1881

BORING LOG

Boring: B-4 (1 of 1)

Project No: 66C-0157
Client: benesch
Project: Ting-Oakhall Greenway Connector
City/State: Holly Springs, NC

Elevation: 354 ±
Total Depth: 8.8'
Boring Location: See Boring Location Plan

Drilling Method: 2.25" ID HSA
Hammer Type: Automatic
Date Drilled: 2/27/25
Driller: G. Mahon

Elevation	Depth	Description of Materials (Classification)	* Sample Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks
353.7	0.3	SURFICIAL ORGANIC SOILS	2-3-4	0.0	7	GROUNDWATER DATA:
		RESIDUAL: Firm, Orange-Brown, Moist, Clayey Fine Sandy SILT (ML) with Trace Roots		1.5		0 Hr: Dry inside PVC
			5-20-50/5"	2.0	100+	24 Hrs: Dry inside PVC
351.0	3.0	PARTIALLY WEATHERED ROCK: Sampled as Gray and Maroon, Silty Fine to Medium SAND with Some Rock Fragments		3.4		
			50/5"	3.5		
				3.9	100+	
			50/3"	6.5		
				6.8	100+	
345.5	8.5		50/4"	8.5		
345.2	8.8	PARTIALLY WEATHERED ROCK: Sampled as Maroon, Fine Sandy SILT with Trace Rock Fragments		8.8	100+	
		Boring Terminated at 8.8 feet.				

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N-Value.

FROEHLING & ROBERTSON
Engineering Stability Since 1881

BORING LOG

Boring: B-5 (1 of 1)

Project No: 66C-0157
Client: benesch
Project: Ting-Oakhall Greenway Connector
City/State: Holly Springs, NC

Elevation: 353.5 ±
Total Depth: 9.7'
Boring Location: See Boring Location Plan

Drilling Method: 2.25" ID HSA
Hammer Type: Automatic
Date Drilled: 2/27/25
Driller: G. Mahon

Elevation	Depth	Description of Materials (Classification)	* Sample Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks
353.2	0.3	SURFICIAL ORGANIC SOILS	1-2-2	0.0	4	GROUNDWATER DATA:
		RESIDUAL: Soft, Tan-Brown, Moist, SILT (ML) with Trace Clay, Rock Fragments, and Roots		1.5		0 Hr: Dry inside PVC
351.5	2.0	Hard, Maroon, Moist, Fine Sandy CLAY (CL)	7-15-19	2.0	34	24 Hrs: Dry inside PVC
			17-36-50/5"	3.5	100+	
349.0	4.5	PARTIALLY WEATHERED ROCK: Sampled as Maroon, Fine Sandy SILT		4.9		
347.0	6.5	RESIDUAL: Very Dense, Gray and Maroon, Silty Fine to Medium SAND (SM) with Some Rock Fragments	25-28-33	6.5	61	
				8.0		
			22-35-50/3"	8.5	100+	
344.0	9.5					
343.8	9.7	PARTIALLY WEATHERED ROCK: Sampled as Gray and Maroon, Silty Fine to Medium SAND with Some Rock Fragments		9.8		
		Boring Terminated at 9.7 feet.				

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N-Value.

APPENDIX III

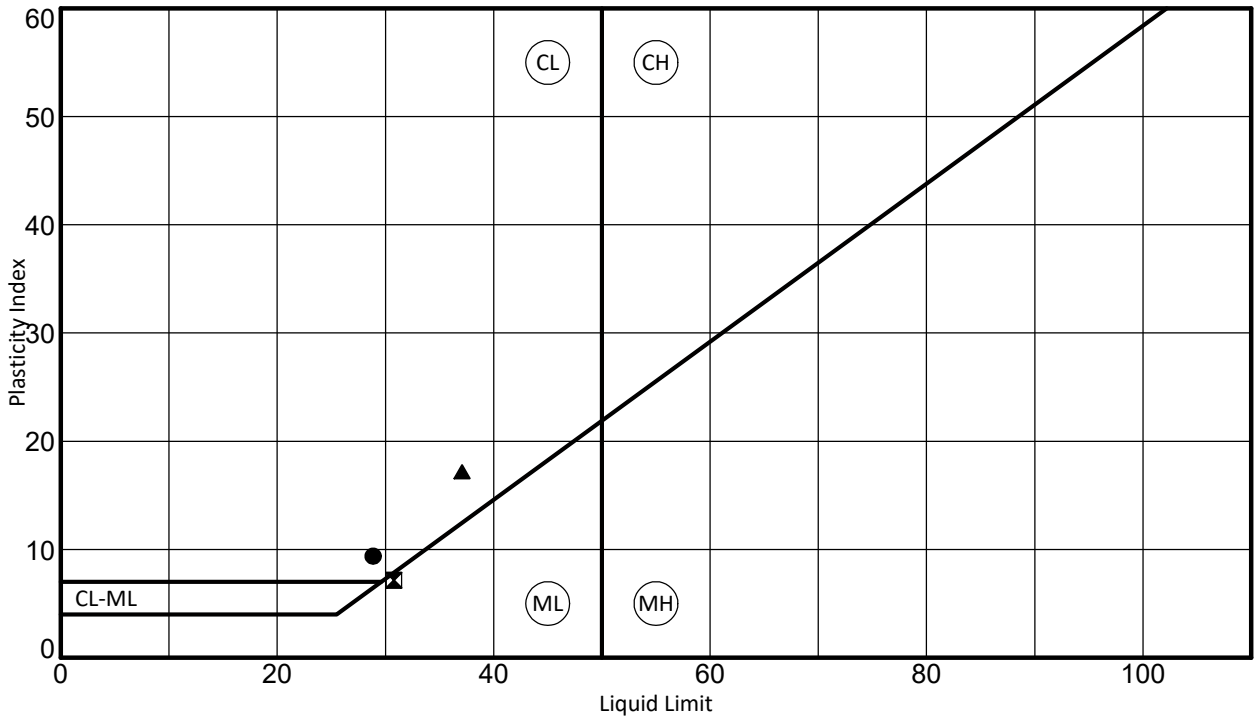
LABORATORY TEST RESULTS

FROEHLING & ROBERTSON
Engineering Stability Since 1881

ATTERBERG LIMITS

Sheet: 1 of 1

Project No: 66C-0157
Client: Alfred Benesch & Company
Project: Ting-Oakhall Greenway Connector
City/State: Holly Springs, NC



Boring No.	Depth	LL	PL	PI	% PASSING #200	Classification	% Natural Water Content
● B-2	0.0' - 1.5'	29	19	10	68.9	SANDY LEAN CLAY (CL)	17.5
⊠ B-4	0.0' - 1.5'	31	24	7	62.4	SANDY SILT (ML)	17.9
▲ B-5	2.0' - 3.5'	37	20	17	67.0	SANDY LEAN CLAY (CL)	9.7

APPENDIX IV

GBA DOCUMENT

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed*. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

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Wetland Delineation

Ting-Oakhall Greenway Connector
Muses Mill Court to the existing Ting Stadium Greenway
Holly Springs, NC

Prepared For:
Benesch
8000 Regency Parkway, Suite 175
Cary, NC 27518

Issue Date: February 6, 2025
F&R Project Number: 59C-0320

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Appendices

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Appendix B - Figures
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Appendix D - USACE Data Forms
Appendix E - NCDWQ Stream Forms

Wetland Delineation
Ting-Oakhall Greenway Connector
Muses Mill Court to the existing Ting Stadium Greenway
Holly Springs, NC

Property Description:

Size (acres):	2.7	Nearest Town:	Holly Springs
Nearest Waterway:	Little Branch	River Basin:	Cape Fear
USGS HUC:	030300040102		
Coordinates:	Lat: 35.66697	Long: -78.83986	
Location:	Located between Muses Mill Court to Existing Ting Stadium Greenway just west of Ting Park in Holly Springs, Wake County, North Carolina.		

Froehling & Robertson, Inc., (F&R) presents herein the results of the Wetland Delineation that has been conducted at the Ting-Oakhall Greenway Connector site, herein referred to as the Review Area. The Review Area is located just north of the termination of Muses Mill Court and south of Sportsmanship Way in Holly Springs, Wake County, North Carolina. It is situated between Muses Mill Court and the existing Ting Stadium Greenway, just west of Ting Park. The Review Area contains one irregular-shaped area totaling 2.7 acres and is a portion of a larger parent parcel identified as Wake County parcel identification number (PIN) 0649881084. The Review Area is situated within a suburban land use area with residential, and commercial land in the immediate area of the Review Area. Route 55 (GB Alford Highway) is located adjacent to the west of the Review Area. The site is currently comprised of wooded land.

1.0 EXECUTIVE SUMMARY

The following is a summary of our findings and is not intended to replace more detailed information contained elsewhere in this report. Based on F&R's field observations and information review, likely jurisdictional features, including one wetland (W1) and three streams (S1, S2, and S3), were identified within the Review Area during our assessment. A graphic depiction of the identified feature locations and relevant riparian buffers is included in the attachments.

S1 and S2 are depicted on the most recent United States Geological Survey (USGS) topographic map, and they are also depicted on the Wake County Natural Resources Conservation Service (NRCS) Soil Survey map. The site is located in the Cape Fear River Basin, and therefore is not subject to NCDWR Riparian Buffer Rules. However, the site is located

within the Town of Holly Springs, which enacts 30-foot, zoned buffers around all perennial and intermittent streams in the Cape Fear River Basin. A graphic depiction of the identified feature locations and relevant riparian buffers is included in the attachments.

2.0 SCOPE OF SERVICES

This report describes the activities and findings associated with the completion of a Wetland Delineation for the above-referenced review area. F&R reviewed applicable information sources to identify areas on the project site that could be considered "Waters of the US" (i.e., wetland, stream, and open water features) and subject to jurisdiction by Environmental Protection Agency (EPA), United States Army Corps of Engineers (USACE) and/or North Carolina Division of Water Resources (NCDWR). On-site determination of the presence or absence of wetlands was performed in general accordance with the 1987 Corps of Engineers Wetlands Delineation Manual and subsequent USACE clarification memorandums. On-site identification of streams was performed in general accordance with the NCDWQ Identification Methods of the Origins of Intermittent and Perennial Streams.

3.0 SITE CONDITIONS

The Review Area is situated within a wooded land use area and the surrounding properties generally consist of a combination of commercial buildings, wooded land, and residential neighborhoods. The site is currently comprised of wooded land. One wetland (W1) and three streams (S1, S2, and S3), were identified within the Review Area. One wetland (W1) was identified immediately adjacent to the north of the Review Area. One upland data point (DP-2) and one wetland data point (DP-1) were collected throughout the Review Area.

3.1 Information Review

F&R reviewed all or some of the following resources prior to visiting the project site: the current 1:24,000-scale USGS topographic map, the Wake County NRCS Soil Survey map, the USFWS NWI map, and aerial photographs. S1 and S2 are depicted on the most recent USGS topographic map, and they are also depicted on the Wake County NRCS Soil Survey map. The site is located in the Cape Fear River Basin, and therefore is not subject to NCDWR Riparian Buffer Rules. However, the site is located within the Town of Holly Springs, which enacts 30-foot, zoned buffers around all perennial and intermittent streams in the Cape Fear River Basin. A graphic depiction of the identified feature locations and relevant riparian buffers is included in the attachments.

The most recent NRCS Soil Survey data indicate three soil series located within the project Review Area: Carbonton-Brickhaven complex (CaC, CaD), Carbonton-Brickhaven-Urban land complex (CcC), and Chewacla and Wehadkee soils, frequently flooded (ChA). One of the soil series mapped within the project area are classified as hydric soils. Chewacla and

Wehadkee soils, frequently flooded, is classified as a hydric soil on the NRCS hydric soils list for Wake County, NC. Hydric soils are defined as "soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part." The presence of hydric soils is one of three wetland determination criteria.

3.2 On-Site Observations

Based on F&R's on-site observations, the below-listed features are each likely to be considered jurisdictional "Waters of the US" (WOTUS) by the USACE and/or NCDWR; however, on-site determinations by the USACE and NCDWR will be required in order to confirm or deny jurisdiction by these two regulatory agencies. The locations of all mapped features are shown on the Stream and Wetland ID Map(s) in the attachments and are described as follows:

Wetland Summary Table

Wetland Name	Wetland Type	Cowardin Code	Surface Water Connection	WOTUS*	SqFt	Acres
W1	Palustrine Forested	PFO	Connected to S1 and S3	Yes	6,488	0.15

*Based on the premise of a Preliminary Jurisdictional Determination only. Per the EPA and USACE September 2023 "Revised Definition of 'Waters of the United States'; Conforming Rule", Approved Jurisdictional Determinations require further investigation of WOTUS consideration for wetlands without continuous surface connection to main tributaries.

Surface Water Summary Table

Surface Water Name	NCDWQ Stream Designation	NCDWQ Stream Score	Subject to NCDWR Riparian Buffer Rules	Cowardin Code	Length (Ft)	Sq Ft	Acres
S1	Perennial	31.5	Yes	R5	229	353	0.008
S2	Perennial	34.5	Yes	R5	46	92	0.002
S3	Intermittent	20.5	Yes	R4	60	100	0.002

NCDWR Riparian Buffers Summary Table

Regulated Watershed	Surface Water Name	Buffer Zone	Buffer Distance (Ft)	SqFt	Acres
Cape Fear	S1	1&2	30	25,612	0.59
Cape Fear	S2	1&2	30	3,297	0.08
Cape Fear	S3	1&2	30	5,239	0.12

4.0 CONCLUSION

During F&R's wetland delineation, three streams (S1, S2, and S3) and one wetland (W1) were identified within the Review Area. It is F&R's opinion that these features are likely to be considered jurisdictional by the USACE and/or NCDWR and will be subject to regulations in accordance with the Clean Water Act (CWA). On-site determinations by the USACE and NCDWR will be required in order to confirm or deny jurisdiction by these two regulatory agencies. Please see the Stream and Wetland ID Map(s) in the attachments for a graphic depiction of the stream and wetland features identified within the Review Area.

Please note that the attached Stream and Wetland ID Map(s) prepared by F&R is meant for use as a reference document only. This map is not designed to satisfy any requirement for a survey plat by a licensed surveyor nor is it intended to be used for construction purposes or relied upon for the jurisdictional limits of the mapped surface features.

5.0 GENERAL GUIDANCE

F&R recommends that plans for development of the Review Area consider the USACE and NCDWR procedures for assessing impacts to jurisdictional wetlands and/or streams (i.e., avoid, minimize, and mitigate) to optimize permitting strategies.

If proposed development on the project site does not result in impacts to wetland areas, the areas immediately adjacent to wetland boundaries, or the identified Waters of the US, a USACE permit will not be necessary. Typical activities requiring USACE permitting include, but are not limited to, depositing of fill or dredged material in wetlands; site development fill; construction of revetments, groins, breakwaters, levees, dams, dikes, and weirs; and placement of rip-rap and road fill.

If impacts to these areas are anticipated, F&R recommends that site plans be developed that optimize permitting strategies to comply with the USACE, NCDWR, and local municipality procedures for assessing impacts to jurisdictional wetlands and/or "Waters of the US" (i.e.,

avoid, minimize, and mitigate). If future impacts to jurisdictional wetlands and/or streams are anticipated, the appropriate permit applications for regulatory review must be completed prior to any initiation of activities that may require permitting.

F&R can provide alternative design measures and make the written request based upon extensive experience and professional relationships with the USACE and NCDWR throughout North Carolina in the event that impacts are unavoidable and written authorization needs to be requested.

6.0 LIMITATIONS

This report has been prepared for the exclusive use of Benesch (Client) and others so designated by the Client for this specific project. These services have been provided in accordance with generally accepted environmental practices. No other warranty, expressed or implied, is made. Our observations were based upon conditions readily visible at the site at the time of our visit. If additional information becomes available which may affect our conclusions and recommendations, we request the opportunity to review the information, and reserve the right to modify our report, as warranted.

7.0 CLOSURE

Please do not hesitate to contact us if you have any questions or require further information. We appreciate the opportunity to work with you as your environmental consultant. Please do not hesitate to contact us if you have any questions, comments or additional needs.

Sincerely,

FROEHLING & ROBERTSON, INC.

Eva DeSantis
Environmental Scientist

Elias Ruhl
Natural Resources Practice Leader

Attachments: General Terms, Conditions, and Limitations
Site Location Map
USGS Topographic Map
NRCS Soil Survey Map

National Wetland Inventory Map
Stream and Wetland ID Map
Holly Springs Cape Fear Riparian Buffers Map
Site Photographs
USACE Data Forms
NCDWQ Stream Forms

Appendix A - General Terms, Conditions, and Limitations

GENERAL TERMS, CONDITIONS, AND LIMITATIONS

Froehling & Robertson, Inc. by virtue of providing the services described in this proposal does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, State, or Federal public agencies any conditions at the site that may present a potential danger to public health, safety, or the environment. The CLIENT agrees to notify the appropriate local, State, or Federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment.

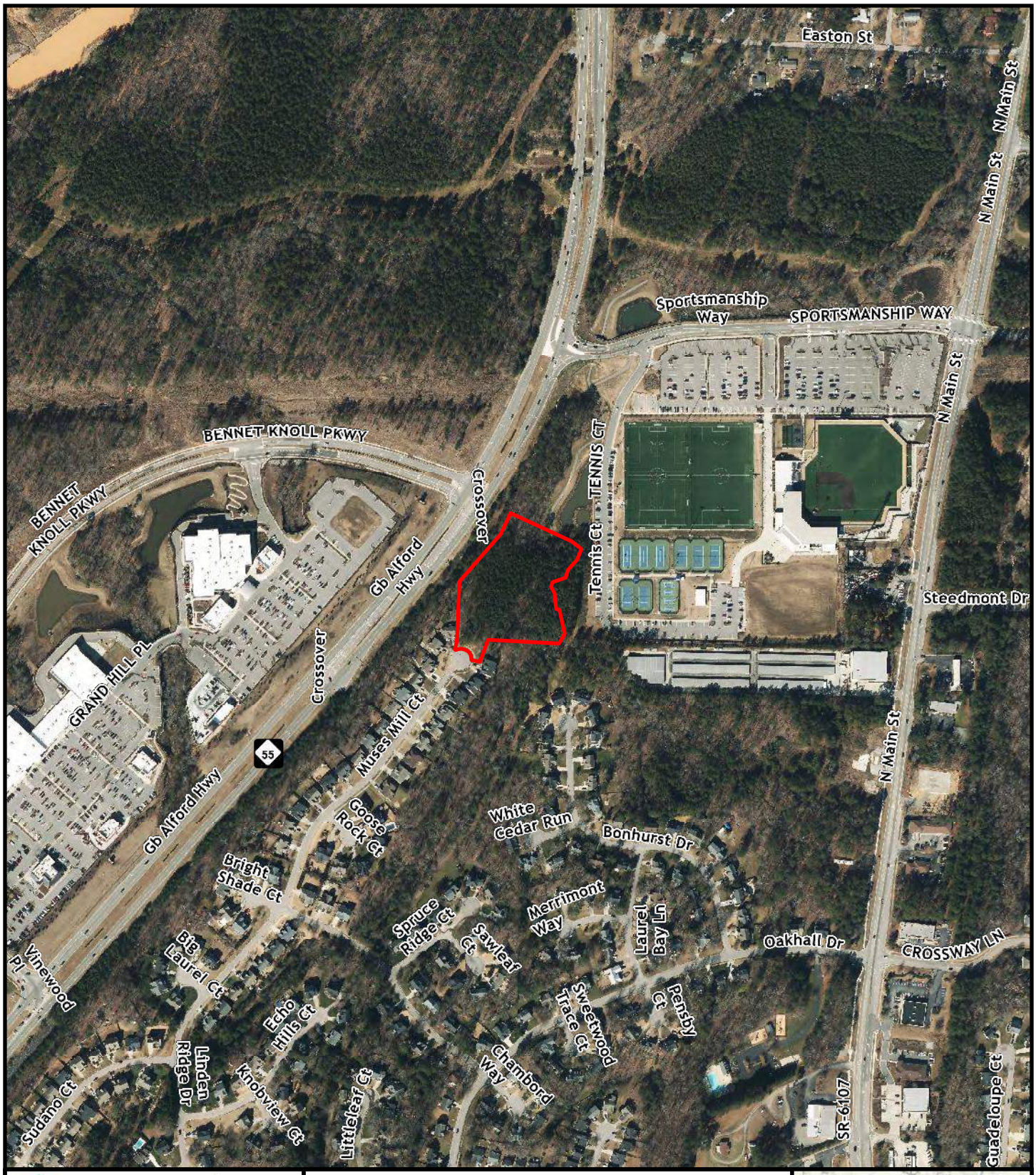
The scope of work will be limited to what is provided for in this report. This evaluation will not constitute an exhaustive evaluation of the site or extant reports. Our services will be based upon available data and upon current industry standards. Under this scope of services, F&R assumes no responsibility regarding response actions conducted by the Client and/or outside contractors initiated as a result of this study(s). Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriate trained and licensed-personnel, as warranted. F&R also assumes no responsibility regarding implementation of any recommendations made as a result of this report.

The findings, recommendations, or discussions provided as part of our services should not be construed in any way as a recommendation to purchase, sell, or develop the project site. F&R retains the right to revise our opinions or conclusions if new information is later discovered or made available.

When hazardous materials are known, assumed or suspected to exist at a site, F&R is required to take appropriate precautions to protect the health and safety of personnel, to comply with applicable laws and regulations, and to follow procedures that an engineer deemed prudent to minimize physical risks to employees and the public. The CLIENT hereby warrants that, if he knows or has any reason to assume or suspect that hazardous materials may exist at the project site, the CLIENT has so informed F&R.

If pollutants are discovered that, in our sole opinion, pose unanticipated risks, it is hereby agreed that the scope of services, schedule and the estimated costs will be reconsidered and that this contract shall immediately become subject to renegotiation or, in the sole discretion of Froehling & Robertson, termination. If accepted, these stated prices are subject to a negotiated increase after a one-year period.

Appendix B - Figures



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Site Location Map

Legend

Review Area

Client:	Benesch
Project:	Ting-Oakhall Greenway Connector
Location:	Holly Springs/Wake County, NC
Project #:	59C-0320
Data:	Wake County GIS 2021

N

November 2024

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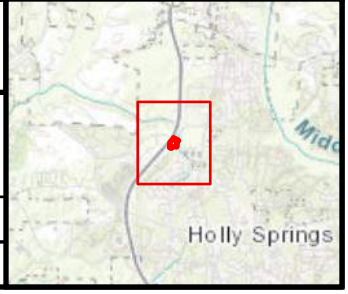

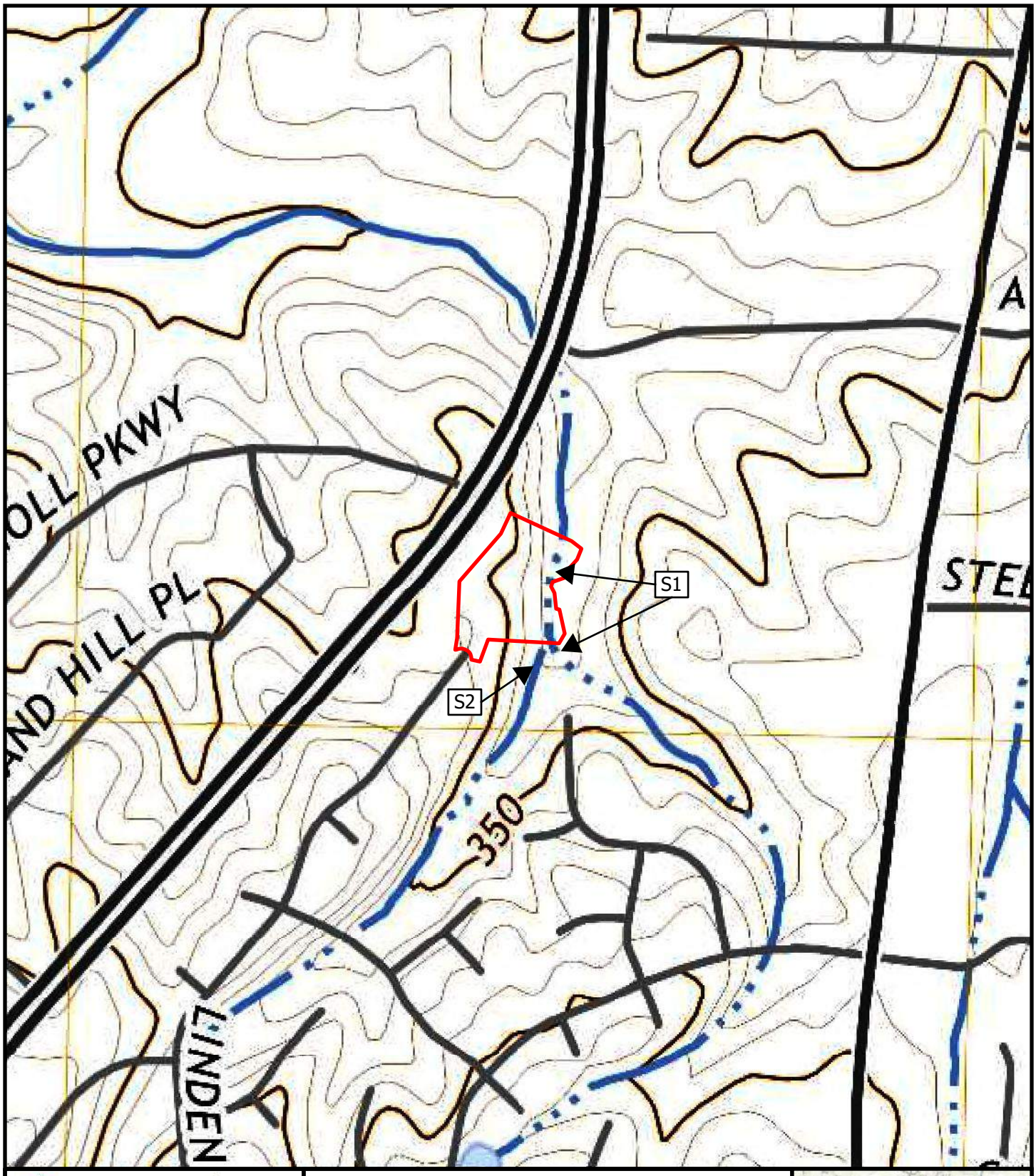

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USGS Topographic Map

Legend

Review Area

Client:	Benesch
Project:	Ting-Oakhall Greenway Connector
Location:	Holly Springs/Wake County, NC
Project #:	59C-0320
Data:	USGS Map "Apex NC" 2022

N

November 2024

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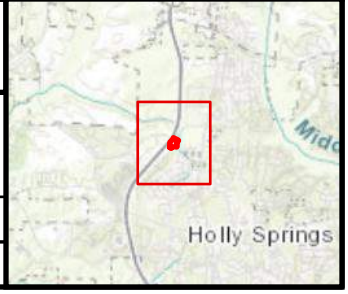

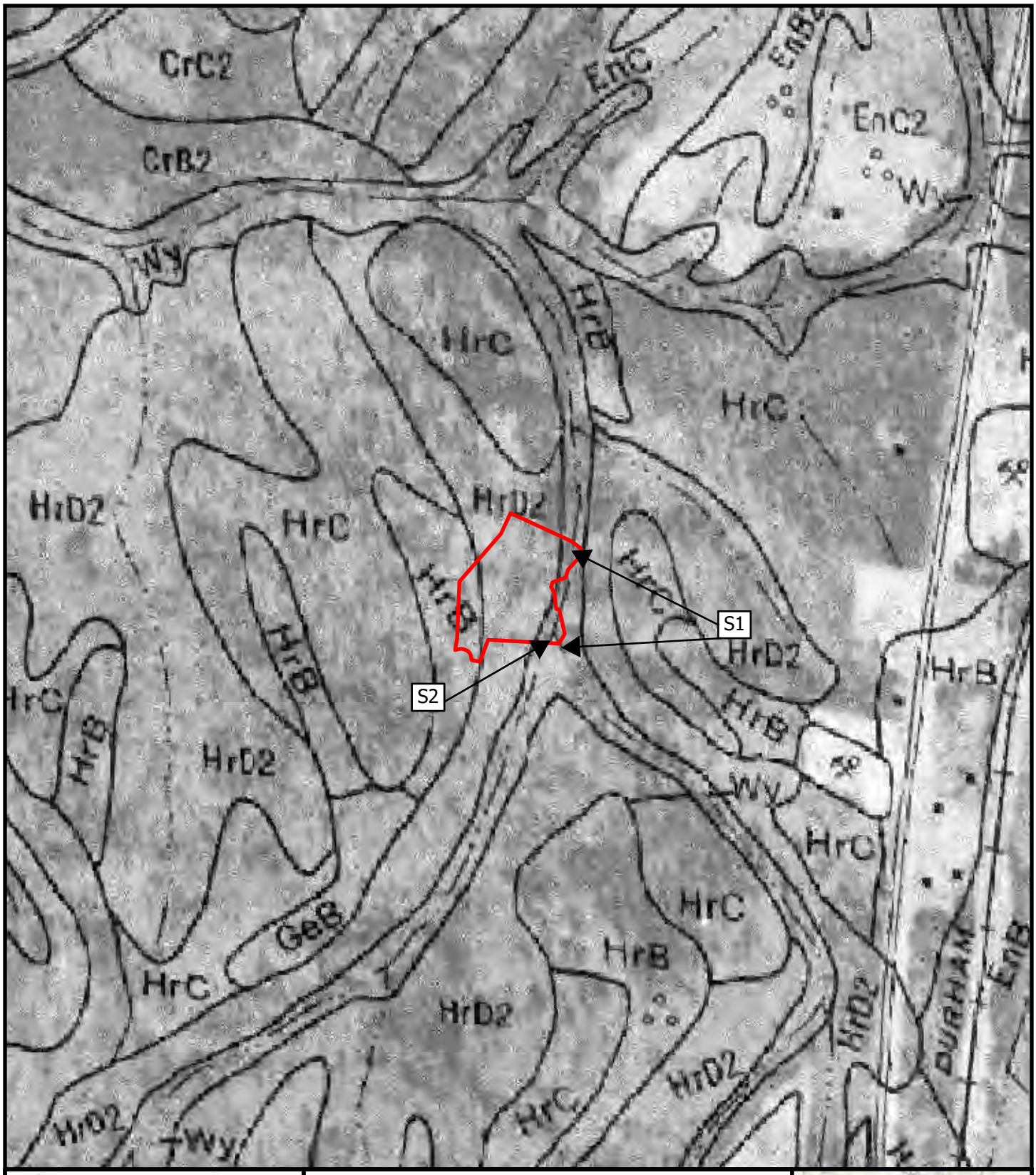

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NRCS Soil Survey Map

Legend

Review Area

Client:	Benesch
Project:	Ting-Oakhall Greenway Connector
Location:	Holly Springs/Wake County, NC
Project #:	59C-0320
Data:	Wake County NRCS Soil Survey

N

November 2024

Scale: 1:6,000

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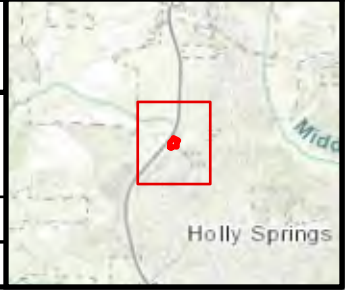

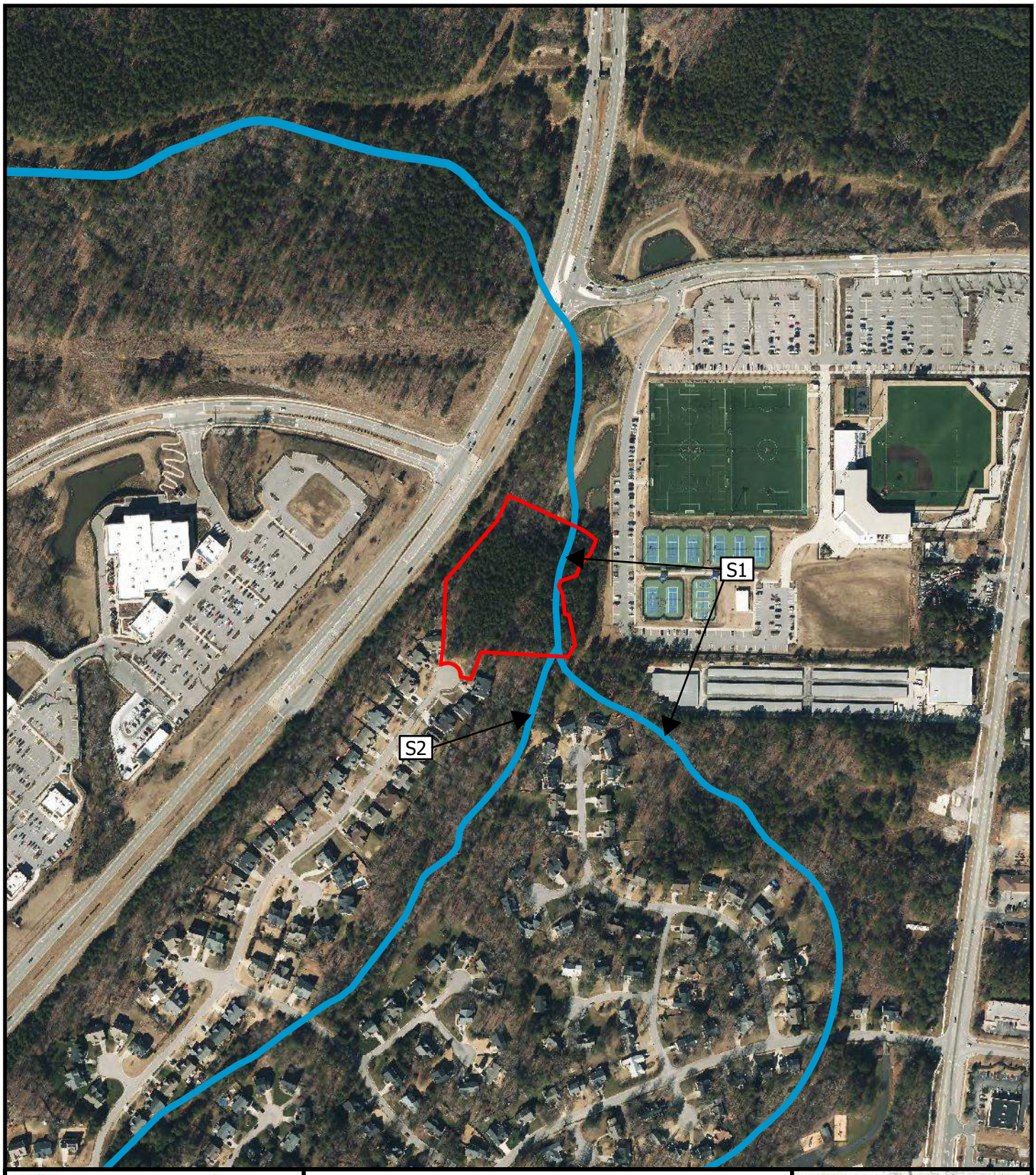

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National Wetland Inventory Map

Legend

- Review Area
- NWI Wetlands
- River

Client:	Benesch
Project:	Ting-Oakhall Greenway Connector
Location:	Holly Springs/Wake County, NC
Project #:	59C-0320
Data:	USFWS NWI, Wake County GIS 2021

N

November 2024

Scale: 1:6,000

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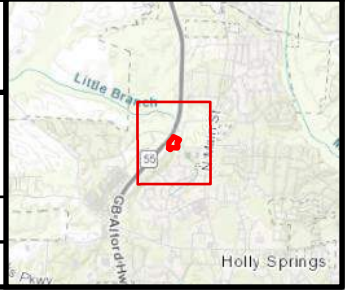

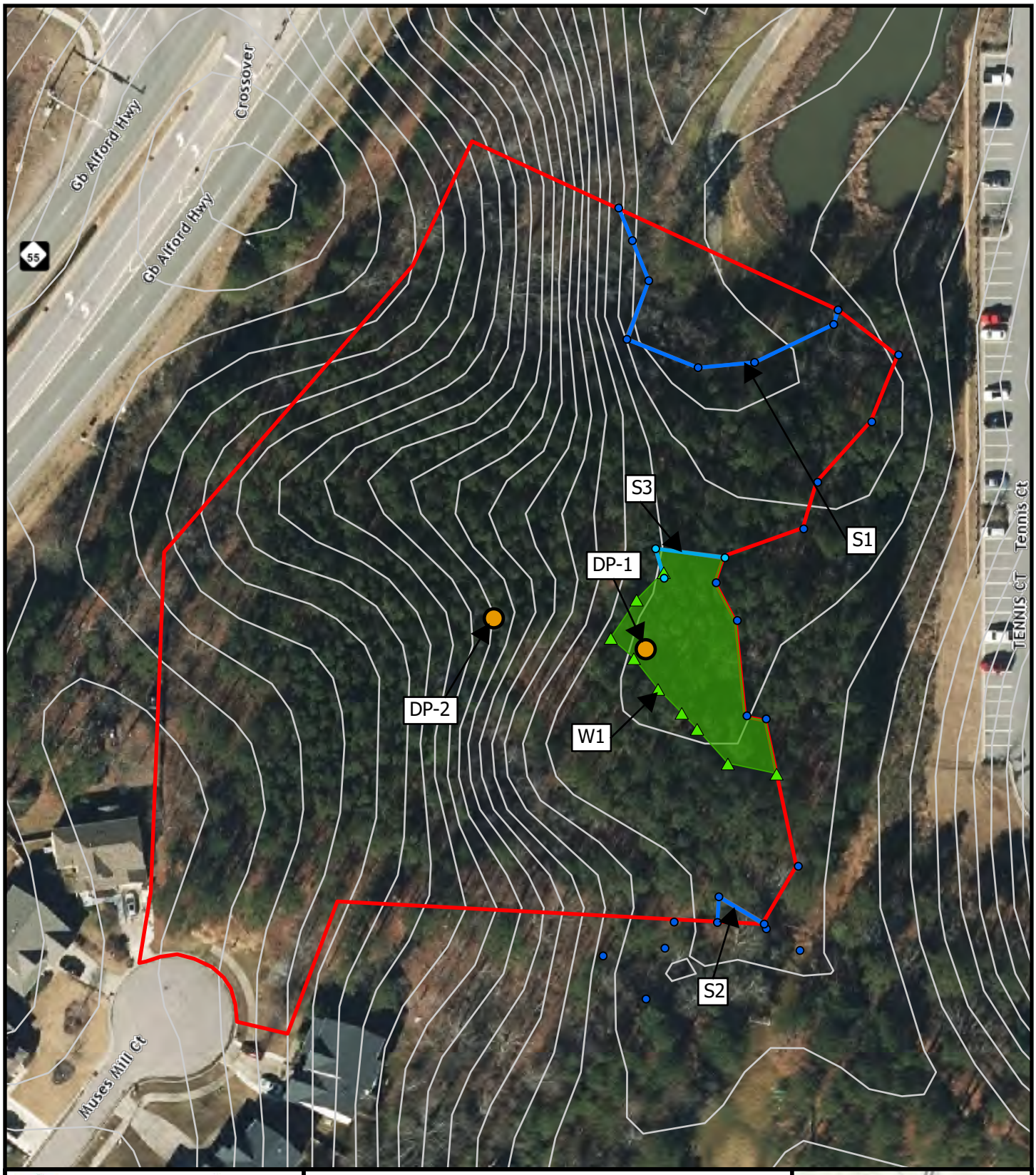

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Stream and Wetland ID Map

Legend

- Review Area
- 2ft Contours
- USACE Data Point
- Stream_Flags
  - Intermittent
  - Perennial
- Stream Lines
  - Intermitent
  - Perrenial
- Wetland Flags
- Wetland Polygon

Client:	Benesch
Project:	Ting-Oakhall Greenway Connector
Location:	Holly Springs/Wake County, NC
Project #:	59C-0320
Data:	Wake County GIS 2021

N

November 2024

Scale: 1:1,000

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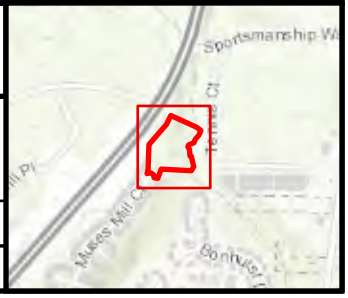

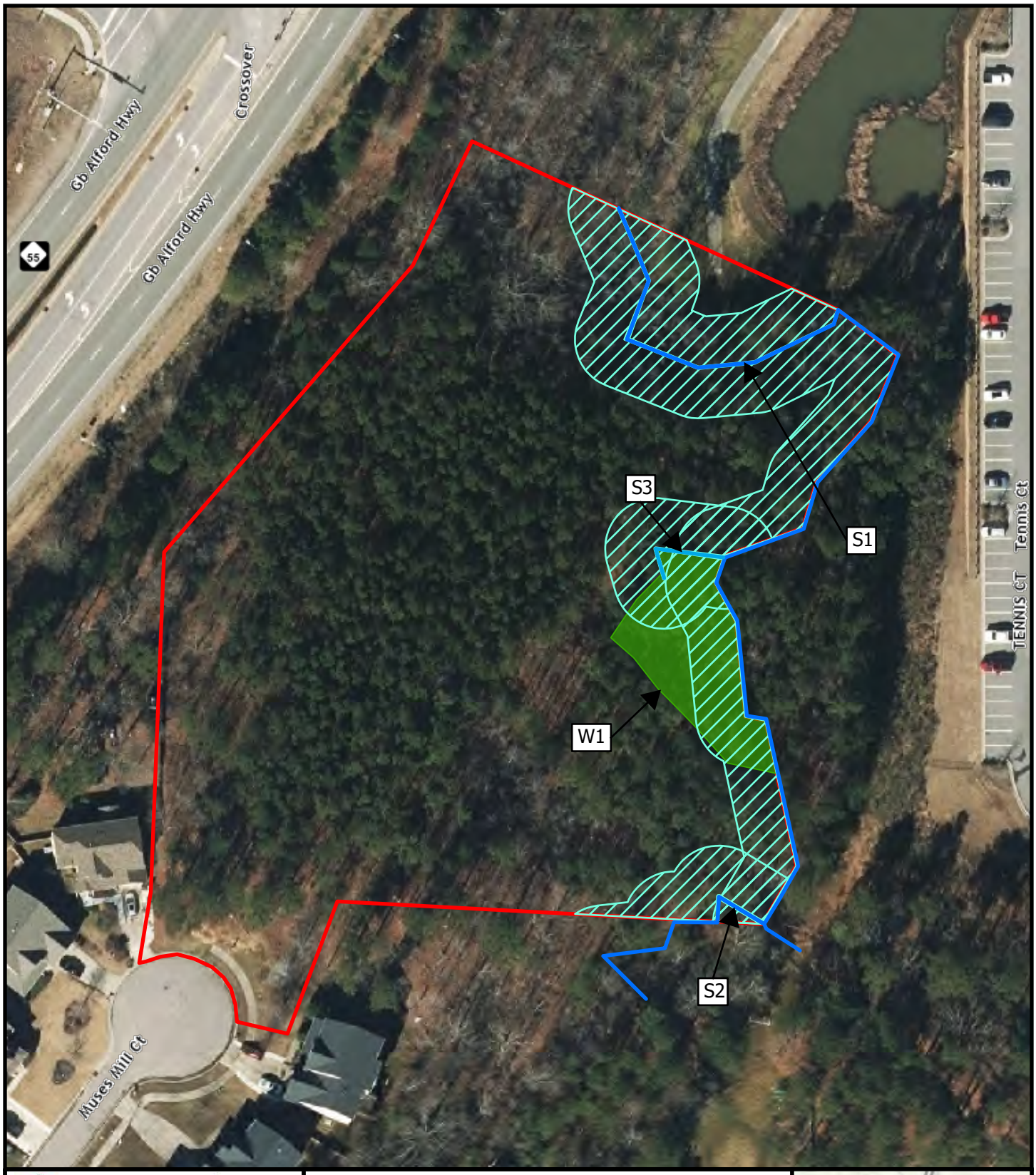

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Holly Springs Riparian Buffers Map

Legend

- Review Area
- Wetland Polygon
- Stream Lines
- Intermitent
- Perrenial
- Holly Springs 30ft Cape Fear Buffers

Client:	Benesch
Project:	Ting-Oakhall Greenway Connector
Location:	Holly Springs/Wake County, NC
Project #:	59C-0320
Data:	Wake County GIS 2021

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November 2024

Scale: 1:1,000

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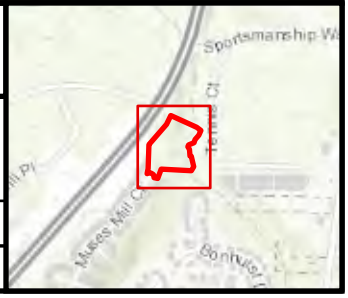

Appendix C - Site Photographs

View of DP-1 (W1) Facing North

View of DP-1 (W1) Facing East

View of DP-1 (W1) Facing South

View of DP-1 (W1) Facing West

View of DP-1 (W1) Soils

View of DP-2 Facing East

View of DP-2 Facing North

View of DP-2 Facing South

VIew of DP-2 Facing West

View of DP-2 Soils

View of S1 Facing Downstream

View of S1 Facing Upstream

View of S2 Facing Downstream

View of S2 Facing Upstream

View of S3 Facing Downstream

View of S3 Facing Upstream

Appendix D - USACE Data Forms

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Ting-Oakhall Greenway Connector City/County: Holly Springs, Wake County Sampling Date: 11/13/2024
Applicant/Owner: Benesch State: NC Sampling Point: DP-1
Investigator(s): Elias Ruhl, Evelia DeSantis Section, Township, Range: NA
Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-3
Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 35.66685 Long: -78.83990 Datum: WGS84
Soil Map Unit Name: Carbonton-Brickhaven Complex NWI classification: NA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
The Antecedent Precipitation Tool (APT) indicates normal climatic conditions on the day of sampling.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 2

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The parameter is met. Saturation at 2 inches.

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: DP-1

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liriodendron tulipifera*	40	Yes	FACU
2. *Acer rubrum*	40	Yes	FAC
3. *Pinus taeda*	20	Yes	FAC
4.			
5.			
6.			
	100	=Total Cover	
50% of total cover: 50		20% of total cover:	20
Sapling Stratum (Plot size: 30)			
1. *Liriodendron tulipifera*	20	Yes	FACU
2. *Acer rubrum*	20	Yes	FAC
3. *Ulmus alata*	5	No	FACU
4.			
5.			
6.			
	45	=Total Cover	
50% of total cover: 23		20% of total cover:	9
Shrub Stratum (Plot size: 15)			
1. *No rooted saplings present*			
2.			
3.			
4.			
5.			
6.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Herb Stratum (Plot size: 5)			
1. *Polystichum acrostichoides*	3	No	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	3	=Total Cover	
50% of total cover: 2		20% of total cover:	1
Woody Vine Stratum (Plot size: 30)			
1. *No rooted woody vines present*			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody Plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody Vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
The parameter is met.

SOIL

Sampling Point: DP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	7.5YR 4/3	100					Loamy/Clayey	
3-8	7.5YR 5/2	95	7.5YR 5/6	5	C	PL	Loamy/Clayey	Prominent redox concentrations
8-20	7.5YR 5/1	90	7.5YR 5/8	10	C	PL	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

The parameter is met.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Ting-Oakhall Greenway Connector City/County: Holly Springs/ Wake County Sampling Date: 11/13/2024
Applicant/Owner: Benesch State: NC Sampling Point: DP-2
Investigator(s): Elias Ruhl, Evelia DeSantis Section, Township, Range: NA
Landform (hillside, terrace, etc.): Hillside Local relief (concave, convex, none): Convex Slope (%): 5-8
Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 35.66690 Long: -78.84021 Datum: WGS84
Soil Map Unit Name: Carbonton-Brickhaven Complex NWI classification: NA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
The Antecedent Precipitaion Tool (APT) indicates normal conditions on the day of sampling.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
The parameter is not met.

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: DP-2

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	40	Yes	FAC
2. *Pinus taeda*	40	Yes	FAC
3. *Quercus nigra*	10	No	FAC
4.			
5.			
6.			
	90	=Total Cover	
50% of total cover: 45		20% of total cover:	18

Sapling Stratum (Plot size: 30)			
1. *Acer rubrum*	10	Yes	FAC
2. *Quercus rubra*	10	Yes	FACU
3.			
4.			
5.			
6.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Shrub Stratum (Plot size: 15)			
1. *No wooded shrubs present*			
2.			
3.			
4.			
5.			
6.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Oryzopsis asperifolia*	5	Yes	UPL
2. *Chimaphila maculata*	5	Yes	UPL
3. *Tipularia discolor*	3	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	13	=Total Cover	
50% of total cover: 7		20% of total cover:	3

Woody Vine Stratum (Plot size: 30)			
1. *No rooted woody vines present*			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42.9% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	100	x 3 =	300
FACU species	13	x 4 =	52
UPL species	10	x 5 =	50
Column Totals:	123 (A)		402 (B)
Prevalence Index = B/A =			3.27

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody Plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody Vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
The parameter is not met

SOIL

Sampling Point: DP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	2.5Y 5/3	100					Sandy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rocks

Depth (inches): 10

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

The parameter is not met.

Appendix E - NCDWQ Stream Forms

S1

NC DWQ Stream Identification Form Version 4.11

Date: 11/13/2024	**Project/Site:** Ting-Oakhall Greenwa	**Latitude:** 35.66672
Evaluator: Evelia DeSantis / Elias Ruhl	**County:** Wake	**Longitude:** -78.83969
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 31.5	**Stream Determination (choose one)** Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 16)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	3 ⊙
2. Sinuosity of channel along thalweg	0	1	2 ⊙	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1 ⊙	2	3
4. Particle size of stream substrate	0	1	2 ⊙	3
5. Active/relict floodplain	0	1 ⊙	2	3
6. Depositional bars or benches	0	1	2 ⊙	3
7. Recent alluvial deposits	0	1	2 ⊙	3
8. Headcuts	0	1 ⊙	2	3
9. Grade control	0	0.5 ⊙	1	1.5
10. Natural valley	0	0.5	1	1.5 ⊙
11. Second or greater order channel	No = 0 ⊙		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9.5)				
12. Presence of Baseflow	0	1 ⊙	2	3
13. Iron oxidizing bacteria	0	1	2 ⊙	3
14. Leaf litter	1.5	1	0.5 ⊙	0
15. Sediment on plants or debris	0	0.5	1	1.5 ⊙
16. Organic debris lines or piles	0	0.5	1	1.5 ⊙
17. Soil-based evidence of high water table?	No = 0		Yes = 3 ⊙	

C. Biology (Subtotal = 6)				
18. Fibrous roots in streambed	3	2 ⊙	1	0
19. Rooted upland plants in streambed	3 ⊙	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1 ⊙	2	3
21. Aquatic Mollusks	0 ⊙	1	2	3
22. Fish	0 ⊙	0.5	1	1.5
23. Crayfish	0 ⊙	0.5	1	1.5
24. Amphibians	0 ⊙	0.5	1	1.5
25. Algae	0 ⊙	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			Other (0)

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

S2

NC DWQ Stream Identification Form Version 4.11

Date: 11/13/2024	**Project/Site:** Ting-Oakhall Greenwa	**Latitude:** 35.66627
Evaluator: Evelia DeSantis / Elias Ruhl	**County:** Wake	**Longitude:** -78.83991
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 34.5	**Stream Determination (choose one)** Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 19.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	3 ⊙
2. Sinuosity of channel along thalweg	0	1	2	3 ⊙
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2 ⊙	3
4. Particle size of stream substrate	0	1	2 ⊙	3
5. Active/relict floodplain	0	1 ⊙	2	3
6. Depositional bars or benches	0	1	2 ⊙	3
7. Recent alluvial deposits	0	1	2	3 ⊙
8. Headcuts	0	1 ⊙	2	3
9. Grade control	0	0.5	1 ⊙	1.5
10. Natural valley	0	0.5	1	1.5 ⊙
11. Second or greater order channel	No = 0 ⊙		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8.5)				
12. Presence of Baseflow	0	1	2 ⊙	3
13. Iron oxidizing bacteria	0	1 ⊙	2	3
14. Leaf litter	1.5	1 ⊙	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5 ⊙
16. Organic debris lines or piles	0	0.5	1 ⊙	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3 ⊙	

C. Biology (Subtotal = 6.5)				
18. Fibrous roots in streambed	3	2 ⊙	1	0
19. Rooted upland plants in streambed	3 ⊙	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1 ⊙	2	3
21. Aquatic Mollusks	0 ⊙	1	2	3
22. Fish	0 ⊙	0.5	1	1.5
23. Crayfish	0 ⊙	0.5	1	1.5
24. Amphibians	0	0.5 ⊙	1	1.5
25. Algae	0 ⊙	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			Other (0)

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

S3

NC DWQ Stream Identification Form Version 4.11

Date: 11/13/2024	**Project/Site:** Ting-Oakhall Greenwa	**Latitude:** 35.66697
Evaluator: Evelia DeSantis / Elias Ruhl	**County:** Wake	**Longitude:** -78.83986
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 20.5	**Stream Determination (choose one)** Intermittent	**Other** *e.g. Quad Name*:

A. Geomorphology (Subtotal = 11.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	3 ⊙
2. Sinuosity of channel along thalweg	0	1 ⊙	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1 ⊙	2	3
4. Particle size of stream substrate	0 ⊙	1	2	3
5. Active/relict floodplain	0	1 ⊙	2	3
6. Depositional bars or benches	0	1	2 ⊙	3
7. Recent alluvial deposits	0	1	2 ⊙	3
8. Headcuts	0 ⊙	1	2	3
9. Grade control	0	0.5 ⊙	1	1.5
10. Natural valley	0	0.5	1 ⊙	1.5
11. Second or greater order channel	No = 0 ⊙		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 5)				
12. Presence of Baseflow	0 ⊙	1	2	3
13. Iron oxidizing bacteria	0 ⊙	1	2	3
14. Leaf litter	1.5	1	0.5 ⊙	0
15. Sediment on plants or debris	0	0.5 ⊙	1	1.5
16. Organic debris lines or piles	0	0.5	1 ⊙	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3 ⊙	

C. Biology (Subtotal = 4)				
18. Fibrous roots in streambed	3	2	1 ⊙	0
19. Rooted upland plants in streambed	3 ⊙	2	1	0
20. Macrobenthos (note diversity and abundance)	0 ⊙	1	2	3
21. Aquatic Mollusks	0 ⊙	1	2	3
22. Fish	0 ⊙	0.5	1	1.5
23. Crayfish	0 ⊙	0.5	1	1.5
24. Amphibians	0 ⊙	0.5	1	1.5
25. Algae	0 ⊙	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			Other (0)

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

FROEHLING & ROBERTSON

Assess. Manage. Consult.

Protected Resources Review

Ting-Oakhall Greenway Connector
Muses Mill Court to Existing Ting Stadium Greenway
Holly Springs, NC

Prepared For:
Benesch
8000 Regency Parkway, Suite 175
Cary, NC 27518

Issue Date: February 6, 2025
F&R Project Number: 59C-0320

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Appendices

Appendix A - NC SHPO Response Letter
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Appendix D - Figures
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Protected Resources Review
Ting-Oakhall Greenway Connector
Muses Mill Court to Existing Ting Stadium Greenway
Holly Springs, NC

Froehling & Robertson, Inc., (F&R) presents herein the results of the informal historical resources and protected species review conducted at the above-mentioned site.

1.0 SUMMARY

The following is a summary of our findings and is not intended to replace more detailed information contained elsewhere in this report. Froehling & Robertson, Inc. reviewed information at the North Carolina State Historic Preservation Office (SHPO) and submitted a Request for Comments (RFC) letter to SHPO. The RFC letter included basic project information and documentation of F&R's information review. The RFC letter included basic project information and documentation of F&R's information review. SHPO responded with a letter dated 13 Dec, 2024, stating that, **"We have conducted a review of the project and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the project as proposed."**

Additionally, F&R reviewed information from the North Carolina Department of Environmental Quality – Natural Heritage Program (NC NHP) and the U.S. Fish and Wildlife Service (USFWS) in order to determine if protected species are likely to be affected. Based on a review of the NHP response letter and the USFWS Information for Planning and Consultation (IPaC) official species list for the Subject Property, five federally-protected species have been identified that may occur in the proposed project location. However, critical habitat was not identified within the project area and F&R's field observations did not identify obvious suitable habitat for the identified species. **Based upon this information, it appears that the proposed project is not likely to affect federal or state listed threatened and endangered species or their designated critical habitats. However, additional coordination with the USFWS may be warranted in order to confirm these findings.**

2.0 PURPOSE

The purpose of the Historical Resources Review was to gain an understanding of what historic, cultural, and/or archeological resources as protected by the National Historic Preservation Act are present within the immediate vicinity of the Subject Property. The purpose of the Protected (threatened & endangered) Species review was to gain an understanding of what biological resources as protected by the state and federal Endangered Species Acts are present within the immediate vicinity of the Subject Property.

The purpose of the North Carolina Natural Heritage Program (NCNHP) review is to gain an understanding of the records for rare species, important natural communities, natural areas, and/or conservation or managed areas within the project boundary.

3.0 PROJECT SITE

According to Client-provided information, the Subject Property is situated between Muses Mill Court to Existing Ting Stadium Greenway just west of Ting Park in Holly Springs, NC,, herein referred to as the Subject Property. The Subject Property consists of one irregular-shaped parcel of land totaling approximately 2.7 acres and currently consists of wooded land. The Subject Property is located in an area of mostly residential development, commercial development, and wooded land. The Subject Property is bound to the north and east by Ting Park; to the south by the Muses Mill Court; and to the west by Gb Alford Highway.

A property topographic map adapted from the USGS 7.5 Minute Topographic Quadrangle Map "Raleigh West, NC" 2022, is included as Figure 2 in the attachments.

4.0 SCOPE OF WORK

The informal rare & endangered species and historical resources review was conducted in general accordance with F&R's Proposal No. 2459-00304, dated June 21, 2024.

5.0 INFORMAL SURVEY

5.1 Historic Resources Review

F&R visited the SHPO GIS Website to review the most current information. Based on F&R's review of 7.5 – Minute USGS Topographic Quadrangle Map and the supporting literature available at the SHPO GIS website, sites listed on the National Register (NR) or Study List (SL) for the NR were not identified on the Subject Property or within 1,500 feet of the Subject Property.

F&R sent a Request for Comments (RFC) Letter to SHPO. The letter included the above project information and the results of F&R's review. SHPO responded to the RFC with a letter dated 13 Dec, 2024. SHPO's response acknowledged that, "We have conducted a review of the project and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the project as proposed." A copy of the SHPO response letter is attached.

5.2 Protected Species Review

F&R visited the NC NHP Data Explorer to review the most current information regarding protected species. Based on F&R's review of the 7.5 – Minute USGS Topographic Quadrangle Map "Raleigh West, NC" 2022, and the supporting literature available in the NC NHP Data Explorer identified the following element occurrences within one mile of the project area:

- Damselfly (*Coryphaeschna ingens*) – Status: No federal status (dragonfly)

In addition, the following natural areas and managed areas were identified within a one-mile radius of the Subject Property:

- Holly Springs Open Space - Town of Holly Springs
- Holly Springs Open Space - Future Park - Town of Holly Springs
- Holly Springs Open Space - Jones Park - Town of Holly Springs
- Holly Springs Open Space - Ting Park - Town of Holly Springs

Additionally, the U.S. Fish and Wildlife Service (USFWS) IPaC list did not identify critical habitat areas within the Subject Property. However, five threatened, endangered, or candidate species are included on the official USFWS list of protected species that may occur in the proposed project location. Listed species include:

- Red-cockaded woodpecker (*Dryobates borealis*) – Status: Threatened (bird)
- Cape Fear shiner (*Notropis mekistocholas*) - Status: Endangered (fish)
- Dwarf wedgemussel (*Alasmidonta heterodon*) - Status: Endangered (clam)
- Monarch butterfly (*Danaus plexippus*) – Status: Candidate (insect)
- Michaux's sumac (*Rhus michauxii*) - Status: Endangered (flowering plant)

Due to the lack of pine savannah habitat on the Subject Property, there is no suitable habitat for the Red-cockaded woodpecker.

Although aquatic habitat exists on the site, the Cape Fear shiner has final critical habitat outlined by the USFWS. The Subject Property is outside the extent of all final critical habitat for these species. Additionally, low water quality from urban runoff and a lack of stable banks on the stream located within the Subject Property create unsuitable habitat for the dwarf wedgemussel.

The monarch butterfly requires the presence of milkweed species. Due to the forested area, maintained lawn, and cleared right-of-way comprising the Subject Property, Michaux's sumac and milkweed species are not present on the site.

F&R's field observations did not identify obvious suitable habitat for the above-identified species. However, if suitable habitat is determined to be present within the disturbance area during future development of the site, a formal survey may be required in order to determine the species' presence or absence within the Subject Property.

Based upon this information, it appears that the proposed project is not likely to affect federally or state listed threatened and endangered species or their designated critical habitats. Copies of the NHP response and USFWS IPaC letter are attached.

6.0 CONCLUSIONS

F&R reviewed information at the North Carolina SHPO and submitted a Request for Comments letter to SHPO. The RFC letter included basic project information and documentation of F&R's information review. SHPO responded with a letter dated13 Dec, 2024, stating that, "We have conducted a review of the project and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the project as proposed."

The Natural Heritage Program has provided a response that includes a table of Potential Occurrences that may occur within a one mile radius of the Subject Property. Based on a review of this information, there do not appear to be species listed by NHP that would be adversely affected by the proposed project. Based on a review of the USFWS IPaC official species list for the Subject Property, five federally-protected species have been identified that may occur in the proposed project location. However, critical habitat was not identified within the Subject Property and F&R's field observations did not identify obvious suitable habitat for the identified species. Based upon this information, it appears that the proposed project is not likely to affect federal or state listed threatened and endangered species or their designated critical habitats. However, based on the limited nature of this review, additional coordination with the USFWS may be warranted in order to confirm these findings.

7.0 LIMITATIONS

This report has been prepared for the exclusive use of the Benesch (the client), and its assigns, for this specific project. These services have been provided in accordance with generally accepted environmental practices. No other warranty, expressed, or implied, is made. F&R did not perform a detailed field study for rare & endangered species or an intensive historical resources survey, including an archaeological assessment. Our observations were based upon conditions readily visible at the site at the time of our

visit. If additional information becomes available which may affect our conclusions and recommendations, we request the opportunity to review the information, and reserve the right to modify our report, as warranted.

F&R, by virtue of providing the services described herein, does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site which may present a potential concern to public health, safety, or the environment. It is F&R's understanding that the Client will notify appropriate regulatory agencies as required.

8.0 CLOSURE

Please do not hesitate to contact us if you have any questions or comments.

Respectfully Submitted,

FROEHLING & ROBERTSON, INC.

Eva DeSantis
Wetland Scientist

Elias Ruhl
Branch Manager

Attachments:
NC SHPO Response Letter
NC Natural Heritage Program Response
US FISH & Wildlife Service IPaC Letter
Figures
Site Photographs

Appendix A - NC SHPO Response Letter

North Carolina Department of Natural and Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Roy Cooper
Secretary D. Reid Wilson

Office of Archives and History
Deputy Secretary, Darin J. Waters, Ph.D.

December 13, 2024

Elias Ruhl eruhl@fandr.com
Froehling & Robertson, Inc.
310 Hubert Street
Raleigh, NC 27603

Re: Ting-Oakhall Greenway Connector, 101 Sportsmanship Way, Holly Springs, Wake County, ER 24-2773

Dear Elias Ruhl:

Thank you for your email November 15, 2024, of regarding the above-referenced undertaking. We have reviewed the submission and offer the following comments.

We have conducted a review of the project and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the project as proposed.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-814-6579 or environmental.review@dncr.nc.gov. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona Bartos, Deputy
State Historic Preservation Officer

Appendix B - NC Natural Heritage Program Response

NC DEPARTMENT OF
NATURAL AND CULTURAL RESOURCES

Roy Cooper, **Governor**

D. Reid Wilson, **Secretary**

Misty Buchanan
Deputy Director, Natural Heritage Program

NCNHDE-28474

November 26, 2024

Elias Ruhl
F&R
310 Hubert Street
Raleigh, NC 27603
RE: Ting-Oakhall Greenway Connector; 59C-0320

Dear Elias Ruhl:

The North Carolina Natural Heritage Program (NCNHP) appreciates the opportunity to provide information about natural heritage resources for the project referenced above.

A query of the NCNHP database indicates that there are records for rare species, important natural communities, natural areas, and/or conservation/managed areas within the proposed project boundary. These results are presented in the attached 'Documented Occurrences' tables and map.

The attached 'Potential Occurrences' table summarizes rare species and natural communities that have been documented within a one-mile radius of the property boundary. The proximity of these records suggests that these natural heritage elements may potentially be present in the project area if suitable habitat exists. Tables of natural areas and conservation/managed areas within a one-mile radius of the project area, if any, are also included in this report.

If a Federally-listed species is documented within the project area or indicated within a one-mile radius of the project area, the NCNHP recommends contacting the US Fish and Wildlife Service (USFWS) for guidance. Contact information for USFWS offices in North Carolina is found here: https://www.fws.gov/offices/Directory/ListOffices.cfm?statecode=37.

Please note that natural heritage element data are maintained for the purposes of conservation planning, project review, and scientific research, and are not intended for use as the primary criteria for regulatory decisions. Information provided by the NCNHP database may not be published without prior written notification to the NCNHP, and the NCNHP must be credited as an information source in these publications. Maps of NCNHP data may not be redistributed without permission.

Also please note that the NC Natural Heritage Program may follow this letter with additional correspondence if a Dedicated Nature Preserve, Registered Heritage Area, Land and Water Fund easement, or an occurrence of a Federally-listed species is documented near the project area.

If you have questions regarding the information provided in this letter or need additional assistance, please contact the NCNHP at natural.heritage@dncr.nc.gov.

Sincerely,
NC Natural Heritage Program

Natural Heritage Element Occurrences, Natural Areas, and Managed Areas Intersecting the Project Area
Ting-Oakhall Greenway Connector
Project No. 59C-0320
November 26, 2024
NCNHDE-28474

No Element Occurrences are Documented within the Project Area

There are no documented element occurrences (of medium to very high accuracy) that intersect with the project area. Please note, however, that although the NCNHP database does not show records for rare species within the project area, it does not necessarily mean that they are not present; it may simply mean that the area has not been surveyed. The use of Natural Heritage Program data should not be substituted for actual field surveys if needed, particularly if the project area contains suitable habitat for rare species. If rare species are found, the NCNHP would appreciate receiving this information so that we may update our database.

No Natural Areas are Documented within the Project Area

Managed Areas Documented Within Project Area*

Managed Area Name	Owner	Owner Type
Wake County Open Space - Ting Park	Wake County	Local Government

*NOTE: If the proposed project intersects with a conservation/managed area, please contact the landowner directly for additional information. If the project intersects with a Dedicated Nature Preserve (DNP), Registered Natural Heritage Area (RHA), or Federally-listed species, NCNHP staff may provide additional correspondence regarding the project.

Definitions and an explanation of status designations and codes can be found at https://ncnhde.natureserve.org/help. Data query generated on November 26, 2024; source: NCNHP, Fall (October) 2024. Please resubmit your information request if more than one year elapses before project initiation as new information is continually added to the NCNHP database.

Natural Heritage Element Occurrences, Natural Areas, and Managed Areas Within a One-mile Radius of the Project Area
Ting-Oakhall Greenway Connector
Project No. 59C-0320
November 26, 2024
NCNHDE-28474

Element Occurrences Documented Within a One-mile Radius of the Project Area

Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Dragonfly or Damselfly	32043	Coryphaeschna ingens	Regal Darner	2004-Pre	H?	5-Very Low	---	Significantly Rare	G5	S2?

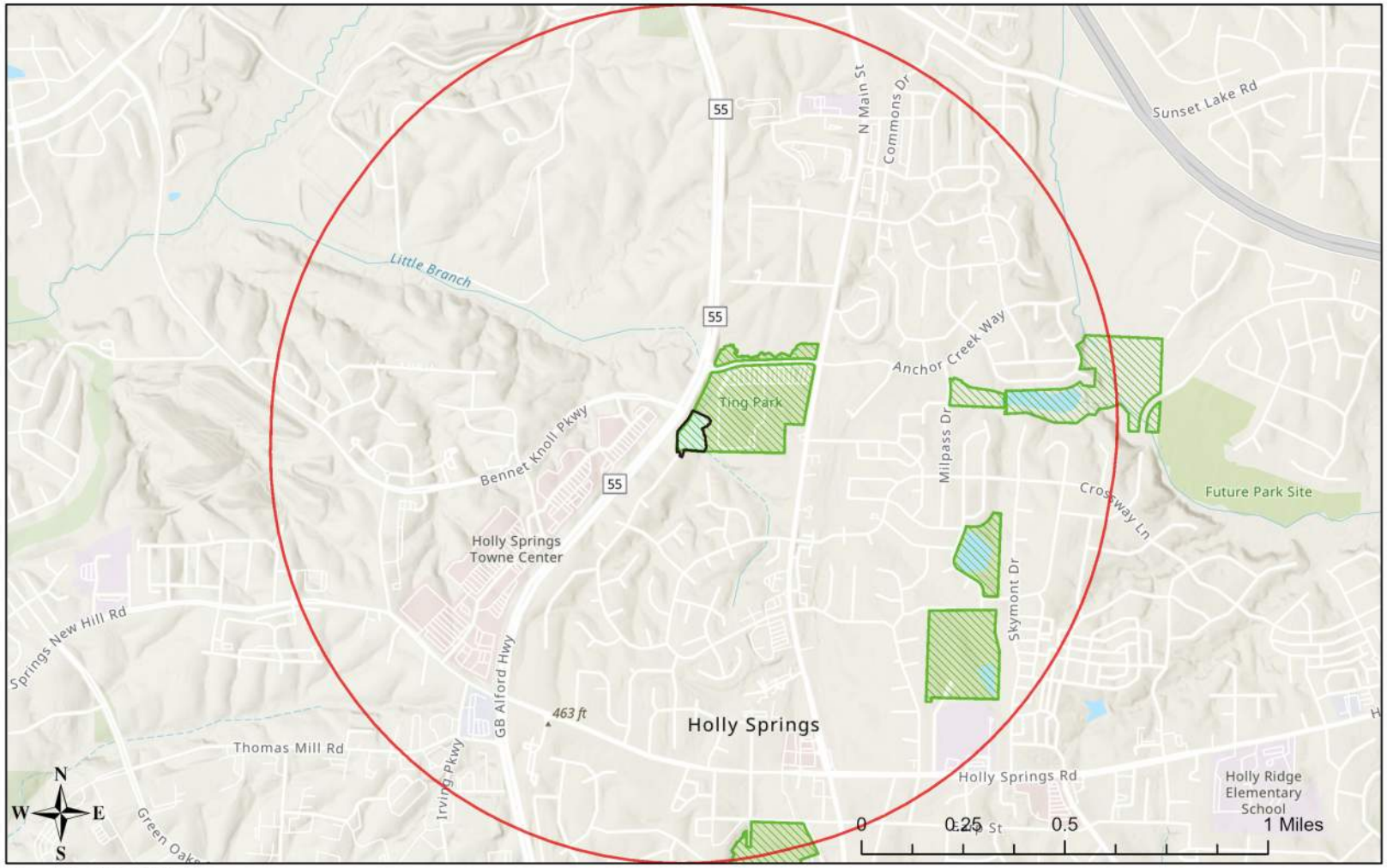
No Natural Areas are Documented Within a One-mile Radius of the Project Area

Managed Areas Documented Within a One-mile Radius of the Project Area

Managed Area Name	Owner	Owner Type
Holly Springs Open Space	Town of Holly Springs	Local Government
Town of Holly Springs Open Space - Future Park Site (Mims Property)	Town of Holly Springs	Local Government
Town of Holly Springs Open Space - Jones Park	Town of Holly Springs	Local Government
Town of Holly Springs Open Space - Veterans Park	Town of Holly Springs	Local Government
Wake County Open Space - Ting Park	Wake County	Local Government

Definitions and an explanation of status designations and codes can be found at https://ncnhde.natureserve.org/help. Data query generated on November 26, 2024; source: NCNHP, Fall (October) 2024. Please resubmit your information request if more than one year elapses before project initiation as new information is continually added to the NCNHP database.

NCNHDE-28474: Ting-Oakhall Greenway Connector



November 26, 2024

- Managed Area (MAREA)
- Buffered Project Boundary
- Project Boundary

Esri, NASA, NGA, USGS, FEMA
Duke University, Wake County, State of North Carolina DOT, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS

Appendix C - US Fish & Wildlife IPaC Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Ecological Services Field Office
3916 Sunset Ridge Rd
Raleigh, NC 27607
Phone: (919) 856-4520 Fax: (919) 856-4556

In Reply Refer To: 11/26/2024 17:14:14 UTC
Project Code: 2025-0024629
Project Name: Ting-Oakhall Greenway Connector

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). If your project area contains suitable habitat for any of the federally-listed species on this species list, the proposed action has the potential to adversely affect those species. If suitable habitat is present, surveys should be conducted to determine the species' presence or absence within the project area. The use of this species list and/or North Carolina Natural Heritage program data should not be substituted for actual field surveys.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Raleigh Ecological Services Field Office
3916 Sunset Ridge Rd
Raleigh, NC 27607
(919) 856-4520

PROJECT SUMMARY

Project Code: 2025-0024629
Project Name: Ting-Oakhall Greenway Connector
Project Type: Road/Hwy - New Construction
Project Description: The proposed project consists of approximately 1,000-linear foot paved greenway trail connecting Muses Mill Court to the existing Ting Stadium Greenway to the north.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@35.6669475,-78.84031837374958,14z

Counties: Wake County, North Carolina

ENDANGERED SPECIES ACT SPECIES

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

BIRDS

NAME	STATUS
Red-cockaded Woodpecker *Dryobates borealis*	Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/7614

FISHES

NAME	STATUS
Cape Fear Shiner *Notropis mekistocholas*	Endangered

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/6063

CLAMS

NAME	STATUS
Dwarf Wedgemussel *Alasmidonta heterodon*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/784

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus*	Candidate

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9743

FLOWERING PLANTS

NAME	STATUS
Michaux's Sumac *Rhus michauxii*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/5217

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

---

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper

Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

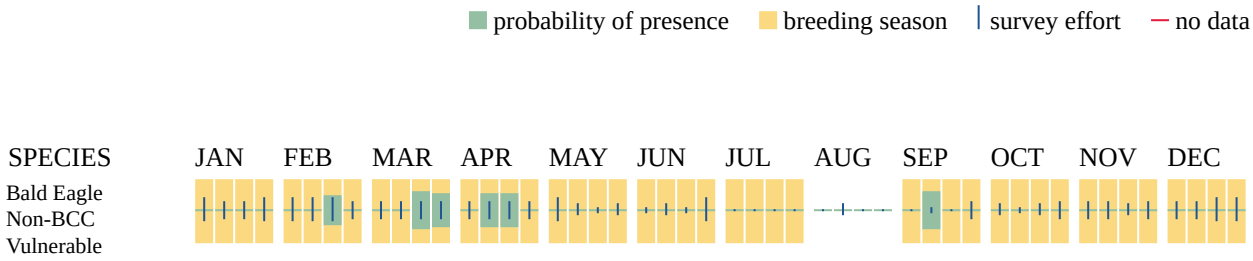
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Eastern Whip-poor-will *Antrostomus vociferus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10678	Breeds May 1 to Aug 20
Prairie Warbler *Setophaga discolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9513	Breeds May 1 to Jul 31
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9439	Breeds Apr 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9398	Breeds May 10 to Sep 10

NAME	BREEDING SEASON
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9431	Breeds May 10 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

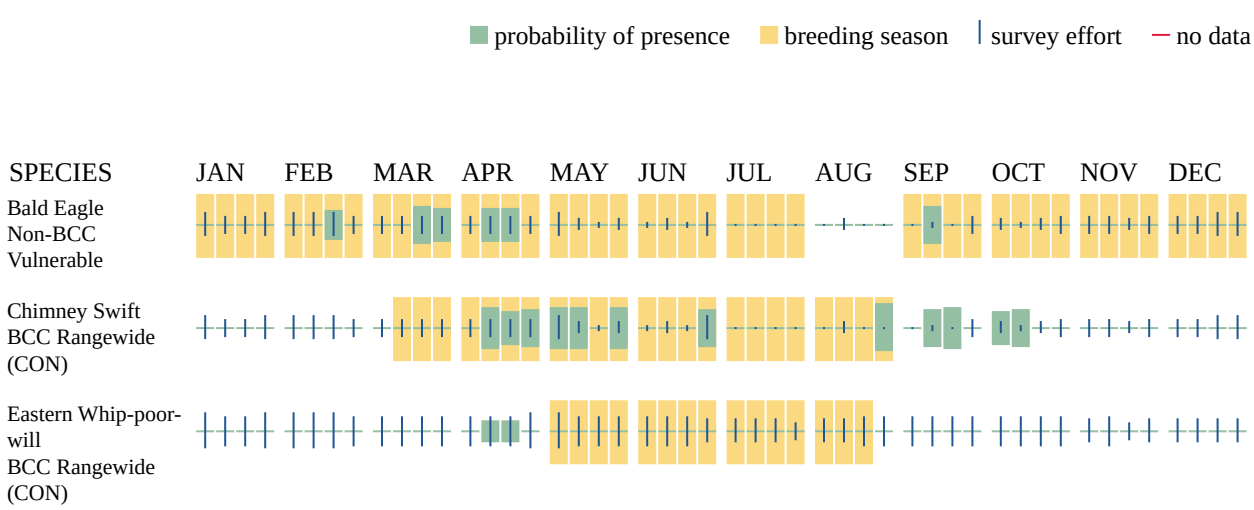
Probability of Presence (■)

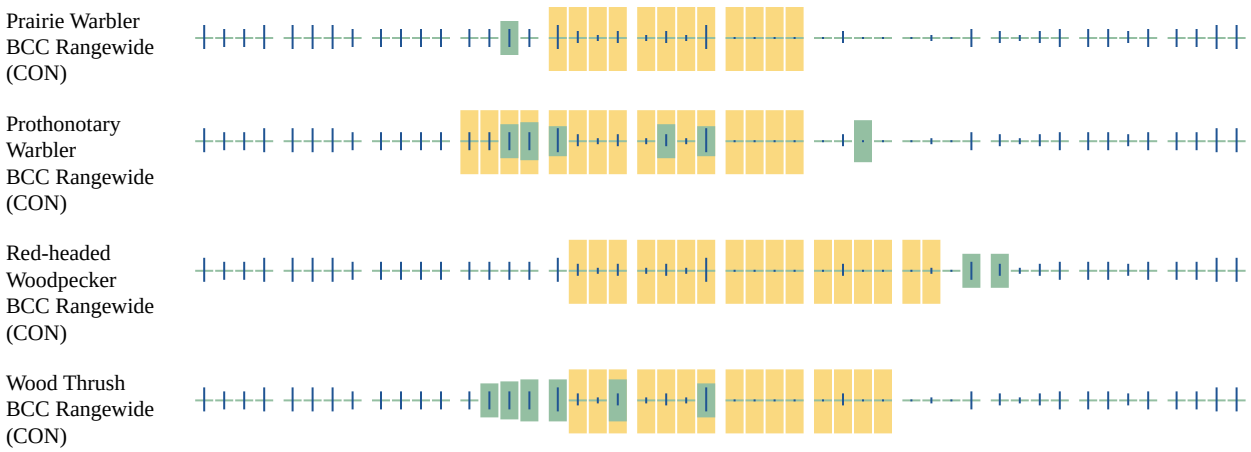
Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.





Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

IPAC USER CONTACT INFORMATION

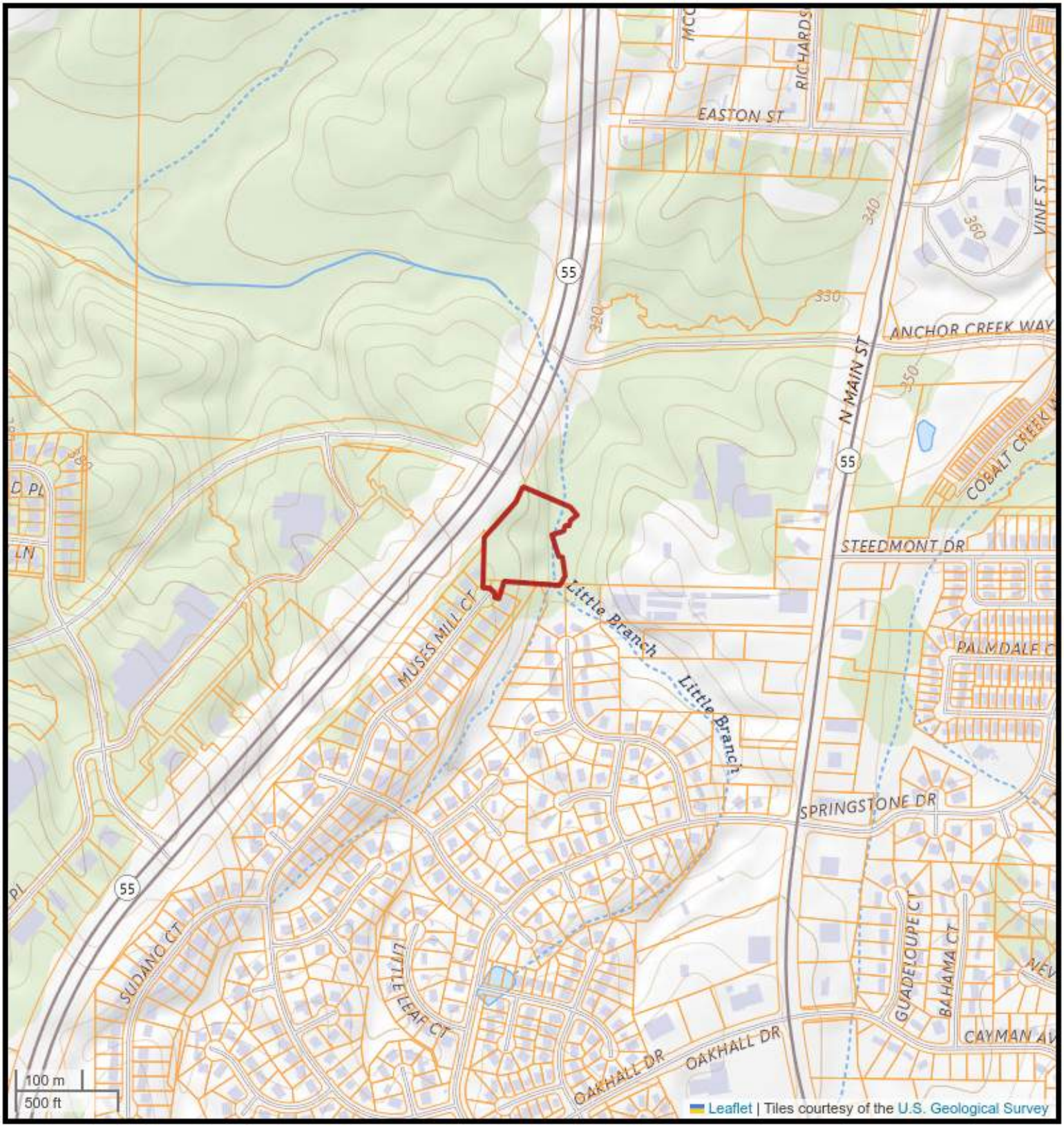
Agency: Holly Springs town
Name: Evelia DeSantis
Address: 310 Hubert St
City: Raleigh
State: NC
Zip: 27603
Email edesantis@fandr.com
Phone: 8043969411

Appendix D - Figures

FROEHLING & ROBERTSON, INC.
Engineering Stability Since 1881

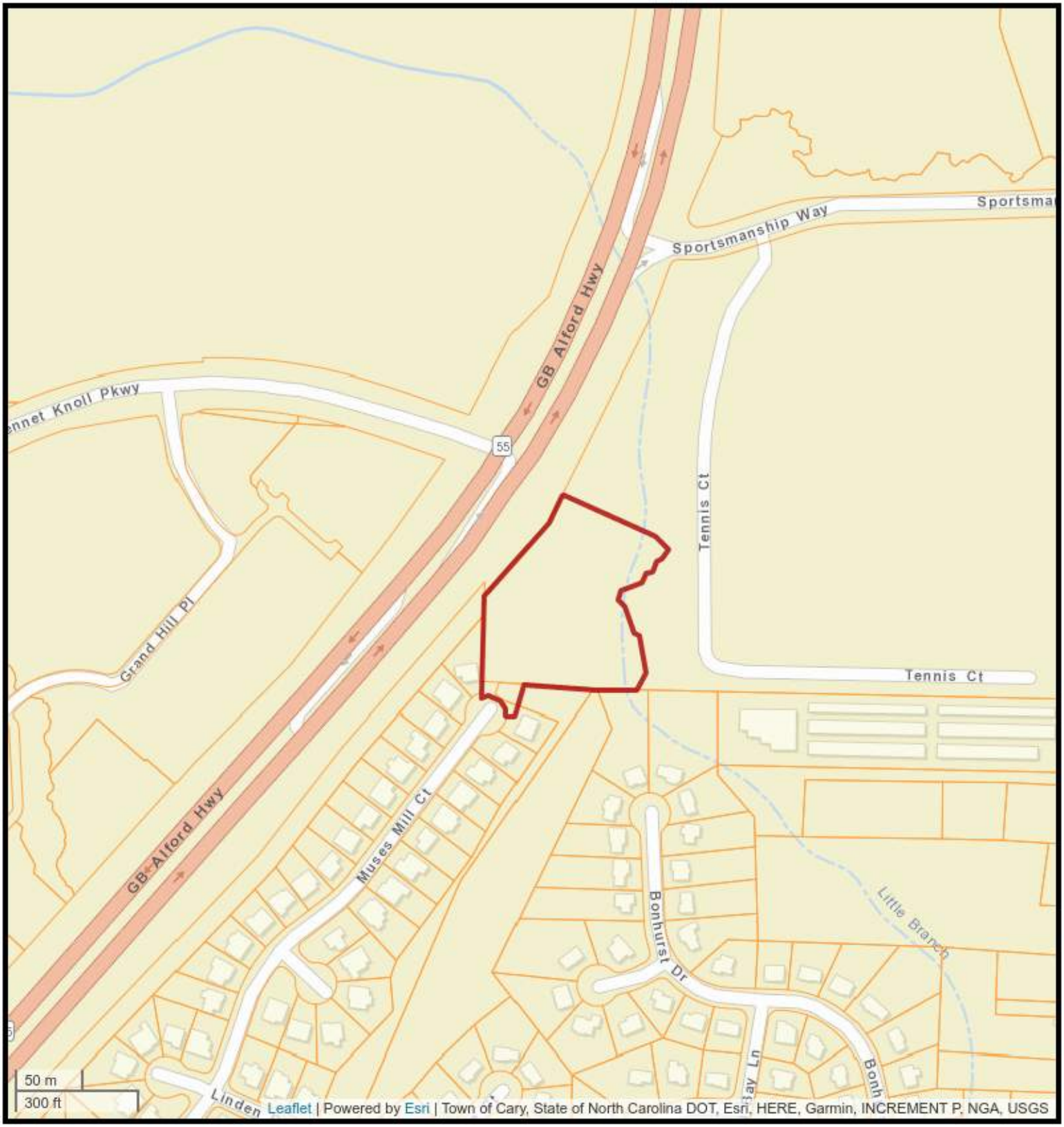
Aerial View

Ting-Oakhall Greenway Connector
Muses Mill Court to Existing Ting Stadium Greenway
Holly Springs, NC
PREPARED FOR: Benesch
DATE:
PROJ. #: 59C-0320



FROEHLING & ROBERTSON, INC.
Engineering Stability Since 1881

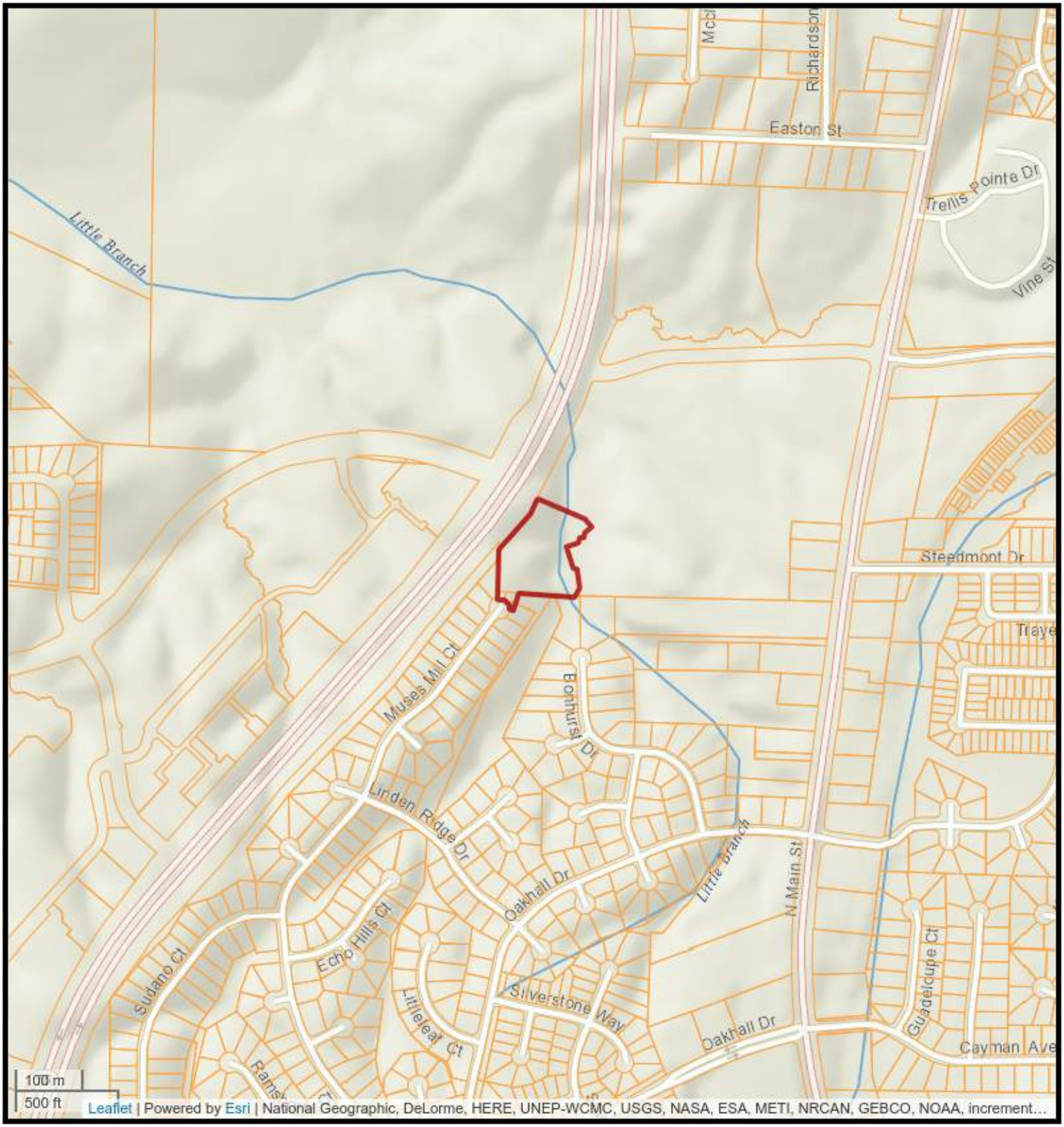
Subject Property Topographic Map
Ting-Oakhall Greenway Connector
Muses Mill Court to Existing Ting Stadium Greenway
Holly Springs, NC
PREPARED FOR: Benesch
PROJ. MGR:
DATE:
PROJ. #: 59C-0320



FROEHLING & ROBERTSON, INC.
Engineering Stability Since 1881

Street Map

Ting-Oakhall Greenway Connector
Muses Mill Court to Existing Ting Stadium Greenway
Holly Springs, NC
PREPARED FOR: Benesch
PROJ. MGR:
DATE:
PROJ. #: 59C-0320



FROEHLING & ROBERTSON, INC.
Engineering Stability Since 1881

Subject Property GIS Map

Ting-Oakhall Greenway Connector
Muses Mill Court to Existing Ting Stadium Greenway
Holly Springs, NC
PREPARED FOR: Benesch
DATE:
PROJ. #: 59C-0320

Appendix E - Site Photographs

View of Little Branch Along Eastern Boundary Facing Upstream

View of Subject Property from Centeral Portion Facing East

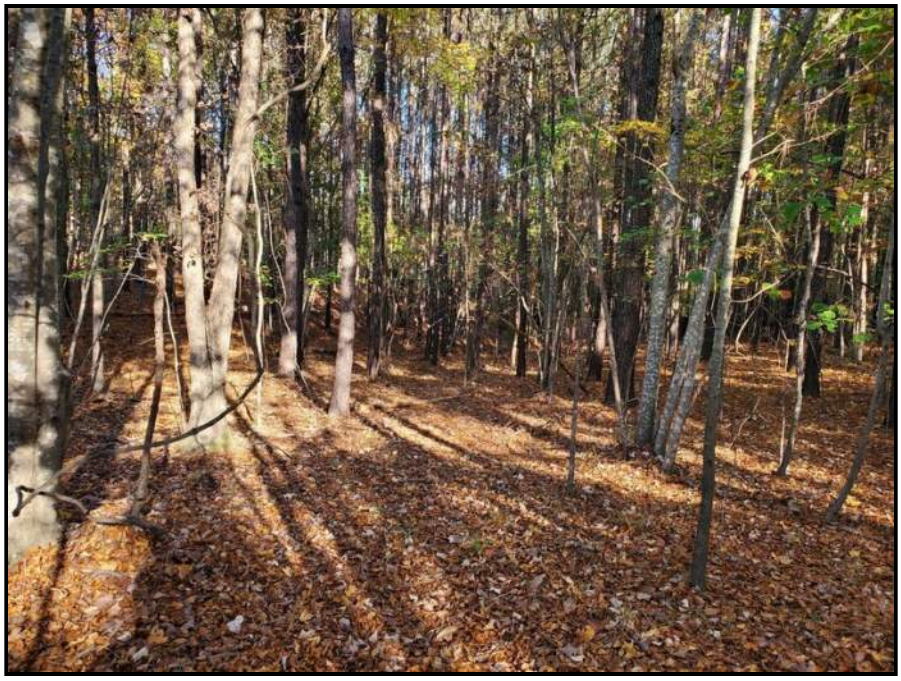
View of Subject Property from Centeral Portion Facing North

View of Subject Property from Centeral Portion Facing South

View of Subject Property from Centeral Portion Facing West

View of Subject Property from Western Boundary Facing East

View of the Subject Property Near the Southwestern Boundary Facing East



View of the Subject Property Near the Southwestern Boundary Facing North

View of Little Branch Along Eastern Boundary Facing Downstream

View of Ting Park Greenway Along the Northern Boundary of the Subject Property Facing North

View of Little Brance Along Adjacent Property on the Northern Boundary oof the Subject Property Facing South

View of Little Branch Along Adjacent Property Along the Northern Boundary Facing North

View of the Subject Property from Muses Mill Court Facing North

View of Adjacent Neighborhood along Muses Mill Court from the Southtwestern Boundary of the Subject Property

Storm Water Management Report / Erosion & Sedimentation Control Plan

Ting Park – Oak Hall Greenway Connector

Prepared For:

Town of Holly Springs

March 12, 2025

Town Project No. 23-015
Benesch Project No. 1725-200012

Corporate Certifications:

NC P.E.: F-1320
NC L.A.: C-454

Alfred Benesch & Company
8000 Regency Parkway
suite 175
Cary, NC 27518
www.benesch.com
P: 984-221-8769

benesch

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- SOILS

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- Site Drainage Area Map
- USGS StreamStats data

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- Culvert Calculations
- Ditch Calculations
- HEC-RAS Cross Sections

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- USGS TOPO map
- NRCS Soils Map

SECTION 1: NARRATIVE

PROJECT DESCRIPTION

This project for Town of Holly Springs Park and Recreation involves the construction of (+/-) 0.2 miles of asphalt paved trail in the Town of Hollys Springs, North Carolina. The main trail will begin at the cul-de-sac of Muses Mill Court and terminate at the southernmost point of the existing Ting Stadium Greenway. This project will serve to connect the Oak Hall neighborhood to Ting Park. On-site drainage improvements include culverts to facilitate drainage to Little Branch. Site construction will take place on one tax parcel between Ting Park and Muses Mill Court. This parcel is owned by the Town of Holly Springs. The area to be denuded/disturbed by construction activities is approximately 1.5 acres.

TOPOGRAPHY AND DRAINAGE

Currently, the site is mostly undeveloped and almost entirely composed of grass and wooded areas with some moderate to steep slopes. All trail runoff post-construction is to be conveyed by trail side ditches. These ditches will discharge to either one of two culvert crossings (CB-01 and IN-01) or directly offsite and ultimately discharging to Little Branch. A 60' long single span fiberglass pedestrian bridge is proposed to cross Little Branch to connect the trail to the existing section of Ting Stadium Greenway.

The drainage area for this section of Little Branch crossing encompasses most of the Oak Hall residential neighborhood and is bounded by North Main Street, West Holly Springs Road and GB Alford Highway (NC 55). According to USGS StreamStats, the area of the delineated basin of the proposed bridge is approximately 0.28 square miles, or 160 acres.

FIGURE 1 USGS DELINEATED DRAINAGE BASIN

This section of Little Branch is currently classified as C (secondary recreation, fishing, wildlife, fish consumption). The project extents are contained within the Cape fear river basin and the Harris Lake watershed. Though Neuse River nor Jordan Lake watershed buffer rules apply, Holly Springs buffer rules are in effect at this bridge crossing. According to the Holly Springs UDO, it is expected that bridges and trail side drainage are allowable land uses within the Cape Fear River Basin buffer zones.

MODEL PARAMETERS / ANALYSIS

The rational equation evaluated with Type II, 24-hour rainfall distribution to determine rainfall intensities based on the time of concentrations were used for both culvert and open channel flow calculations. All culverts were sized using the 25-year storm while proposed ditch capacity and stability were determined using the 10-year storm.

FLOODPLAIN ANALYSIS

Though Little Branch is a FEMA Zone AE Detailed flood studied stream, this section is not incorporated. The proposed bridge crosses approximately 850 feet upstream of NC 55, the upstream boundary of the Little branch flood study. A FEMA floodplain coordination will not be required for this project, however, due to the drainage area, a Town Flood Study will be required. This flood study will be completed upon coordination with the Town of Holly Springs Engineering department. A HEC-RAS model has been developed to demonstrate adequate capacity of the bridge to convey the 100-year storm. The proposed model was developed using StreamStats generated flows and modelling assumptions, such as manning's n values and boundary conditions, were derived from the Wake County FIS Report with an effective date of July 19, 2022.

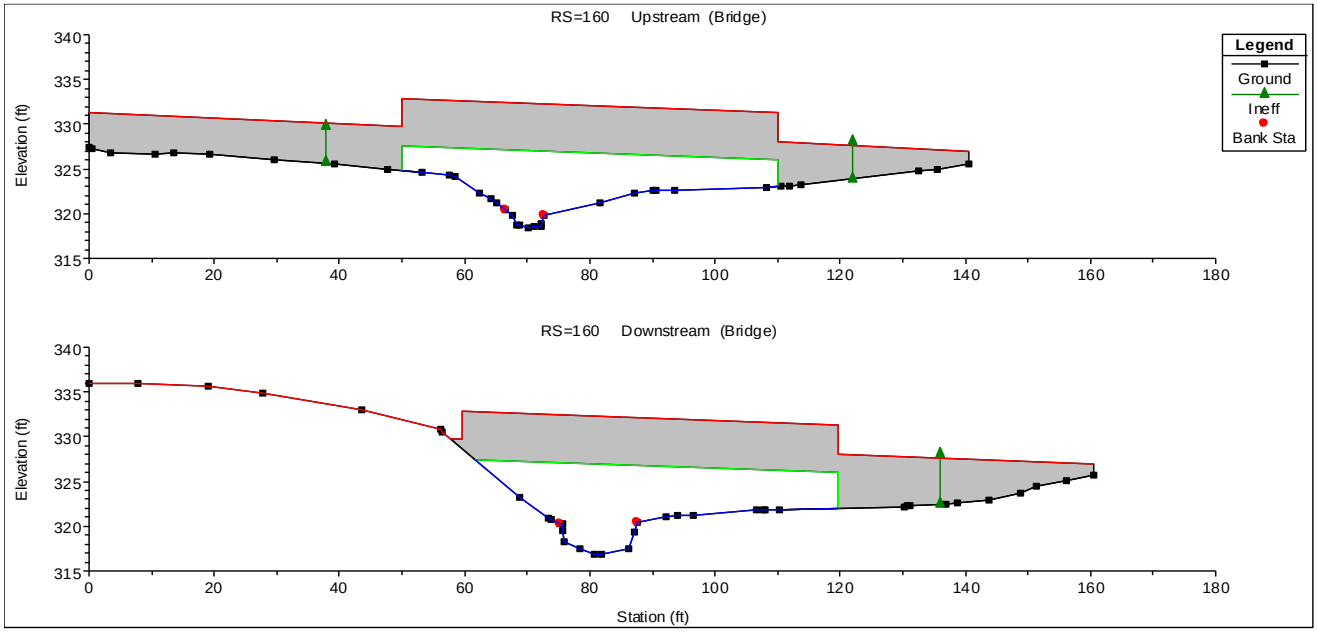

FIGURE 2 HEC-RAS MODEL OF PROPOSED BRIDGE

EROSION AND SEDIMENTATION CONTROL PLAN

The erosion control plan is designed to divert the offsite runoff to the trail side ditches and treated with check dams before discharging to Little Branch. All devices have been designed according to the NCDOT Erosion and Sedimentation Control guidelines. Ditch matting and lining for erosion control was determined based on NCDOT erosion control matting guidance. Riprap aprons were sized per NCDOT Standard 876.02 for rip rap sizing.

SOILS

The soil survey of Wake County indicates that soils on this site are as follows:

- Carbonton-Brickhaven Complex (CaC), 6 to 10 percent slope, soil rating D
- Carbonton-Brickhaven Complex (CaD), 10-15 Percent Slope, soil rating D
- Carbonton-Brickhaven-Urban land Complex, 0 to 10 percent slopes, soil rating D
- Chewacla and Wehadkee Soils (ChA) 0 to 2 percent slopes, soil rating D

SECTION 2: HYDROLOGY ANALYSIS

Site Drainage Area Map

USGS StreamStats data

NOAA Atlas 14, Volume 2, Version 3
Location name: Holly Springs, North Carolina, USA*
Latitude: 35.6608°, Longitude: -78.8252°
Elevation: 450 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	4.94 (4.54-5.41)	5.78 (5.29-6.34)	6.65 (6.08-7.27)	7.38 (6.76-8.08)	8.16 (7.43-8.90)	8.74 (7.92-9.54)	9.26 (8.34-10.1)	9.71 (8.70-10.6)	10.2 (9.08-11.2)	10.6 (9.37-11.6)
10-min	3.95 (3.62-4.32)	4.63 (4.24-5.06)	5.32 (4.87-5.82)	5.90 (5.40-6.46)	6.50 (5.92-7.10)	6.95 (6.31-7.59)	7.36 (6.62-8.02)	7.70 (6.90-8.41)	8.08 (7.18-8.83)	8.38 (7.38-9.16)
15-min	3.29 (3.02-3.60)	3.88 (3.55-4.24)	4.49 (4.11-4.91)	4.98 (4.55-5.44)	5.49 (5.00-6.00)	5.87 (5.32-6.41)	6.20 (5.58-6.76)	6.48 (5.80-7.07)	6.78 (6.02-7.40)	7.01 (6.18-7.67)
30-min	2.26 (2.07-2.47)	2.68 (2.45-2.93)	3.19 (2.92-3.49)	3.61 (3.30-3.94)	4.07 (3.70-4.44)	4.42 (4.01-4.83)	4.75 (4.28-5.18)	5.04 (4.52-5.50)	5.40 (4.79-5.89)	5.68 (5.00-6.21)
60-min	1.41 (1.29-1.54)	1.68 (1.54-1.84)	2.04 (1.87-2.24)	2.35 (2.15-2.57)	2.71 (2.46-2.96)	3.00 (2.72-3.27)	3.27 (2.94-3.56)	3.53 (3.17-3.86)	3.87 (3.44-4.23)	4.14 (3.65-4.53)
2-hr	0.823 (0.748-0.908)	0.986 (0.898-1.09)	1.21 (1.10-1.34)	1.41 (1.28-1.55)	1.65 (1.48-1.81)	1.85 (1.66-2.03)	2.04 (1.82-2.24)	2.24 (1.98-2.46)	2.49 (2.18-2.73)	2.70 (2.35-2.97)
3-hr	0.580 (0.530-0.641)	0.696 (0.636-0.769)	0.861 (0.783-0.950)	1.01 (0.913-1.11)	1.19 (1.07-1.31)	1.35 (1.21-1.48)	1.50 (1.34-1.65)	1.66 (1.47-1.83)	1.88 (1.64-2.07)	2.07 (1.79-2.28)
6-hr	0.349 (0.320-0.383)	0.418 (0.383-0.460)	0.517 (0.472-0.568)	0.606 (0.551-0.664)	0.720 (0.651-0.788)	0.817 (0.734-0.893)	0.916 (0.815-1.00)	1.02 (0.898-1.11)	1.16 (1.01-1.26)	1.28 (1.10-1.40)
12-hr	0.204 (0.187-0.224)	0.245 (0.224-0.269)	0.304 (0.278-0.334)	0.358 (0.326-0.393)	0.429 (0.387-0.469)	0.490 (0.439-0.535)	0.553 (0.490-0.602)	0.620 (0.543-0.675)	0.712 (0.614-0.775)	0.793 (0.674-0.864)
24-hr	0.120 (0.111-0.129)	0.145 (0.135-0.157)	0.183 (0.169-0.197)	0.212 (0.196-0.229)	0.253 (0.233-0.273)	0.285 (0.262-0.307)	0.318 (0.292-0.343)	0.353 (0.323-0.380)	0.400 (0.364-0.432)	0.437 (0.396-0.472)
2-day	0.069 (0.064-0.075)	0.084 (0.078-0.090)	0.104 (0.097-0.113)	0.121 (0.112-0.130)	0.143 (0.132-0.155)	0.161 (0.148-0.174)	0.179 (0.165-0.194)	0.198 (0.181-0.214)	0.224 (0.204-0.242)	0.244 (0.221-0.264)
3-day	0.049 (0.045-0.052)	0.059 (0.055-0.063)	0.073 (0.068-0.078)	0.084 (0.078-0.091)	0.100 (0.092-0.107)	0.112 (0.103-0.120)	0.125 (0.114-0.134)	0.137 (0.126-0.148)	0.155 (0.141-0.167)	0.169 (0.154-0.183)
4-day	0.038 (0.036-0.041)	0.046 (0.043-0.050)	0.057 (0.053-0.061)	0.066 (0.061-0.071)	0.078 (0.072-0.084)	0.087 (0.081-0.094)	0.097 (0.089-0.104)	0.107 (0.098-0.115)	0.121 (0.110-0.130)	0.132 (0.120-0.142)
7-day	0.025 (0.023-0.027)	0.030 (0.028-0.032)	0.037 (0.034-0.039)	0.042 (0.039-0.045)	0.050 (0.046-0.053)	0.055 (0.051-0.059)	0.061 (0.057-0.066)	0.068 (0.062-0.072)	0.076 (0.070-0.082)	0.083 (0.075-0.089)
10-day	0.020 (0.019-0.021)	0.024 (0.022-0.026)	0.029 (0.027-0.031)	0.033 (0.031-0.035)	0.038 (0.036-0.041)	0.042 (0.039-0.045)	0.047 (0.043-0.050)	0.051 (0.047-0.054)	0.057 (0.052-0.060)	0.061 (0.056-0.065)
20-day	0.013 (0.012-0.014)	0.016 (0.015-0.017)	0.019 (0.018-0.020)	0.021 (0.020-0.022)	0.024 (0.023-0.026)	0.027 (0.025-0.029)	0.029 (0.027-0.031)	0.032 (0.029-0.034)	0.035 (0.032-0.038)	0.038 (0.035-0.041)
30-day	0.011 (0.010-0.012)	0.013 (0.012-0.014)	0.015 (0.014-0.016)	0.017 (0.016-0.018)	0.019 (0.018-0.020)	0.021 (0.019-0.022)	0.023 (0.021-0.024)	0.024 (0.023-0.026)	0.027 (0.025-0.028)	0.028 (0.026-0.030)
45-day	0.009 (0.009-0.010)	0.011 (0.010-0.012)	0.013 (0.012-0.013)	0.014 (0.013-0.015)	0.015 (0.015-0.016)	0.017 (0.016-0.018)	0.018 (0.017-0.019)	0.019 (0.018-0.020)	0.021 (0.019-0.022)	0.022 (0.020-0.023)
60-day	0.008 (0.008-0.009)	0.010 (0.009-0.010)	0.011 (0.010-0.012)	0.012 (0.011-0.013)	0.013 (0.013-0.014)	0.014 (0.014-0.015)	0.015 (0.014-0.016)	0.016 (0.015-0.017)	0.018 (0.016-0.019)	0.018 (0.017-0.020)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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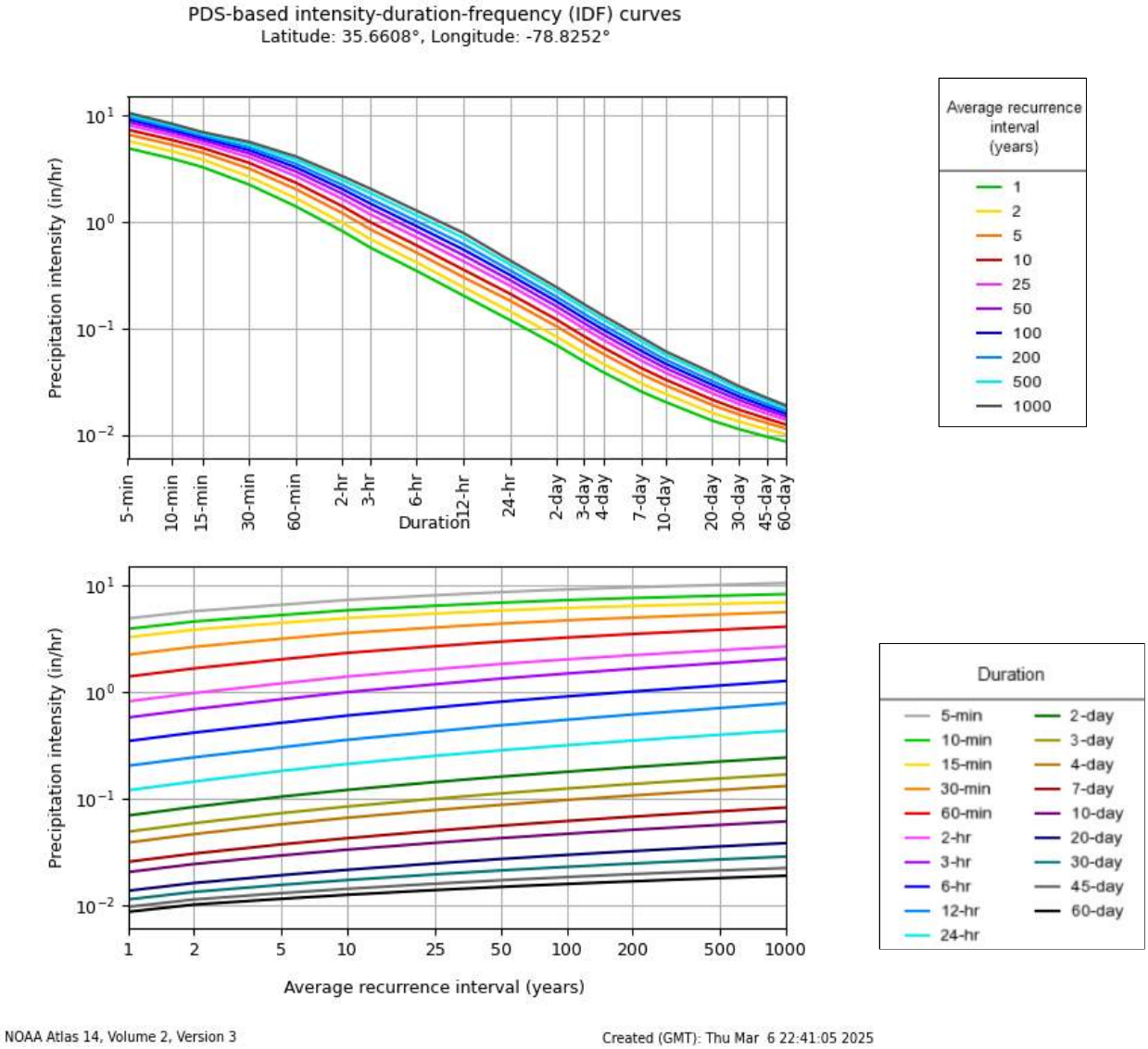
PF graphical



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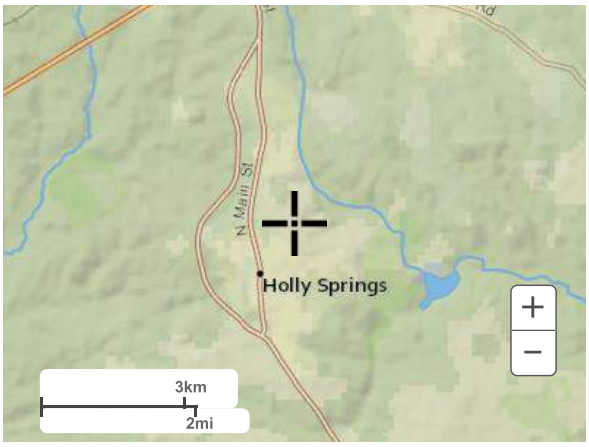
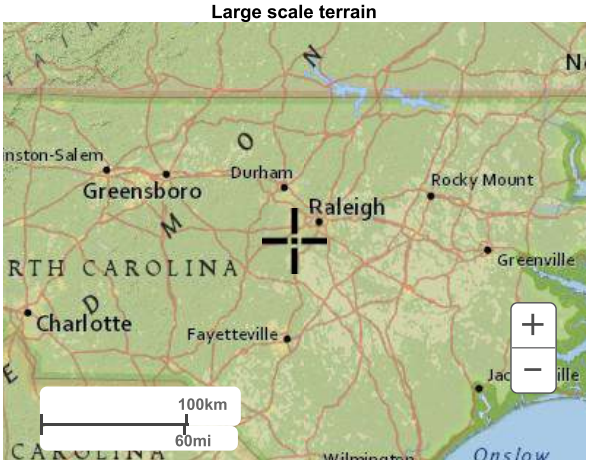
Maps & aerials

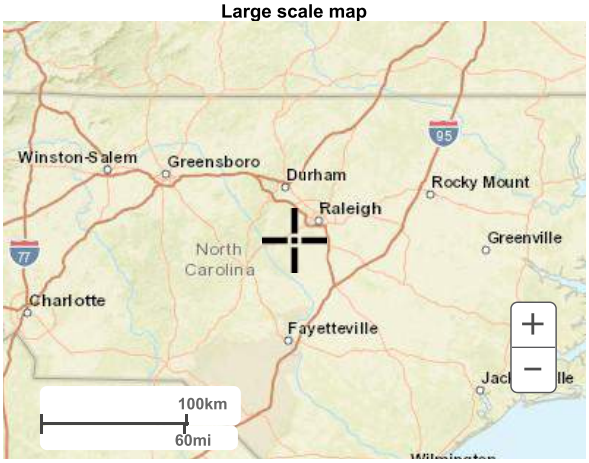
Small scale terrain



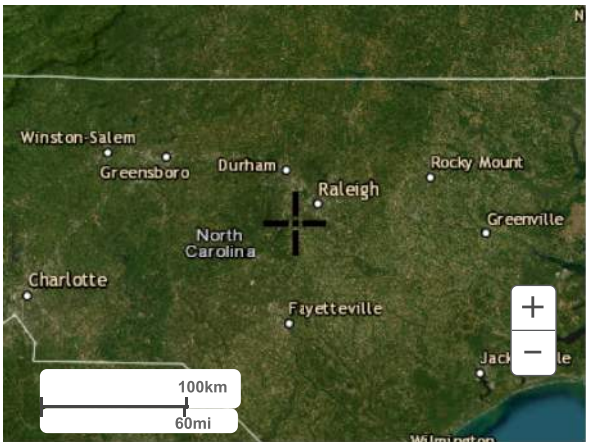
Large scale terrain



Large scale map



Large scale aerial



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National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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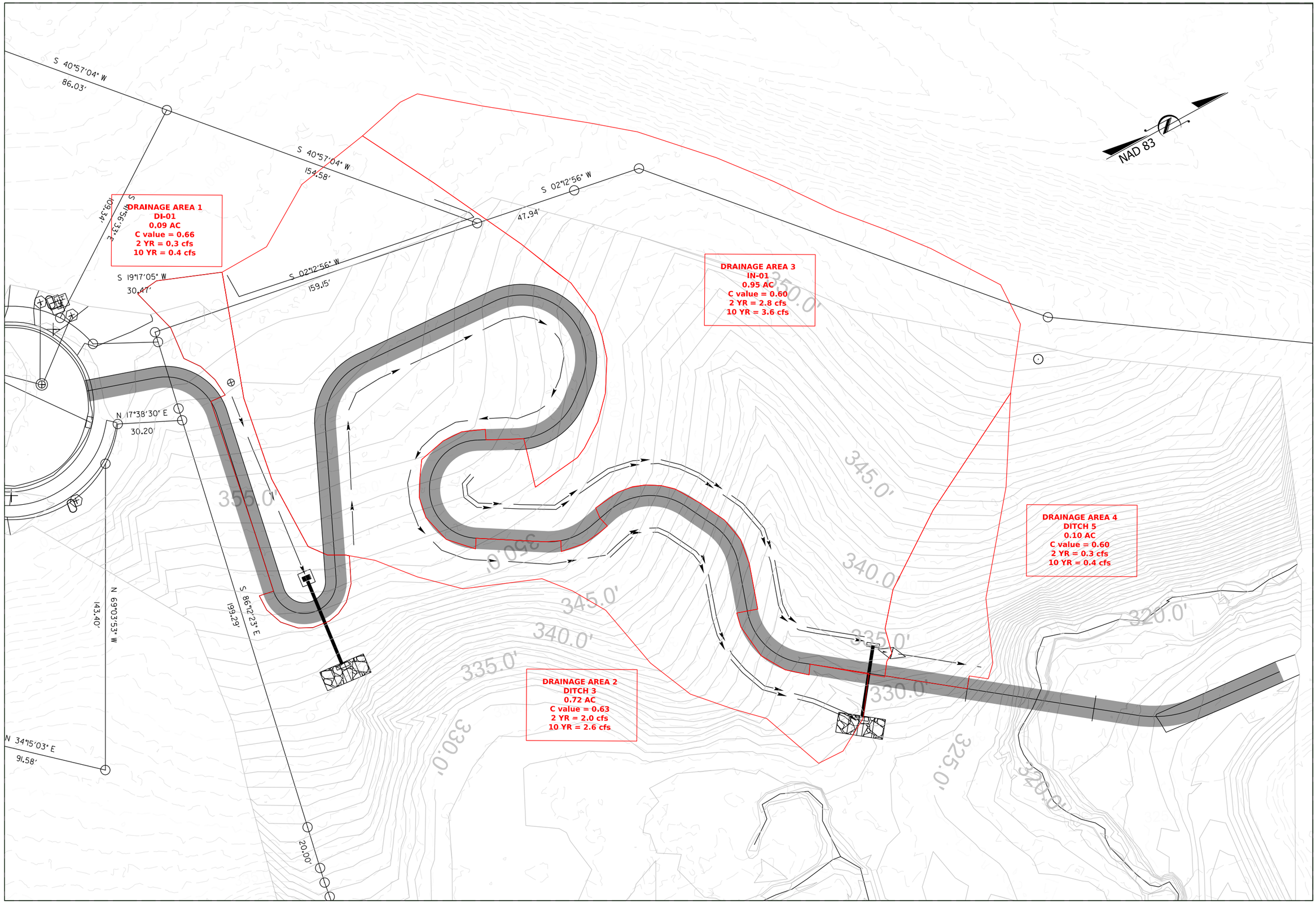

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CONSTRUCTION

Corp. NC License: F-1320

Ting Park-Oak Hall Greenway Connector

Ting Park
Holly Springs, North Carolina

Project No: 1725-200012.00
Date: 1/16/2025
Revisions:
-
-

Sheet Title:

Drainage Areas

Sheet No:

DA.1

Ting Park StreamStats

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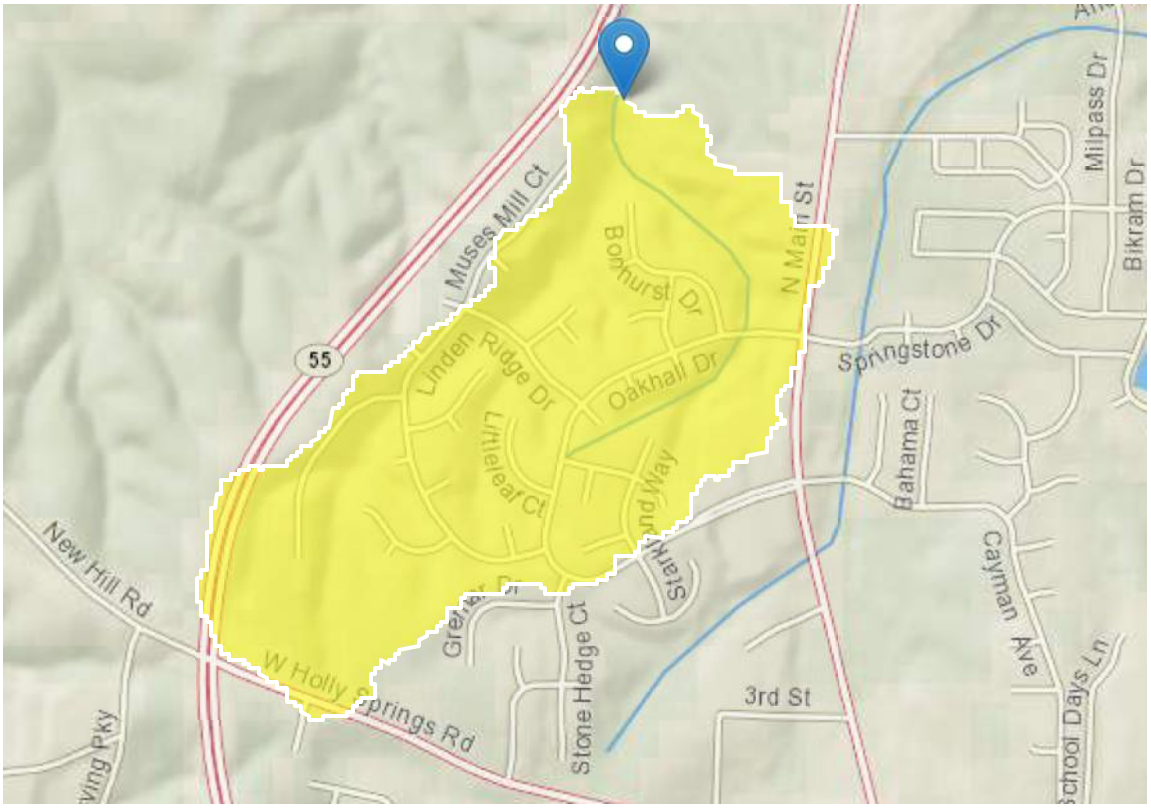
Workspace ID: NC20250310162826824000
Clicked Point (Latitude, Longitude): 35.66736, -78.83969
Time: 2025-03-10 12:27:51 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.28	square miles

Parameter Code	Parameter Description	Value	Unit
LC06IMP	Percentage of impervious area determined from NLCD 2006 impervious dataset	19.93	percent
PCTREG1	Percentage of drainage area located in Region 1 - Piedmont / Ridge and Valley	100	percent
PCTREG2	Percentage of drainage area located in Region 2 - Blue Ridge	0	percent
PCTREG3	Percentage of drainage area located in Region 3 - Sandhills	0	percent
PCTREG4	Percentage of drainage area located in Region 4 - Coastal Plains	0	percent
PCTREG5	Percentage of drainage area located in Region 5 - Lower Tifton Uplands	0	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Region 1 Piedmont rural under 1 sqmi 2014 5030]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.28	square miles	0.1	1
LC06IMP	Percent Impervious NLCD2006	19.93	percent	0	47.9

Peak-Flow Statistics Parameters [Peak Southeast US NC 2023 5006]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.28	square miles	0.08	8902
PCTREG1	Percent Area in Region 1 - Piedmont / Ridge and Valley	100	percent	0	100
PCTREG2	Percent Area in Region 2 - Blue Ridge	0	percent	0	100
PCTREG3	Percent Area in Region 3 - Sandhills	0	percent	0	100
PCTREG4	Percent Area in Region 4 - Coastal Plains	0	percent	0	100
PCTREG5	Percent Area in Region 5 - Lower Tifton Uplands	0	percent	0	100

Peak-Flow Statistics Flow Report [Region 1 Piedmont rural under 1 sqmi 2014 5030]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU	ASEp
50-percent AEP flood	122	ft^3/s	65.6	227	31.9
20-percent AEP flood	173	ft^3/s	105	286	25.4
10-percent AEP flood	207	ft^3/s	128	335	25
4-percent AEP flood	246	ft^3/s	145	416	27
2-percent AEP flood	274	ft^3/s	155	484	29.3
1-percent AEP flood	302	ft^3/s	162	564	32.1
0.5-percent AEP flood	328	ft^3/s	167	646	35.1
0.2-percent AEP flood	370	ft^3/s	179	763	37.5

Peak-Flow Statistics Flow Report [Peak Southeast US NC 2023 5006]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU	ASEp
50-percent AEP flood	65.6	ft^3/s	35.9	120	36.8
20-percent AEP flood	119	ft^3/s	66.9	212	35.8
10-percent AEP flood	164	ft^3/s	91.6	294	36.3
4-percent AEP flood	224	ft^3/s	120	419	38.4
2-percent AEP flood	279	ft^3/s	148	526	39.8
1-percent AEP flood	334	ft^3/s	173	644	41.3
0.5-percent AEP flood	391	ft^3/s	198	771	42.8
0.2-percent AEP flood	466	ft^3/s	231	940	44.4

Peak-Flow Statistics Citations

Feaster, T.D., Gotvald, A.J., and Weaver, J.C.,2014, Methods for estimating the magnitude and frequency of floods for urban and small, rural streams in Georgia, South Carolina, and North Carolina, 2011 (ver. 1.1, March 2014): U.S. Geological Survey Scientific Investigations Report 2014–5030, 104 p. (http://pubs.usgs.gov/sir/2014/5030/)

Feaster, T.D., Gotvald, A.J., Musser, J.W., Weaver, J.C, Kolb, K.R., Veilleux, A.G., and Wagner, D.M.2023, Magnitude and frequency of floods for rural streams in Georgia, South Carolina, and North Carolina, 2017—Results: U.S. Geological Survey Scientific Investigations Report 2023-5006, 75 p. (https://pubs.er.usgs.gov/publication/sir20235006)

SECTION 3: HYDRAULIC ANALYSIS

Culvert Calculations

Ditch Calculations

HEC-RAS Cross Sections

Culvert Hydrology

Label	Outflow Element	Runoff C Value	Area (acres)	T_c (min)	Rational Flow (cfs)
DR-02	IN-01	0.60	0.95	10.9	3.64
DR-01	CB-01	0.66	0.09	6.6	0.47

Culvert Calculations

Label	Diameter (in)	Start Node	Stop Node	Invert (Start) (ft)	Invert (Stop) (ft)	Slope (ft/ft)	Flow (cfs)	Capacity (Design) (cfs)	Velocity (ft/s)	Depth (Normal) (ft)
SS-01	15	CB-01	OUT1	346.57	344.83	0.04	0.47	15.02	5.71	0.15
SS-02	18	IN-01	OUT2	329.00	328.50	0.01	3.64	14.26	6.79	0.51

Outflow Conditions

Label	Elevation (Invert) (ft)	Boundary Condition Type	Hydraulic Grade (ft)	Flow (cfs)	Depth (Node) (ft)
OUT1	345	Free Outfall	344.98	0.47	0.15
OUT2	329	Free Outfall	329.04	3.63	0.54

All calculations generated from ORD Drainage and Utilitie Flex Tables

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Comp. by: J. Saddler Date: 3/7/2025 Sheet 2 of 7

Job No. 1725-20012

Project: Ting Oakhall Park Greenway

Element: 10+60 to 11+86 (LT)

Peak Flow Rates based on Holly Springs Drainage Manual

Ditch 1

Drainage Area: **0.09** **acres**

Land Use:

--		acres	c-value =	
--		acres	c-value =	
Greenway area	0.02	acres	c-value =	0.96
wooded area	0.07	acres	c-value =	0.58
--		acres	c-value =	

COMPOSITE C-VAL $\Sigma(C*A) / A_{tot}$ = **0.66**

Time of Concentration: (National Engineering Handbook Table 6D-2 & Eq. 15-8)

Sheet Flow: $t_t = (0.007(nL)^{0.8})/(P_{2-24}^{0.5} S^{0.4})$

n 0.202 L = 50 ft P_{2-24} = 3.42 in S = 0.03 ft/ft t_t = 0.10 hr

Shallow Concentrated Flow:

Paved Surface: $V = 20.328(S)^{0.5}$

Length 1: L = 0 ft S = 0.00 ft/ft V = 0.00 ft/s t_t = 0.00 hr

Unpaved Surface: $V = 16.135(S)^{0.5}$

Length 2: L = ft S = 0.00 ft/ft V = 0.00 ft/s t_t = 0.00 hr

Channelized Flow: $V=(1.49/n)*R^{2/3}*S^{0.5}$

L = ### ft n = 0 R = 0.12 ft S = 0.048 ft/ft V = 2.65 ft/ft t_t = 0.01 hr

Total Time of Concentrat $T_c = \Sigma T_t$ T_c = 0.11 hr = **6.6** **min**

Rainfall Intensity (NOAA Atlas 14 Table 1):

i_2 = 5.41 in/hr i_{10} = 6.90 in/hr i_{25} = 7.63 in/hr i_{100} = 8.15 in/hr

Rational Method Peak Flows: $Q = C_f*CiA$

2-year Peak Flow Ra	10-year Peak Flow Rate:	25-year Peak Flow Rate:	100-year Peak Flow Rate:
Q_2 = 0.3 cfs	Q_{10} = 0.4 cfs	Q_{25} = 0.5 cfs	Q_{100} = 0.6 cfs
C_f = 1.0	C_f = 1.0	C_f = 1.1	C_f = 1.25

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Comp. by: J. Saddler Date: 3/7/2025 Sheet 3 of 7

Job No. 1725-20012

Project: Ting Oakhall Park Greenway

Element: 12+14 TO 16+27 (RT)

Peak Flow Rates based on Holly Springs Drainage Manual

Ditch 2

Drainage Area: **0.56** **acres**

Land Use:

--		acres	c-value =	
--		acres	c-value =	
Greenway area	0.06	acres	c-value =	0.96
wooded area	0.50	acres	c-value =	0.58
--		acres	c-value =	

COMPOSITE C-VALUE $\Sigma(C*A) / A_{tot}$ = **0.63**

Time of Concentration: (National Engineering Handbook Table 6D-2 & Eq. 15-8)

Sheet Flow: $t_t = (0.007(nL)^{0.8})/(P_{2\text{-}24}{}^{0.5} S^{0.4})$

n = 0.202 L = 86 ft $P_{2\text{-}24}$ = 3.42 in S = 0.047 ft/ft t_t = 0.13 hr

Shallow Concentrated Flow:

Paved Surface: $V = 20.328(S)^{0.5}$

Length 1: L 0 ft S 0.00 ft/ft V = 0.00 ft/s t_t = 0.00 hr

Unpaved Surface: $V = 16.135(S)^{0.5}$

Length 2: L 0 ft S 0.00 ft/ft V = 0.00 ft/s t_t = 0.00 hr

Channelized Flow: $V=(1.49/n)*R^{2/3}*S^{0.5}$

L = 413 ft n = 0 R = 0.26 ft S = 0.020 ft/ft V = 2.48 ft/ft t_t = 0.05 hr

Total Time of Concentration $T_c = \Sigma T_t$ T_c 0.17 hr = **10.4** **min**

Rainfall Intensity (NOAA Atlas 14 Table 1):

i_2 = 4.55 in/hr i_{10} = 5.80 in/hr i_{25} = 6.38 in/hr i_{100} = 7.23 in/hr

Rational Method Peak Flows: $Q = C_f*CiA$

2-year Peak Flow Rate:	10-year Peak Flow Rate:	25-year Peak Flow Rate:	100-year Peak Flow Rate:
Q_2 = 1.6 cfs	Q_{10} = 2.0 cfs	Q_{25} = 2.5 cfs	Q_{100} = 3.2 cfs
C_f = 1.0	C_f = 1.0	C_f = 1.1	C_f = 1.25

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Comp. by: J. Saddler Date: 3/7/2025 Sheet 4 of 7

Job No. 1725-20012

Project: Ting Oakhall Park Greenway

Element: 15+20 to 18+16 (LT)

Peak Flow Rates based on Holly Springs Drainage Manual

Ditch 3

Drainage Area: **0.95** **acres**

Land Use:

--		acres	c-value =	
--		acres	c-value =	
Greenway area	0.04	acres	c-value =	0.96
wooded area	0.91	acres	c-value =	0.58
--		acres	c-value =	

COMPOSITE C-VALUE: $\Sigma(C*A) / A_{tot}$ = **0.60**

Time of Concentration: (National Engineering Handbook Table 6D-2 & Eq. 15-8)

Sheet Flow: $t_t = (0.007(nL)^{0.8})/(P_{2\text{-}24}^{0.5} S^{0.4})$

n = 0.202 L = 100 ft $P_{2\text{-}24}$ = 3.42 in S = 0.075 ft/ft t_t = 0.12 hr

Shallow Concentrated Flow:

Paved Surface: $V = 20.328(S)^{0.5}$

Length 1: L = 0 ft S = 0.00 ft/ft V = 0.00 ft/s t_t = 0.00 hr

Unpaved Surface: $V = 16.135(S)^{0.5}$

Length 2: L = 64 ft S = 0.11 ft/ft V = 5.28 ft/s t_t = 0.00 hr

Channelized Flow: $V=(1.49/n)*R^{2/3}*S^{0.5}$

L = 296 ft n = 0.03 R = 0.25 ft S = 0.048 ft/ft V = 4.35 ft/ft t_t = 0.02 hr

Total Time of Concentration: $T_c = \Sigma T_t$ T_c = 0.14 hr = **8.4** **min**

Rainfall Intensity (NOAA Atlas 14 Table 1):

i_2 = 4.99 in/hr i_{10} = 6.37 in/hr i_{25} = 7.02 in/hr i_{100} = 7.96 in/hr

Rational Method Peak Flows: $Q = C_f*CiA$

2-year Peak Flow Rate:	10-year Peak Flow Rate:	25-year Peak Flow Rate:	100-year Peak Flow Rate:
Q_2 = 2.8 cfs	Q_{10} = 3.6 cfs	Q_{25} = 4.4 cfs	Q_{100} = 5.6 cfs
C_f = 1.0	C_f = 1.0	C_f = 1.1	C_f = 1.25

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Comp. by: J. Saddler Date: 3/7/2025 Sheet 5 of 7

Job No. 1725-20012

Project: Ting Oakhall Park Greenway

Element: 16+27 to 18+15 (RT)

Peak Flow Rates based on Holly Springs Drainage Manual

Ditch 3

Drainage Area: **0.72** **acres**

Land Use:

--		acres	c-value =	
--		acres	c-value =	
Greenway area	0.09	acres	c-value =	0.96
wooded area	0.63	acres	c-value =	0.58
--		acres	c-value =	

COMPOSITE C-VALUE: $\Sigma(C*A) / A_{tot}$ = **0.63**

Time of Concentration: (National Engineering Handbook Table 6D-2 & Eq. 15-8)

Sheet Flow: $t_t = (0.007(nL)^{0.8})/(P_{2-24}^{0.5} S^{0.4})$

n = 0.202 L = 100 ft P_{2-24} = 3.42 in S = 0.047 ft/ft t_t = 0.14 hr

Shallow Concentrated Flow:

Paved Surface: $V = 20.328(S)^{0.5}$

Length 1: L = 0 ft S = 0.00 ft/ft V = 0.00 ft/s t_t = 0.00 hr

Unpaved Surface: $V = 16.135(S)^{0.5}$

Length 2: L = 0 ft S = 0.00 ft/ft V = 0.00 ft/s t_t = 0.00 hr

Channelized Flow: $V=(1.49/n)*R^{2/3}*S^{0.5}$

L = 602 ft n = 0.03 R = 0.25 ft S = 0.048 ft/ft V = 4.35 ft/ft t_t = 0.04 hr

Total Time of Concentration: $T_c = \Sigma T_t$ T_c = 0.18 hr = **10.9** **min**

Rainfall Intensity (NOAA Atlas 14 Table 1):

i_2 = 4.43 in/hr i_{10} = 5.65 in/hr i_{25} = 6.22 in/hr i_{100} = 7.04 in/hr

Rational Method Peak Flows: $Q = C_f*CiA$

2-year Peak Flow Rate:	10-year Peak Flow Rate:	25-year Peak Flow Rate:	100-year Peak Flow Rate:
Q_2 = 2.0 cfs	Q_{10} = 2.6 cfs	Q_{25} = 3.1 cfs	Q_{100} = 4.0 cfs
C_f = 1.0	C_f = 1.0	C_f = 1.1	C_f = 1.25

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Comp. by: J. Saddler Date: 3/7/2025 Sheet 6 of 7

Date: Job No. 1725-20012

Project: Ting Oakhall Park Greenway

Element: 18+16 to 18+62 LT

Peak Flow Rates based on Holly Springs Drainage Manual

Ditch 5

Drainage Area: **0.10** **acres**

Land Use:

--		acres	c-value =	
--		acres	c-value =	
Greenway area	0.00	acres	c-value =	0.96
wooded area	0.10	acres	c-value =	0.58
--		acres	c-value =	

COMPOSITE C-VALUE: $\Sigma(C*A) / A_{tot}$ = **0.60**

Time of Concentration: (National Engineering Handbook Table 6D-2 & Eq. 15-8)

Sheet Flow: $t_t = (0.007(nL)^{0.8})/(P_{2-24}^{0.5} S^{0.4})$

n = 0.202 L = 100 ft P_{2-24} = 3.42 in S = 0.15 ft/ft t_t = 0.09 hr

Shallow Concentrated Flow:

Paved Surface: $V = 20.328(S)^{0.5}$

Length 1: L = 0 ft S = 0.00 ft/ft V = 0.00 ft/s t_t = 0.00 hr

Unpaved Surface: $V = 16.135(S)^{0.5}$

Length 2: L = 31 ft S = 0.15 ft/ft V = 6.15 ft/s t_t = 0.00 hr

Channelized Flow: $V=(1.49/n)*R^{2/3}*S^{0.5}$

L = 46 ft n = 0.03 R = ## ft S = 0.048 ft/ft V = 2.68 ft/ft t_t = 0.00 hr

Total Time of Concentration: $T_c = \Sigma T_t$ T_c = 0.10 hr = **5.7** **min**

Rainfall Intensity (NOAA Atlas 14 Table 1):

i_2 = 5.61 in/hr i_{10} = 7.16 in/hr i_{25} = 7.91 in/hr i_{100} = 8.98 in/hr

Rational Method Peak Flows: $Q = C_f*CiA$

2-year Peak Flow Rate:	10-year Peak Flow Rate:	25-year Peak Flow Rate:	100-year Peak Flow Rate:
Q_2 = 0.3 cfs	Q_{10} = 0.4 cfs	Q_{25} = 0.5 cfs	Q_{100} = 0.7 cfs
C_f = 1.0	C_f = 1.0	C_f = 1.1	C_f = 1.25

- Town of Holly Springs Stormwater Design

Table 8.05d Curve Numbers and Rational C

Cover Description	SCS Curve Number				Rational C				Percent Impervious
	HSG A	HSG B	HSG C	HSG D	HSG A	HSG B	HSG C	HSG D	
Fully developed urban areas									
Open space									
Poor condition (<50% grass)	68	79	86	89	0.36	0.58	0.72	0.78	
Fair condition (50 -75% grass)	49	69	79	84	0.15	0.38	0.58	0.68	
Good condition (>50% grass)	39	61	74	80	0.15	0.22	0.48	0.60	
Impervious areas									
Pavement, roofs	98	98	98	98	0.96	0.96	0.96	0.96	
Gravel	76	85	89	91	0.52	0.70	0.78	0.82	
Dirt	72	82	87	89	0.44	0.64	0.74	0.78	
Good	30	48	65	73	0.15	0.15	0.30	0.46	
Woods and grass (orchard)									
Poor	57	73	82	86	0.15	0.46	0.64	0.72	
Fair	43	65	76	82	0.15	0.30	0.52	0.64	
Good	32	58	72	79	0.15	0.16	0.44	0.58	
Woods									
Poor	45	66	77	83	0.15	0.32	0.54	0.66	
Fair	36	60	73	79	0.15	0.20	0.46	0.58	
Good	30	55	70	77	0.15	0.15	0.40	0.54	

Town of Holly Springs Drainage manual Runoff Coefficients

Table 8.05h Rational runoff coefficients (Munson, et al., 1990 and Chow et al., 1988)

Channel lining	Manning roughness coefficient, n
Asphalt	0.016
Concrete, finished	0.012
Concrete, unfinished	0.014
Grass	0.035
Gravel bottom with riprap sides	0.033
Weeds	0.04

-

National Engineering Handbook - Shallow Flow Velocity Equations (Table 15-

Table 15–3 Equations and assumptions developed from figure 15–4

Flow type	Depth (ft)	Manning's *n*	Velocity equation (ft/s)
Pavement and small upland gullies	0.2	0.025	$V = 20.328(s)^{0.5}$
Grassed waterways	0.4	0.050	$V = 16.135(s)^{0.5}$
Nearly bare and untilled (overland flow); and alluvial fans in western mountain regions	0.2	0.051	$V = 9.965(s)^{0.5}$
Cultivated straight row crops	0.2	0.058	$V = 8.762(s)^{0.5}$
Short-grass pasture	0.2	0.073	$V = 6.962(s)^{0.5}$
Minimum tillage cultivation, contour or strip-cropped, and woodlands	0.2	0.101	$V = 5.032(s)^{0.5}$
Forest with heavy ground litter and hay meadows	0.2	0.202	$V = 2.516(s)^{0.5}$

- NOAA Atlas 14 Rainfall Intensities - For Use in Excel Formulas

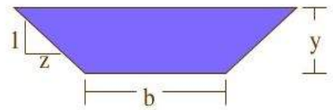
tc(min)	2-YR	10-YR	25-YR	100-YR
5	5.78	7.38	8.16	9.26
10	4.63	5.9	6.5	7.36
15	3.88	4.98	5.49	6.2
30				
60				

National Engineering Handbook - Sheet Flow Tc Equation (Equation 15-8)

$$T_t = \frac{0.007(n\ell)^{0.8}}{(P_2)^{0.5} S^{0.4}} \qquad \text{(eq. 15–8)}$$

where:
T_t = travel time, h
n = Manning's roughness coefficient (table 15–1)
ℓ = sheet flow length, ft
P_2 = 2-year, 24-hour rainfall, in
S = slope of land surface, ft/ft

Ditch I.D.	Location		Channel Length (ft)	Design Year	Peak Q (cfs)	Channel Characteristics								Flow Depth, y (ft)	Capacity Q (cfs)	Velocity (ft/s)		Depth of Ditch*	Shear Stress (lb/ft^)	Freeboard
	From Station	To Station				Mannings 'n'	min. Slope (ft/ft)	B	Z_1	Z_2	A	P	R							
Ditch 1	10+60	11+86	126	10	0.4	0.035	0.0480	0	3	2	0.2	1.4	0.12	**0.26**	0.4	**2.3**		2.00	0.79	**1.7**
Ditch 2	12+14	16+27	413	10	2.0	0.035	0.0200	0	3	2	0.8	3.1	0.26	**0.57**	2.0	**2.5**		2.00	0.71	**1.4**
Ditch 3	15+20	18+16	296	10	3.6	0.035	0.0480	2	3	2	1.0	3.8	0.25	**0.34**	3.6	**3.7**		2.00	1.02	**1.7**
Ditch 4	16+27	18+16	602	10	2.6	0.035	0.0480	2	3	2	0.8	3.5	0.22	**0.29**	2.6	**3.4**		2.00	0.85	**1.7**
Ditch 5	18+16	18+62	46	10	0.4	0.035	0.0480	0	3	2	0.2	1.4	0.12	**0.26**	0.4	**2.3**		2.00	0.79	**1.7**



Manning's Equation for Open Channel Flow:

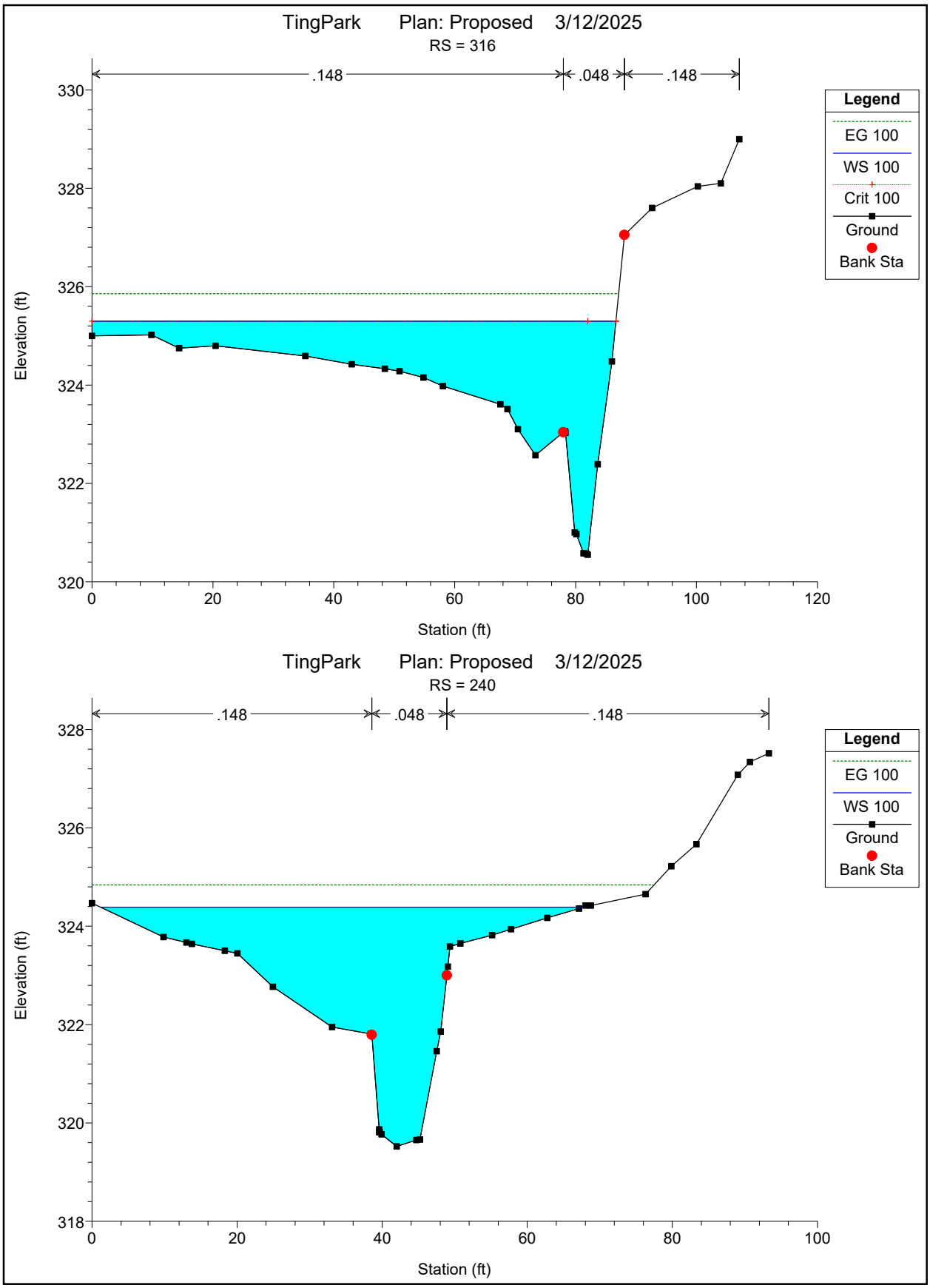
$Q = A*(1.486/n)*(R^{2/3})*(S^{0.5})$

Q = Channel flow (cfs)
A = Flow area (sq. ft.)
n = Manning's roughness coefficient
P = Wetted perimeter of channel
P = Wetted perimeter of channel
P = Wetted perimeter of channel
S = Channel slope (ft/ft)
V = Channel Flow/Flow Area

Froude Number Equation:
$Fr = v/(gD)^{0.5}$

v = mean velocity of flow (ft/s)
g = acceleration of gravity (32.2 ft/s)

1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.048
.148
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328
326
324
322
320
Elevation (ft)
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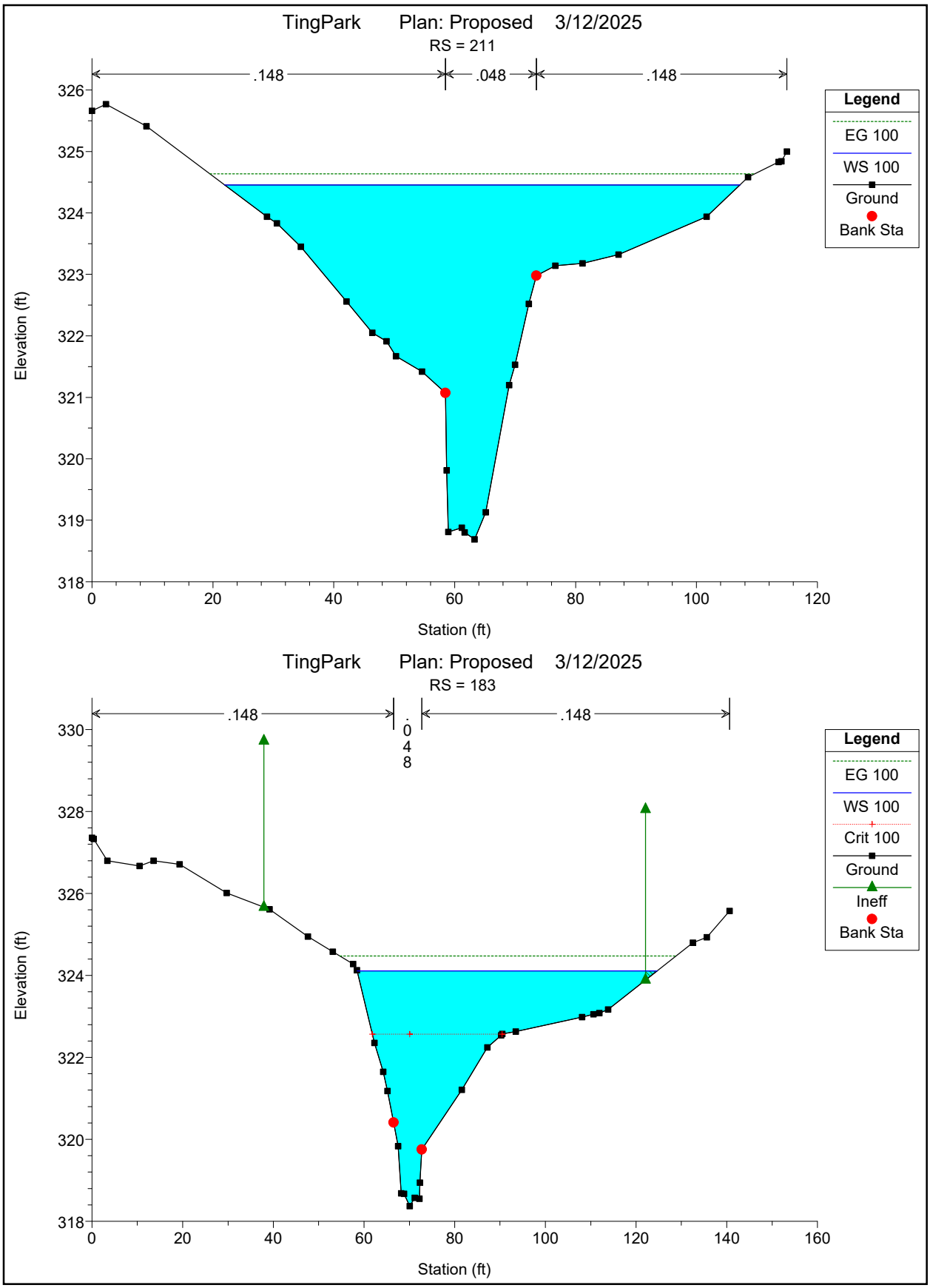
20
40
60
80
100
120
Station (ft)
Legend
EG 100
WS 100
Crit 100
Ground
Bank Sta
TingPark Plan: Proposed 3/12/2025
RS = 240
.148
.048
.148
328
326
324
322
320
318
Elevation (ft)
0
20
40
60
80
100
Station (ft)
Legend
EG 100
WS 100
Ground
Bank Sta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EG 100
WS 100
Ground
Bank Sta
Elevation (ft)
Station (ft)
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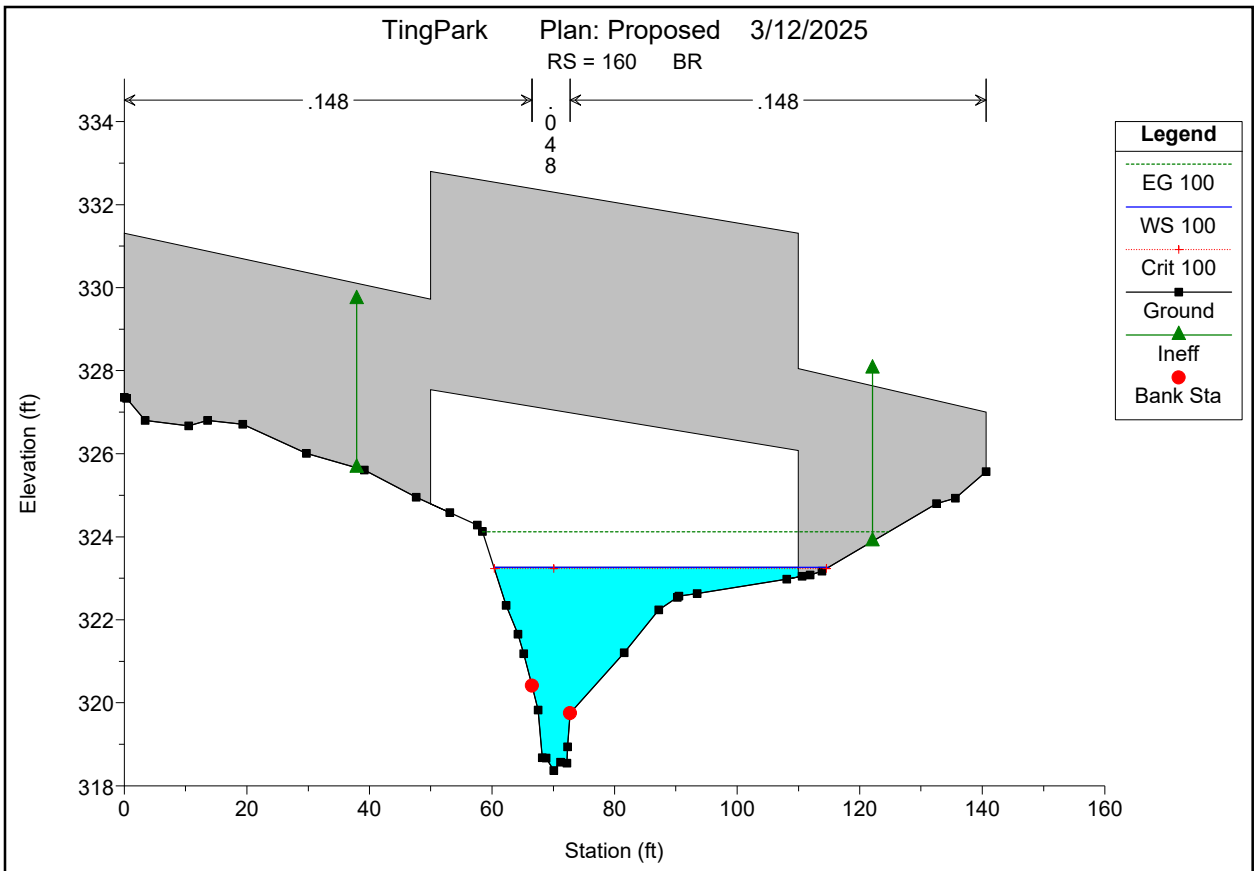
.048
.148
Legend
EG 100
WS 100
Crit 100
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)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.048
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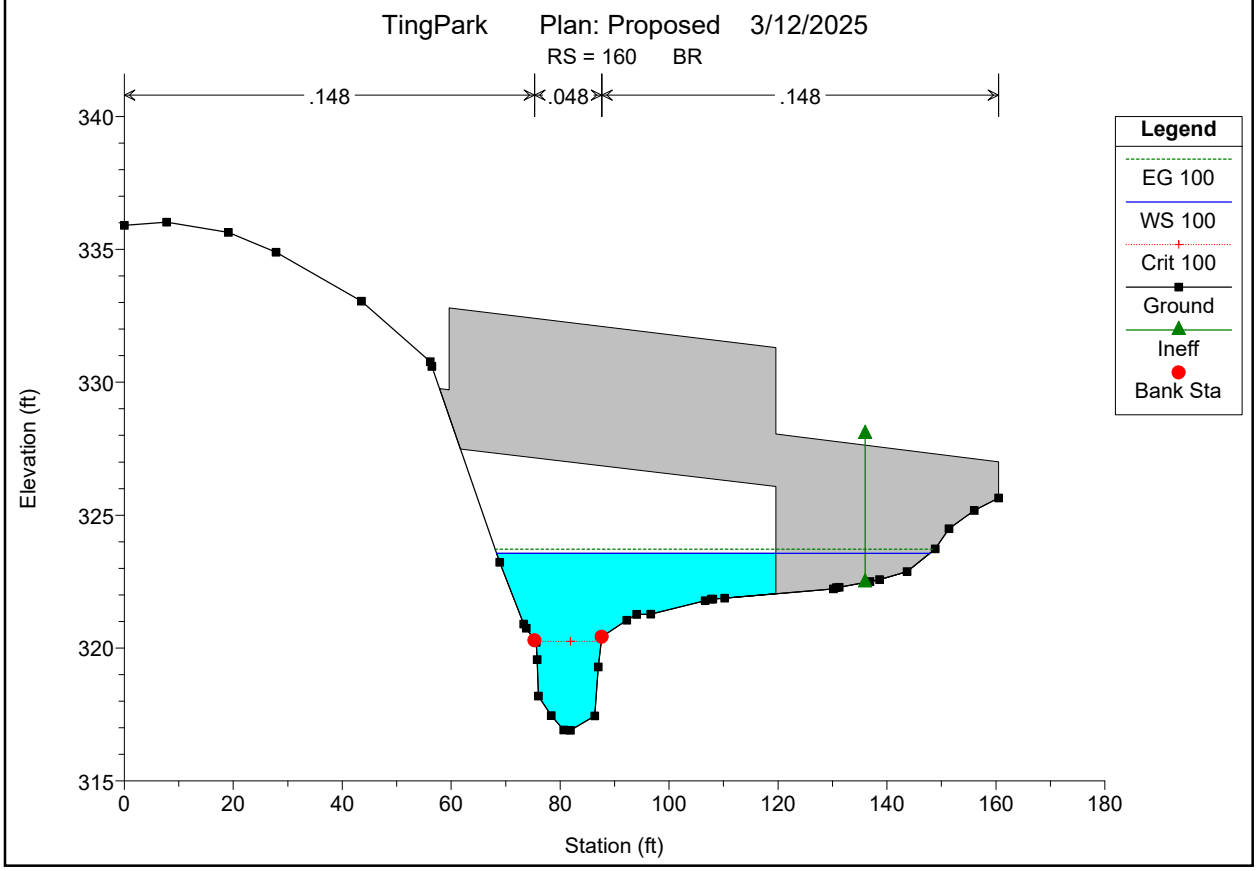
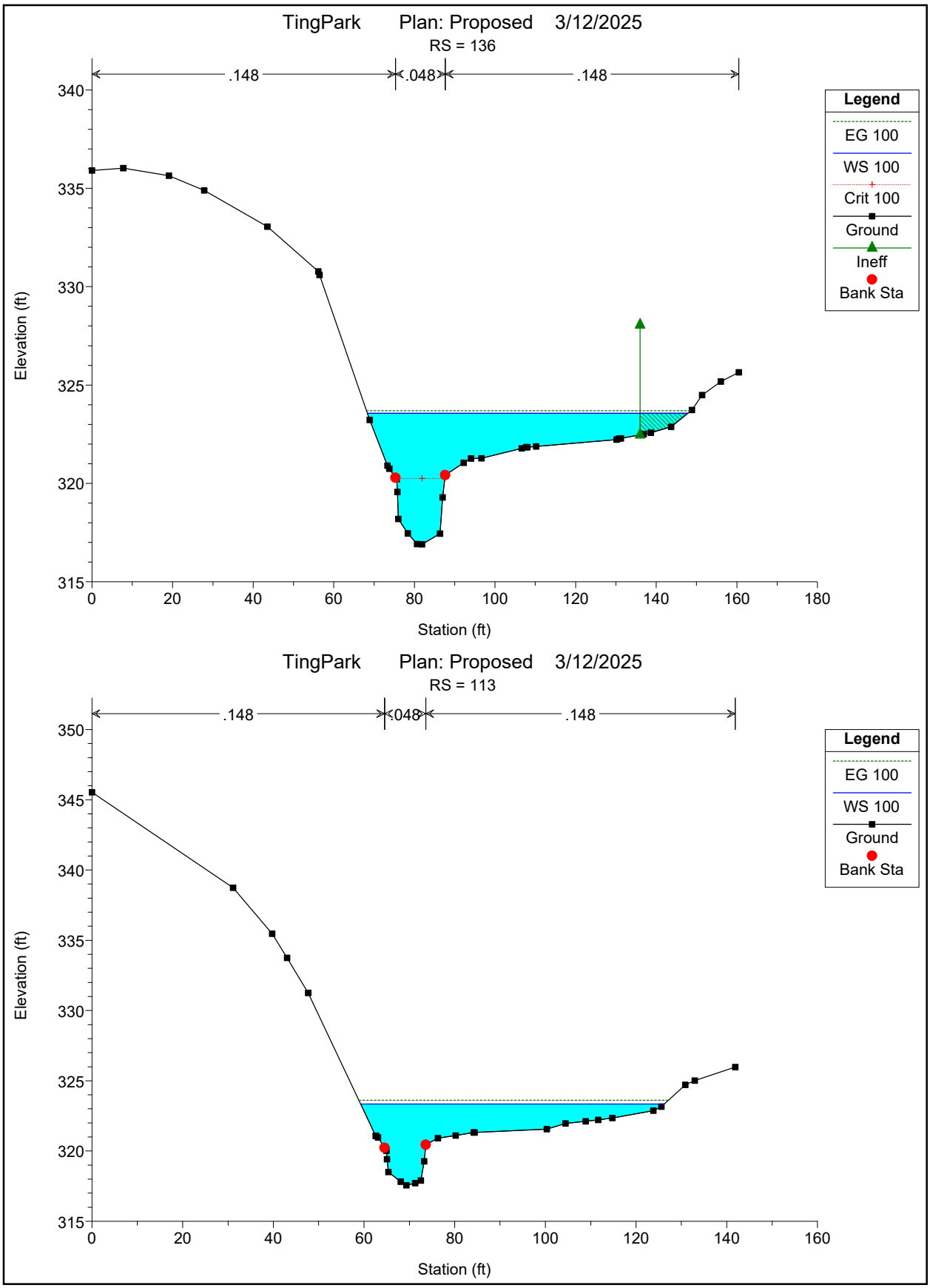
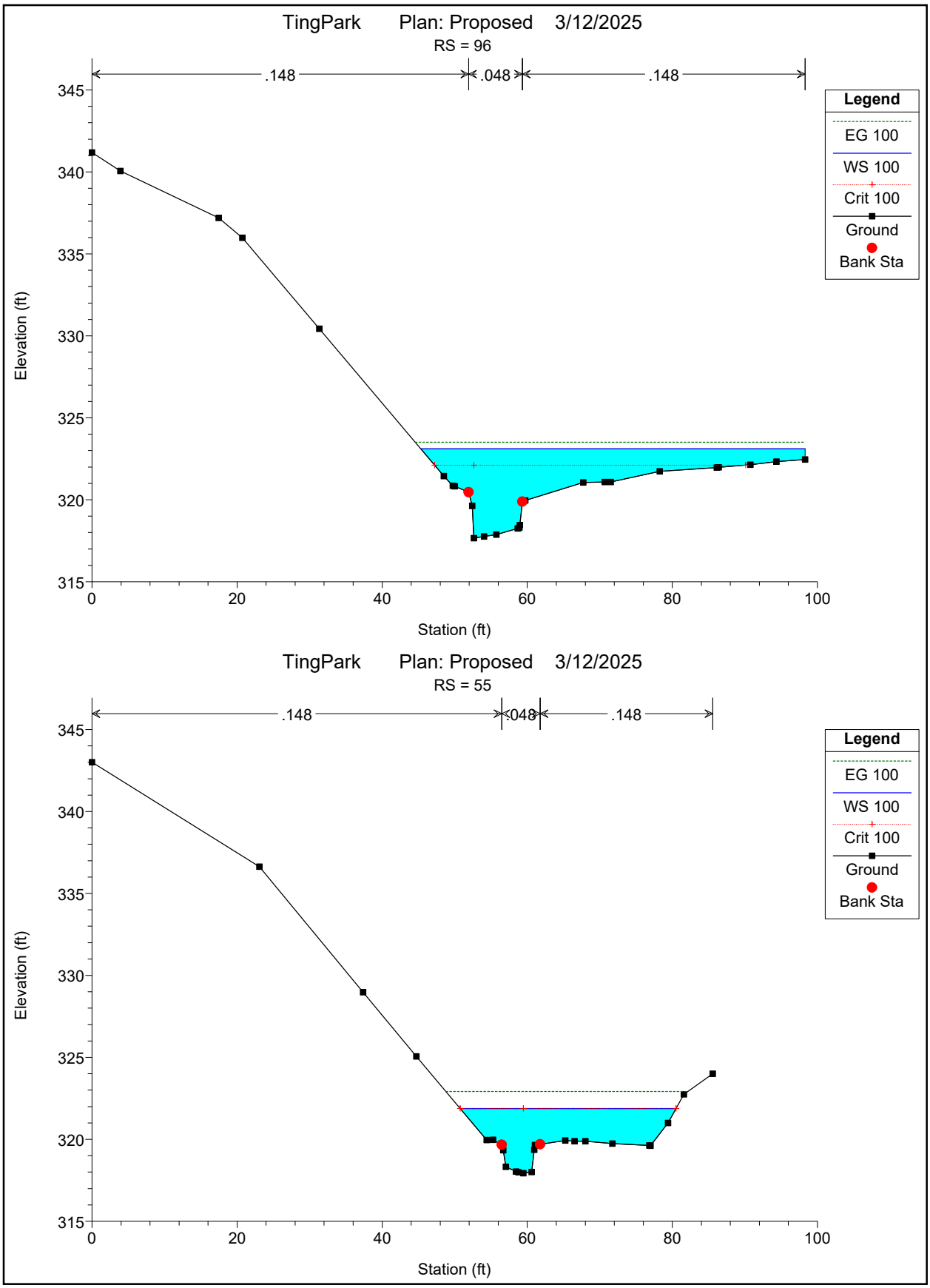
Legend
EG 100
WS 100
Crit 100
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


TingPark Plan: Proposed 3/12/2025
RS = 160 BR
.148
.048
.148
Legend
EG 100
WS 100
Crit 100
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


TingPark Plan: Proposed 3/12/2025
RS = 136
.148
.048
.148
Legend
EG 100
WS 100
Crit 100
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
TingPark Plan: Proposed 3/12/2025
RS = 113
.148
.048
.148
Legend
EG 100
WS 100
Ground
Bank Sta
Elevation (ft)
Station (ft)


TingPark Plan: Proposed 3/12/2025
RS = 96
.148
.048
.148
Legend
EG 100
WS 100
Crit 100
Ground
Bank Sta
Elevation (ft)
345
340
335
330
325
320
315
0
20
40
60
80
100
Station (ft)
TingPark Plan: Proposed 3/12/2025
RS = 55
.148
.048
.148
Legend
EG 100
WS 100
Crit 100
Ground
Bank Sta
Elevation (ft)
345
340
335
330
325
320
315
0
20
40
60
80
100
Station (ft)

SECTION 4: APPENDIX

USGS TOPO map

NRCS Soils Map

NCDOT Matting for Erosion Control Calculations

Soil Map—Wake County, North Carolina
(Ting-Oakhill Greenway)

78° 50' 31" W
78° 50' 18" W
35° 40' 4" N
35° 39' 57" N

Map Scale: 1:1,550 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 20 40 80 120

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Wake County, North Carolina
Survey Area Data: Version 26, Sep 9, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 24, 2022—May 9, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

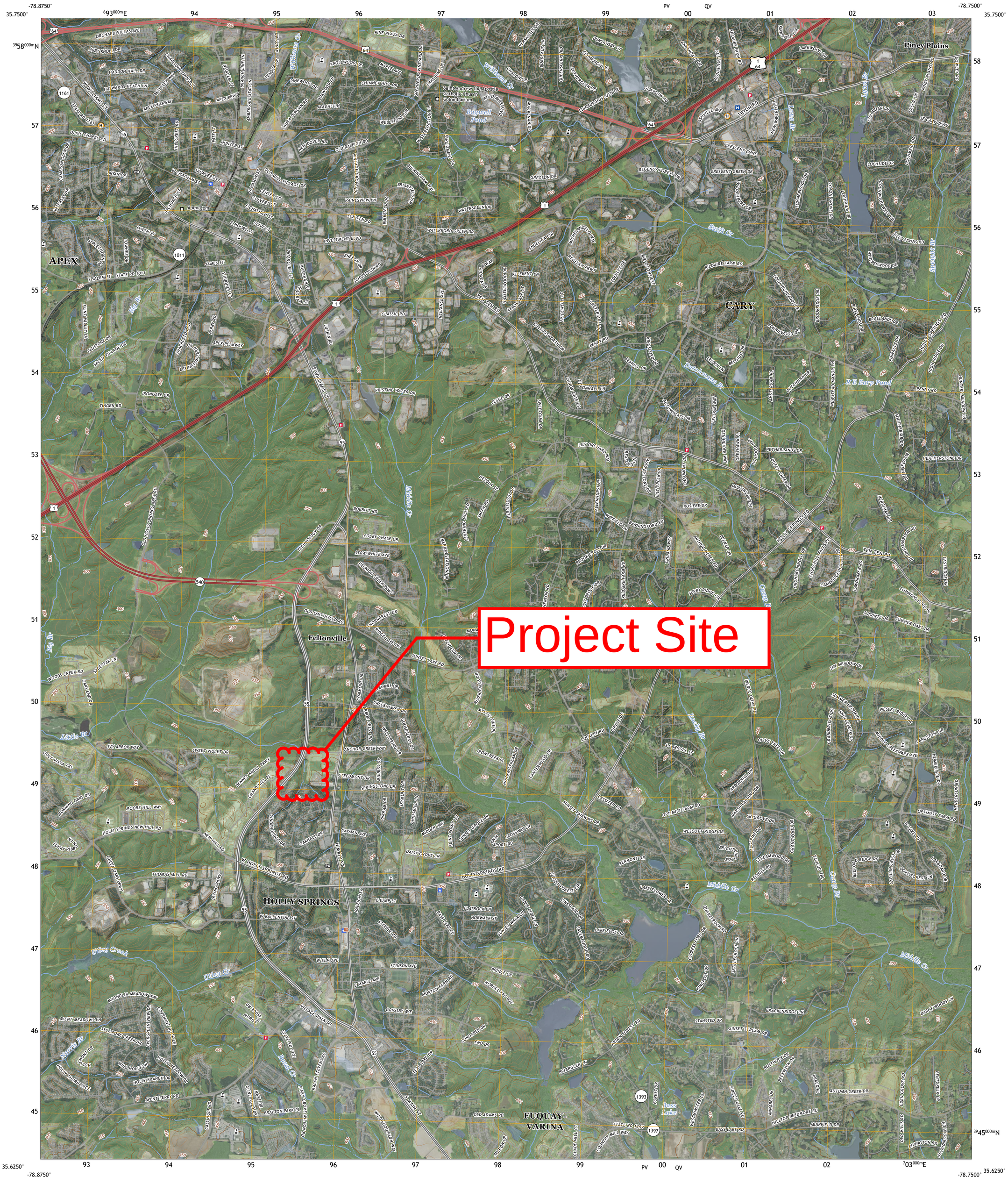
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CaC	Carbonton-Brickhaven complex, 6 to 10 percent slopes	2.5	25.1%
CaD	Carbonton-Brickhaven complex, 10 to 15 percent slopes	5.2	51.2%
CcC	Carbonton-Brickhaven-Urban land complex, 0 to 10 percent slopes	0.9	8.7%
ChA	Chewacla and Wehadkee soils, 0 to 2 percent slopes, frequently flooded	1.5	14.9%
Totals for Area of Interest		**10.1**	**100.0%**

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

APEX QUADRANGLE
NORTH CAROLINA - WAKE COUNTY
7.5-MINUTE SERIES



Produced by the United States Geological Survey

North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid:Universal Transverse Mercator, Zone 17S

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery.....NAIP, July 2020 - September 2020
Roads.....U.S. Census Bureau, 2016
Names.....GNIS, 1980 - 2022
Hydrography.....National Hydrography Dataset, 2001 - 2018
Contours.....National Elevation Dataset, 2008
Boundaries.....Multiple sources; see metadata file 2019 - 2021

Wetlands.....FWS National Wetlands Inventory Not Available

MN
GN
9°6′ 162 MILS
1°17′ 23 MILS
UTM GRID AND 2019 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000 - m Square ID
PV QV
Grid Zone Designation 17S

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard.

NORTH CAROLINA
QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

ADJOINING QUADRANGLES

1 Green Level
2 Cary
3 Raleigh West
4 New Hill
5 Lake Wheeler
6 Cokesbury
7 Fuquay-Varina
8 Angier

ROAD CLASSIFICATION

Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

APEX, NC
2022

NSN. 7643016378500
NGA REF NO. USGSX24K1253

NCDOT Temporary Liner (Matting) in Ditchline Calculations (English)

Construction Sheet #	3.1	3.1	3.1	3.2	3.2					
Construction Line (-L-,-Y-,etc.)	-L-	-L-	-L-	-L-	-L-					
Left or Right (LT.,RT.,Median)	LT	RT	LT	RT	LT					
Upper Station No.	1060	1214	1520	1627	1816					
Upper Station Elevation (ft.)										
Lower Station No.	1186	1627	1816	1816	1862					
Lower Station Elevation (ft.)										
Design Storm Flow Depth (ft.)	0.26	0.57	0.34	0.29	0.26	0.5	0.5	0.5	0.5	0.5
Actual Ditch Depth (ft.)	2	2	2	2	2					
Frontslope Grade (i.e. 2 for 2:1)	3	3	3	3	3					
Backslope Grade (i.e. 2 for 2:1)	2	2	2	2	2					
Base Width (ft., 0 for V-Ditches)	0	0	2	2	0					
Measured Ditchline Length (ft.)	126	413	296	602	46					
Ditch Grade (%)	4.80	2.00	4.80	4.80	4.80	0.00	0.00	0.00	0.00	0.00
Velocity (ft/s)	3.46	3.77	5.67	5.20	3.46	0.00	0.00	0.00	0.00	0.00
Shear Stress in Ditch (lb/ft^2)	0.78	0.71	1.02	0.87	0.78	0.00	0.00	0.00	0.00	0.00
Matting Requirement	Straw	Straw	Straw	Straw	Straw	None	None	None	None	None
Straw Matting Quantity (yd^2)	165	540	460	935	65	0	0	0	0	0
Excelsior Matting Quantity (yd^2)	0	0	0	0	0	0	0	0	0	0
PSRM Type 1 Matting Quantity (yd^2	0	0	0	0	0	0	0	0	0	0
PSRM Type 2 Matting Quantity (yd^2	0	0	0	0	0	0	0	0	0	0
PSRM Type 3 Matting Quantity (yd^2	0	0	0	0	0	0	0	0	0	0
PSRM Type 4 Matting Quantity (yd^2	0	0	0	0	0	0	0	0	0	0
Construction Line (-L-,-Y-,etc.)										
Left or Right (LT.,RT.,Median)										
Upper Station No.										
Upper Station Elevation (ft.)										
Lower Station No.										
Lower Station Elevation (ft.)										
Design Ditch Flow Depth (ft.)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Actual Ditch Depth (ft.)										
Frontslope Grade (i.e. 2 for 2:1)										

PSRM Type 3 Matting Quantity (yd^2)	0	0	0	0	0	0	0	0	0	0
PSRM Type 4 Matting Quantity (yd^2)	0	0	0	0	0	0	0	0	0	0
Construction Line (-L-,-Y-,etc.)										
Left or Right (LT.,RT.,Median)										
Upper Station No.										
Upper Station Elevation (ft.)										
Lower Station No.										
Lower Station Elevation (ft.)										
Design Ditch Flow Depth (ft.)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Actual Ditch Depth (ft.)										
Frontslope Grade (i.e. 2 for 2:1)										
Backslope Grade (i.e. 2 for 2:1)										
Base Width (ft., 0 for V-Ditches)										
Measured Ditchline Length (ft.)										
Ditch Grade (%)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Velocity (ft./s)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Shear Stress in Ditch (lb/ft^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Matting Requirement	None	None	None	None	None	None	None	None	None	None
Straw Matting Quantity (yd^2)	0	0	0	0	0	0	0	0	0	0
Excelsior Matting Quantity (yd^2)	0	0	0	0	0	0	0	0	0	0
PSRM Type 1 Matting Quantity (yd^2)	0	0	0	0	0	0	0	0	0	0
PSRM Type 2 Matting Quantity (yd^2)	0	0	0	0	0	0	0	0	0	0
PSRM Type 3 Matting Quantity (yd^2)	0	0	0	0	0	0	0	0	0	0
PSRM Type 4 Matting Quantity (yd^2)	0	0	0	0	0	0	0	0	0	0
Total Straw Matting Quantity (yd^2) =	165	540	460	935	65	0	0	0	0	0
l Ditchline Straw Matting Quantity =	2165.00	yd^2								
al Excelsior Matting Quantity (yd^2) =	0	0	0	0	0	0	0	0	0	0
tchline Excelsior Matting Quantity =	0.00	yd^2								

JOSH STEIN
Governor
D. REID WILSON
Secretary
WILLIAM E. TOBY VINSON, JR
Director

NORTH CAROLINA
Environmental Quality

12-15-2025

LETTER OF APPROVAL

Town of Holly Springs
128 S. Main St.
Holly Springs, NC 27540

RE: Project Name: Ting Park - Oak Hall Greenway Connector
Permit Number: WAKE-2026-00321
Acres Approved: 2.43
County: Wake
City: Holly Springs
Address: 101 Sportsmanship Way
River Basin: Cape Fear
Stream Classification: C: Aquatic Life, Secondary Contact Recreation, Fresh water
Plan Type: Revised Plan

Dear Town of Holly Springs,

This office has received and reviewed the subject erosion and sedimentation control plan. We find the plan to be acceptable and hereby issue this Letter of Approval. The enclosed Certificate of Approval must be posted at the job site. This plan shall expire three (3) years following the date of approval, if no land disturbing activity has been undertaken, as is required by Title 15A NCAC 4B .0129.

As of April 1, 2019, all new construction activities are required to complete and submit an electronic Notice of Intent (eNOI) form requesting a COC under the NCG010000 Construction Stormwater General Permit. You must apply for coverage by submitting a "Construction Stormwater – NCG01 (Subject to the SPCA) in the AccessDEQ Portal. Once your application is complete, you will receive an invoice for the $127 annual permit fee and can submit payment through the AccessDEQ Portal. Once the fee is processed and the application approved, you will receive the COC via email. As the Financially Responsible Party shown on the FRO form submitted for this project, you MUST obtain the COC prior to commencement of any land disturbing activity. Please direct questions about the eNOI form to the Stormwater Program staff in the Raleigh central office. If the owner/operator of this project changes in the future, the new responsible party must obtain a new COC.

North Carolina Department of Environmental Quality
Division of Energy, Mineral and Land Resources
512 North Salisbury Street | 1612 Mail Service Center
Raleigh, North Carolina 27699-1612

Title 15A NCAC 4B .0118(a) and the NCG01 permit require that the following documentation be kept on file at the job site:

1. The approved E&SC plan as well as any approved deviation.
2. The NCG01 permit and the COC, once it is received.
3. Records of inspections made during the previous 12 months.

Also, this letter gives the notice required by G.S. 113A-61.1(a) of our right of periodic inspection to ensure compliance with the approved plan.

North Carolina's Sedimentation Pollution Control Act is performance-oriented, requiring protection of existing natural resources and adjoining properties. If, following the commencement of this project, the erosion and sedimentation control plan is inadequate to meet the requirements of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statute 113A-51 through 66), this office may require revisions to the plan and implementation of the revisions to ensure compliance with the Act.

Acceptance and approval of this plan is conditioned upon your compliance with Federal and State water quality laws, regulations, and rules. In addition, local city or county ordinances or rules may also apply to this land-disturbing activity. This approval does not supersede any other permit or approval.

Please note that this approval is based in part on the accuracy of the information provided in the Financial Responsibility Form and on the plan, which you provided. You are requested to file an amended form if there is any change in the information included on the form.

Your cooperation is appreciated.

Sincerely,

Prabesh Mishra

Land Quality Section

CERTIFICATE OF PLAN APPROVAL

The posting of this certificate certifies that an erosion and sedimentation control plan has been approved for this project by the North Carolina Department of Environmental Quality in accordance with North Carolina General Statute 113A – 57 (4) and 113A – 54 (d) (4) and North Carolina Administrative Code, Title 15A, Chapter 4B.0107 (c). This certificate must be posted at the primary entrance of the job site before construction begins and until establishment of permanent groundcover as required by North Carolina Administrative Code, Title 15A, Chapter 4B.0127 (b).

Ting Park - Oak Hall Greenway Connector
101 Sportsmanship Way Holly Springs, NC 27540

12/15/2025	WAKE-2026-00321
Date of Plan Approval	**Project Identifier**

Certificate of Coverage Number: _____

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, WILMINGTON DISTRICT
RALEIGH REGULATORY FIELD OFFICE
3331 HERITAGE TRADE DRIVE SUITE 105
WAKE FOREST NORTH CAROLINA 27587

August 25, 2025

Regulatory Division
SAW-2013-01763

Sent Via email: randy.harrington@hollysprings.gov

Randy Harrington
Town of Holly Springs
128 South Main Street
Holly Springs, NC 27540

Dear Mr. Harrington:

This letter is in response to the Pre-Construction Notification (PCN) you submitted to the Wilmington District, Raleigh Regulatory Field Office on June 2, 2025, for a Department of the Army Nationwide permit (NWP) verification. This project has been assigned the file number SAW-2013-01763 and is known as Oakhill Greenway Connector. This file number should be referenced in all correspondence concerning this project.

A review of the information provided indicates that the proposed work would include the temporary discharge of fill material into 67 linear feet of stream for the construction of a temporary crossing for the construction of a permanent bridge for the Ting Park-Oak Hall Greenway Connector. The project area for this determination includes a 2.7 acre(s) area which is illustrated on the enclosed site plans/maps. The project/review area is located in approximately 0.1 miles northeast of the end of Muses Mill Court and directly east of the tennis courts and parking lot at the North Main Athletic Complex, at Latitude 35.668010 and Longitude -78.837920; in Holly Springs, Wake County, North Carolina.

We have determined that the proposed work is authorized by NWP 14 pursuant to authorities under Section 404 of the Clean Water Act (33 U.S.C § 1344). The proposed work must be accomplished in strict accordance with the general permit conditions, any regional conditions, the application materials, and the enclosed plans. If the extent of the project area and/or nature of the authorized impacts to waters are modified, a revised PCN must be submitted to this office for written approval before work is initiated. Any violation of permit conditions or deviation from your submitted plans may subject the permittee to enforcement action.

This verification is valid until March 14, 2026, unless prior to this date the subject NWP(s) is suspended, revoked, or is modified such that the activity no longer complies

with the terms and conditions of this NWP. If you commence or are under contract to commence this activity before the date that the relevant NWP is modified or revoked, you will have 12 months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this NWP.

Project Specific Special Conditions:

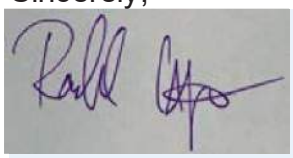
1. Suitable habitat for tricolored bat (Perimyotis subflavus) may be present at the site. On September 14, 2022, the USFWS published a proposal in the Federal Register to list the tricolored bat as endangered under the Endangered Species Act (ESA). The permittee understands and agrees that all work associated with the clearing and removal of trees and removal or modification of culverts must be completed prior to the effective date of the final listing in the Federal Register. Work associated with the aforementioned activities not completed by that time must cease and the permittee must contact the Corps' Rachel Capito, Rachel.A.Capito@usace.army.mil to determine if additional coordination with the United States Fish and Wildlife Service is required under Section 7 of the Endangered Species Act prior to continuing work.

Activities subject to Section 404 (as indicated above) may also require an individual Section 401 Water Quality Certification. You should contact the NC Division of Water Resources (telephone 919-807-6300) to determine Section 401 requirements.

This NWP verification does not preclude the necessity to obtain any other Federal, State, or local permits, licenses, and/or certifications, which may be required.

If you have any questions related to this verification or have issues accessing documents referenced in this letter, please contact Rachel Capito, Regulatory Project Manager of the Raleigh Regulatory Field Office at (919)-440-1823, by mail at the above address, or by email at Rachel.A.Capito@usace.army.mil. Please take a moment to complete our customer satisfaction survey located at https://regulatory.ops.usace.army.mil/customer-service-survey/.

Sincerely,



Rachel Capito
Project Manager

Enclosures

Cc (w/enclosures)
Erin Binkley, FROEHLING & ROBERTSON (via EBinkley@FandR.com)

U.S. Army Corps of Engineers (USACE)

CERTIFICATION OF COMPLIANCE WITH DEPARTMENT OF THE ARMY PERMIT

For use of this form, see Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act of 1899, and Section 103 of the Marine Protection, Research, and Sanctuaries Act; the proponent agency is CECW-COR.

Form Approved -
OMB No. 0710-0003
Expires 2027-10-31

The Agency Disclosure Notice (ADN)

The Public reporting burden for this collection of information, 0710-0003, is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

PURPOSE: This form is used by recipients of U.S. Army Corps of Engineer Regulatory permits to certify compliance with the permit terms and conditions.

Your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with this permit, you are subject to permit suspension, modification, or revocation.

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the U.S. Army Corps of Engineers, Wilmington District District, Regulatory Office.

The certification can be submitted by email at Rachel.A.Capito @usace.army.mil or by mail at the below address:

U.S. Army Corps of Engineers
Wilmington District District Office
Street Address: 3331 Heritage Trade Drive Suite 201
City: Wake Forest State: North Carolina Zip Code: 27587

COMPLETED BY THE CORPS

Corps Action Number: SAW-2013-01763

Permit Type: General Permit

General Permit Number and Name (*if applicable*):

Name of Permittee: Randy Harrington

Project Name: Oakhill Greenway Connector

Project Location (*physical address*): Holly Springs, North Carolina

PERMITTEE'S CERTIFICATION

Date Work Started:

Date Work Completed:

Enclose photographs showing the completed project (*if available*).

I _____ hereby certify that the work authorized by the above referenced permit has been completed in accordance with all of the permit terms and conditions, and that any required compensatory mitigation has been completed in accordance with the permit conditions.

Name	Date	Signature

Ting Park-Oak Hall Greenway Connector

Town of Holly Springs (#23-015)

101 Sportsmanship Way, Holly Springs, NC 27540

Consultants

Surveyor

WithersRavenel

WithersRavenel
115 Mackenan Drive
Cary, NC 27511
www.withersravenel.com
P 919.469.3340

Civil Engineer

benesch

Alfred Benesch & Company
8000 Regency Parkway, Sulte 175
Cary, NC 27518
www.benesch.com
P 984.275.2490

Corp. NC License: F-1320

Structural Engineer

benesch

Alfred Benesch & Company
8000 Regency Parkway, Sulte 175
Cary, NC 27518
www.benesch.com
P 984.275.2490

Corp. NC License: F-1320

Geotechnical Engineer

FROEHLING & ROBERTSON

Froehling & Robertson, Inc.
310 Hubert Street
Raleigh, NC 27603
www.FandR.com
P 919.719.1973

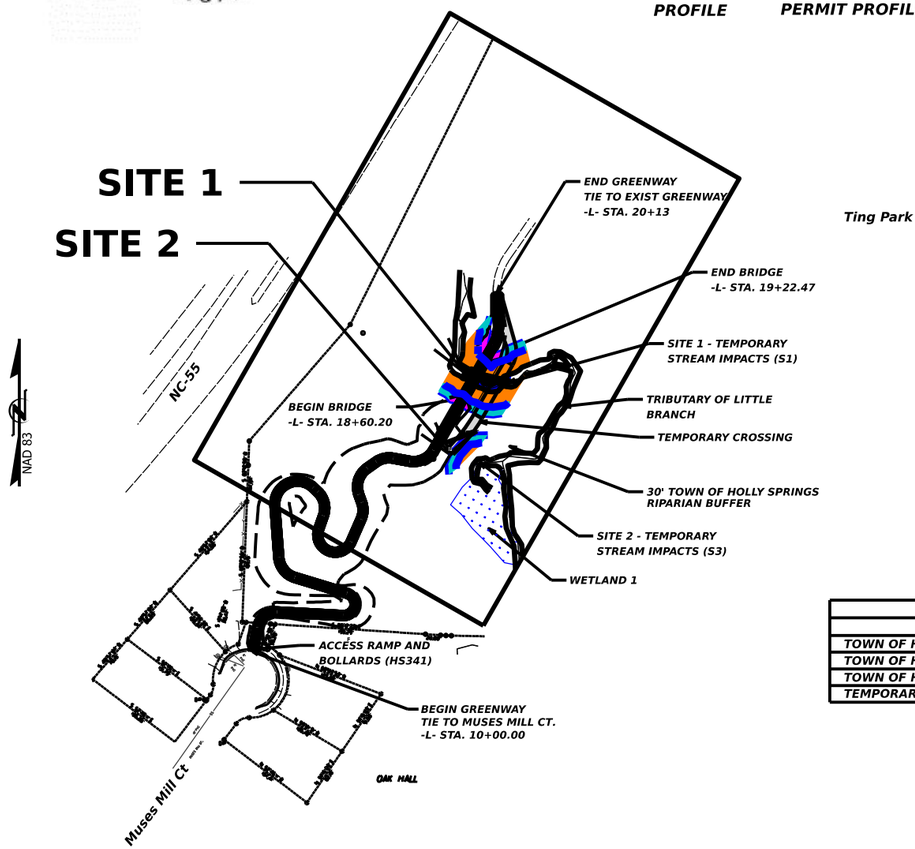
Environmental Engineer

FROEHLING & ROBERTSON

Froehling & Robertson, Inc.
310 Hubert Street
Raleigh, NC 27603
www.FandR.com
P 919.719.1973

Schedule of Drawings

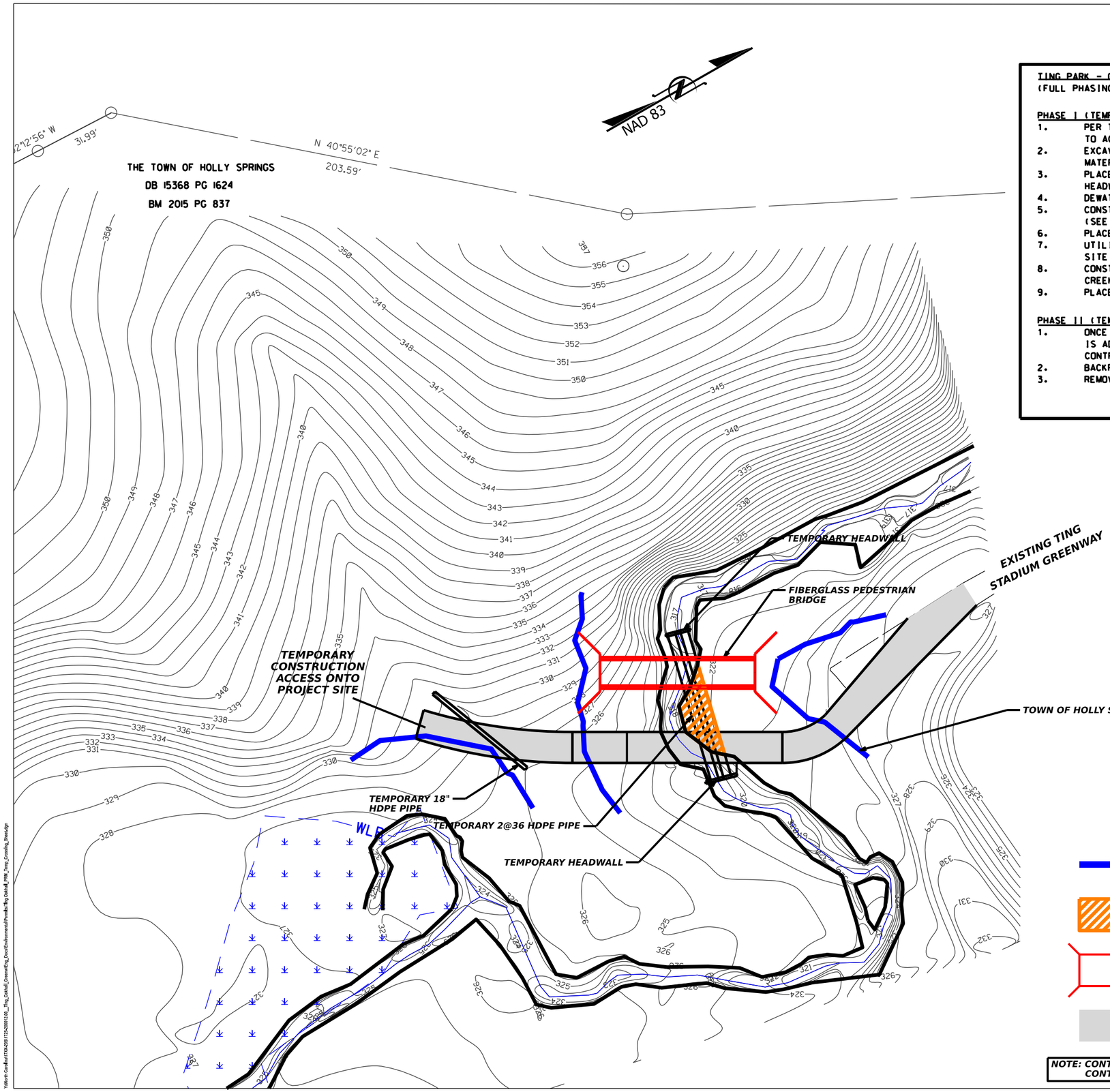
CS	*COVER SHEET*
TC	*TEMPORARY CROSSING LAYOUT*
DETAIL	*TEMPORARY CROSSING DETAIL*
IMPACT MAP	*SITE 1*
IMPACT MAP	*SITE 2*
PROFILE	*PERMIT PROFILE*



IMPACT TABLE	
TYPE	*EXTENT (SF)*
TOWN OF HOLLY SPRINGS ZONE 1 BUFFER TEMPORARY IMPACTS	*4,789*
TOWN OF HOLLY SPRINGS ZONE 2 BUFFER TEMPORARY IMPACTS	*2,133*
TOWN OF HOLLY SPRINGS ZONE 2 BUFFER PERMANENT IMPACTS	*555*
TEMPORARY STREAM IMPACTS	*738 (67 LF)*

Surface Water and Wetland Impact Overall Map

Date of Issue: 8/6/2025 (Rev)



TING PARK - OAK HALL GREENWAY CONSTRUCTION SEQUENCING FOR TEMPORARY CROSSING
(FULL PHASING CAN BE SEEN IN CONSTRUCTION DRAWINGS)

PHASE I (TEMPORARY CROSSING CONSTRUCTION):

1. PER THE PHASING OUTLINED IN THE CONSTRUCTION DRAWINGS, CONSTRUCTION VEHICLES TO ACCESS THE PROJECT SITE AND CLEAR NECESSARY AREA TO PLACE THE TEMPORARY CROSSING
2. EXCAVATE AREAS WHERE PIPES ARE TO BE PLACED, AND STOCKPILE THE STREAMBED MATERIALS ON SITE, BUT OUTSIDE OF THE RIPARIAN BUFFER AND WITHIN LOD
3. PLACE TWO TEMPORARY 36" HDPE PIPES (60' LONG EACH), ALONG WITH TEMPORARY HEADWALLS ON BOTH ENDS
4. DEWATER THE STREAM AREAS AROUND THE PROPOSED AND TEMPORARY CROSSINGS
5. CONSTRUCT TEMPORARY CONSTRUCTION ACCESS TO THE EAST OF THE PROPOSED BRIDGE LOCATION (SEE TOWN DETAIL HS418 FOR ADDITIONAL INFORMATION)
6. PLACE FIRST PHASE OF EROSION CONTROL DEVICES
7. UTILIZE NEWLY CONSTRUCTED TEMPORARY ACCESS FOR CONSTRUCTION VEHICLES TO ACCESS THE SITE
8. CONSTRUCT ABUTMENTS FOR FIBERGLASS PEDESTRIAN BRIDGE, UTILIZING AREA NORTH OF THE CREEK AS A LOCATION FOR EQUIPMENT/CRANE PAD
9. PLACE PEDESTRIAN FIBERGLASS BRIDGE

PHASE II (TEMPORARY CROSSING REMOVAL):

1. ONCE SITE WORK, GREENWAY CONSTRUCTION AND PEDESTRIAN BRIDGE INSTALLATION IS ADVANCED THAT THE TEMPORARY CONSTRUCTION ACCESS IS NO LONGER REQUIRED BY CONTRACTOR TO ACCESS THE PROJECT SITE, THE TEMPORARY STREAM CROSSING CAN BE REMOVED
2. BACKFILL THE STOCKPILED STREAMBED MATERIAL TO MATCH PRE CONSTRUCTION CONDITIONS
3. REMOVE EROSION CONTROL DEVICES ON PROJECT SITE

TOWN OF HOLLY SPRINGS RIPARIAN BUFFER

MATERIAL EXCAVATED FOR TEMPORARY PIPE INSTALLATION TO BE STOCKPILED ON-SITE (OUTSIDE OF RIPARIAN BUFFER & WITHIN LOD) TO BE RE-INSTALLED AT A LATER TIME

FIBERGLASS PEDESTRIAN BRIDGE WITH WING WALLS

TEMPORARY CONSTRUCTION ACCESS

20 10 0 20 40
PLANS

NOTE: CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE DURING CONSTRUCTION AT ALL TIMES
CONTRACTOR TO IMPLEMENT PROPER EROSION CONTROL MEASURES WHILE ACCESSING THE SITE

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Seals:

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Ting Park-Oak Hall Greenway Connector

Ting Park
Holly Springs, North Carolina

Project No: 1725-200012.00
Date: 8/6/2025
Revisions:

Sheet Title:
Temporary Crossing

Sheet No:
TC

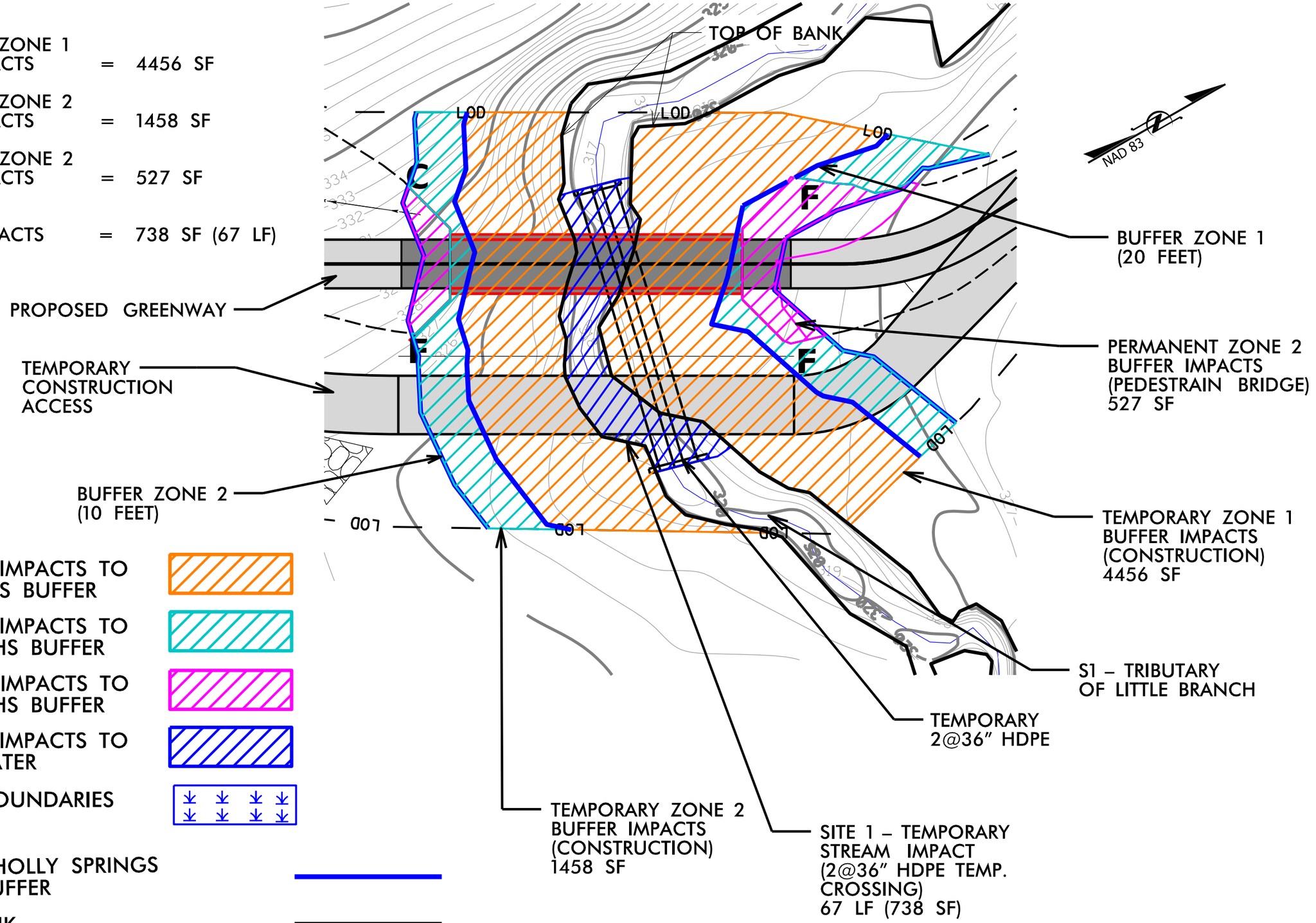
TOTAL

TEMPORARY ZONE 1
BUFFER IMPACTS = 4456 SF

TEMPORARY ZONE 2
BUFFER IMPACTS = 1458 SF

PERMANENT ZONE 2
BUFFER IMPACTS = 527 SF

TEMPORARY
STREAM IMPACTS = 738 SF (67 LF)



TEMPORARY IMPACTS TO ZONE 1 TOHS BUFFER

TEMPORARY IMPACTS TO ZONE 2 TOHS BUFFER

PERMANENT IMPACTS TO ZONE 2 TOHS BUFFER

TEMPORARY IMPACTS TO SURFACE WATER

WETLAND BOUNDARIES (WLB)

TOWN OF HOLLY SPRINGS RIPARIAN BUFFER

TOP OF BANK

LIMITS OF DISTURBANCE (LOD) LINE — LOD —

10 5 0 10 20
PLANS

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Ting Park-Oak Hall Greenway Connector
Ting Park
Holly Springs, North Carolina

Project No: 1725-200012.00
Date: 8/6/2025
Revisions:

Sheet Title:
IMPACT MAP

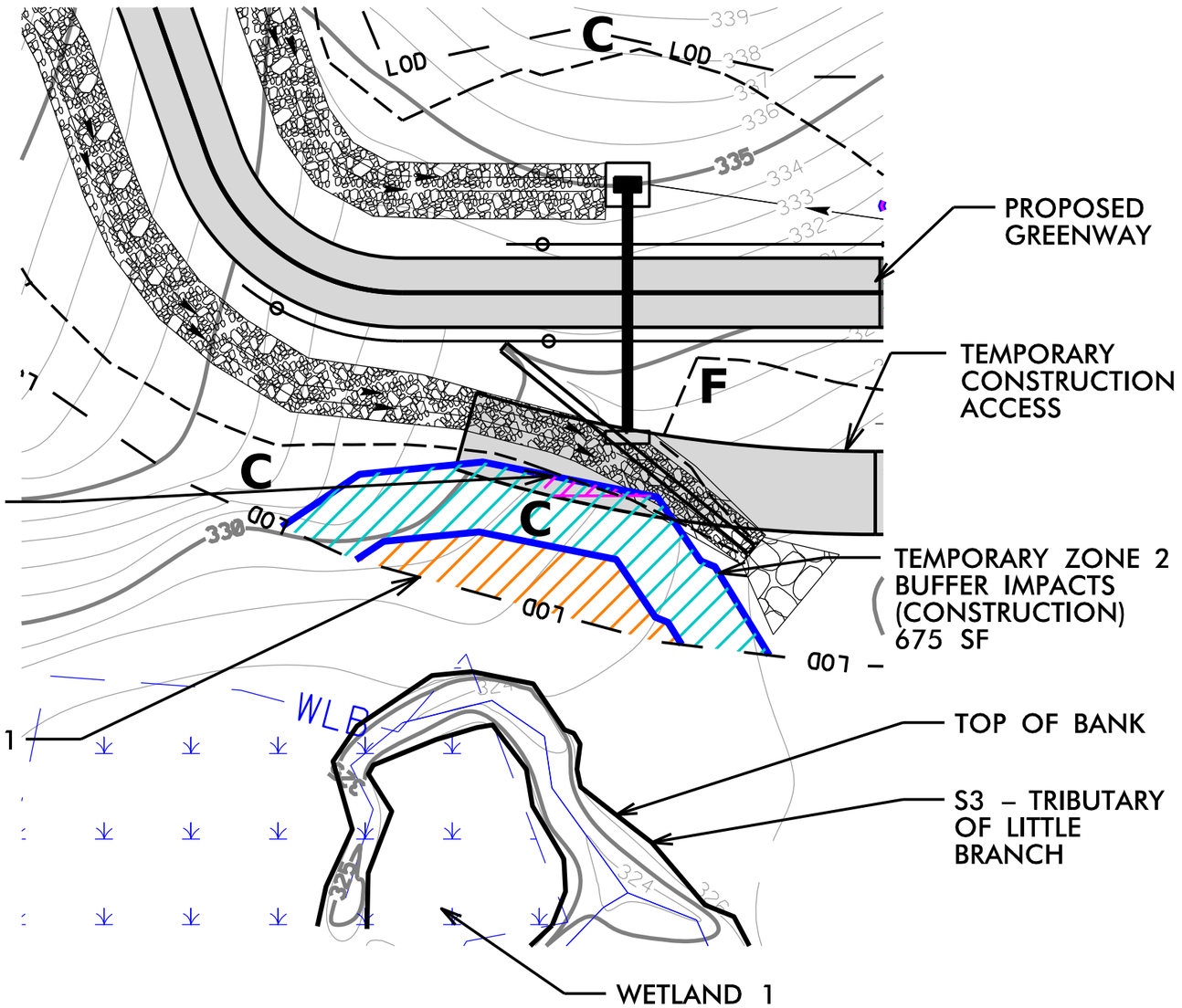
Sheet No:
SITE 1

TOTAL

PERMANENT ZONE 2 BUFFER IMPACTS = 28 SF

TEMPORARY ZONE 1 BUFFER IMPACTS = 333 SF

TEMPORARY ZONE 2 BUFFER IMPACTS = 675 SF



TEMPORARY IMPACTS TO ZONE 1 TOHS BUFFER

TEMPORARY IMPACTS TO ZONE 2 TOHS BUFFER

PERMANENT IMPACTS TO ZONE 2 TOHS BUFFER

TEMPORARY IMPACTS TO SURFACE WATER

WETLAND BOUNDARIES (WLB)

TOWN OF HOLLY SPRINGS RIPARIAN BUFFER

TOP OF BANK

LIMITS OF DISTURBANCE (LOD) LINE — LOD —

10 5 0 10 20
PLANS

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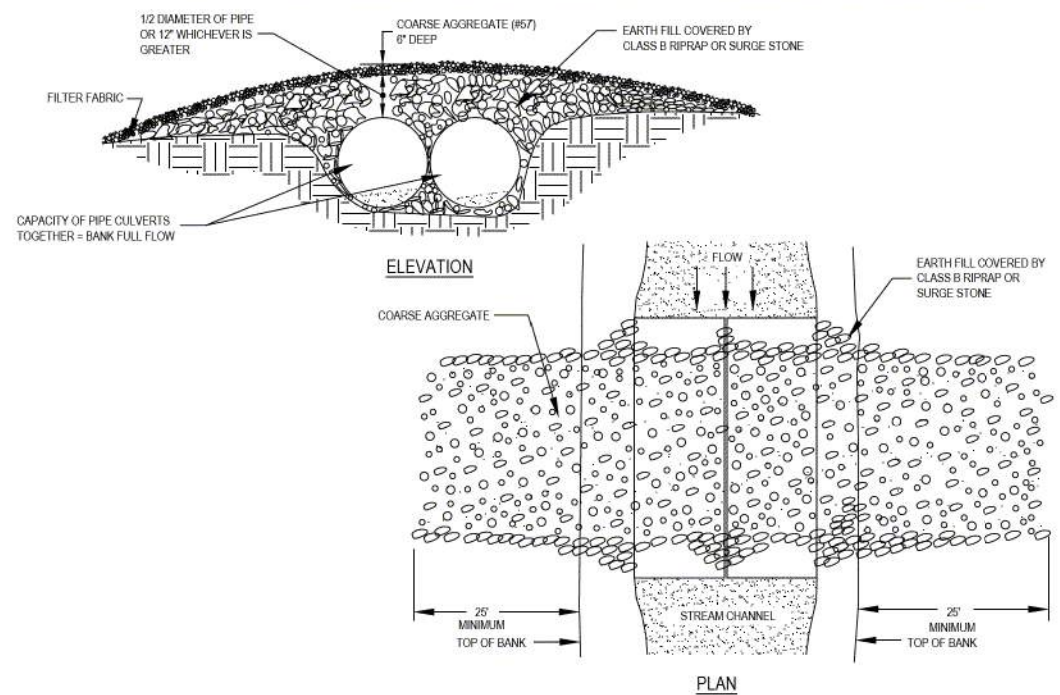
Ting Park-Oak Hall Greenway Connector
Ting Park
Holly Springs, North Carolina

Project No: 1725-200012.00
Date: 8/6/2025
Revisions:

Sheet Title:
IMPACT MAP

Sheet No:
SITE 2



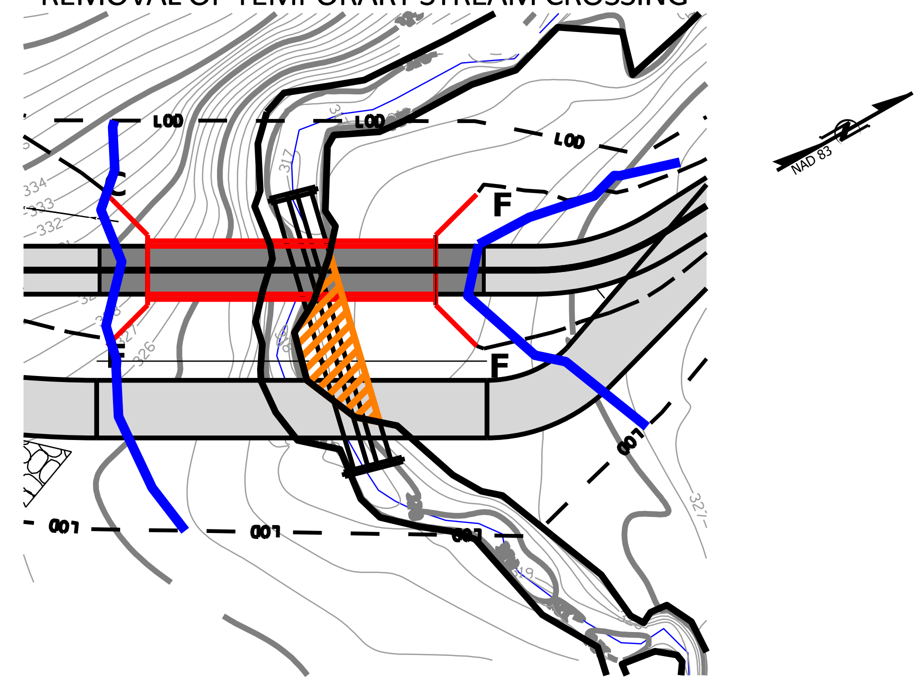
MAINTENANCE:
INSPECT TEMPORARY STREAM CROSSINGS AFTER RUNOFF-PRODUCING RAINS TO CHECK FOR BLOCKAGE IN CHANNEL, EROSION OF ABUTMENTS, CHANNEL SCOUR, RIPRAP DISPLACEMET, OR PIPING. MAKE ALL REPAIRS IMMEDIATELY TO PREVENT FURTHER DAMAGE TO THE INSTALLATION.

DRAWING NOT TO SCALE

TEMPORARY STREAM CROSSING	*STANDARD DETAIL NUMBER:* HS418		HOLLY SPRINGS North Carolina
	DATE	*REVISIONS*	
TOWN OF HOLLY SPRINGS	7/24/09		
	6/11/24		

TEMPORARY HEADWALLS TO BE INSTALLED AT DOWNSTREAM AND UPSTREAM ENDS OF TWO TEMPORARY 36" HDPE PIPES (PIPE CULVERTS) TO CONTAIN EMBANKMENT / COARSE AGGREGATE AND PREVENT WASHOUT DURING RAIN EVENTS.

REMOVAL OF TEMPORARY STREAM CROSSING



1 - REMOVE ALL MATERIAL USED TO INSTALL TWO TEMPORARY PIPES AND HEADWALLS.
2- UTILIZE STOCKPILED NATURAL STREAM BED MATERIAL FROM ORIGINAL EXCAVATION EFFORTS TO RESTORE THE EXCAVATED AREAS FOR THE TWO TEMPORARY PIPES AND HEADWALLS THAT ARE NOW REMOVED.
3 - NATURAL MATERIAL TO BE PLACED TO RESTORE ORIGINAL CONFIGURATION, TOP OF BANK LOCATION AND ELEVATIONS. ORIGINAL EDGE OF STREAM CHANNEL LOCATION TO BE RESTORED TO PRE-CONSTRUCTION CONDITION.
4 - RIPARIAN SEED MIX TO BE INSTALLED FOR ALL DISTURBED AREAS/RESTORED AREAS WITH THE RIPARIAN BUFFER.

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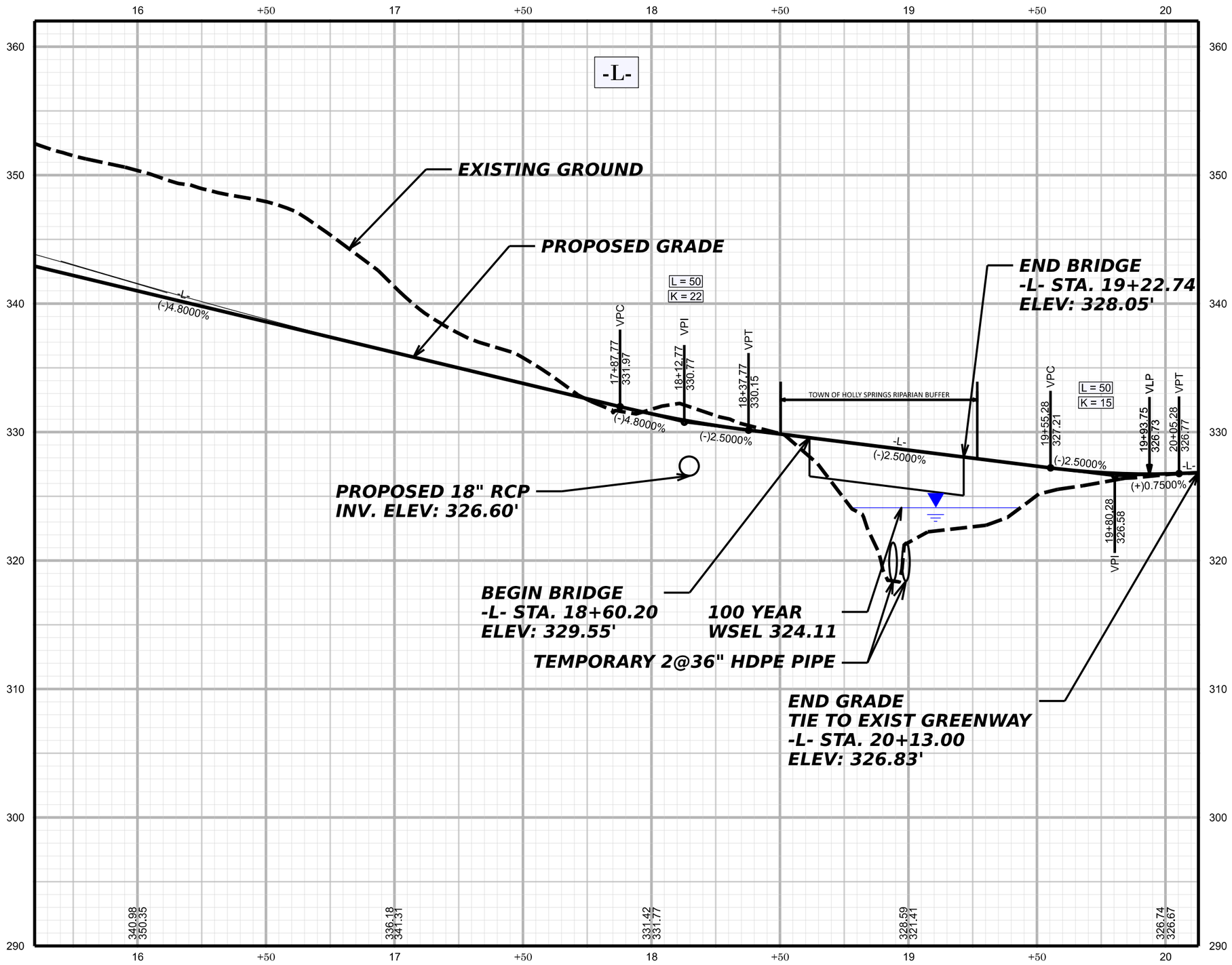
Ting Park-Oak Hall Greenway Connector

Ting Park
Holly Springs, North Carolina

Project No: 1725-200012.00
Date: 8/6/2025
Revisions:

Sheet Title:
Temporary Crossing Detail

Sheet No:
DETAIL



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CONSTRUCTION

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Ting Park-Oak Hall Greenway Connector

Ting Park
Holly Springs, North Carolina

Project No: 1725-200012.00
Date: 8/6/2025
Revisions:

Sheet Title:

SITE 1 PROFILE

Sheet No:

PROFILE

Nationwide Permit 14
Linear Transportation Projects
Effective Date: February 25, 2022 / Expiration Date: March 14, 2026
Authority: Sections 10 and 404

Activities required for crossings of waters of the United States associated with the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, driveways, airport runways, and taxiways) in waters of the United States. For linear transportation projects in non-tidal waters, the discharge of dredged or fill material cannot cause the loss of greater than 1/2-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge of dredged or fill material cannot cause the loss of greater than 1/3-acre of waters of the United States. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project.

This NWP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to construct the linear transportation project. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges of dredged or fill material, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

This NWP cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) the loss of waters of the United States exceeds 1/10-acre; or (2) there is a discharge of dredged or fill material in a special aquatic site, including wetlands. (See general condition 32.) (Authorities: Sections 10 and 404)

Note 1: For linear transportation projects crossing a single waterbody more than one time at separate and distant locations, or multiple waterbodies at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. Linear transportation projects must comply with 33 CFR 330.6(d).

Note 2: Some discharges of dredged or fill material for the construction of farm roads or forest roads, or temporary roads for moving mining equipment, may qualify for an exemption under Section 404(f) of the Clean Water Act (see 33 CFR 323.4).

Note 3: For NWP 14 activities that require pre-construction notification, the PCN must include any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings that require Department of the Army authorization but do not require pre-construction notification (see paragraph (b)(4) of general condition 32). The district engineer will evaluate the PCN in accordance with Section D, “District Engineer’s Decision.” The district engineer may require mitigation to ensure that the authorized activity results in no

more than minimal individual and cumulative adverse environmental effects (see general condition 23).

GENERAL CONDITIONS

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

1. **Navigation.**

(a) No activity may cause more than a minimal adverse effect on navigation.

(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee’s expense on authorized facilities in navigable waters of the United States.

(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. **Aquatic Life Movements.** No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.

3. **Spawning Areas.** Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. **Migratory Bird Breeding Areas.** Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. **Shellfish Beds.** No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. **Suitable Material.** No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).

7. **Water Supply Intakes.** No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. **Adverse Effects from Impoundments.** If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. **Management of Water Flows.** To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. **Fills Within 100-Year Floodplains.** The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. **Equipment.** Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. **Soil Erosion and Sediment Controls.** Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.

13. **Removal of Structures and Fills.** Temporary structures must be removed, to the maximum extent practicable, after their use has been discontinued. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. **Proper Maintenance.** Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. **Single and Complete Project.** The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. **Wild and Scenic Rivers.**

(a) No NWP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a ''study river'' for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.

(b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a ''study river'' for possible inclusion in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. Permittees shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status.

(c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: http://www.rivers.gov/.

17. **Tribal Rights.** No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

18. **Endangered Species.**

(a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which “may affect” a listed species or critical habitat unless ESA section 7 consultation addressing the consequences of the proposed activity on listed species or critical habitat has been completed. See 50 CFR 402.02 for the definition of “effects of the action” for the purposes of ESA section 7 consultation, as well as 50 CFR 402.17, which provides further explanation under ESA section 7 regarding “activities that are reasonably certain to occur” and “consequences caused by the proposed action.”

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA (see 33 CFR 330.4(f)(1)). If pre-construction notification is required for the proposed activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed

endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that might be affected by the proposed activity or that utilize the designated critical habitat that might be affected by the proposed activity. The district engineer will determine whether the proposed activity “may affect” or will have “no effect” to listed species and designated critical habitat and will notify the non- Federal applicant of the Corps’ determination within 45 days of receipt of a complete pre-construction notification. For activities where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activity will have “no effect” on listed species or critical habitat, or until ESA section 7 consultation has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species specific permit conditions to the NWPs.

(e) Authorization of an activity by an NWP does not authorize the “take” of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with “incidental take” provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word “harm” in the definition of “take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) If the non-federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will coordinate with the agency that issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation conducted for the ESA section 10(a)(1)(B) permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA section 7 consultation for the proposed NWP activity. The district engineer will notify the non-federal applicant within 45 days of receipt of a complete pre- construction notification whether the ESA section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required.

(g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS and NMFS or their worldwide Web pages at http://www.fws.gov/ or http://www.fws.gov/ipac and http://www.nmfs.noaa.gov/pr/species/esa/ respectively.

19. **Migratory Birds and Bald and Golden Eagles**. The permittee is responsible for ensuring that an action authorized by NWP complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting the appropriate local office of the U.S. Fish and Wildlife Service to determine what measures, if any, are

necessary or appropriate to reduce adverse effects to migratory birds or eagles, including whether "incidental take" permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.

20. **Historic Properties.**

(a) No activity is authorized under any NWP which may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)(1)). If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section 106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties might have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts commensurate with potential impacts, which may include background research, consultation, oral history interviews, sample field investigation, and/or field survey. Based on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause effects on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations for the purposes of section 106 of the NHPA: no historic properties affected, no adverse effect, or adverse effect.

(d) Where the non-Federal applicant has identified historic properties on which the proposed NWP activity might have the potential to cause effects and has so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed. For non-federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is

required, the district engineer will notify the non-Federal applicant that he or she cannot begin the activity until section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. **Discovery of Previously Unknown Remains and Artifacts.** Permittees that discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by NWP, they must immediately notify the district engineer of what they have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. **Designated Critical Resource Waters.** Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, 52, 57 and 5258 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity proposed by permittees in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after she or he determines that the impacts to the critical resource waters will be no more than minimal.

23. **Mitigation.** The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (*i.e.,* on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects.

(d) Compensatory mitigation at a minimum one-for-one ratio will be required for all losses of stream bed that exceed 3/100-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. This compensatory mitigation requirement may be satisfied through the restoration or enhancement of riparian areas next to streams in accordance with paragraph (e) of this general condition. For losses of stream bed of 3/100-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation since streams are difficult-to-replace resources (see 33 CFR 332.3(e)(3)).

(e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. If restoring riparian areas involves planting vegetation, only native species should be planted. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWPs, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee- responsible mitigation.

(2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f)).

(3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.

(4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)). If permittee-responsible mitigation is the proposed option, and the proposed compensatory mitigation site is located on land in which another federal agency holds an easement, the district engineer will coordinate with that federal agency to determine if proposed compensatory mitigation project is compatible with the terms of the easement.

(5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan needs to address only the baseline conditions at the impact site and the number of credits to be provided (see 33 CFR 332.4(c)(1)(ii)).

(6) Compensatory mitigation requirements (*e.g.,* resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)).

(g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of ½-acre, it cannot be used to authorize any NWP activity resulting in the loss of greater than ½-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWPs.

(h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee-responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill material into waters of the United States that will convert a forested or scrub-shrub wetland to an herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

24. **Safety of Impoundment Structures.** To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state or federal, dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. **Water Quality.**

(a) Where the certifying authority (state, authorized tribe, or EPA, as appropriate) has not previously certified compliance of an NWP with CWA section 401, a CWA section 401 water quality certification for the proposed discharge must be obtained or waived (see 33 CFF 330.4(c)). If the permittee cannot comply with all of the conditions of a water quality certification previously issued by certifying authority for the issuance of the NWP, then the permittee must obtain a water quality certification or waiver for the proposed discharge in order for the activity to be authorized by an NWP.

(b) If the NWP activity requires pre-construction notification and the certifying authority has not previously certified compliance of an NWP with CWA section 401, the proposed discharge is not authorized by an NWP until water quality certification is obtained or waived. If the certifying authority issues a water quality certification for the proposed discharge, the permittee must submit a copy of the certification to the district engineer. The discharge is not authorized by an NWP until the district engineer has notified the permittee that the water quality certification requirement has been satisfied by the issuance of a water quality certification or a waiver.

(c) The district engineer or certifying authority may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. **Coastal Zone Management.** In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). If the permittee cannot comply with all of the conditions of a

coastal zone management consistency concurrence previously issued by the state, then the permittee must obtain an individual coastal zone management consistency concurrence or presumption of concurrence in order for the activity to be authorized by an NWP. The district engineer or a state may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. **Regional and Case-By-Case Conditions.** The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its CWA section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. **Use of Multiple Nationwide Permits.** The use of more than one NWP for a single and complete project is authorized, subject to the following restrictions:

(a) If only one of the NWPs used to authorize the single and complete project has a specified acreage limit, the acreage loss of waters of the United States cannot exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

(b) If one or more of the NWPs used to authorize the single and complete project has specified acreage limits, the acreage loss of waters of the United States authorized by those NWPs cannot exceed their respective specified acreage limits. For example, if a commercial development is constructed under NWP 39, and the single and complete project includes the filling of an upland ditch authorized by NWP 46, the maximum acreage loss of waters of the United States for the commercial development under NWP 39 cannot exceed 1/2-acre, and the total acreage loss of waters of United States due to the NWP 39 and 46 activities cannot exceed 1 acre.

29. **Transfer of Nationwide Permit Verifications.** If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

"When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below."

_____

(Transferee)

_____

(Date)

30. **Compliance Certification.** Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance

standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

(a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;

(b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and

(c) The signature of the permittee certifying the completion of the activity and mitigation. The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

31. **Activities Affecting Structures or Works Built by the United States.** If an NWP activity also requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers (USACE) federally authorized Civil Works project (a ‘‘USACE project’’), the prospective permittee must submit a pre-construction notification. See paragraph (b)(10) of general condition 32. An activity that requires section 408 permission and/or review is not authorized by an NWP until the appropriate Corps office issues the section 408 permission or completes its review to alter, occupy, or use the USACE project, and the district engineer issues a written NWP verification.

32. **Pre-Construction Notification.**

(a) *Timing.* Where required by the terms of the NWP, the permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) 45 calendar days have passed from the district engineer’s receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or are in the vicinity of the activity, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is ‘‘no

effect'' on listed species or ''no potential to cause effects'' on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the pr set forth in 33 CFR 330.5(d)(2).

(b) *Contents of Pre-Construction Notification:* The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed activity;

(3) Identify the specific NWP or NWP(s) the prospective permittee wants to use to authorize the proposed activity;

(4)

(i) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or other mitigation measures.

(ii) For linear projects where one or more single and complete crossings require pre-construction notification, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete crossing of those wetlands, other special aquatic sites, and other waters (including those single and complete crossings authorized by an NWP but do not require PCNs). This information will be used by the district engineer to evaluate the cumulative adverse environmental effects of the proposed linear project and does not change those non-PCN NWP activities into NWP PCNs.

(iii) Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans).

(5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial and intermittent streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore, the 45-day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate.

(6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands or 3/100-acre of stream bed and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(7) For non-federal permittees, if any listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat (or critical habitat proposed for such designation), the PCN must include the name(s) of those endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or utilize the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act.

(8) For non-federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with section 106 of the National Historic Preservation Act.

(9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a ‘‘study river’’ for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the ‘‘study river’’ (see general condition 16); and

(10) For an NWP activity that requires permission from, or review by, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from, or review by, the Corps office having jurisdiction over that USACE project.

(c) *Form of Pre-Construction Notification:* The nationwide permit pre-construction notification form (Form ENG 6082) should be used for NWP PCNs. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and supporting materials if the district engineer has established tools and procedures for electronic submittals.

(d) *Agency Coordination:*

(1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the activity's adverse environmental effects so that they are no more than minimal.

(2) Agency coordination is required for:

(i) All NWP activities that require pre-construction notification and result in the loss of greater than 1⁄2-acre of waters of the United States;

(ii) NWP 13 activities in excess of 500 linear feet, fills greater than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and

(iii) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line in tidal waters or the ordinary high water mark in the Great Lakes.

(3) When agency coordination is required, the district engineer will immediately provide (e.g., via email, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural resource or water quality agency, EPA, and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to notify the district engineer via telephone, facsimile transmission, or email that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so, contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre- construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure that the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

DISTRICT ENGINEER'S DECISION

1. In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If a project proponent requests authorization by a specific NWP, the district engineer should issue the NWP verification for that activity if it meets the terms and conditions of that NWP, unless he or she determines, after considering mitigation, that the proposed activity will result in more than minimal individual and cumulative adverse effects on the aquatic environment and other aspects of the public interest and exercises discretionary authority to require an individual permit for the proposed activity. For a linear project, this determination will include an evaluation of the single and complete crossings of waters of the United States that require PCNs to determine whether they individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings of waters of the United States authorized by an NWP. If an applicant requests a waiver of an applicable limit, as provided for in NWPs 13, 36, or 54, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in only minimal individual and cumulative adverse environmental effects.

2. When making minimal adverse environmental effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. He or she will also consider the cumulative adverse environmental effects caused by activities authorized by an NWP and whether those cumulative adverse environmental effects are no more than minimal. The district engineer will also consider site specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional or condition assessment method is available and practicable to use, that assessment method may be used by the district engineer to assist in the minimal adverse environmental effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.

3. If the proposed activity requires a PCN and will result in a loss of greater than 1/10-acre of wetlands or 3/100-acre of stream bed, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for NWP activities with smaller impacts, or for impacts to other types of waters. The district engineer will consider any proposed compensatory mitigation or other mitigation measures the applicant has included in the proposal in determining whether the net adverse environmental effects of the proposed activity are no more than minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are no more than minimal, after considering mitigation, the district engineer will notify the permittee and include any activity-specific conditions in the NWP verification the district engineer deems necessary. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. If the

prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the proposed compensatory mitigation plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure that the NWP activity results in no more than minimal adverse environmental effects. If the net adverse environmental effects of the NWP activity (after consideration of the mitigation proposal) are determined by the district engineer to be no more than minimal, the district engineer will provide a timely written response to the applicant. The response will state that the NWP activity can proceed under the terms and conditions of the NWP, including any activity-specific conditions added to the NWP authorization by the district engineer.

4. If the district engineer determines that the adverse environmental effects of the proposed activity are more than minimal, then the district engineer will notify the applicant either:

(a) That the activity does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit;

(b) that the activity is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal; or

(c) that the activity is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse environmental effects, the activity will be authorized within the 45-day PCN period (unless additional time is required to comply with general conditions 18, 20, and/or 31), with activity-specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed mitigation plan or a requirement that the applicant submit a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal. When compensatory mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan or has determined that prior approval of a final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation.

FURTHER INFORMATION

1. District engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.
3. NWPs do not grant any property rights or exclusive privileges.
4. NWPs do not authorize any injury to the property or rights of others.
5. NWPs do not authorize interference with any existing or proposed Federal project (see general condition 31).

DEFINITIONS

Best management practices (BMPs): Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

Compensatory mitigation: The restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for

the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Direct effects: Effects that are caused by the activity and occur at the same time and place.

Discharge: The term ‘‘discharge’’ means any discharge of dredged or fill material into waters of the United States.

Ecological reference: A model used to plan and design an aquatic habitat and riparian area restoration, enhancement, or establishment activity under NWP 27. An ecological reference may be based on the structure, functions, and dynamics of an aquatic habitat type or a riparian area type that currently exists in the region where the proposed NWP 27 activity is located. Alternatively, an ecological reference may be based on a conceptual model for the aquatic habitat type or riparian area type to be restored, enhanced, or established as a result of the proposed NWP 27 activity. An ecological reference takes into account the range of variation of the aquatic habitat type or riparian area type in the region.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

Establishment (creation): The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

High Tide Line: The line of intersection of the land with the water’s surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

Historic Property: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

Independent utility: A test to determine what constitutes a single and complete non-linear project in the Corps Regulatory Program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent

utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Indirect effects: Effects that are caused by the activity and are later in time or farther removed in distance but are still reasonably foreseeable.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. The loss of stream bed includes the acres of stream bed that are permanently adversely affected by filling or excavation because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters or wetlands for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities that do not require Department of the Army authorization, such as activities eligible for exemptions under section 404(f) of the Clean Water Act, are not considered when calculating the loss of waters of the United States.

Navigable waters: Waters subject to section 10 of the Rivers and Harbors Act of 1899. These waters are defined at 33 CFR part 329.

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. Non- tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NWPs, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of flowing or standing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of ‘‘open waters’’ include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: The term ordinary high water mark means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Perennial stream: A perennial stream has surface water flowing continuously year-round during a typical year.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Pre-construction notification: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre- construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-

construction notification may be voluntarily submitted in cases where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function but does not result in a gain in aquatic resource area.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: Re-establishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a course substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Riparian areas: Riparian areas are lands next to streams, lakes, and estuarine-marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects riverine, lacustrine, estuarine, and marine waters with their adjacent wetlands, non-wetland waters, or uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 23.)

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete linear project: A linear project is a project constructed for the purpose of getting people, goods, or services from a point of origin to a terminal point, which often involves multiple crossings of one or more waterbodies at separate and distant locations. The term ‘‘single and complete project’’ is defined as that portion of the total linear project proposed or accomplished by one owner/developer or partnership or other association of owners/developers that includes all crossings of a single water of the United States (i.e., a

single waterbody) at a specific location. For linear projects crossing a single or multiple waterbodies several times at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Single and complete non-linear project: For non-linear projects, the term ‘‘single and complete project’’ is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete non-linear project must have independent utility (see definition of ‘‘independent utility’’). Single and complete non-linear projects may not be ‘‘piecemealed’’ to avoid the limits in an NWP authorization.

Stormwater management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream channelization: The manipulation of a stream’s course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized jurisdictional stream remains a water of the United States.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

Tidal wetland: A tidal wetland is a jurisdictional wetland that is inundated by tidal waters. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line.

Tribal lands: Any lands title to which is either: (1) Held in trust by the United States for the benefit of any Indian tribe or individual; or (2) held by any Indian tribe or individual subject to restrictions by the United States against alienation.

Tribal rights: Those rights legally accruing to a tribe or tribes by virtue of inherent sovereign

authority, unextinguished aboriginal title, treaty, statute, judicial decisions, executive order or agreement, and that give rise to legally enforceable remedies.

Vegetated shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: For purposes of the NWPs, a waterbody is a ‘‘water of the United States.’’ If a wetland is adjacent to a waterbody determined to be a water of the United States, that waterbody and any adjacent wetlands are considered together as a sing e aquatic unit (see 33 CFR 328.4(c)(2)).

REGIONAL CONDITIONS:

The following Regional Conditions have been approved by the Wilmington District for the Nationwide Permits (NWPs) published in the January 13, 2021, and December 27, 2021, *Federal Register* (86 FR 2744 and 86 FR 73522) announcing the reissuance of 52 existing (NWPs) and five new NWPs, as well as the reissuance of NWP general conditions and definitions with some modifications.

A. EXCLUDED WATER AND/OR AREAS

The Corps has identified waters that will be excluded from the use of all NWP's during certain timeframes. These waters are:

1. **Anadromous Fish Spawning Areas.** Work in waters of the U.S. designated by either the North Carolina Division of Marine Fisheries (NCDMF) or the North Carolina Wildlife Resources Commission (NCWRC) as anadromous fish spawning areas are prohibited from February 15th through June 30th, without prior written approval from the Corps and the appropriate wildlife agencies (NCDMF, NCWRC and/or the National Marine Fisheries Service (NMFS)). Work in waters of the U.S. designated by NCWRC as primary nursery areas in inland waters are prohibited from February 15th through September 30th, without prior written approval from the Corps and the appropriate wildlife agencies. Work in waters of the U.S. designated by NCDMF as primary nursery areas shall be coordinated with NCDMF prior to being authorized by this NWP. Coordination with NCDMF may result in a required construction moratorium during periods of significant biological productivity or critical life stages.

2. **Trout Waters Moratorium.** Work in waters of the U.S. in the designated trout watersheds of North Carolina are prohibited from October 15th through April 15th without prior written approval from the NCWRC, or from the Eastern Band of Cherokee Indians (EBCI) Fisheries and Wildlife Management (FWM) office if the project is located on EBCI trust land. (See Section C.3. below for information on the designated trout watersheds).

3. **Sturgeon Spawning Areas.** No in-water work shall be conducted in waters of the U.S. designated by the National Marine Fisheries Service as Atlantic sturgeon critical habitat from February 1st through June 30th. No in-water work shall be conducted in waters of the U.S. in the Roanoke River designated as Atlantic sturgeon critical habitat from February 1st through June 30th, and August 1st through October 31st, without prior written approval from NMFS.

4. **Submerged Aquatic Vegetation.** Impacts to Submerged Aquatic Vegetation (SAV) are not authorized by any NWP, except NWP 48, NWP 55 and NWP 56, unless Essential Fish Habitat (EFH) consultation has been completed pursuant to the Magnuson-Stevens Fisheries Conservation and Management Act (Magnuson-Stevens Act). Permittees shall submit a PCN (See NWP General Condition 32) to the District Engineer prior to commencing the activity if the project would affect SAV. The permittee may not begin work until notified by the Corps that the requirements of the Magnuson-Stevens Act have been satisfied and that the activity is verified.

B. REGIONAL CONDITIONS APPLICABLE TO ALL NWP's

1. **Critical Habitat in Western NC.** For proposed activities within waters of the U.S. that require a Pre-Construction Notification (PCN) and are located in the thirteen counties listed below, permittees must provide a copy of the PCN to the U.S. Fish and Wildlife Service (USFWS), 160 Zillicoa Street, Asheville, North Carolina 28801 and the Corps Asheville Regulatory Field Office. Please see General Condition 18 for specific PCN requirements

related to the Endangered Species Act and the below website for information on the location of designated critical habitat.

Counties with tributaries that drain to designated critical habitat that require notification to the Asheville U.S. Fish and Wildlife Service: Avery, Cherokee, Graham, Haywood, Henderson, Jackson, Macon, Mecklenburg, Mitchell, Swain, Transylvania, Union and Yancey.

Website and office addresses for Endangered Species Act Information:

The Wilmington District has developed the following website for permittees which provides guidelines on how to review linked websites and maps in order to fulfill NWP General Condition 18 (Endangered Species) requirements: http://www.saw.usace.army.mil/Missions/RegulatoryPermitProgram/AgencyCoordination/ESA.aspx.

Permittees who do not have internet access may contact the appropriate U.S. Fish and Wildlife Service offices listed below or Corps at (910) 251-4850.

Below is a map of the USFWS Field Office Boundaries:

Asheville U.S. Fish and Wildlife Service Office counties: All counties west of and including Anson, Stanly, Davidson, Forsythe and Stokes Counties.

U.S. Fish and Wildlife Service
Asheville Field Office
160 Zillicoa Street
Asheville, NC 28801
Telephone: (828) 258-3939

Raleigh U.S. Fish and Wildlife Service Office counties: All counties east of and including Richmond, Montgomery, Randolph, Guilford, and Rockingham Counties.

U.S. Fish and Wildlife Service
Raleigh Field Office
Post Office Box 33726
Raleigh, NC 27636-3726
Telephone: (919) 856-4520

2. **Special Designation Waters.** Prior to the use of any NWP that involves a discharge of dredged or fill material in any of the following identified waters and/or adjacent wetlands in North Carolina, permittees shall submit a PCN to the District Engineer prior to commencing the activity (see General Condition 32). The North Carolina waters and wetlands that require additional PCN requirements are:

"Primary Nursery Areas" (PNA), including inland PNA, as designated by the North Carolina Marine Fisheries Commission and/or the North Carolina Wildlife Resources Commission. The definition of and designated PNA waters can be found in the North Carolina State Administrative Code at Title 15A, Subchapters 3R and 10C (15A NCAC 03R .0103; 15A NCAC 10C .0502; and 15A NCAC 10C .0503) and at the following web pages:

- http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2003%20-%20marine%20fisheries/subchapter%20r/15a%20ncac%2003r%20.0103.pdf

- http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2010%20-%20wildlife%20resources%20and%20water%20safety/subchapter%20c/15a%20ncac%2010c%20.0502.pdf

- http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2010%20-%20wildlife%20resources%20and%20water%20safety/subchapter%20c/15a%20ncac%2010c%20.0503.pdf

3. **Trout Waters.** Prior to any discharge of dredge or fill material into streams, waterbodies or wetlands within the 294 designated trout watersheds of North Carolina, the permittee shall submit a PCN (see General Condition 32) to the District Engineer prior to commencing the activity. The permittee shall also provide a copy of the PCN to the appropriate NCWRC office, or to the EBCI FWM Office (if the project is located on EBCI trust land), to facilitate the determination of any potential impacts to designated Trout Waters.

NCWRC and NC Trout Watersheds:

NCWRC Contact**	Counties that are entirely within Trout Watersheds*	Counties that are partially within Trout Watersheds*

Mountain Coordinator 645 Fish Hatchery Rd., Building B Marion, NC 28752 828-803-6054 For NCDOT Projects: NCDOT Coordinator 12275 Swift Rd. Oakboro, NC 28129 704-984-1070	Alleghany Ashe Avery Graham Haywood Jackson Macon Swain Transylvania Watauga	Burke Buncombe Caldwell Cherokee Clay Henderson Madison McDowell Mitchell Polk Rutherford Surry Wilkes Yancey
EBCI Contact**	**Counties that are within Trout Watersheds***	
Office of Natural Resources P.O. Box 1747, Cherokee, NC 28719 (828) 359-6113	Qualla Boundary and non-contiguous tracts of trust land located in portions of Swain, Jackson, Haywood, Graham and Cherokee Counties.	

*NOTE: To determine PCN requirements, contact the Corps Asheville Regulatory Field Office at (828) 271-7980 or view maps showing trout watersheds in each County at the following webpage: http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/Trout/.

**If a project is located on EBCI trust land, submit the PCN in accordance with Regional Condition C.16. Contact the Corps Asheville Regulatory Field Office at (828) 271-7980 with questions.

4. **Western NC Waters and Corridors.** The permittee shall submit a PCN (see General Condition 32) to the District Engineer prior to commencing the activity in waters of the U.S. if the activity will occur within any of the following identified waters in western North Carolina, within 0.5 mile on either side of these waters, or within 0.75 mile of the Little Tennessee River, as measured from the top of the bank of the respective water (i.e., river, stream, or creek):

Brasstown Creek
Burningtown Creek

Cane River
Caney Fork
Cartoogechaye Creek
Chattooga River
Cheoah River
Cowee Creek
Cullasaja River
Deep Creek
Ellijay Creek
French Broad River
Garden Creek
Hiwassee River
Hominy Creek
Iotla Creek
Little Tennessee River (within the river or within 0.75 mile on either side of this river)
Nantahala River
Nolichucky River
North Fork French Broad River
North Toe River
Nottley River
Oconaluftee River (portion not located on trust/EBCI land)
Peachtree Creek
Shooting Creek
Snowbird Creek
South Toe River
Stecoah Creek
Swannanoa River
Sweetwater Creek
Tuckasegee River (also spelled Tuckaseegee or Tuckaseigee)
Valley River
Watauga Creek
Watauga River
Wayah Creek
West Fork French Broad River

To determine PCN requirements, contact the Corps Asheville Regulatory Field Office at (828) 271-7980 or view maps for all corridors at the following webpage: http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/Designated-Special-Waters.aspx .

5. **Limitation of Loss of Stream Bed.** NWPs may not be used for activities that may result in the loss of more than 0.05 acres of stream bed, except for NWP 32.

6. **Pre-Construction Notification for Loss of Stream Bed Exceeding 0.02 acres.** The permittee shall submit a PCN to the District Engineer prior to commencing the activity (see General Condition 32) prior to the use of any NWP for any activity that results in the loss of more than 0.02 acres of stream bed. This applies to NWPs that do not have PCN requirements as well as those NWPs that require a PCN.

7. **Mitigation for Loss of Stream Bed.** For any NWP that results in a loss of more than 0.02 acres of stream bed, the permittee shall provide a mitigation proposal to compensate for more than minimal individual and cumulative adverse impacts to the aquatic environment, unless the

District Engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal. For stream bed losses of 0.02 acres or less that require a PCN, the District Engineer may determine, on a case-by-case basis, that compensatory mitigation is required to ensure that the activity results in minimal adverse effect on the aquatic environment.

8. **Riprap.** For all NWPs that allow for the use of riprap material for bank stabilization, the following conditions shall be applied:

a. Filter cloth must be placed underneath the riprap as an additional requirement of its use in North Carolina waters. The placement of filter fabric is not required if the riprap will be pushed or “keyed” into the bank of the waterbody. A waiver from the specifications in this Regional Condition must be requested in writing.

b. Riprap shall be placed only on the stream banks, or, if it is necessary to be placed in the stream bed, the finished top elevation of the riprap should not exceed that of the original stream bed.

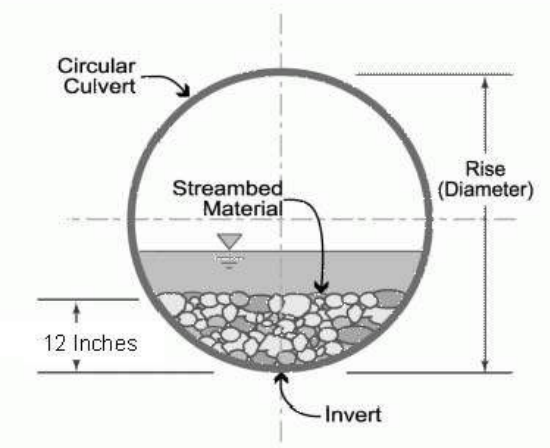
9. **Culvert Placement.** For all NWPs that allow for culvert placement, the following conditions shall be applied:

a. For all NWPs that involve the construction/installation of culverts, measures shall be included in the construction/installation that will promote the safe passage of fish and other aquatic organisms

Placement of culverts and other structures in streams shall be below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20% of the culvert diameter for culverts having a diameter less than or equal to 48 inches. If the culvert outlet is submerged within a pool or scour hole and designed to provide for aquatic passage, then culvert burial into the streambed is not required.

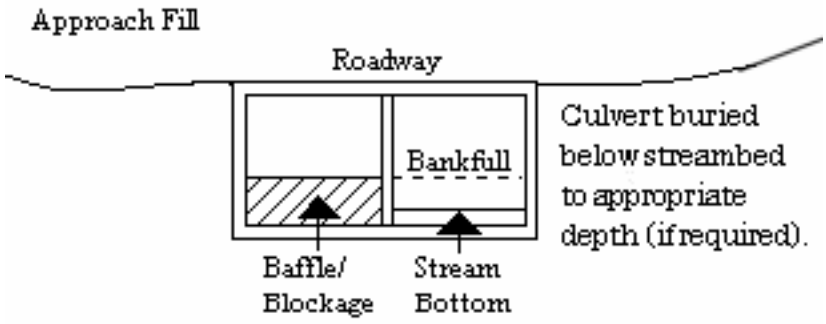
Culvert burial is not required for structures less than 72 inch diameter/width, where the slope of the culvert will be greater than 2.5%, provided that all alternative options for flattening the slope have been investigated and aquatic life movement/connectivity has been provided when possible (e.g., rock ladders, cross vanes, sills, baffles etc.). Culvert burial is not required when bedrock is present in culvert locations.

Installation of culverts in wetlands shall ensure continuity of water movement and be designed to adequately accommodate high water or flood conditions. When roadways, causeways, or other fill projects are constructed across FEMA-designated floodways or wetlands, openings such as culverts or bridges shall be provided to maintain the natural hydrology of the system as well as prevent constriction of the floodway that may result in destabilization of streams or wetlands.



A waiver from the depth specifications in this condition may be requested, in writing, by the permittee and issued by the Corp. This waiver request must be specific as to the reasons(s) for the request. The waiver will be issued if it can be demonstrated that the proposed design would result in less impacts to the aquatic environment. Culverts placed across wetland fills purely for the purposes of equalizing surface water do not have to be buried, but the culverts must be of adequate size and/or number to ensure unrestricted transmission of water.

b. Bank-full flows (or less) shall be accommodated through maintenance of the existing bank-full channel cross sectional area. Additional culverts or culvert barrels at such crossings shall be allowed only to receive bank-full flows.



c. Culverts shall be designed and installed in such a manner that the original stream profiles are not altered and allow for aquatic life movement during low flows. The dimension, pattern, and profile of the stream above and below a pipe or culvert shall not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. The width, height, and gradient of a proposed culvert shall be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. If the width of the culvert is wider than the stream channel, the culvert shall include multiple boxes/pipes, baffles, benches and/or sills to maintain the natural width of the stream channel. If multiple culverts/pipes/barrels are used, low flows shall be accommodated in one culvert/pipe and additional culverts/pipes shall be installed such that they receive only flows above bankfull.

10. **Utility Lines.** For all NWPs that allow for the construction and installation of utility lines, the following conditions shall be applied:

a. Utility lines consisting of aerial electric power transmission lines crossing navigable waters of the U.S. (which are defined at 33 CFR part 329) must comply with the applicable minimum clearances specified in 33 CFR 322.5(i).

b. The work area authorized by this permit, including temporary and/or permanent fills, will be minimized to the greatest extent practicable. Justification for work corridors exceeding forty (40) feet in width is required and will be based on pipeline diameter and length, size of equipment required to construct the utility line, and other construction information deemed necessary to support the request. The permittee is required to provide this information to the Corps with the initial PCN package.

c. A plan to restore and re-vegetate wetland areas cleared for construction must be submitted with the required PCN. Cleared wetland areas shall be re-vegetated, as appropriate, with species of canopy, shrub, and herbaceous species. The permittee shall not use fescue grass or any other species identified as invasive or exotic species by the NC Native Plant Society (NCNPS): https://ncwildflower.org/invasive-exotic-species-list/.

d. Any permanently maintained corridor along the utility right of way within forested wetlands shall be considered a loss of aquatic function. A compensatory mitigation plan will be required for all such impacts associated with the requested activity if the activity requires a PCN and the cumulative total of permanent conversion of forested wetlands exceeds 0.1 acres, unless the District Engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal.

Where permanently maintained corridor within forested wetlands is 0.1 acres or less, the District Engineer may determine, on a case-by-case basis, that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment.

e. When directional boring or horizontal directional drilling (HDD) under waters of the U.S., including wetlands, permittees shall closely monitor the project for hydraulic fracturing or “fracking.” Any discharge from hydraulic fracturing or “fracking” into waters of the U.S., including wetlands, shall be reported to the appropriate Corps Regulatory Field Office within 48 hours. Restoration and/or compensatory mitigation may be required as a result of any unintended discharges.

11. **Temporary Access Fills.** The permittee shall submit a PCN to the District Engineer prior to commencing the activity if the activity will involve the discharge of dredged or fill material into more than 0.1 acres of wetlands or 0.02 acres of stream channel for the construction of temporary access fills and/or temporary road crossings. The PCN must include a restoration plan that thoroughly describes how all temporary fills will be removed, how pre-project conditions will be restored, and include a timetable for all restoration activities.

12. **Federal Navigation Channel Setbacks.** Authorized structures and fills located in or adjacent to Federally authorized waterways must be constructed in accordance with the latest setback criteria established by the Wilmington District Engineer. You may review the setback policy at http://www.saw.usace.army.mil/Missions/Navigation/Setbacks.aspx. This general permit does not authorize the construction of hardened or permanently fixed structures within the Federally Authorized Channel Setback, unless the activity is approved by the Corps. The permittee shall submit a PCN (see General Condition 32) to the District Engineer to obtain a written verification prior to the construction of any structures or fills within the Federally Authorized Channel Setback.

13. **Northern Long-eared Bat – Endangered Species Act Compliance.** The Wilmington District, U.S. Army Corps of Engineers has consulted with the United States Fish and Wildlife

Service (USFWS) in regard to the threatened northern long-eared bat (NLEB) (*Myotis septentrionalis*) and Standard Local Operating Procedures for Endangered Species (SLOPES) have been approved by the Corps and the USFWS. This condition concerns effects to the NLEB only and does not address effects to other federally listed species and/or federally designated critical habitat.

a. Procedures when the Corps is the lead federal* agency for a project:

The permittee must comply with (1) and (2) below when:

• the project is located in the western 41 counties of North Carolina, to include non-federal aid North Carolina Department of Transportation (NCDOT) projects, OR;

• the project is located in the 59 eastern counties of North Carolina and is a non-NCDOT project.

*Generally, if a project is located on private property or on non-federal land, and the project is not being funded by a federal entity, the Corps will be the lead federal agency due to the requirement to obtain Department of the Army authorization to impact waters of the U.S. If the project is located on federal land, contact the Corps to determine the lead federal agency.

(1) A permittee using an NWP must check to see if their project is located in the range of the NLEB by using the following website: http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf. If the project is within the range of the NLEB, or if the project includes percussive activities (e.g., blasting, pile driving, etc.), the permittee is then required to check the appropriate website in the paragraph below to discover if their project:

• is located in a 12-digit Hydrologic Unit Code area (“red HUC” - shown as red areas on the map), AND/OR;

• involves percussive activities within 0.25 mile of a red HUC.

Red HUC maps - for the western 41 counties in NC (covered by the Asheville Ecological Services Field Office), check the project location against the electronic maps found at: http://www.fws.gov/asheville/htmls/project_review/NLEB_in_WNC.html. For the eastern 59 counties in NC (covered by the Raleigh Ecological Services Field Office), check the project location against the electronic maps found at: https://www.fws.gov/raleigh/NLEB_RFO.html.

(2) A permittee must submit a PCN to the District Engineer, and receive written verification from the District Engineer, prior to commencing the activity, if the activity will involve any of the following:

• tree clearing/removal and/or, construction/installation of wind turbines in a red HUC, AND/OR;

• bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, (applies anywhere in the range of the NLEB), AND/OR:

• percussive activities in a red HUC, or within 0.25 mile of a red HUC.

The permittee may proceed with the activity without submitting a PCN to either the Corps or the USFWS, provided the activity complies with all applicable NWP terms and general and regional conditions, if the permittee's review under A.(1) and A.(2) above shows that the project is:

- located outside of a red HUC (and there are no percussive activities), and the activity will NOT include bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, OR;
- located outside of a red HUC and there are percussive activities, but the percussive activities will not occur within 0.25-mile of a red HUC boundary, and the activity will NOT include bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, OR;
- located in a red HUC, but the activity will NOT include tree clearing/removal; construction/installation of wind turbines; bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, and/or; any percussive activities.

b. Procedures when the USACE is not the lead federal agency:

For projects where another federal agency is the lead federal agency - if that other federal agency has completed project-specific ESA Section 7(a)(2) consultation for the NLEB, and has (1) determined that the project would not cause prohibited incidental take of the NLEB, and (2) completed coordination/consultation that is required by the USFWS (per the directions on the respective USFWS office's website), that project may proceed without PCN to either the USACE or the USFWS, provided all General and Regional Permit Conditions are met.

The NLEB SLOPES can be viewed on the USACE website at: http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/ESA/. Permittees who do not have internet access may contact the USACE at (910) 251- 4633.

14. **West Indian Manatee Protection.** In order to protect the endangered West Indian manatee (*Trichechus manatus*) the Permittee shall implement the USFWS' Manatee Guidelines, and strictly adhere to all requirements therein. The guidelines can be found at https://www.fws.gov/raleigh/pdfs/ManateeGuidelines2017.pdf.

15. **ESA Programmatic Biological Opinions.** The Wilmington District, USFWS, NCDOT, and the FHWA have conducted programmatic Section 7(a)(2) consultation for a number of federally listed species and designated critical habitat (DCH), and programmatic consultation concerning other federally listed species and/or DCH may occur in the future. The result of completed programmatic consultation is a Programmatic Biological Opinion (PBO) issued by the USFWS. These PBOs contain mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" of whichever species or critical habitat is covered by a specific PBO. Authorization under NWPs is conditional upon the permittee's compliance with all the mandatory terms and conditions associated with incidental take of the applicable PBO (or PBOs), which are incorporated by reference in the NWPs. Failure to comply with the terms and conditions associated with incidental take of an applicable PBO, where a take of the federally listed species occurs, would constitute an unauthorized take by the permittee, and would also constitute permittee non-compliance with the authorization under the NWPs. If the terms and conditions of a specific PBO (or PBOs) apply to a project, the Corps will include this/these requirements in any NWP verification that may be issued for a project. For an activity/project that does not require a PCN, the terms and conditions of the applicable PBO(s) also apply to that non-notifying

activity/project. The USFWS is the appropriate authority to determine compliance with the terms and conditions of its PBO and the ESA. All PBOs can be found on our website at: https://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/ESA/.

16. **Work on Eastern Band of Cherokee Indian Land.**

Notifying NWPs - All PCNs submitted for activities in waters of the U.S. on Eastern Band of Cherokee Indians (EBCI) trust land (i.e., Qualla Boundary and non-contiguous tracts of trust land located in portions of Swain, Jackson, Haywood, Graham and Cherokee Counties), must comply with the requirements of the latest MOU between the Wilmington District and the EBCI.

Non-notifying NWPs - Prior to the use of any non-notifying NWP for activities in waters of the U.S. on EBCI trust land (i.e., Qualla Boundary and non-contiguous tracts of trust land located in portions of Swain, Jackson, Haywood, Graham and Cherokee Counties), all prospective permittees must comply with the requirements of the latest MOU between the Wilmington District and the EBCI; this includes coordinating the proposed project with the EBCI Natural Resources Program and obtaining a Tribal Approval Letter from the Tribe.

The EBCI MOU can be found at the following URL: http://saw-reg.usace.army.mil/FO/Final-MOU-EBCI-USACE.pdf

17. **Sedimentation and Erosion Control Structures and Measures.**

All PCNs will identify and describe sedimentation and erosion control structures and measures proposed for placement in waters of the U.S. The structures and measures should be depicted on maps, surveys or drawings showing location and impacts to jurisdictional wetlands and streams.

C. REGIONAL CONDITIONS APPLICABLE TO NWP 14

a. If appropriate, permittees shall employ natural channel design (see definition below and NOTE below) to the maximum extent practicable for stream relocations. All stream relocation proposals shall include a Relocation and Monitoring Plan and a functional assessment of baseline conditions (e.g., use of the North Carolina Stream Assessment Methodology). Compensatory mitigation may be required for stream relocations.

Natural Channel Design means a geomorphologic approach to stream restoration based on an understanding of valley type, general watershed conditions, dimension, pattern, profile, hydrology and sediment transport of natural, stable channels (reference condition) and applying this understanding to the reconstruction of a stable channel.
NOTE: For more information on Natural Channel Design, permittees should reference North Carolina Stream Mitigation Guidance on the Corps RIBITS (Regulatory In-lieu Fee and Bank Information Tracking System) website or at the following World Wide Web Page: https://ribits.ops.usace.army.mil/ords/f?p=107:2

b. In designated trout watersheds, a PCN is not required for impacts to a maximum of 0.007 acres (0.02 acres for temporary dewatering). In designated trout waters, the permittee shall submit a PCN (see Regional Conditions C.3. above and General Condition 32) to the District Engineer prior to commencing the activity if 1) impacts (other than temporary dewatering to work in dry conditions) to jurisdictional aquatic resources exceed 0.007 acres; 2) temporary

impacts to streams or waterbodies associated with dewatering to work in dry conditions exceed 0.02 acres; 3) the project will involve impacts to wetlands; 4) the primary purpose of the project is for commercial development; 5) the project involves the replacement of a bridge or spanning structure with a culvert or non-spanning structure in waters of the United States; or 6) the activity will be constructed during the trout waters moratorium (October 15 through April 15).

D. SECTION 401 WATER QUALITY CERTIFICATION (WQC) AND/OR COASTAL ZONE MANAGEMENT ACT (CZMA) CONSISTENCY DETERMINATION SUMMARY AND APPLICABLE CONDITIONS

The CZMA Consistency Determination and all Water Quality Certifications for the NWPs can be found at: https://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Permits/2017-Nationwide-Permits/

Spalding, Eric

From: Pait, Bruce E. <Bruce.Pait@duke-energy.com>
Sent: Wednesday, December 10, 2025 5:12 PM
To: Chelsea Davis
Cc: McMillan, Addison
Subject: --[EXTERNAL]--Duke Energy - Ting Park storage area and OSHA Minimum Approach
Attachments: 1 C OSHA LOOK UP AND LIVE BROCHURE-8-7-2014 130695.pdf; NMAC DETAILED SITE PLAN 12-18-13.pdf; Ting Park - Oak Hall Greenway_Signed Design Plans_StagingArea.pdf

Re: Safety while working in proximity to High Voltage Power Line **230,000 Volts at Ting Park Holly Springs, NC 27540**

Line: OL146 Harris Plant – Wake 230kV at structures # 52 and # 53

Location: 101 Sportsmanship Way, Holly Springs, NC 27540

To: Chelsea Davis, PE (919.802.7145) Project Engineer – Town of Holly Springs | 128 S. Main St, Holly Springs, NC 27540
Cc: Addison McMillan – Duke Energy

Dear Chelsea, as per our phone conversation today, Duke Energy does not object to the Town of Holly Springs using the area **outside** of the Duke Energy 180' wide easement as shown on the two above attachments for the staging and storage of materials and equipment. Also as per our conversation today, see the above attached OSHA "Look Up and Live" Brochure and the below information to be shared with all those working in proximity to the 230kV high voltage power lines shown on the above attached drawings.

-1. With the understanding that work is being done adjacent to the easement, I am providing to you this safety information. The most important of which is the above attached **"Look Up and Live"** Brochure that relates to the **Twenty (20) foot** OSHA minimum clearance between the overhead wires and working equipment or non-qualified electrical workers for these **230,000 volt lines**.

-2. These overhead transmission lines are energized, bare wires (that are isolated, consistent with industry standard, but do not possess an insulated coating), supported by poles and other structures. A hazardous situation may result any time mobile equipment such as trucks, backhoes, fork lifts, cranes, ladders, etc. approach these overhead lines beyond the safe working distances established by federal law (OSHA).

-3. It is the responsibility of the Owners/Contractors/Developers to ensure that all work performed in the proximity of the transmission lines complies with all applicable laws and regulations, including but not limited to the National Electric Safety Code ("**NESC**"), the Overhead High-Voltage Line Safety Act ("**OHVLSA**"), and the Occupational Safety and Health Act ("**OSHA**"), and that all persons working near the electric power lines are made aware of the inherent safety hazards associated with these lines.

-4. Any damages to the transmission lines or structural facilities, may result in claims caused by the damage. Also, other substantial liabilities may occur as a result of power outages to residential, industrial and

commercial customers. It will be the responsibility of the contractors/owners/developers to mitigate such claims and liabilities, which could be substantial and costly to your business.

-5. Duke Energy objects to any proposed activity which would involve the lifting of material over the top of the **230,000 Volt** transmission lines such as the lines crossing your site. We have been asked this question in the past.

Note 1: Storage of materials, dirt, debris, junk or other items is prohibited under the overhead conductors, within any Duke Energy power line easement or within **50 Feet** of any power line pole, guy wire, guy anchor or tower.

Thank you for your careful consideration of this information for the Safety of your employees/contractors, Duke Energy workers and the general public.

Your cooperation in this regard is greatly appreciated.

Best regards,

Bruce 919-219-9567

Bruce E Pait

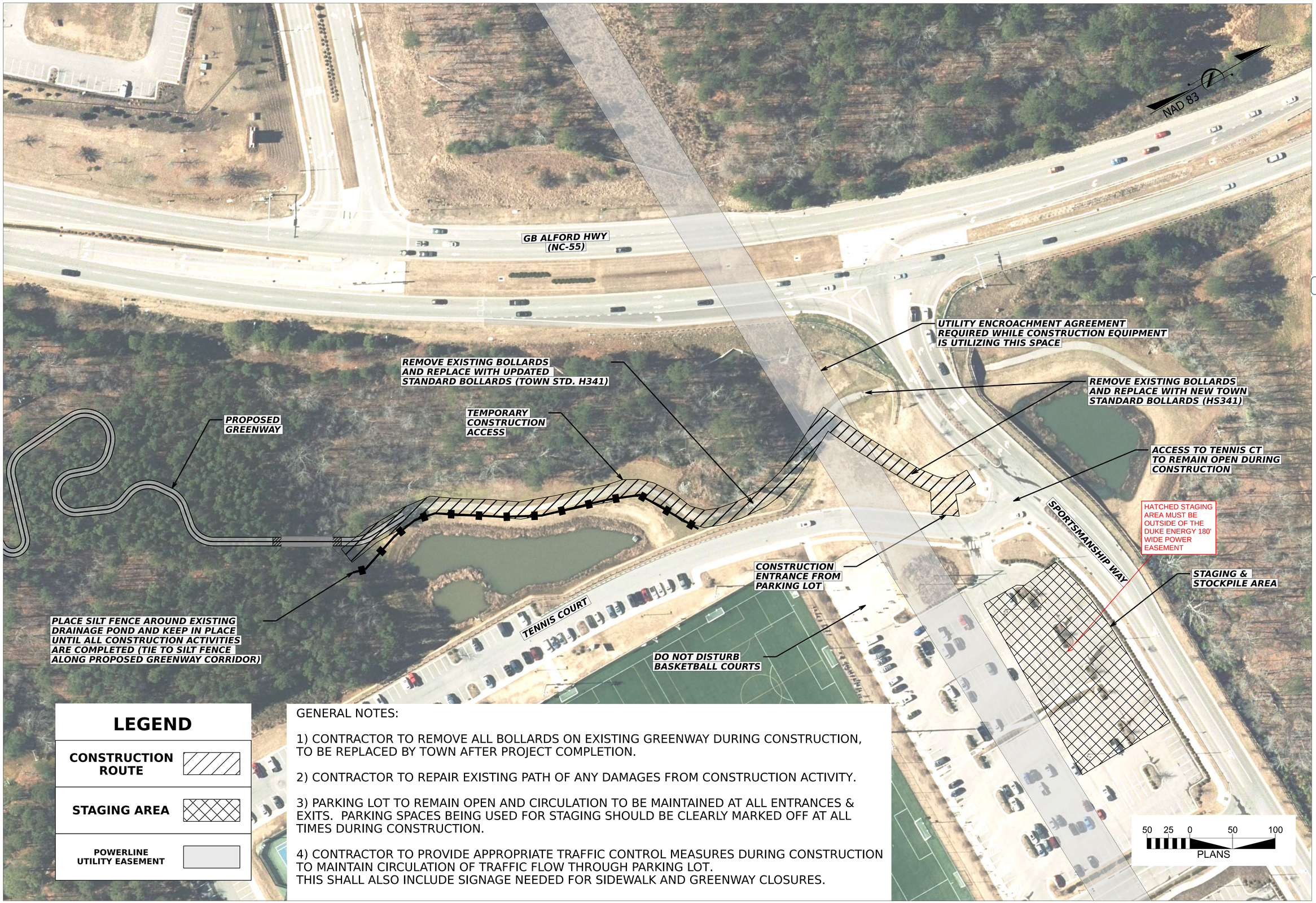
DUKE ENERGY.

Lead Asset Protection Program Manager - Carolinas
Power Grid Operations Vegetation Management

4690 Simms Creek Road | MC: US 1N T&D OPS | Raleigh, NC 27616
Cell: 919.219.9567 | Office: 919.431.4831
Bruce.Pait@duke-energy.com

Power Grid Operations

For more information about Transmission Asset Protection: Trees & Rights of Way @ Duke-Energy.com [protect.checkpoint.com]



LEGEND

CONSTRUCTION ROUTE	
STAGING AREA	
POWERLINE UTILITY EASEMENT	

GENERAL NOTES:

1) CONTRACTOR TO REMOVE ALL BOLLARDS ON EXISTING GREENWAY DURING CONSTRUCTION, TO BE REPLACED BY TOWN AFTER PROJECT COMPLETION.

2) CONTRACTOR TO REPAIR EXISTING PATH OF ANY DAMAGES FROM CONSTRUCTION ACTIVITY.

3) PARKING LOT TO REMAIN OPEN AND CIRCULATION TO BE MAINTAINED AT ALL ENTRANCES & EXITS. PARKING SPACES BEING USED FOR STAGING SHOULD BE CLEARLY MARKED OFF AT ALL TIMES DURING CONSTRUCTION.

4) CONTRACTOR TO PROVIDE APPROPRIATE TRAFFIC CONTROL MEASURES DURING CONSTRUCTION TO MAINTAIN CIRCULATION OF TRAFFIC FLOW THROUGH PARKING LOT.
THIS SHALL ALSO INCLUDE SIGNAGE NEEDED FOR SIDEWALK AND GREENWAY CLOSURES.

benesch
Alfred Benesch & Company
8000 Regency Parkway, Suite 223
Cary, NC 27518
www.benesch.com
P 984.372.3490
Corp. NC License: F-1320

Seals:

NORTH CAROLINA PROFESSIONAL SEAL 045955 ENGINEER ERIC SPALDING

Docusigned by: Eric Spalding 9/8/2025
C7E7FA0BA3664DE...
Corp. NC License: F-1320

Ting Park-Oak Hall Greenway Connector

Ting Park
Holly Springs, North Carolina

Project No: 1725-200012.00
Date: 9/4/2025
Revisions:
-
-

HOLLY SPRINGS North Carolina

Sheet Title:

Construction Access

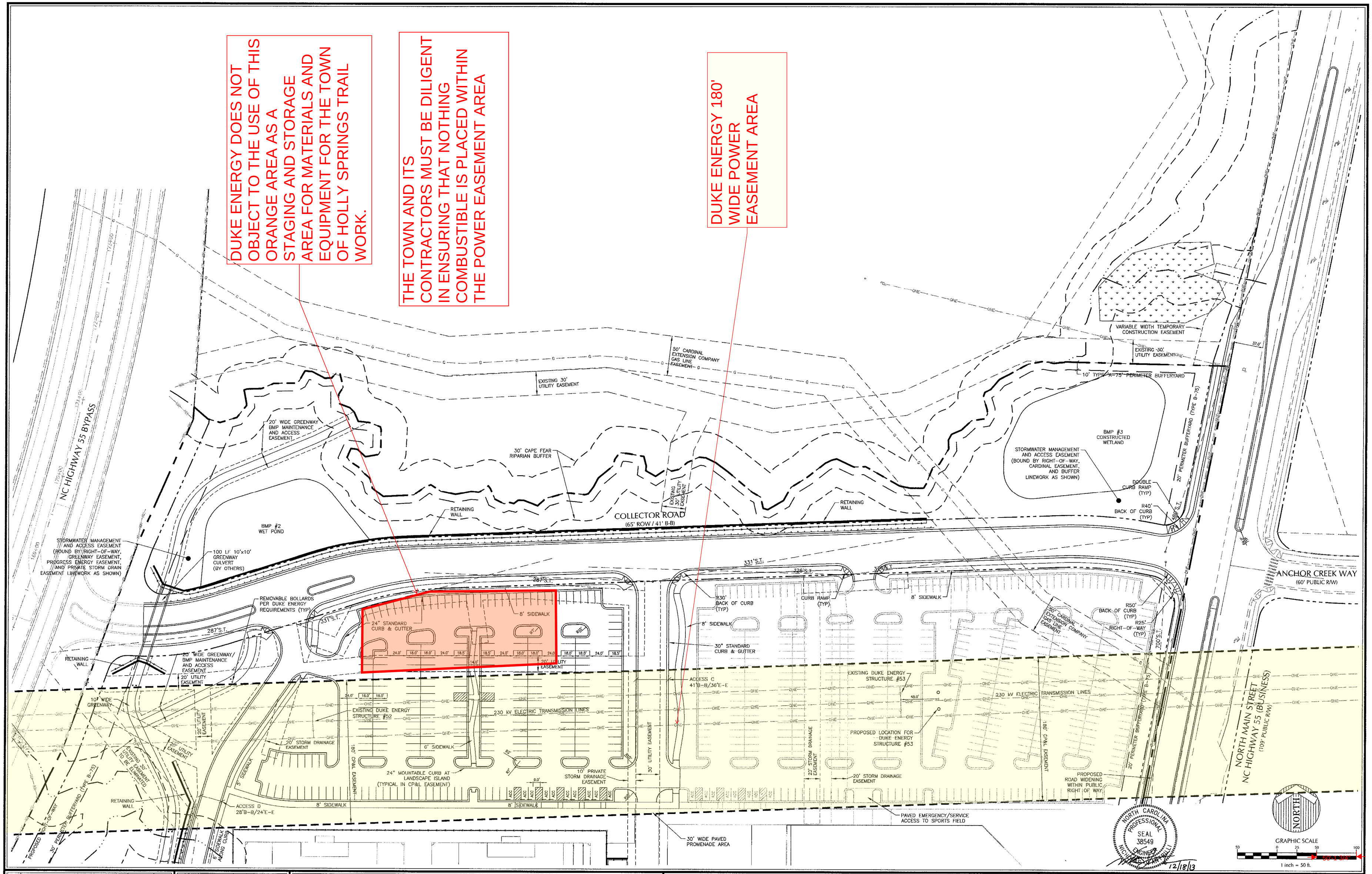
Sheet No:

C2.8

DUKE ENERGY DOES NOT OBJECT TO THE USE OF THIS ORANGE AREA AS A STAGING AND STORAGE AREA FOR MATERIALS AND EQUIPMENT FOR THE TOWN OF HOLLY SPRINGS TRAIL WORK.

THE TOWN AND ITS CONTRACTORS MUST BE DILIGENT IN ENSURING THAT NOTHING COMBUSTIBLE IS PLACED WITHIN THE POWER EASEMENT AREA

DUKE ENERGY 180' WIDE POWER EASEMENT AREA



NORTH CAROLINA PROFESSIONAL SEAL 38549 ENGINEER NICHOLAS G. STAFFORD
12/18/13

No.	Revision	Date	By
1	REV. PER DUKE ENERGY REVIEW	12/18/13	NJA

Designer	W&R	Scale	AS SHOWN
Drawn By	NJA	Date	09/24/13
Checked By	LGS	Job No.	02130012.00

NORTH MAIN ATHLETIC COMPLEX
DUKE ENERGY EXHIBITS

TOWN OF HOLLY SPRINGS WAKE COUNTY NORTH CAROLINA

DETAILED SITE PLAN

WITHERS & RAVENEL
ENGINEERS | PLANNERS | SURVEYORS
115 MacKenan Drive Cary, North Carolina 27511 tel: 919-469-3340 www.withersravenel.com License No. C-0832

Sheet No. C2.1

K:\13\13-0010\130012-NMC Phase 1\CAD\Progress Energy Exhibit\C2.0 SITE PLAN.dwg Wednesday, December 18, 2013 2:07:55 PM by STRICKLAND, GREG

Your safety is our priority

We have a goal at Duke Energy – to eliminate injury and death from needless power line contacts. We want to provide you with the information you need to stay safe at work.

Important OSHA minimum approach regulation

The following table is from OSHA 1910.333 and applies to nonqualified persons working in proximity to energized power lines. The minimum approach distance is to be maintained for nonqualified workers. When using equipment classified as a crane or derrick, OSHA 29 CFR 1926.1407-1411 must be followed.

OSHA - 1910.333 Applies to NonQualified Persons Minimum Approach Distance	
Up to 50 kV	10 Feet
50 kV up to 200 kV	15 Feet
200 kV up to 350	20 Feet
350 to 500 kV	25 Feet
500 kV to 750 kV	35 Feet

Important OSHA crane regulation

Cranes and derricks near transmission power lines – OSHA 29 CFR 1926.1407-1411

This regulation applies to power-operated equipment used in construction that can hoist, lower and horizontally move a suspended load. Such equipment includes, but is not limited to:

If any part of equipment, load line or load could get closer than 20 feet to less than 350 kV power lines or 50 feet for greater than 350 kV power lines, you must speak with a Duke Energy representative before beginning work.

Such equipment includes, but is not limited to:

- Articulating cranes (such as knuckle boom cranes)
- Floating cranes
- Locomotive cranes
- Multipurpose machines when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load
- Industrial cranes (such as carry deck cranes)
- Pedestal cranes
- Straddle cranes
- Derricks
- Overhead bridge and gantry cranes NOT permanently installed
- Crawler cranes
- Cranes on barges
- Side boom tractors
- Base-mounted drum hoists only when used with derricks
- Tower cranes
- Portal cranes
- Service/mechanic trucks with a hoisting device
- Dedicated pile drivers
- Mobile cranes (such as wheel-mounted, rough-terrain, all-terrain, commercial truck-mounted and boom truck cranes)
- Variations of these types of equipment

DUKE ENERGY®

Contact us

For more information, please visit duke-energy.com/safety or call:

Duke Energy Carolinas
800.777.9898 or 800.POWERON

Duke Energy Indiana
800.521.2232

Duke Energy Kentucky or Ohio
800.544.6900

Duke Energy Progress
800.452.2777

Duke Energy Florida
800.700.8744

Printed on 10% post-consumer recycled stock.

550 South Tryon Street
Charlotte, NC 28202

www.duke-energy.com

DUKE ENERGY®

Look up and live.

Working around high-voltage transmission lines

Know how to protect yourself, your crew and the public when working around transmission lines.

Duke Energy cares about your safety. This brochure contains important information for:

- Anyone working around power lines
- Grading contractors
- Forklift operators
- Crane operators
- Developers (residential, commercial, industrial)
- Architects and engineers
- Dump truck operators

Know your voltage, know your clearance

Federal law requires that all contractors maintain at least a 10-foot clearance from overhead power lines up to 50 kV. Greater clearance is required for higher-voltage power lines and cranes and derricks in construction.

Contact Duke Energy at least three working days before you start working near overhead power lines and equipment so that safety recommendations can be made.

Treat all transmission lines, regardless of their operating voltage, with caution:

- 44 kV and 100 kV lines look similar.
- Never assume a voltage based on the illustration.
- Minimum clearance includes maximum sag, which must be calculated for each instance.
- Injury or death can occur without touching power lines.
- Assume all overhead power lines are energized.
- Contact Duke Energy if you are in doubt about safe operating distances.

Fact 1.

Power lines that serve your homes and businesses are not insulated like home appliance cords.

Fact 2.

Power lines carry 4,000 to 500,000 volts of electricity that can seriously injure or kill on contact.

Fact 3.

The simplest way to stay safe is to know where your power lines are located and stay away.

A planned project is a safe project

Check the job site for hazards and know the location of all overhead power lines and electric equipment, including poles and guy wires.

Consider all overhead lines as energized. Mark the work site boundaries to keep workers, vehicles, tools and equipment a safe distance from electric lines and equipment.

Hold a pre-work safety meeting, pointing out areas where overhead lines and electric equipment are located.

We can help you:

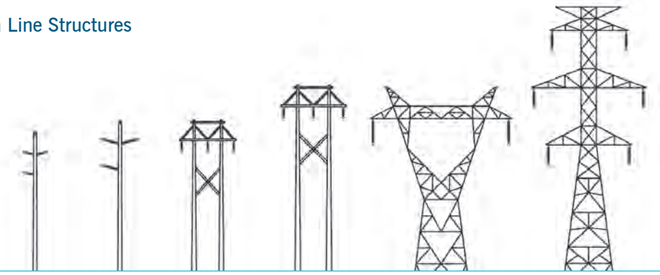
- Confirm voltage
- Confirm clearance
- Confirm wire height under peak conditions
- Provide safety guidance around power lines
- Review and approve drawings for:
  - Compliance with right-of-way restrictions
  - Compliance to National Electric Safety Code
- Identify the best, safe solution

Emergency situations

If your equipment makes contact with an overhead power line, notify Duke Energy immediately and take these precautions:

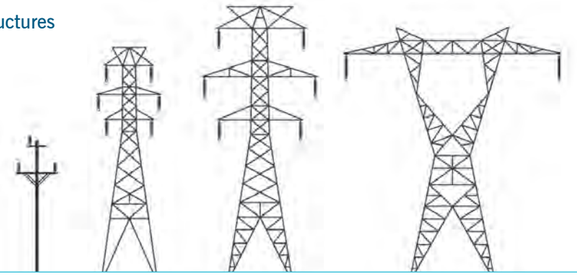
- Have someone call 911.
- Do not attempt to turn off engines or generators.
- Move equipment away from the line only if it is safe to do so.
- Remain on equipment until utility workers arrive and de-energize the line.
- Warn others to stay away. Those on the ground can be injured or killed if they make contact with the equipment.
- If you must leave the equipment because of fire or other dangers, jump off with your feet together. Never touch the ground and equipment at the same time. Keeping your feet together, shuffle or hop away until you are clear of the area.

Duke Energy Midwest Transmission Line Structures

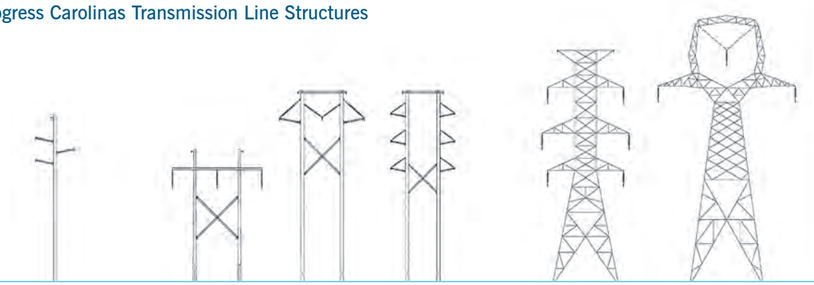


Duke Energy Florida Transmission Line Structures

Duke Energy Carolinas Transmission Line Structures



Duke Energy Progress Carolinas Transmission Line Structures



For more information, visit duke-energy.com/safety.

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Page 1 of 4
OFFICIAL RECORDS OF WAKE COUNTY
Tammy L. Brunner, Register of Deeds
07/28/2025 01:32 PM Fee: $26.00 Excise Tax: $0.00

Prepared by/Mail To: John P. Schifano, PO Box 8, Holly Springs, NC 27540

PIN: (Out of) 0649761943

TaxID:(Out of) 0367158

Excise Tax $0.00

EASEMENT DEED

STATE OF NORTH CAROLINA
COUNTY OF WAKE

This DEED OF EASEMENT is made and executed the 23rd day of July, 2025.

By and Between:

GRANTOR(s)	GRANTEE(s)
Oakhall Community Assn Inc. 150 Towerview Court Cary, NC 27513-3595	TOWN OF HOLLY SPRINGS A North Carolina Municipality PO Box 8 Holly Springs, NC 27540

The designation "Grantor" as used herein shall include the singular and plural, as required, and the masculine, feminine and neuter gender as appropriate.

WITNESSETH:

WHEREAS, the Grantor is the Owner of an approximate 0 acre tract described in that certain Deed recorded in Book 012947 Page 02305, Wake County Registry, having a Wake County Real Estate Tax ID Number of 0367158 and a PIN of 0649761943 and an address of 0 Linden Ridge Drive, Holly Springs, NC 27540, (the 'Property') and has agreed to convey to the Grantee, hereinafter referred to as the "Town," according to the terms set forth below, the easements hereinafter described:

THIS PROPERTY DOES___ DOES NOT_X_ CONTAIN THE PERSONAL RESIDENCE OF THE GRANTOR

Legal Interest Conveyed: **Temporary Construction Easement**

a right, privilege, and easement, for a period of 365 days from the start of initial construction by the Town or its agents, for a temporary construction easement allowing for egress and ingress, removal of vegetation, sloping, grading, digging and earthwork, and all other activities incident to construction in the easement area, said easement area as described in the legal description. Town shall restore all other lands to the relative

ProjectName: Ting Park-Oakhall Greenway Connector

before condition and repair any known condition that would cause a negative drainage result, or other liability that did not exist in the before condition.

Legal Description of area conveyed

See attached map at Exhibit A.

SquareFoot: 452

ProjectName: Ting Park-Oakhall Greenway Connector

AS FURTHER GENERAL TERMS AND CONDITIONS of this easement, the Grantor shall remain the fee owner of the affected property, and may make all lawful uses of such property not inconsistent with the easement herein conveyed; and, following completion of any public improvements within the easement areas, including maintenance and repair of same, the Town will restore any disturbed lands to their former condition.
TO HAVE AND TO HOLD the aforesaid easement interests and all privileges and rights thereunto belonging to the Town of Holly Springs, its successors and assigns forever.
THIS EASEMENT shall be binding upon the heirs, successors and assigns of the Grantor.
AND the Grantor does covenant that it is vested of the premises in fee and has the right to convey the same in fee simple; that the same are free from encumbrances except as may be hereinafter stated; and that it will warrant and defend title to the same against the claims of all persons whomsoever.

IN WITNESS WHEREOF, the Grantor hereinbefore named has set its hand and seal the day and year first above written.

Grantor: Oakhall Community Assn., Inc.

Sarah Larson

Sarah Larson
Oakhall HOA President

(Seal)

STATE OF NORTH CAROLINA
COUNTY OF WAKE

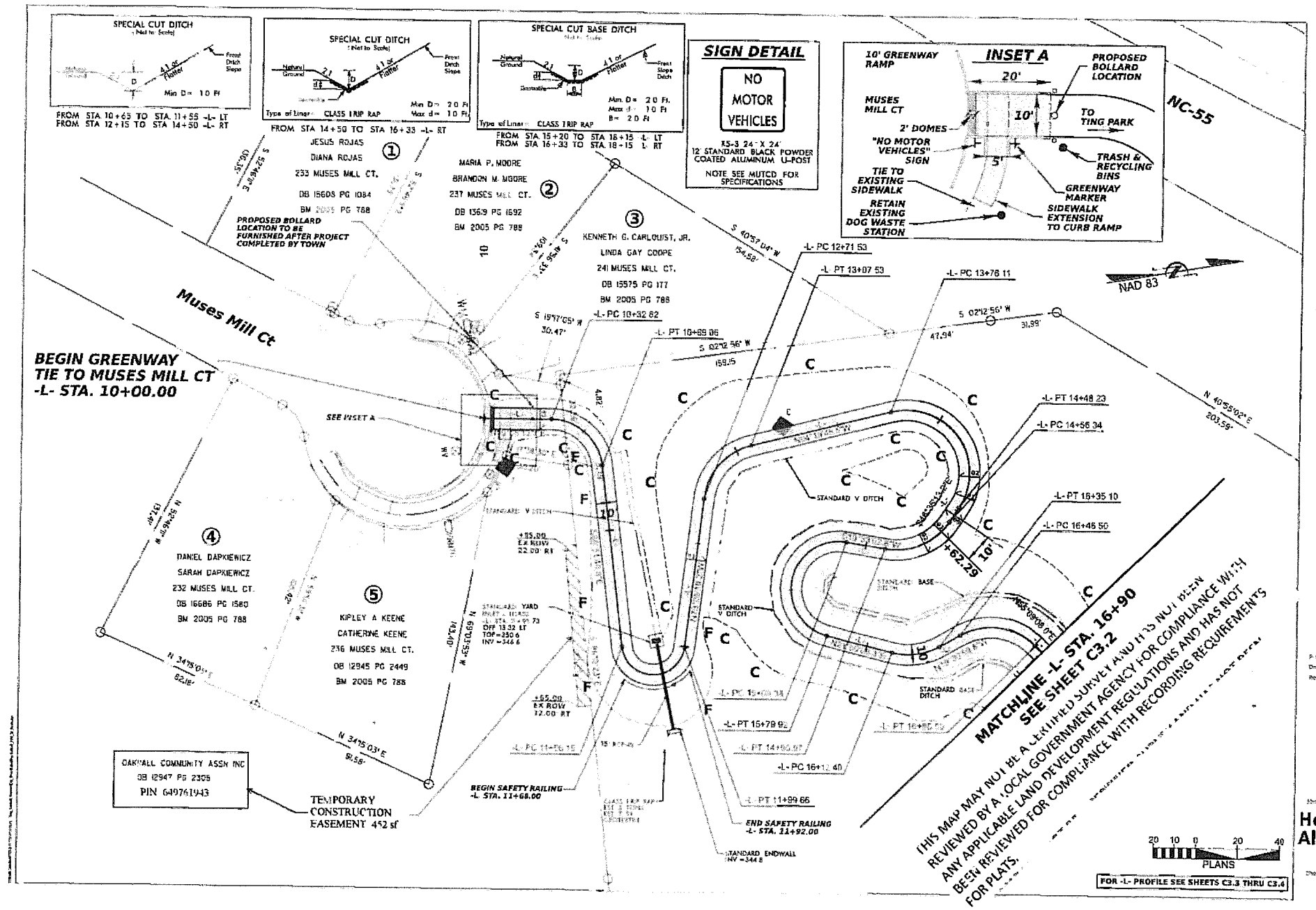
I, a Notary Public for the said County and State, certify that personally came before me this day and acknowledged the foregoing instrument as the President /Vice President/Secretary/Sarah Larson(other) of the corporation, Oakhall Community Assn., Inc. and as its officer was authorized to execute the foregoing document.

Witness my hand and official seal, this the 23rd day of July, 2025 (Official Seal of Notary)

Angela Carter
Notary Public Angela Carter
My Commission Expires: 6/24/2029

ANGELA CARTER NOTARY PUBLIC My Commission Expires 06-24-2029 WAKE COUNTY, NC

ProjectName: Ting Park-Oakhall Greenway Connector



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PRELIMINARY NOT FOR CONSTRUCTION

Ting Park-Oak Hall Greenway Connector

Ting Park
Holly Springs, North Carolina

Horizontal Alignment

C3.1