Appendix F-1: Proposed Refinements Archaeological Resources Technical Report

Durham-Orange Light Rail Transit Project

GO Triangle

Connecting all points of the Triangle

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List of Acronyms and Abbreviations

Acronym / Abbreviation	Definition
A.D.	Anno Domini
APE	Area of Potential Effects
B.P.	Years Before Present
B.C.	Before Christ
bs	below surface
CFR	Code of Federal Regulations
D-O	Durham-Orange
D-O LRT	Durham-Orange Light Rail Transit
GIS	Geographic Information Systems
LRT	Light Rail Transit
NCDENR	North Carolina Department of Environment and Natural Resources
NCOSA	North Carolina Office of State Archaeology
NCSHPO	North Carolina State Historic Preservation Office
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
OSA	Office of State Archaeology
ROD	Record of Decision
RTP	Research Triangle Park
SHPO	State Historic Preservation Office
TPSS	Traction Powered Substation

Management Summary

A Phase I archaeological survey was conducted for the Proposed Refinements to the Durham-Orange Light Rail Transit (D-O LRT) project in Durham and Orange Counties, North Carolina. The survey complied with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and the 2017 North Carolina Archaeological Investigation Standards and Guidelines. This project was reviewed by the North Carolina State Historic Preservation Office (SHPO) and Office of State Archaeology (OSA) and designated ER 12-0738.

The D-O LRT project covers approximately 17.7 miles between Durham and Chapel Hill. The Previous Design has been refined to include the following: revised station designs to reflect the use of two-car trains; addition of (and revisions to) bicycle and pedestrian facilities to improve access to stations and parking areas; changes in the locations of the Traction Powered Substations; proposed improvements associated with joint development opportunities; minor modifications to the track alignment and the surrounding roadway network; and minor shifts in the station locations, based on changes in the track design. The majority of the Proposed Refinements are minor and are located in developed areas. No additional survey was recommended for these areas. Three areas were recommended for further analysis due to the larger size of the survey area and the potential for archaeological deposits.

This investigation sought to identify archaeological sites within these survey areas and assess their eligibility for the National Register of Historic Places (NRHP). The Phase I archaeological survey of the Leigh Village Station, Gateway Station, and the Erwin Road/LaSalle Street area was negative for cultural resources. Eighty-three new shovel test locations were investigated across the three survey areas. Out of the 83 shovel test locations, 60 shovel tests were negative, and 23 were not excavated due to existing conditions such as residential and commercial development and wetlands. No further archaeological work is recommended for the proposed refinements to the D-O LRT project considered in this analysis.

Please note: *Figures within this report containing archaeological site location information have been redacted. Archaeological site location information is confidential information under North Carolina General Statute (N.C.G.S.) 70-18 and not intended for public display or public viewing. The GIS data used to create the redacted figures are for use by GoTriangle and their consultants for planning purposes. The GIS data should not be used in any format that may be accessible by the public (e.g., public documents, brochures, town meetings, and/or presentations).*

1. Introduction

A Phase I archaeological survey was conducted for Proposed Refinements to the Durham-Orange Light Rail Transit (D-O LRT) project in Durham and Orange Counties, North Carolina (Figure 1-1). This investigation sought to identify archaeological sites within these survey areas and assess their eligibility for the National Register of Historic Places (NRHP). The survey complied with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and the 2017 North Carolina *Archaeological Investigation Standards and Guidelines* and was designated as ER 12-0738 by the North Carolina State Historic Preservation Office (NCSHPO). Fieldwork was conducted on February 15, March 16, and April 2, 2018, by Shawn Patch (Principal Investigator), John Kimes (Archaeological Technician), and CJ Idol (Archaeological Technician).

1.1 Description of the Proposed Refinements

The Proposed Refinements have been incorporated into the Previous Project Design based on the following:

- Advancements in design since the Amended Record of Decision (ROD);
- Responses to public comments and stakeholder feedback on the previous NEPA documentation;
- Recommendations from the Transit Oriented Development grant study to optimize platform locations for future development; and
- Recommendations from the updated Durham County and Orange County transit plans.

The major refinements discussed in this technical report (or Supplemental EA) include:

- Modification to the station platform lengths;
- Adjustments to the location and configuration of the station platforms, as well as corresponding refinements to the track alignments;
- Modifications to the planned park-and-ride lots;
- Inclusion of bicycle and pedestrian facilities throughout the project;
- Reconfiguration of the Rail Operation Maintenance Facility (ROMF) and rail yard;
- Elevation of the alignment on Erwin Road;
- Inclusion of drainage, grading, and site preparation throughout the project; and
- Addition of a new station at Blackwell/Mangum Streets and a pedestrian/bicycle signature civic space that would span Pettigrew Street, the light rail tracks, NCRR tracks, and Ramseur Street approximately mid-block between Blackwell Street and Mangum Street.

The area of potential effects (APE) for archaeological resources was revised as a result of the Proposed Refinements. Almost all of the Proposed Refinements are minor and are located in areas that are highly developed, including roadways, parking lots, and existing rights-of-way (Appendix F1-A: Sheets 1-36). For these areas, no further analysis was recommended based on the existing environmental conditions, locations of previous survey work, and low potential for intact archaeological resources. Three areas were recommended for further analysis because they were relatively large compared to other areas and characterized as having moderate to high archaeological probability (Table 1-1): Leigh Village Station (Appendix F1-A: Sheets 8 and 9), Gateway Station (Appendix F1-A: Sheet 14), and a small section on the Duke University campus near the intersection of Erwin Road and LaSalle Street (Appendix F1-A: Sheet 28).

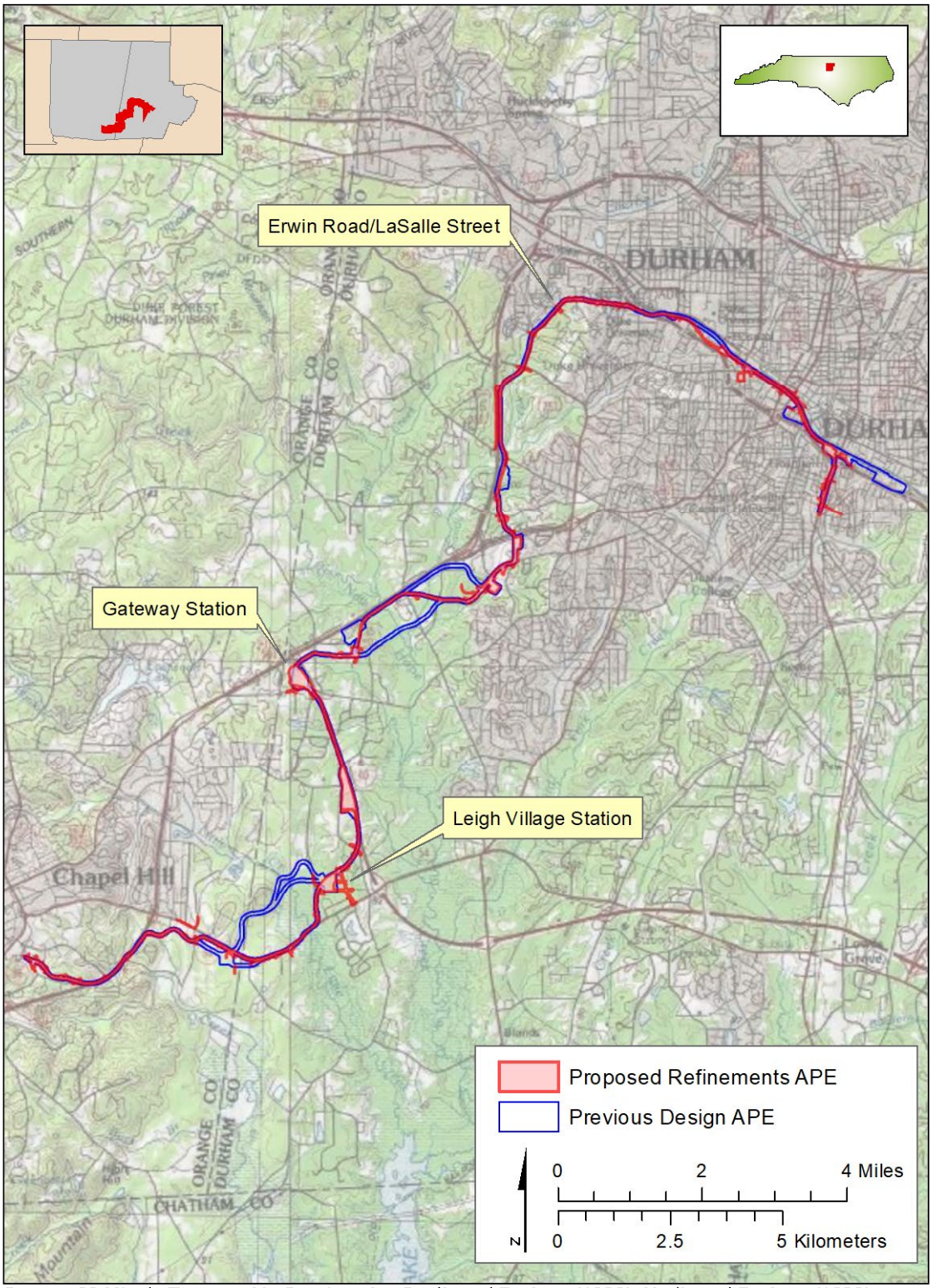
Table 1-1: Summary of Proposed Changes to Archaeological APE that Required Additional Analysis

Location	Proposed Change	Reason
Leigh Village Station	▪ Reconfigured the proposed roadways around the station to improve intersections, roadways, and access to the stations.	▪ The proposed changes would better preserve future development potential adjacent to the station.
Gateway Station	▪ Moved the station to the west and reconfigured the station and park-and-ride site layout and revised alignment to accommodate the station location. ▪ Added a sidewalk along the east side of Pope Road from Olde Coach Road to Chapel Hill Road. ▪ Identified the Gateway Station park-and-ride site as a potential joint development site. At this time, the Proposed Refinements do not include activities or improvements specifically tied to a joint development project; rather, the design refinements include acquisition and site preparation for a park-and-ride facility that may also support a future joint development (redevelopment).	▪ The change in station location would increase potential economic development benefits for both Orange and Durham counties. ▪ The change to the park-and-ride site layout would make it conducive to urban redevelopment. ▪ Since publication of the Amended ROD, GoTriangle engaged with a task force of local stakeholders, including representatives from local governments, regional agencies, and the Durham Housing Authority to identify potential joint development sites in the D-O LRT Project Corridor. The task force identified and evaluated over 30 potential sites and recommended four sites for further study, including the Gateway Station park-and-ride.
Erwin Road/LaSalle Street	▪ Revised the track design between Cameron Boulevard and Anderson Street from a street-level median-running plan to a combination of street-level side-running and elevated median-running plan. Shifted the rail alignment from the median of Erwin Road at the intersection of Cameron Boulevard to the southeast side of Erwin Road. The alignment transitions from ground level to elevated structure just southwest of LaSalle Street, remains elevated and transitions into the median of Erwin Road, and shifts out of the median and back to ground-level just east of Flowers Drive on the north side of Erwin Road. ▪ Revised location of the LaSalle Street Station to the south side of Erwin Road on an elevated structure.	▪ In the Amended ROD, GoTriangle committed to perform additional engineering design work to avoid or limit impacts to existing utilities (Mitigation ID # UI01). The changes would avoid the need to move a high voltage 44kV electrical transmission line under Erwin Road. This transmission line brings power to the hospitals and would be cost-prohibitive to move. ▪ In the Amended ROD, GoTriangle committed to coordinate with emergency and medical personnel during design advancement to investigate impacts of the light rail system on their day-to-day operations (Mitigation ID # SS01). VA and Duke University Medical Centers personnel encouraged GoTriangle to refine the design to an elevated alignment through the hospitals area to eliminate potential conflicts with ambulances crossing and traveling along the light rail corridor.

Table 1-1 (Cont'd): Summary of Proposed Changes to Archaeological APE that Required Additional Analysis

Location	Proposed Change	Reason
Erwin Road/LaSalle Street (Cont'd)	▪ Revised the location of the Duke/VA Medical Centers station from between Trent and Flowers Drives in the Previous Design to just west of Fulton Street. The elevated structure provide direct access to the platform from the sidewalks.	▪ In the Amended ROD, GoTriangle committed to incorporate roadway safety measures into the design refinements, such as shifting the light rail alignment horizontally or vertically away from vehicular traffic (e.g., shifting to side-running from median-running), and installing elevated structures to avoid significant impacts on existing roads (Mitigation ID # R04). ▪ In the Amended ROD, GoTriangle committed to continue coordination with Duke University on relocating and maintaining services provided at the John Hope Franklin Center (Mitigation ID # NCR02); the changes would avoid impacts to the John Hope Franklin Center and eliminate the need for its relocation.

In addition, in response to comments received from the City of Durham on the D-O LRT Project design, the Proposed Refinements include relocating a water line that would have conflicted with the light rail alignment. The water line would be relocated from the east side of US 15/501 to the west side of US 15/501. As a result of the proposed relocation, a fourth APE expansion is proposed to cover the area of disturbance associated with the relocated water line. This area was previously surveyed by a separate North Carolina Department of Transportation (NCDOT) project and the results of this survey were reviewed by the North Carolina State Historic Preservation Office (SHPO) (ER 14-1904), and recommended no further cultural resource analysis. GoTriangle consulted with the North Carolina Office of State Archaeology (OSA) on the proposed APE expansion and confirmed via phone consultation that no archaeological investigations were necessary for this fourth APE expansion along US 15/501.



Source: 30 Minute Topographic Quadrangles Southwest Durham (1983), Northwest Durham (1982), and Chapel Hill (1982), North Carolina

Figure 1-1: Project Location in Durham and Orange Counties, North Carolina

2. Environmental Context

2.1 Project Setting

The Previous Design APE is approximately 820 acres and the Proposed Refinements APE is approximately 403 acres (Figure 2.1). The specific areas investigated for the Proposed Refinements included Leigh Village Station (35 acres), Gateway Station (31 acres), and Erwin Road/LaSalle Street (1 acre). Historic land use in the areas investigated for the Proposed Refinements was primarily agricultural because they were rural and located on the fringes of urban areas such as Chapel Hill and Durham. Modern development has created pressures in recent years that has transformed the formerly rural character of these areas.

The APE is located in the eastern Piedmont Physiographic province, an area of approximately 20,000 square miles between the Coastal Plain and the Blue Ridge Mountains. The Piedmont is principally a highly divided plateau dominated by well-rounded hills and ridges that trend northeast-southwest, with elevations ranging from 400 feet in the east to 2,000 feet in the west. The typical topography of rounded and rolling hills is a direct result of stream action on rocks of unequal hardness. Three major river systems are present in the Piedmont: the Dan River, which drains from the northern portion; the Tar, Neuse, and Cape Fear rivers, which drain the southern and eastern portions; and the Yadkin, Catawba, and Broad rivers, which drain the western portion (Stuckey 1965:16). The hydrology of the APE consists of tributaries to Sandy Creek, New Hope Creek, or Little Creek, which all drain to the reservoir Jordan Lake. Jordan Lake empties into the Haw River, which joins with the Deep River forming the Cape Fear River.

The Piedmont is well known for its diversity of lithic resources that were important to, and exploited by, prehistoric groups. The Carolina Slate Belt occupies much of the eastern Piedmont. This metavolcanic region contains multiple lithic raw material types useful for the construction of stone tools (Steponaitis et al. 2006). This region also contains abundant stone that could be utilized in building construction, since most of the rocks are relatively flat and could be easily stacked. Quartz and quartzite are also common and were widely used. These materials were used for building foundation construction during the historic period.

2.2 Soils

Soils in the Leigh Village and Gateway Station APE are classified as White Store sandy loam, 2-6 percent slopes and White Store sandy loam, 6-10 percent slopes (Soil Survey Staff 2018). These types are common on landforms such as hillslopes on ridges, shoulders, summits, and side slopes. They are moderately well drained with average depth of the water table between 12 and 18 inches. Parent material consists of residuum weathered from mudstone and/or shale and siltstone and/or sandstone.

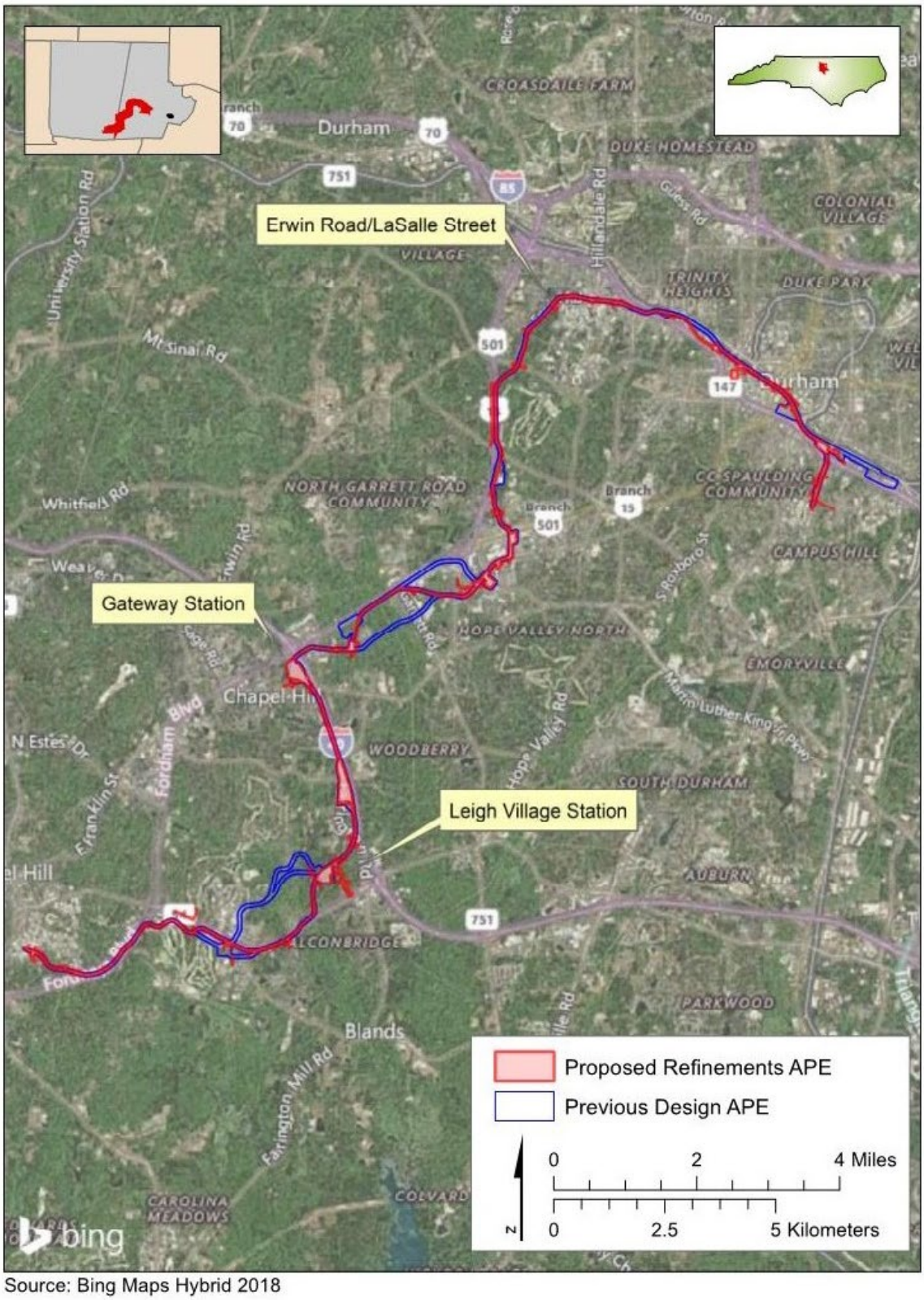
A typical profile for both types is defined as:

- H1: 0-6 inches: sandy loam;
- H2: 6-35 inches: clay;
- H3: 35-53 inches: clay loam; and
- Cr: 53-80 inches: weathered bedrock.

Soils in the Erwin Road/Lasalle Street APE are classified as White Store clay loam, 2-10 percent slopes, moderately eroded (Soil Survey Staff 2018). This type is common on landforms such as hillslopes on ridges, back slopes, and side slopes. It is moderately well drained with average depth of the water table between 6 and 18 inches. Parent material consists of residuum weathered from mudstone and/or shale and siltstone and/or sandstone.

A typical profile is defined as:

- H1: 0-5 inches: clay loam;
- H2: 5-34 inches: clay;
- H3: 34-50 inches: silt loam; and
- Cr: 50-80 inches: weathered bedrock.



Source: Bing Maps Hybrid 2018

Figure 2-1: Project Location on Aerial Imagery

2.3 Paleoenvironment

Current understanding of paleoclimatic conditions is based on inference from generalized reconstructions for the eastern United States (Delcourt and Delcourt 1981). Detailed paleoenvironmental assessments have been made for the Middle Atlantic and eastern North America (Boyd 1989; Cable 1991; Carbone 1977; Custer 1990; Delcourt and Delcourt 1981; 1985; Watts 1980). The work of these individuals has been used as reference material for the majority of the discussion that follows.

The northern North Carolina terrain underwent radical environmental changes over the last 120,000 years (Delcourt and Delcourt 1981). The changes during this period occurred on a global scale and centered on the advance and retreat of the last Pleistocene glacial period, commonly known in North America as the Wisconsin Glaciation. Beginning around 135,000 B.C., the glaciers expanded across the continent to form the Laurentide ice sheet. At its greatest extent, approximately 20,000 B.C., the sheet had extended as far south as southern Indiana, Ohio, and New Jersey (Boyd 1989:141; Cable 1991:23). This massive extent of ice produced a cold and dry climate over the Appalachian Summit. Glacial period temperatures were as much as 10-15 degrees Celsius cooler than currently experienced, and rainfall was 20-50 percent less than present levels (Boyd 1989:142–143). These climatic conditions also had profound impact on the flora and fauna of the period. Those species present during that time were radically different from present taxa (Cable 1991).

A series of major environmental warming trends in North America began approximately 16,000 B.C. Warmer temperatures caused the Laurentide ice sheet to wither, sea levels to rise, and certain large, middle latitude lakes to become desiccated (Cable 1991:23). The period from 16,000-12,000 B.C. is widely recognized as the time when modern, Holocene climatic conditions replaced those of the Late Wisconsin glacial period (Boyd 1989:142–145; Cable 1991:23; Custer 1990:7; Davis 1976; Watts 1980; Wright 1978). Research suggests that the Pleistocene/Holocene ecological transition was gradual with the encroachment of deciduous tree species into previously glaciated areas of the northeastern United States (Custer 1990:7). The higher altitudes of the Appalachian Summit preserved peri-glacial conditions. As hardwoods took over lower elevation Appalachian forests, the ridges and mountaintops preserved boreal woods and tundra-like conditions until approximately 12,500 B.C. (Purrington 1983). Intermixing of these boreal and oak-hickory-chestnut climax created a “mosaic of plant communities” (Purrington 1983:92) that would have supported a diverse faunal population.

3. Cultural Context

3.1 Precontact Overview

The following discussion presents a brief overview of generally recognized cultural developments of the Piedmont region of North Carolina. Coe's (1952; 1964) research of the prehistoric cultural sequence of the Piedmont laid the foundation for all subsequent studies. There is less known about the earliest periods, but knowledge has been growing over time. These earlier periods include the Paleoindian, and to a lesser extent, the Early Archaic. There are a few reasons for this, but the most obvious is the lack of archaeological visibility and poor preservation of older sites. These older sites are not only difficult to locate and identify, but the populations are commonly assumed to have had low population density and to have been highly mobile, and therefore left little evidence of their presence. Traditionally, the Piedmont prehistory is divided into the Paleoindian, Archaic, and Woodland periods, each of which are further sub-divided based on changes in artifact styles, technology, and subsistence-settlement systems.

3.2 Pre-Clovis (Pre-10,000 B.C.)

The Paleoindian period is commonly dated from 10,500-8000 B.C. (Anderson 1990; Anderson et al. 1996). Traditional hypotheses regarding human entrance into the New World have centered on Bering Land Bridge access and the corresponding ice-free corridor (Anderson et al. 1990:3). The "Clovis first" model has been questioned by data from several sites in the east, such as Meadowcroft Rockshelter in Pennsylvania (Adovasio 1990), Cactus Hill in Virginia (McAvoy and McAvoy 1997), and Topper in South Carolina (Goodyear 2006). However, not all archaeologists accept these sites uncritically, and there is no consensus about a pre-Clovis presence in the New World (Fiedel 1999; 2013).

3.3 Paleoindian Period (10,000-8000 B.C.)

Contextual evidence for artifacts is poor, and no unambiguous sites have been excavated in North Carolina. The information that has been gathered stems primarily from surface finds of isolated projectile points, and many of these have likely been re-deposited and/or eroded from other contexts (Perkinson 1971; 1973). Other sites likely exist, but are probably buried deeper in floodplain sediments or submerged on the continental shelf.

The most commonly recognized artifacts from this period are the large, lanceolate, and frequently fluted projectile points including Clovis (early) and Hardaway-Dalton (later). They are typically well made, and it seems that these groups purposefully selected high quality stone for tool production (Daniel 1998). Other artifacts such as endscrapers, burins, and blades can also be diagnostic, though context is critical.

Direct evidence for the exploitation of megafauna is scarce in the Southeast, and it is likely because these groups practiced a much more generalized subsistence strategy (Sassaman et al. 1990). Few details are known about the settlement and subsistence patterns of these groups; however, they are frequently assumed to have been highly mobile, moving seasonally in response to different resources, and had relatively low populations (Anderson and Joseph 1988; Gardner 1979; Goodyear 1979). Because of current sea levels, most Paleoindian sites on the coast are thought to be located farther out on the continental shelf and are therefore submerged. There are very few examples of Paleoindian artifacts known for this North Carolina region beyond surface finds. This has been pointed out by Phelps (1983) as attributable to lack of good depositional contexts in upland settings.

3.4 Archaic Period (8000-1000 B.C.)

The Archaic period is dated from circa 8000-1000 B.C., and is commonly divided into early (8000-6000 B.C.), middle (6000-3000 B.C.), and late (3000-1000 B.C.) subperiods based on specific projectile point types. The Archaic was a time of climate change with the onset of Holocene climatic conditions, a period that was warmer and wetter than the late Pleistocene. In addition to these changes in temperature and precipitation, there was a significant rise in sea levels as continental glaciers began to melt. Prehistoric populations' response to these changes included increased population, expansion into new environmental zones, and regional variations in point styles.

Archaic groups are commonly assumed to have been highly mobile in response to the seasonality of available resources. Site types are often divided into base camps (residential) and resource extraction or task-specific sites (Phelps 1983). The increase in tool diversity and site locations is widely interpreted as a result of an expanded subsistence and settlement system. There have been several models proposed for the Archaic period settlement and subsistence. Anderson and Hanson (1988) have proposed a drainage-based system, with bands of 50-150 people that roamed an entire drainage system throughout the year exploiting multiple resources. Daniel's (1998) alternate model is based on the presence and availability of high quality stone utilized in tool production.

Definition of this period sequence is largely due to Coe's (1964) work at several well-known and stratified sites in the North Carolina Piedmont. Projectile point types of the Archaic include Palmer and Kirk (early), Stanly, Morrow Mountain (I and II), Guilford, and Halifax (middle), and Savannah River (late). During the Late Archaic, two important technological innovations were added: the use of soapstone for cooking slabs and vessel manufacture, and fiber-tempered pottery. Also at this time, more permanent settlements were established, and there is some evidence for intensive occupations.

3.5 Woodland Period (1000 B.C.-A.D. 1650)

The Woodland period is dated from approximately 1000 B.C.-A.D. 1650 and differs from the preceding Archaic period in many important ways. This period is typically defined as beginning around 1000 B.C. for the Coastal Plain and 500 B.C. for the Piedmont (Ward and Davis 1999). With one major exception, the Coastal Plain and Piedmont regions of North Carolina did not encounter any major, classic Mississippian developments. The Pee Dee culture was characterized by Coe (1964; 1995) based on his work at the Town Creek site; however, this is widely seen as an intrusive element rather than *in situ* cultural development (Ward and Davis 1999).

Highlights of this period are generally considered to be the appearance of pottery production on a larger scale, more semi-sedentary settlements, and horticulture (Ward and Davis 1999:76). Although subsistence strategies were a continuation of earlier hunter-gatherer systems, they were augmented with increased reliance on cultivation of native and domesticated plants (Smith 1986). Despite significant attention given to Woodland sites, the period is paradoxically one of the least well understood.

Overall, the Woodland is a period of increased sedentism with adaptive strategies focused on limited agriculture, mixed hunting, and intensive collecting. Semi-permanent settlements are common in alluvial settings with structural remains, storage pits, and burials, all of which are indicative of an increase in social complexity and stratification (Steponaitis 1986). As agriculture grew in importance so too did village life and social complexity; however, hunting and gathering continued to be a supplemental dietary strategy.

During this period, the stemmed point tradition of the Archaic was replaced, overwhelmingly, by the production of triangular points. Many researchers have noted a probable correlation between point size

and time, and attribute this to the adoption of the bow and arrow at various times throughout the Southeast (Coe 1964). The diagnostic point types of the period include Caraway triangular, Pee Dee triangular and pentagonal, and Clarksville.

3.6 Contact Period (1620s-1670s)

Between the 1620s and 1670s there was a significant increase in contact between Native American groups and Europeans. By this time, traders from Virginia were making regular visits to the Piedmont. In 1701, John Lawson visited the area and by the 1730s, there was a growing flow of immigrants from Virginia, Maryland, Pennsylvania, and the North Carolina Coastal Plain. Early Europeans lived a frontier lifestyle and were largely self-sufficient subsistence farmers.

3.7 Historic Overview

Because the three areas recommended for additional archaeological survey are all located in Durham County, the historic overview focuses specifically on Durham County and the City of Durham. Historical context for the project area between period 1740 and 1900 was provided in the *Durham-Orange Light Rail Transit Project Phase I Archaeological Survey* report (Jorgenson et al. 2017). The historical context for Durham County and the City of Durham in the twentieth century follows. It is adapted from "Historic Resources of Durham County," a National Register of Historic Places Multiple Property Documentation Form prepared by M. Ruth Little (1991).

3.8 Durham County and the City of Durham in the Twentieth Century

In the twentieth century, Durham County's population shifted from the countryside to industrial centers following statewide trends in rural life. During the century's first three decades, agricultural production in Durham County was negatively affected by crop diseases and pests, such as the arrival of the cotton boll weevil to the county in 1923, and the lure of workers from the farm to jobs in the city. The Depression and World War II further eroded farm life.

Rural dwellers found factory work more stable than farm work, and many chose employment at nearby factories in Durham such as the American Tobacco Company, Liggett & Myers, or the Durham Hosiery Mill. The state's Good Roads Campaign made it feasible for workers to travel from the countryside to the city for work. Despite employment in local industries, some farmers continued to farm on a small scale to supplement their factory incomes. By 1920, only half of the county's population was living on the farm and by 1930 the average farm size was reduced to 20 acres. By 1940, more than half of the 1,500 farms in operation were run by tenant farmers. They generally operated on the margins of the agricultural economy with little hope for improvement to their social conditions (Little 1991).

Durham County farmers tried to capitalize on the City of Durham's status as a tobacco manufacturing and trading center. By 1921, 50 percent of the farmers in the county belonged to a new farmer's cooperative, the Tobacco Growers Cooperative Association. However, these efforts resulted in an oversupply of tobacco in the 1930s, which drove down the prices farmers were offered for their crop. As a result, a system of tobacco quotas was implemented in 1933 to help stabilize prices. Over 90 percent of Durham County farmers participated in the tobacco quota system and 70 percent enrolled in the parallel system of cotton quotas. Quotas were intended to help farmers recover from the Depression; however, World War II limited the success of the quota programs as did the loss of available farm labor caused by the war (Little 1991). Other efforts to help farmers were the establishment of a new farmer's cooperative, the

Durham Farmers Mutual Exchange in 1930, and a curb market in Durham where farmers could sell their goods directly to the public (Little 1991).

World War II's effect on Durham County perpetuated the exodus from farms to the city with few veterans choosing to return to the family farm. In 1942, Camp Butner, a large infantry training camp, was constructed in the northeast corner of the county. The camp also encompassed land in Granville and Person counties. The construction of Camp Butner removed large swaths of farm land from cultivation. Four hundred families and 125 farms were displaced for its construction (Little 1991).

Durham County's rural acreage continues to diminish. In 2007, 242 Durham County farmers were tending a total of 26,150 acres out of a total of 69,000 acres. Most farmers work on a small-scale or as a hobby, as half of the farms produce less than $2,500 worth of sales per year. Today, nursery and greenhouse production constitute two-thirds the county's agricultural economy. Cattle farming provides $1.1 million to the local economy. The once dominant tobacco crop is grown on only 275 acres and contributes $839,000. Forage and hay are grown on 2,200 acres, while wheat, corn, and soybeans combined are grown on 2,000 acres (Cohn 2009). New residential subdivisions, shopping centers, the Research Triangle Park (RTP) and the expansion of the Raleigh-Durham International Airport continue to change the county's landscape.

As Durham County's rural population diminished in the first half of the twentieth century, the City of Durham's population grew. This growth trend can be attributed to the establishment of tobacco factories and warehouses and cotton mills, which provided a solid base for the city's economy and stimulated its overall economic climate. Durham also became known as a national center for African American-owned businesses such as the North Carolina Mutual and Provident Society (today known as the North Carolina Mutual Insurance Company) and the Mechanics and Farmers Bank. A four-block area on Parrish Street became known as "Black Wall Street," named after the financial center in New York City. Another African American residential and business neighborhood known as "Hayti," grew up around Pettigrew and Fayetteville streets. The physical fabric of Hayti was mostly destroyed by urban renewal and the construction of NC 147 in the mid-twentieth century.

Education and research became major economic drivers in the twentieth century. Trinity College relocated to Durham in 1892 from its original site near Trinity, in Randolph County, and was renamed Duke University in 1924. In 1910, James Shepard established the National Religious Training School and Chautauqua for the Colored Race to train African American teachers and missionaries. The institution became the first public liberal arts college for African Americans in the nation and was renamed North Carolina Central University in 1969 (North Carolina Central University 2018; Richardson 2013).

Despite a growing population, the City of Durham encountered economic difficulties after World War II. Between 1947 and 1959, industrial employment in Durham dropped 19 percent and the city declined from second to fourth place among manufacturing cities in the Piedmont (Richardson 2013). To counteract this trend, the RTP corporate office park was established in eastern Durham County in the early 1950s. The park was a collaborative effort between Duke University and the University of North Carolina at Chapel Hill. In the late 1950s, Durham's director of city planning commissioned the University of North Carolina's Department of City and Regional Planning to study how Durham might reverse its economic slide. An urban renewal plan for a 200-acre area of Hayti was developed. Promises of compensation and "better accommodations" for Hayti's residents were not kept. This resulted in tension between the city's black residents and both black and white political leaders (Richardson 2013).

The 1960s saw a period of activity around the struggle for civil rights and equality that reflected that of the larger national movement. In 1953, Rencher Nicholas Harris, the first successful black candidate, was

elected to city council. The 1959-1960 school year saw the integration of the all-white Brogden Junior High School by eight African American students. In the 1970-1971 school year, court-ordered racial integration fully integrated all of Durham's public schools. African American residents conducted sit-ins at Durham's downtown Woolworth's lunch counter in 1960, and Martin Luther King, Jr. visited the protestors. During 1962, the Durham's Howard Johnson's restaurant was the site of repeated sit-ins and demonstrations. By the end of 1963, many of the city's public facilities were integrated (Richardson 2013).

The last of the city's cotton mills closed in 1986. The last tobacco manufacturing operation, Liggett and Meyers, left Durham in 1999 (Richardson 2013). Despite these losses, the city has reinvented itself as a technical and medical center. Durham County is home to RTP, the site of 170 major research and development companies, including Bayer, GlaxoSmithKline, IBM, Underwriters Laboratories, and federal agencies such as the Environmental Protection Agency. There are over 39,000 full-time positions at RTP (Durham Convention and Visitors Bureau 1996). Duke University and North Carolina Central University are leading educational and research institutions within the City of Durham. The city is also a national leader in medical research and health care. The redevelopment of old mills, warehouses and factories in the downtown urban core is facilitating an influx of both tech and startup businesses and residents.

3.9 Expected Archaeological Site Types

Based on the precontact and historic contexts, archaeological resources from all periods are expected in the North Carolina Piedmont. Precontact sites are located across environmental zones but are most common adjacent to water sources on level terrain with well-drained soils. Exceptions to this pattern may be related to the activities that were conducted and duration of occupation. Sites from the historic period may include a range of types such as dwellings, farmsteads, mills, cemeteries, stills, and refuse scatters. Certain site types, such as mills, are located in restricted settings because of specific needs. Because of the linear nature of the overall study corridor and its highly developed condition, the small sizes of the specific areas investigated for the Proposed Refinements, and results of earlier archaeological survey, archaeological potential was expected to be low.

4. Research Methods

4.1 Background Research

Background research included a visit to the North Carolina OSA to review information on previously recorded site locations and their reports library, a review of historic maps of the area, review of the North Carolina SHPO's HPOWEB (http://gis.ncdcr.gov/hpoweb/), and review of NRHP listings. Historic map review of Durham County included the D.G. McDuffie Map (1881), C. M. Miller Map (1914), Wells & Brinkley Map (1920), and North Carolina State Highway Map (1938). Each of these maps shows varying levels of detail, and they are informative regarding the presence of potential historic buildings that may also have associated archaeological deposits. Archaeological sites that were previously considered as part of the original APE are shown in Table 4-1.

Table 4-1: Previously Recorded Archaeological Sites within Draft APE of D-O LRT Project

Site Number	Site Type	NRHP Eligibility	Comments
Orange County			
31OR033	Unknown	Unevaluated	Recorded in 1979; no details provided on site form
31OR275	Prehistoric	Not eligible	Previously destroyed by golf course construction
31OR306**	Historic	Not eligible	Phase II Testing determined site not eligible; destroyed by Meadowmont development
31OR474/ 474**	Prehistoric and historic	Not eligible	Previously destroyed by golf course construction
31OR477	Prehistoric	Not eligible	Previously destroyed by golf course construction

Table 4-1 (Cont'd): Previously Recorded Archaeological Sites within Draft APE of D-O LRT Project

Site Number	Site Type	NRHP Eligibility	Comments
Durham County			
31DH029	Prehistoric	Not eligible	Largely destroyed by cultivation
31DH209/ 209**	Prehistoric and historic	Not eligible	Largely destroyed by cultivation and erosion
31DH210	Prehistoric	Not eligible	Largely destroyed by cultivation and erosion
31DH214	Prehistoric	Not eligible	Largely destroyed by cultivation
31DH215**	Historic	Potentially eligible	Historic location of Barbee family's first homestead (1785-1810); later a school and church (19th century); likely destroyed by construction of I-40
31DH615**	Historic	Not eligible	Previously destroyed by Meadowmont development
31DH654**	Historic	Not eligible	Identified during Wake-Durham Regional Rail project
31DH655**	Historic	Potentially eligible	Identified during Wake-Durham Regional Rail project; Phase II testing recommended
31DH656**	Historic	Potentially eligible	Identified during Wake-Durham Regional Rail project; Phase II testing recommended
31DH657**	Historic	Not eligible	Identified during Wake-Durham Regional Rail project
31DH658**	Historic	Not eligible	Identified during Wake-Durham Regional Rail project
31DH659**	Historic	Not eligible	Identified during Wake-Durham Regional Rail project
31DH669**	Historic	Potentially eligible	Identified during Wake-Durham Regional Rail project
31DH758**	Historic	Not eligible	Identified during 2015-2016 D-O LRT project
Potential Site 1 (PS-1)	Historic	Potentially eligible	Identified during Wake-Durham Regional Rail project
Potential Site 3 (PS-3)	Historic	Potentially eligible	Identified during Wake-Durham Regional Rail project
Potential Site 5 (PS-5)	Historic	Potentially eligible	Identified during Wake-Durham Regional Rail project

4.2 Archaeological Field Methods

Archaeological field methods followed North Carolina OSA's Archaeological Investigations *Standards and Guidelines for Background Research, Field Methodologies, Technical Reports, and Curation* (2017). Within the designated survey areas, shovel tests were excavated at 100-foot (30-m) intervals and measured approximately 30-centimeters in diameter. The soil from all shovel tests was screened through 0.25-inch mesh hardware cloth for artifact recovery. Shovel tests were excavated until sterile subsoil, bedrock, or the water table was encountered. Transect placement depended on the size and configuration of individual survey parcels. Transects and shovel tests locations were determined with pre-plotted grids created within ArcGIS. Shovel test results (including soil color, texture, depths, and outcomes with respect to cultural material) were documented using standardized forms entered with smart phone technology.

Shovel test and site locations were established and recorded with GPS equipment capable of sub-meter accuracy. See shovel test logs at Appendix F1-B.

4.3 Archaeological Laboratory Methods

No artifacts were recovered, and no laboratory analysis was necessary.

4.4 Curation and Reporting

All data relevant to the studies conducted are included in this report. Digital copies will be submitted to North Carolina OSA with the final report. See Appendix F1-C for the resumes of the Principal Investigator and co-authors of this report.

4.5 NRHP

Historic properties, defined as districts, sites, buildings, objects, or structures, are evaluated based on criteria specified by the Department of Interior Regulations 36 CFR Part 60: National Register of Historic Places. Historic properties can be defined as significant if they "possess integrity of location, design, setting, materials, workmanship, feeling, and association," and if they are 50 years of age or older and:

A) Are associated with events that have made a significant contribution to the broad patterns of our history (history); or
B) Are associated with the lives of persons significant in our past (person); or
C) Embody the distinctive characteristic of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that components may lack individual distinction (architecture); or
D) Have yielded, or may be likely to yield, information important in prehistory or history (archaeology).

National Register Bulletin 15 recommends the following sequence for NRHP evaluation (National Register of Historic Places 1997):

- Categorize the property;
- Determine which historic context(s) the property represents;
- Determine whether the property is significant under the NRHP Criteria;
- Determine if the property represents a type usually excluded from the NRHP;
- Determine whether the property maintains integrity.

4.5.1 Significance

Under Criteria A, B, and C, an archaeological property must have demonstrated its ability to convey its significance, while under Criterion D, only the potential to yield information is required (Hardesty 2000:33; King 1998:77–80). Under Criterion A, the strength of the property's specific association must be considered important (Hardesty and Little 2000:33). Typically, significance is conveyed through the presence of visible remains, although sites with buried (i.e., non-visible) intact features and patterning might represent important events or themes. According to Hardesty and Little (2000:33), the required steps include 1) identifying the associated historical pattern or event, 2) documenting the importance of the pattern or event to national, state, or local history, 3) demonstrating the strength of association between the event or pattern and the archaeological remains of the site, and 4) assessing the integrity of the archaeological remains.

The application of Criterion B requires that there are no other properties that represent the person in question (Hardesty and Little 2000:34). Sufficient information must be provided about the important person and the strength of the connection to the archaeological site in question. According to Hardesty and Little (2000:34–35), the required steps include 1) identifying the important person(s) associated with the property, 2) documenting the importance of the person in the context of national, state, and local history, 3) demonstrating the strength of the association between the person(s) and the property, and 4) assessing the property's integrity.

Under Criterion C, archaeological sites may be significant if they illustrate or interpret a historic property that is strongly associated with a distinctive architectural or engineering pattern or style or type (Hardesty and Little 2000:35). Visible remains more easily convey their significance, although a well-preserved archaeological site with evidence for buildings, features, activity areas, and community organization might represent a distinctive design. According to Hardesty and Little (2000:35–36), the required steps include 1) identifying the distinctive architectural or engineering characteristics of the property, 2) documenting the importance of the architectural or engineering pattern or type or style in the context of national, state, or local history, 3) evaluating the how strongly the property illustrates the distinctive architectural or engineering characteristics, and 4) assessing the property's integrity.

Under Criterion D, archaeological sites may be significant if they are important to scientific or scholarly research (Hardesty and Little 2000:37). Information is defined as the datasets that a site contains, such as artifacts, ecofacts, and features. According to Hardesty and Little (2000:37–38), the required steps include 1) identifying the property's datasets or categories of information, 2) identifying the appropriate historical and archaeological contexts, 3) documenting why the information is important to scientific and scholarly research, and 4) assessing the property's integrity.

In general, there are several factors that influence evaluations of eligibility, particularly under Criterion D. The most important include sites with sufficient artifact density and diversity to generate information regarding spatial patterning, technology, adaptations, behavior, and lifeways. The presence of clear spatial patterning, either vertically or horizontally, and stratigraphic context are important variables. The presence or absence of known or suspected features can also be critical because of the information they often contain. Sites that represent types, components, or periods that are rare or relatively unknown can be important, even if they lack other variables such as high artifact density (e.g., Paleoindian). Specialized locations such as seeps or raw material outcrops may have been important as well.

4.5.2 Integrity

The NRHP defines seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association (National Register of Historic Places 1997; Townsend et al. 1993). Although the evaluation of integrity is somewhat subjective, it must be grounded in an understanding of the site's physical features/condition and how they relate to its significance (Townsend et al. 1993). The importance of each aspect of integrity varies depending on which criteria the property meets. As noted by Townsend et al. (1993:36), "assessment of integrity must come after an assessment of significance: significance + integrity = eligibility." To properly assess integrity, one must first define the essential physical qualities that must be present for the property to represent its significance. For archaeological sites, integrity is generally considered to be high when soils, artifact deposits, spatial patterning, and features are intact and relatively unaltered.

5. Results of Investigations

5.1 Background Research Results

5.1.1 Leigh Village Station

No previously recorded archaeological sites are located directly in the Proposed Refinements APE; however, there are 21 sites within a one-mile radius [Table 5-1, Figure 5-1 (redacted per N.C.G.S. 70-18)]. Thirteen sites have only precontact components, three sites have only historic components, and five sites have both precontact and historic components. The higher number of sites and diversity of types, especially for the precontact period, is likely due to the proximity to larger water bodies, favorable landforms, and more comprehensive survey coverage. Site 31DH758 is located in the Previous Design APE and was recommended not eligible for the NRHP.

Table 5-1: Summary of Previously Recorded Archaeological Sites within One Mile of Leigh Village Station

Site Number	Cultural Component(s)	NRHP Status
31DH1a	Precontact	Unknown
31DH1b	Precontact	Unknown
31DH1c	Precontact	Unknown
31DH3	Precontact	Unknown
31DH19	Precontact	Unknown
31DH22	Precontact	Unknown
31DH205	Precontact	Unknown
31DH209	Precontact and Historic	Unknown
31DH210	Precontact	Unknown
31DH211	Precontact	Unknown
31DH212	Precontact	Unknown
31DH213	Precontact	Unknown
31DH214	Precontact	Unknown
31DH215	Historic	Unknown
31DH216	Precontact and Historic	Unknown
31DH217	Precontact and Historic	Unknown
31DH218	Precontact and Historic	Unknown
31DH351	Precontact	National Register Listed
31DH628	Historic	National Register Listed
31DH705	Precontact and Historic	Unknown
31DH758	Historic	Not Eligible

Please note:
Page 5-2 containing Figure 5-1 is redacted pursuant to N.C.G.S. 70-18
Page 5-4 containing Figure 5-2 is redacted pursuant to N.C.G.S. 70-18
Page 5-5 containing Figure 5-3 is redacted pursuant to N.C.G.S. 70-18

Figure 5-1. Redacted (pursuant to N.C.G.S. 70-18)

5.1.2 Gateway Station

No previously recorded archaeological sites are located directly in the revised APE; however, five archaeological sites are located within a one-mile radius [Table 5-2, Figure 5-2 (redacted per N.C.G.S. 70-18)]. Sites 31DH10, 31DH11, 31DH29, and 31DH220 all have precontact components. Site 31DH218 has both precontact and historic components. None of the five previously recorded sites have been assessed for the NRHP.

Table 5-2: Summary of Previously Recorded Archaeological Sites within One Mile of Gateway Station

Site Number	Cultural Component(s)	NRHP Status
31DH10	Precontact	Unknown
31DH11	Precontact	Unknown
31DH29	Precontact	Unknown
31DH218	Precontact and Historic	Unknown
31DH220	Precontact	Unknown

5.1.3 Erwin Road/LaSalle Street

No previously recorded archaeological sites are located directly in the revised APE. Previously recorded site 31DH653 is located within one-mile of the APE [Figure 5-3 (redacted per N.C.G.S. 70-18)]. This is an historic site that was recommended not eligible for the NRHP. The single site and highly urban nature of the area around Erwin Road suggested a low probability for additional sites in the revised APE. However, additional analysis was recommended for this area because of the scale of the Proposed Refinements and moderate probability for intact archaeological sites based on review of aerial photography and topographic maps.

5.2 Results of Phase I Archaeological Survey

Additional archaeological analysis was conducted for Proposed Refinements associated with Leigh Village Station, Gateway Station, and the Erwin Road/LaSalle Street location. The field survey required six person days to complete.

5.2.1 Leigh Village Station

The Leigh Village Station study area consists of forested land surrounded by residential and commercial development (Figure 5-4). Portions of the area are drained by an unnamed stream that flows south into Jordan Lake. Shovel testing indicated a shallow water table (i.e., less than 30 cm) in many tests in upland locations. Vegetation is open hardwoods and mature forest with limited undergrowth. Residences are located in neighborhoods along the eastern and southern portions of the survey area.

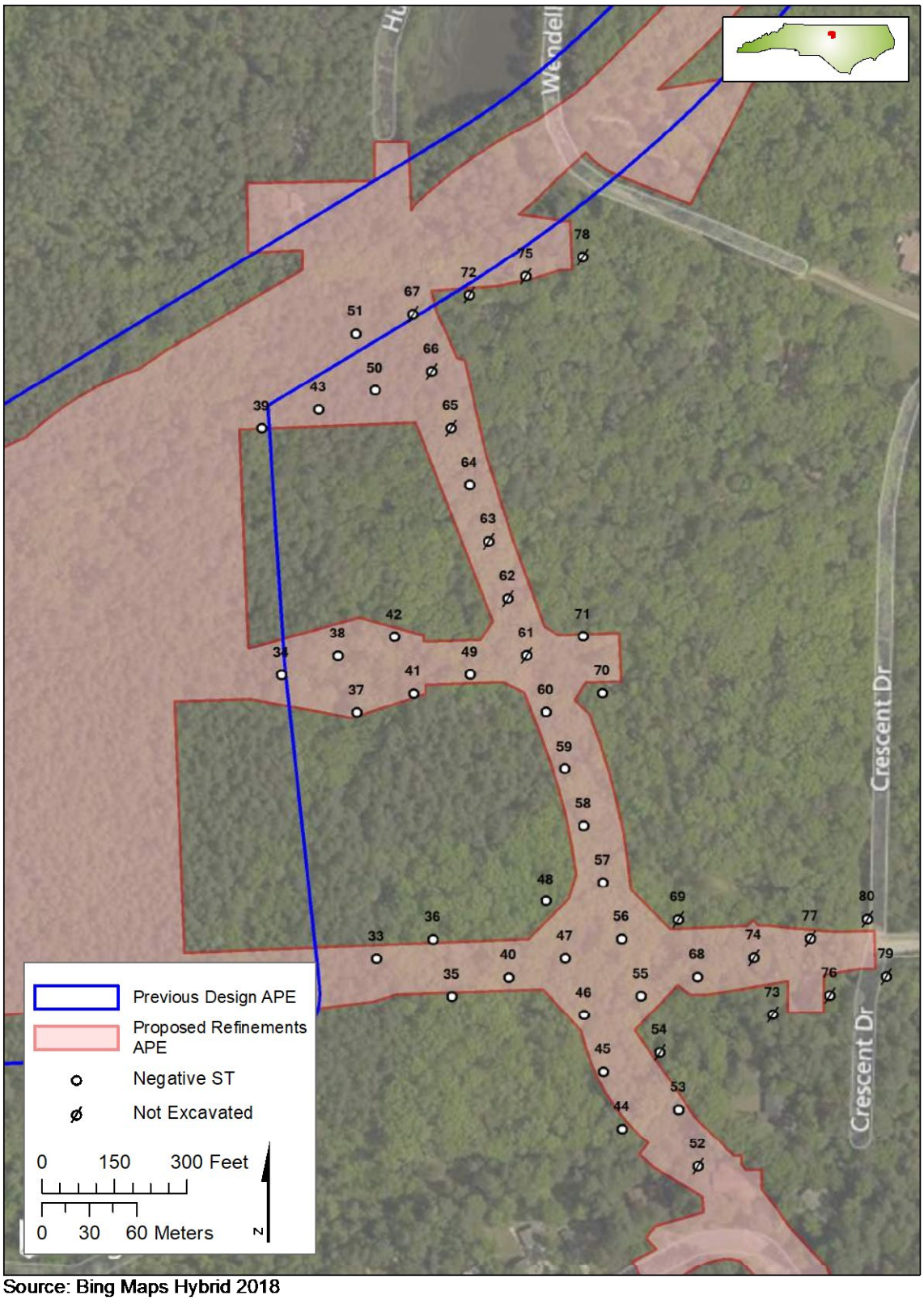
Investigations in this area included 48 shovel test locations (Figure 5-5). Of these locations, 18 were not excavated because of existing conditions that included ongoing construction (Shovel Tests 79 and 80), residential lots (Shovel Tests 52, 73, 74, 76, and 77), and/or surface water (Shovel Tests 54, 61, 62, 63, 65, 66, 67, 69, 72, 75, and 78). The remaining 30 shovel tests were negative and did not yield cultural material (Table 5-3, Figure 5-6).

Figure 5-2: Redacted (pursuant to N.C.G.S. 70-18)

Figure 5-3: Redacted (pursuant to N.C.G.S. 70-18)

Figure 5-4: General View of Leigh Village, Looking East

Figure 5-5: Photograph of Shovel Test 44



Source: Bing Maps Hybrid 2018

Figure 5-6: Map Showing Shovel Test Locations and Results for Leigh Village Station

Table 5-3: Summary of Shovel Tests in the Leigh Village Station Study Area

STP ID	Result	Stratum	Depth (cmbs)	Color	Texture	Notes
33	Negative	I	0-15	Strong Brown	Clay	
34	Negative	I	0-15	Dark Brown	Loam	
	Negative	II	15-25	Reddish Brown	Clay Loam	
35	Negative	I	0-12	Dark Brown	Loam	
	Negative	II	12-30	Brownish Yellow	Loam	
	Negative	III	30-40	Reddish Yellow	Silty Loam	
36	Negative	I	0-5	Dark Brown	Loam	
	Negative	II	5-16	Brownish Yellow	Loam	
	Negative	III	16-26	Yellowish Red	Clay Loam	
37	Negative	I	0-20	Pale Brown	Silty Clay	Hydric
38	Negative	I	0-5	Dark Brown	Silt	
	Negative	II	5-25	Strong Brown	Clay Loam	
39	Negative	I	0-10	Brown	Loam	
	Negative	II	10-20	Strong Brown	Silty Loam	
40	Negative	I	0-20	Pale Brown	Silty Clay Loam	Field road
41	Negative	I	0-15	Strong Brown	Clay	
42	Negative	I	0-10	Dark Brown	Loam	
	Negative	II	10-25	Yellowish Brown	Silty Loam	
	Negative	III	25-35	Brownish Yellow	Silty Loam	
43	Negative	I	0-5	Dark Brown	Loam	
	Negative	II	5-20	Brownish Yellow	Clay Loam	
	Negative	III	20-25	Yellowish Red	Clay	
44	Negative	I	0-10	Dark Brown	Loam	
	Negative	II	10-20	Brownish Yellow	Loam	
	Negative	III	20-30	Reddish Yellow	Silty Loam	
45	Negative	I	0-5	Dark Brown	Loam	
	Negative	II	5-30	Brownish Yellow	Loam	Wet
46	Negative	I	0-10	Dark Brown	Loam	
	Negative	II	10-36	Brownish Yellow	Silty Loam	Wet
47	Negative	I	0-10	Brown	Silty Clay Loam	
	Negative	II	10-20	Brown	Silty Clay	
48	Negative	I	0-17	Pale Brown	Silty Clay Loam	
	Negative	II	17-27	Strong Brown	Clay	
49	Negative	I	0-15	Pale Brown	Silty Clay	Hydric

Table 5-3 (Cont'd): Summary of Shovel Tests in the Leigh Village Station Study Area

STP ID	Result	Stratum	Depth (cmbs)	Color	Texture	Notes
50	Negative	I	0-10	Dark Brown	Loam	
	Negative	II	10-20	Red	Clay	
51	Negative	I	0-16	Brownish Yellow	Loam	
	Negative	II	16-26	Yellowish Red	Clay	
52	Not Excavated	NA	NA	NA	NA	House and yard
53	Negative	I	0-5	Dark Brown	Loam	
	Negative	II	5-25	Brownish Yellow	Loam	
	Negative	III	25-30	Light Gray	Silty Loam	
54	Not Excavated		NA	NA	NA	Wet
55	Negative	I	0-10	Dark Brown	Loam	Wet
	Negative	II	10-30	Brownish Yellow	Silty Loam	
56	Negative	I	0-10	Grayish Brown	Silty Clay Loam	
	Negative	II	10-20	Pale Brown	Silty Clay	Hydric
57	Negative	I	0-24	Dark Grayish Brown	Silty Clay Loam	
	Negative	II	24-30	Strong Brown	Clay	
58	Negative	I	0-32	Dark Brown	Silty Clay Loam	Hydric
59	Negative	I	0-10	Dark Brown	Loam	
	Negative	II	10-30	Brownish Yellow	Loam	
60	Negative	I	0-25	Pale Brown	Silty Clay	
61	Not Excavated	NA	NA	NA	NA	Wet
62	Not Excavated	NA	NA	NA	NA	Wet
63	Not Excavated	NA	NA	NA	NA	Wet
64	Negative	I	0-10	Dark Brown	Loam	
	Negative	II	10-20	Dark Yellowish Brown	Clay Loam	Wet
65	Not Excavated	NA	NA	NA	NA	Wet
66	Not Excavated	NA	NA	NA	NA	Wet
67	Not Excavated	NA	NA	NA	NA	Wet

Table 5-3 (Cont'd): Summary of Shovel Tests in the Leigh Village Station Study Area

STP ID	Result	Stratum	Depth (cmbs)	Color	Texture	Notes
68	Negative	I	0-10	Dark Brown	Loam	
	Negative	II	10-20	Brownish Yellow	Loam	
	Negative	III	20-30	Brownish Yellow	Loam	
69	Not Excavated	NA	NA	NA	NA	House/yard
70	Negative	I	0-10	Dark Brown	Loam	
	Negative	II	10-23	Brownish Yellow	Loam	
	Negative	III	23-30	Yellowish Red	Clay Loam	
71	Negative	I	0-10	Dark Brown	Loam	
	Negative	II	10-27	Brownish Yellow	Loam	
	Negative	III	27-32	Yellowish Red	Clay Loam	
72	Not Excavated	NA	NA	NA	NA	House/yard
73	Not Excavated	NA	NA	NA	NA	House/yard
74	Not Excavated	NA	NA	NA	NA	Back yard
75	Not Excavated	NA	NA	NA	NA	House/yard
76	Not Excavated	NA	NA	NA	NA	House/yard
77	Not Excavated	NA	NA	NA	NA	Residential
78	Not Excavated	NA	NA	NA	NA	House/yard
79	Not Excavated	NA	NA	NA	NA	House/yard
80	Not Excavated	NA	NA	NA	NA	Construction

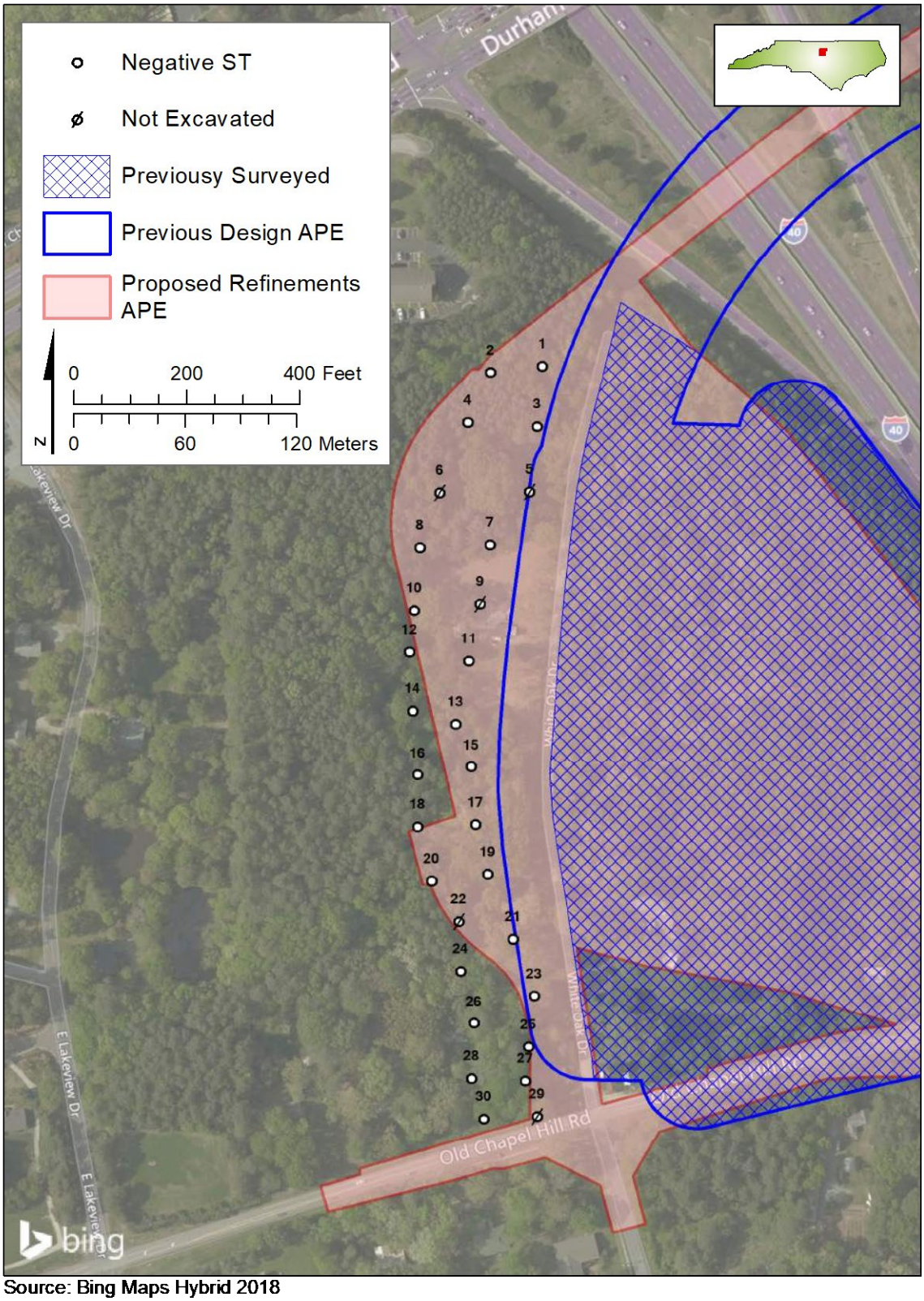
5.2.2 Gateway Station

The Gateway Station study area is mostly forested with interspersed residential development. Vegetation consists of mature hardwood forest and limited undergrowth (Figure 5-7). An intermittent stream runs through a small section of the study area.

Investigations in this area included 30 shovel test locations (Figure 5-8). Of these locations, five were not excavated because of modern disturbances such as extant houses (Shovel Tests 5 and 6), utility lines (Shovel Test 9), grading and land alteration (Shovel Test 22), or limits of the APE (Shovel Test 29). All of the excavated shovel tests were negative and did not yield cultural material (Table 5-4, Figure 5-9).

Figure 5-7: General View of Gateway Station, Looking North

Figure 5-8: Photograph of Shovel Test 8



Source: Bing Maps Hybrid 2018

Figure 5-9: Map Showing Shovel Test Locations and Results for Gateway Station

Table 5-4: Summary of Shovel Tests in the Gateway Station Study Area

STP ID	Result	Stratum	Depth (cmbs)	Color	Texture	Notes
1	Negative	I	0-33	Light Brown	Sandy Clay Loam	
		II	33-44	Yellowish Red	Clay	
2	Negative	I	0-10	Dark Brown	Loam	
		II	10-25	Brown	Sandy Loam	
		III	25-35	Reddish Brown	Clay	
3	Negative	I	0-18	Light Brown	Sandy Clay Loam	
		II	18-28	Yellowish Red	Clay	
4	Negative	I	0-10	Dark Brown	Loam	
		II	10-25	Brown	Sandy Loam	
		III	25-35	Reddish Brown	Clay	
5	Not Excavated	NA	NA	NA	NA	House
6	Not Excavated	NA	NA	NA	NA	Back yard
7	Negative	I	0-13	Dark Brown	Loam	
		II	13-26	Light Brown	Sandy Clay Loam	
		III	26-34	Yellowish Red	Clay	
8	Negative	I	0-5	Brown	Loam	
		II	5-27	Light Brown	Loam	
		III	27-37	Red	Clay	
9	Not Excavated	NA	NA	NA	NA	Water and gas line
10	Negative	I	0-5	Dark Brown	Loam	
		II	5-20	Brown	Clay Loam	
		III	20-30	Yellow	Silt Loam	
11	Negative	I	0-26	Reddish Brown	Clay Loam	
		II	26-38	Reddish Brown	Clay Loam	Mottled with grey and light brown clay
		III	38-46	Dark Red	Clay	
12	Negative	I	0-8	Dark Brown	Loam	
		II	8-25	Brown	Loam	
		III	25-38	Reddish Yellow	Silt Loam	

Table 5-4 (Cont'd): Summary of Shovel Tests in the Gateway Station Study Area

STP ID	Result	Stratum	Depth (cmbs)	Color	Texture	Notes
13	Negative	I	0-14	Dark Brown	Loam	
		II	14-25	Light Brown	Clay Loam	
		III	25-33	Red	Clay	
14	Negative	I	0-10	Dark Brown	Loam	
		II	10-30	Tan	Loam	
		III	30-50	Reddish Brown	Silt Loam	Wet
15	Negative	I	0-14	Dark Brown	Loam	
		II	14-53	Light Brown	Sand	
		III	53-60	Yellowish Red	Clay	
16	Negative	I	0-15	Brown	Silt Loam	
		II	15-28	Reddish Yellow	Clay	
17	Negative	I	0-38	Light Brown	Clay Loam	Mottled with red yellow clay; water @38cm
18	Negative	I	0-5	Dark Brown	Loam	
		II	5-20	Brown	Loam	
		III	20-30	Reddish Yellow	Silty Clay	
19	Negative	I	0-45	Light Brown	Clay Loam	
		II	45-53	Yellowish Red	Clay	Wet
20	Negative	I	0-10	Dark Brown	Loam	
		II	10-20	Brown	Silt Loam	Water @20 cmbs
21	Negative	I	0-35	Light Brown	Clay Loam	
22	Not Excavated		NA	NA	NA	Area heavily disturbed by push piles. Appears to have been graded at some point.
23	Negative	I	0-17	Dark Brown	Loam	
		II	17-35	Light Brown	Sandy Clay Loam	Root impasse @ 35cm; soil turning to yellow red clay with degrading iron chunks
24	Negative	I	0-16	Brown	Loam	
			16-26	Reddish Yellow	Clay	

Table 5-4 (Cont'd): Summary of Shovel Tests in the Gateway Station Study Area

STP ID	Result	Stratum	Depth (cmbs)	Color	Texture	Notes
25	Negative	I	0-22	Dark Brown	Loam	
		II	22-33	Pale Red	Clay	Mottled with grey and red clay and degrading iron chunks
26	Negative	I	0-26	Brown	Loam	
		II	26-30	Reddish Brown	Silt Loam	
27	Negative	I	0-18	Dark Brown	Loam	
		II	18-41	Light Brown	Clay Loam	
		III	41-49	Yellowish Red	Clay	
28	Negative	I	0-28	Brown	Sandy Loam	
		II	28-40	Brown	Sandy Loam	
29	Not Excavated	NA	NA	NA	NA	Surface disturbance
30	Negative	I	0-10	Brown	Loam	
		II	10-30	Yellow	Silt Loam	Water @30 cmbs

5.2.3 Erwin Road/LaSalle Street

The Erwin Road and LaSalle Street study area is located on Duke University property and is mostly forested. Vegetation consists of mixed pines and limited undergrowth (Figure 5.10). The study area is located on a rise above the surrounding terrain and is surrounded by modern development.

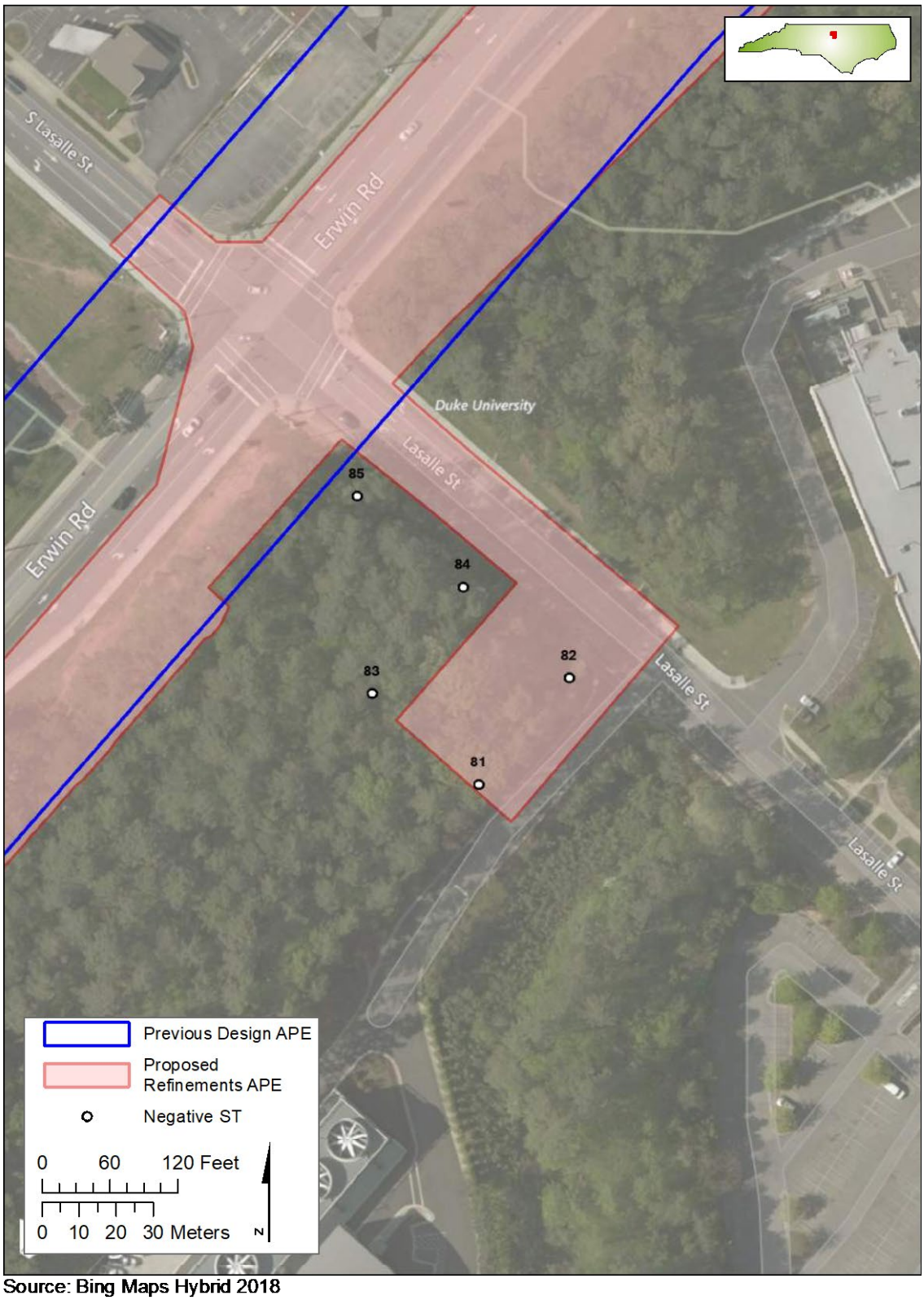
Investigations in this area included five shovel test locations (Figure 5.11). All of the excavated shovel tests were negative and did not yield cultural material. Shovel tests showed consistent profiles indicating shallow deposits indicative of fill episodes (Table 5-5, Figure 5.12).

Table 5-5: Summary of Shovel Tests in the Erwin Road and LaSalle Street Study Area

STP ID	Result	Stratum	Depth (cmbs)	Color	Texture	Notes
81	Negative	I	0-20	Light Yellowish Brown	Clay Loam	Mottled fill
82	Negative	I	0-20	Light Yellowish Brown	Clay Loam	Mottled fill
83	Negative	I	0-40	Yellowish Brown	Sandy Loam	Fill from road construction
		II	40-50	Pale Brown	Sandy Clay	
84	Negative	I	0-100	Yellowish Brown	Sandy Loam	
85	Negative	I	0-25	Strong Brown	Silt Loam	
		II	25-40	Light Brownish Gray	Clay Loam	

Figure 5-10: General View of Erwin Road/LaSalle Street, Looking Southwest

Figure 5-11: Photograph of Shovel Test 81



Source: Bing Maps Hybrid 2018

Figure 5-12: Map Showing Shovel Test Locations and Results for Erwin Road/LaSalle Street

6. Summary and Recommendations

6.1 Summary

The D-O LRT Project will cover a distance of approximately 17.7 miles and provide 18 transit stations. Included in the Proposed Refinements is one additional station at Blackwell/Mangum Streets, bringing the total number of light rail stations to 19. The Proposed Refinements have resulted in slight modifications to the APE. Three areas were recommended for additional archaeological survey: Leigh Village Station (9.7 ac.), Gateway Station (5.8 ac.), and a small area near Erwin Road/LaSalle Street (0.6 ac.). All of the proposed changes were in Durham County for a total of 16.1 acres surveyed.

No archaeological resources were located or identified in any of the study areas. These results are consistent with previous work and expectations for this portion of the Piedmont given the highly developed nature of the study corridor. No additional archaeological work is recommended for the design changes considered in this analysis.

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Attachments

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Attachment F-1a: Maps Showing Archaeological APE

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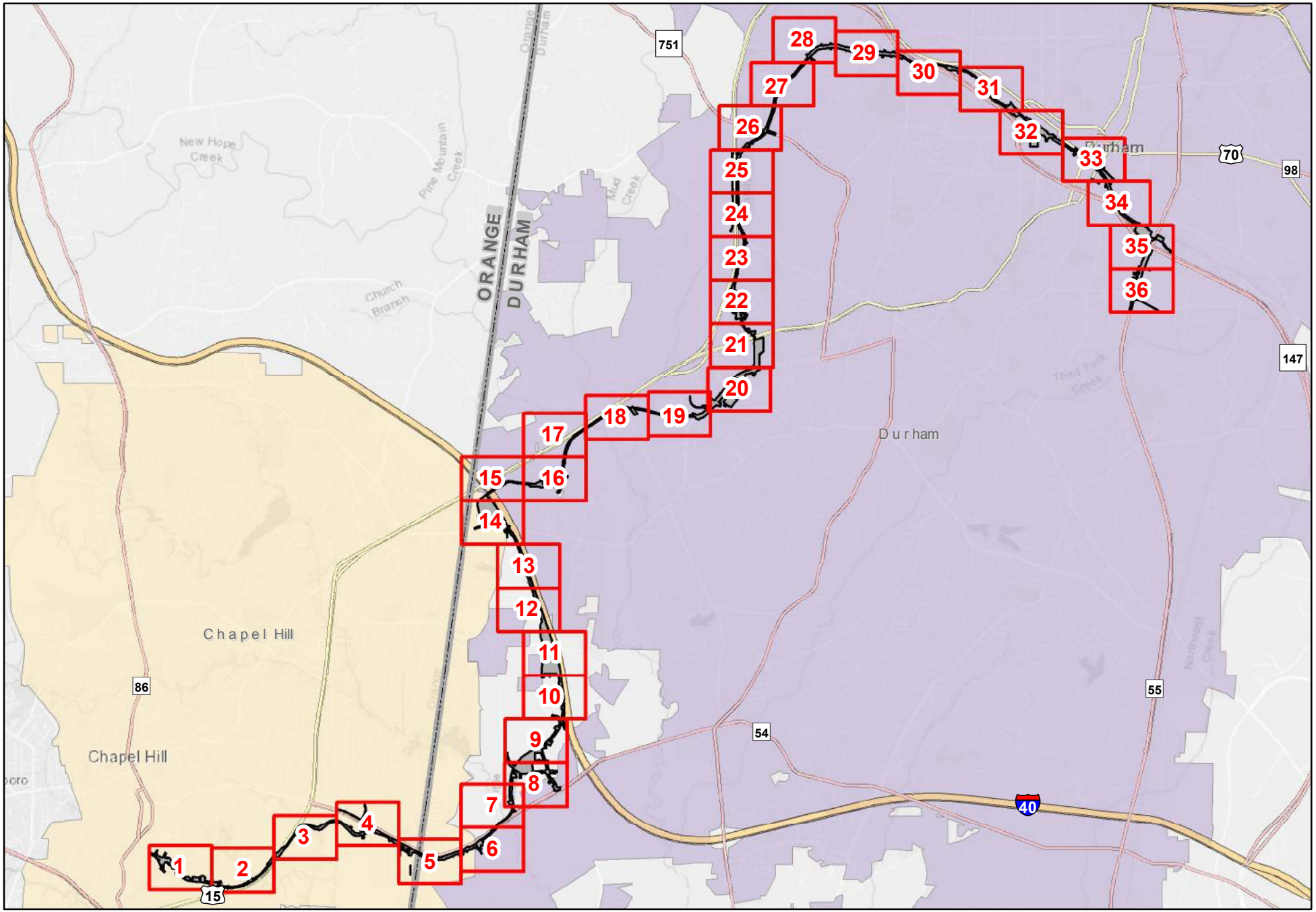

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DURHAM-ORANGE LIGHT RAIL TRANSIT PROJECT

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Grid Index

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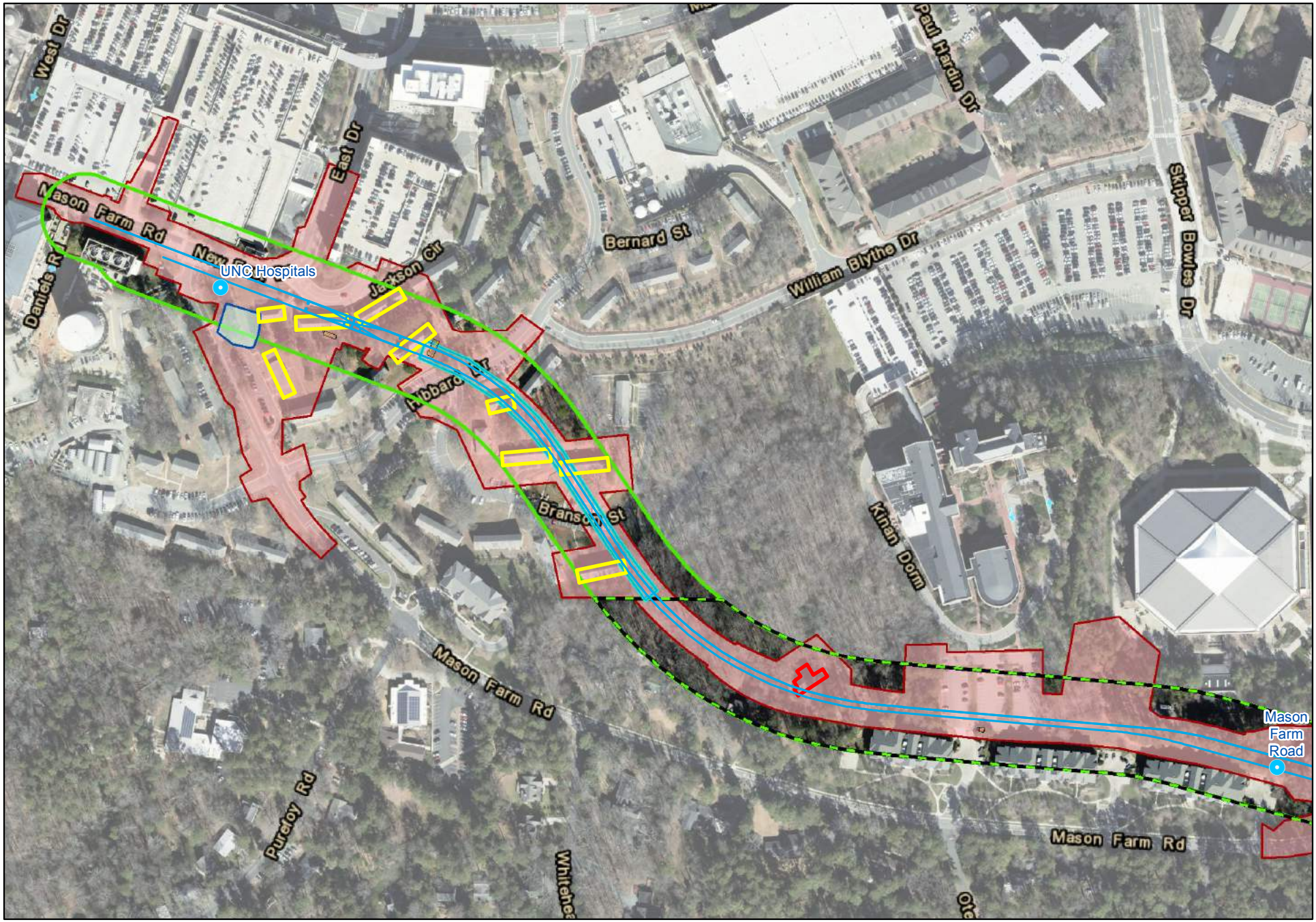

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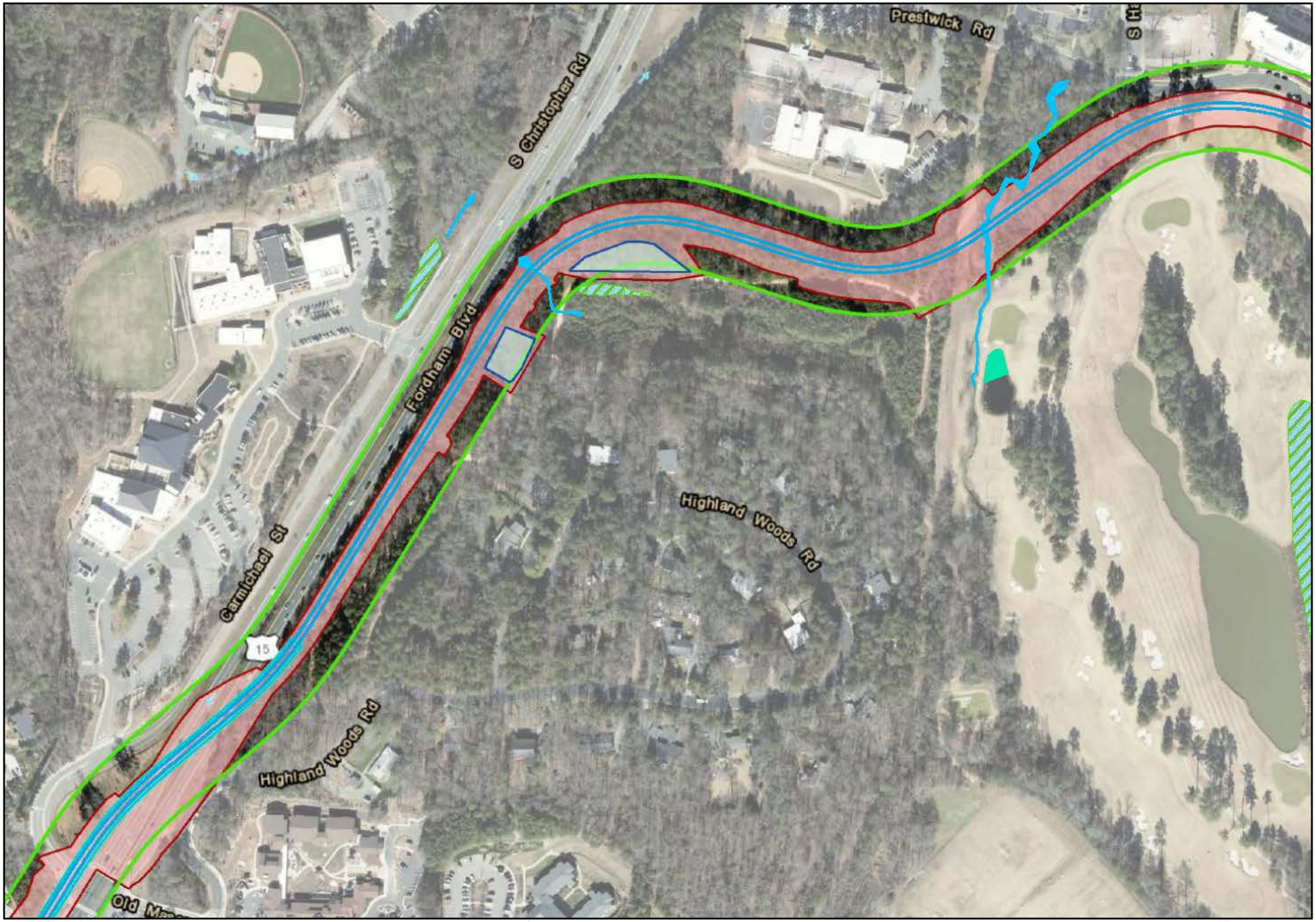

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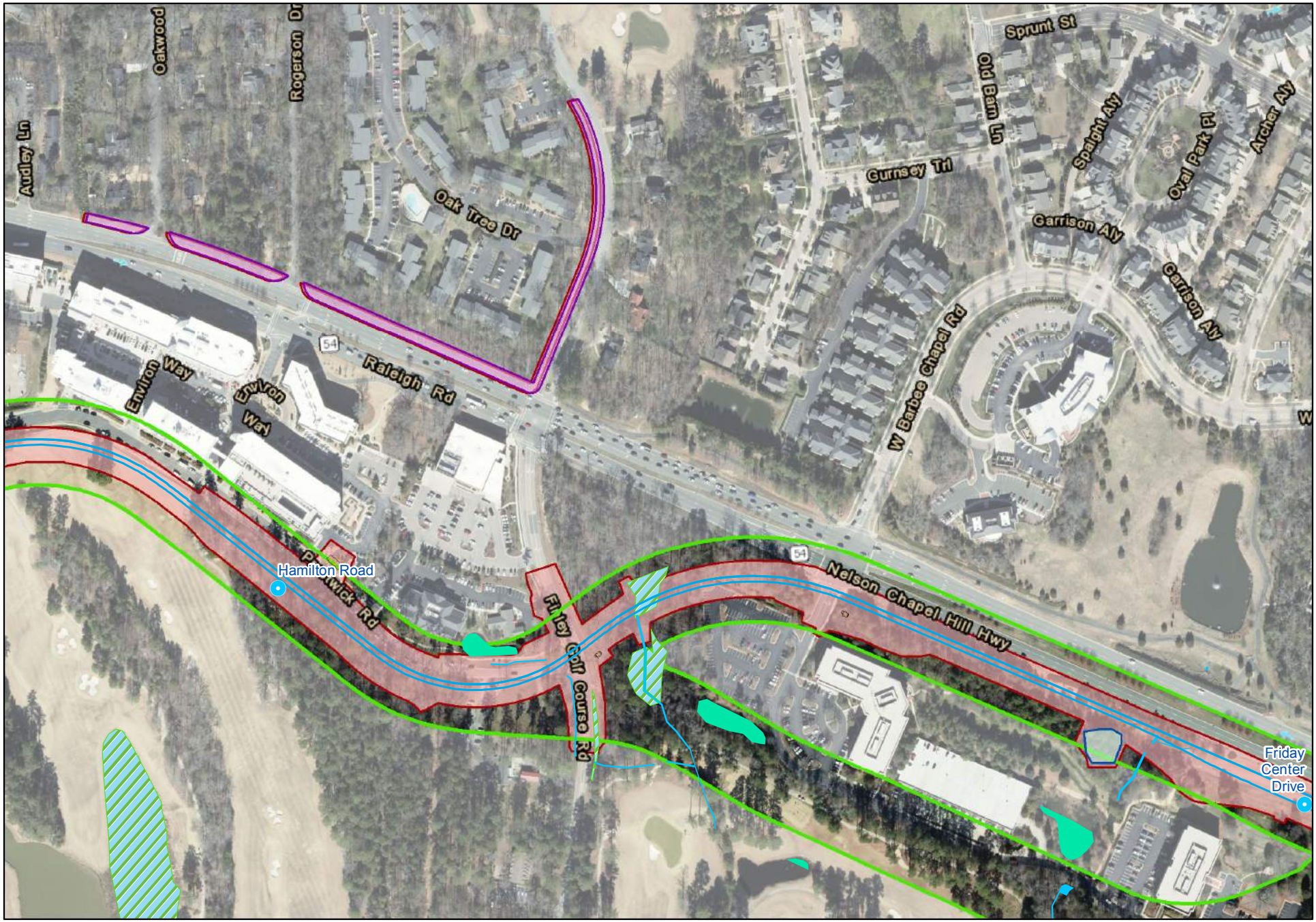

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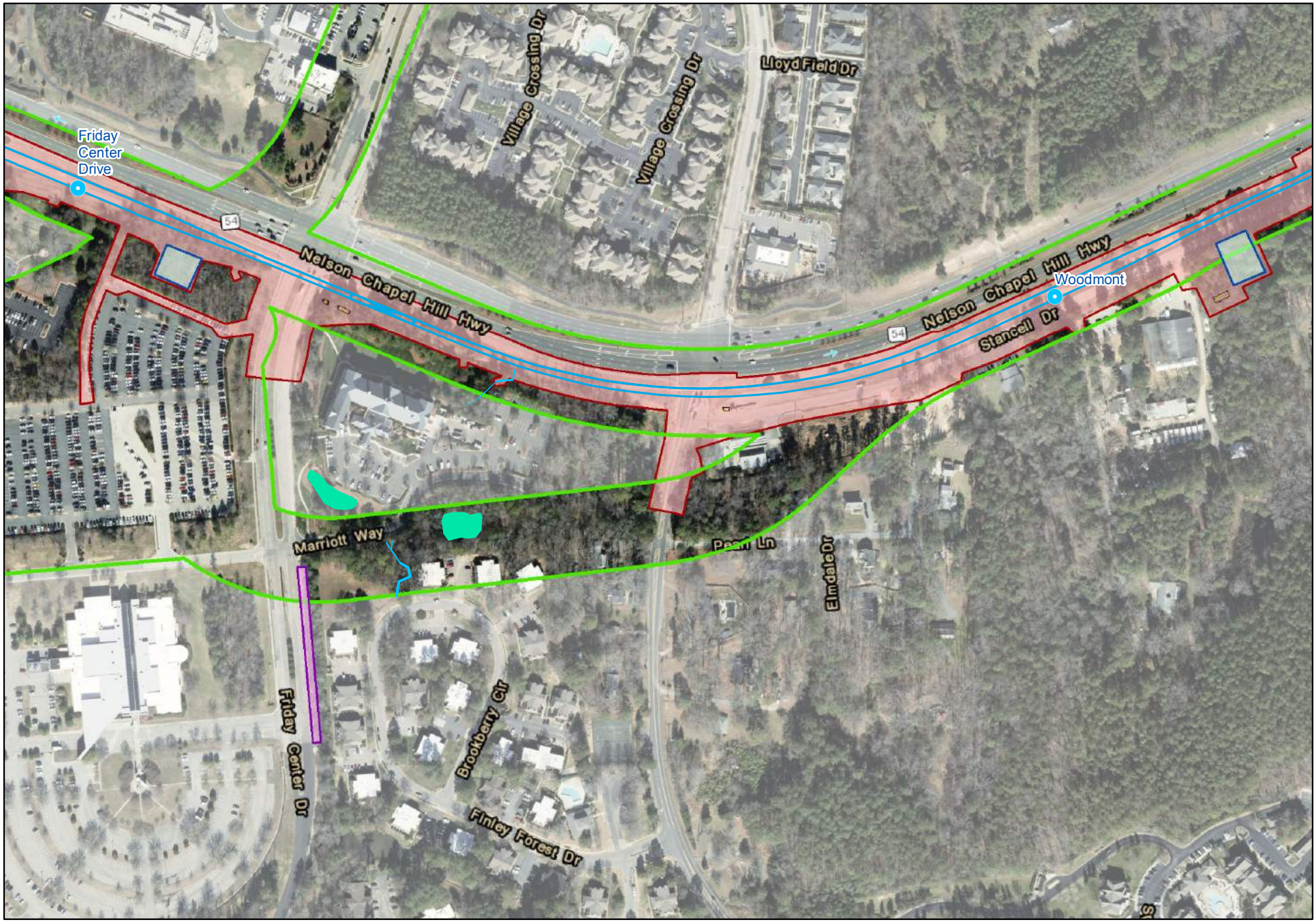

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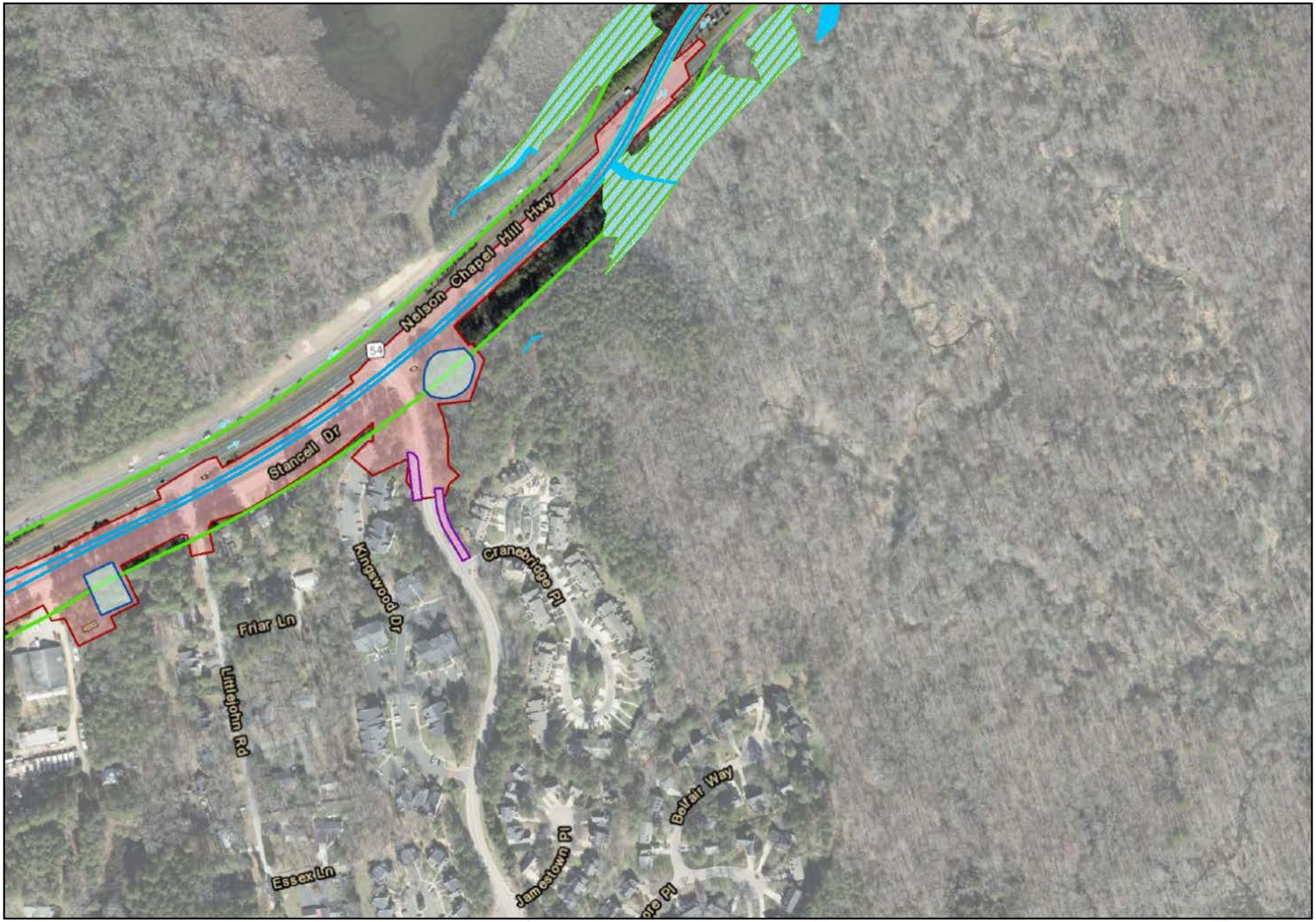

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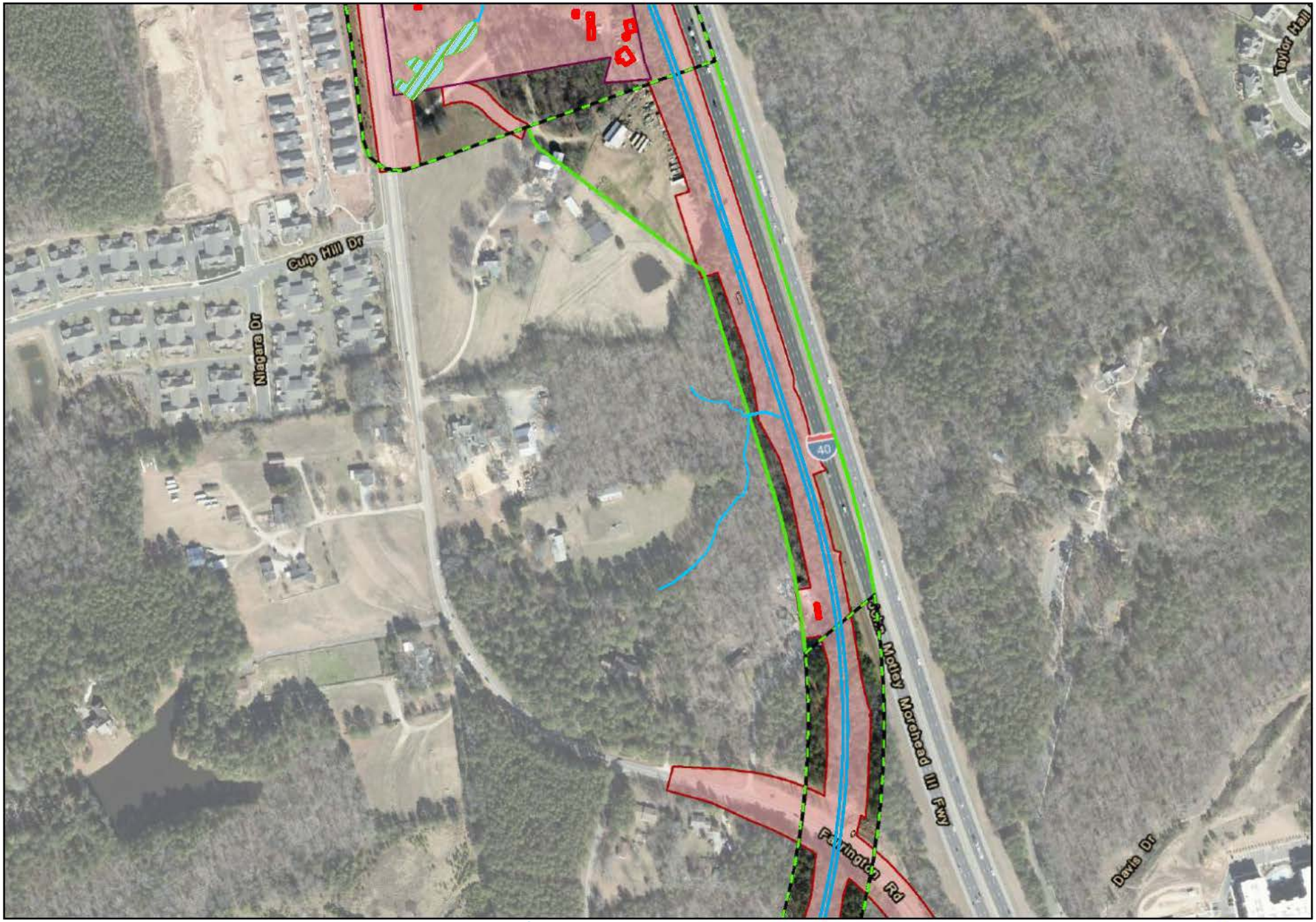

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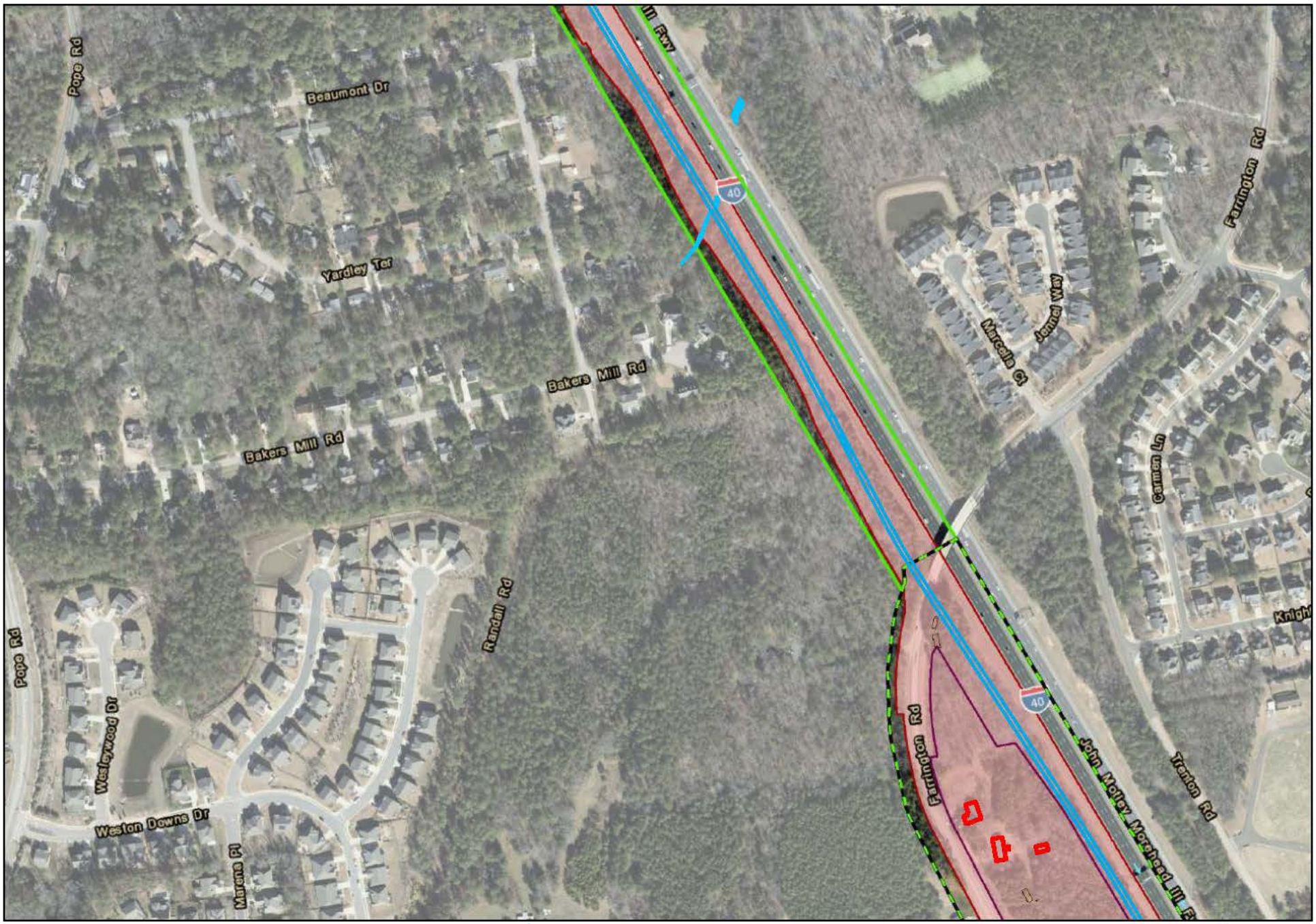

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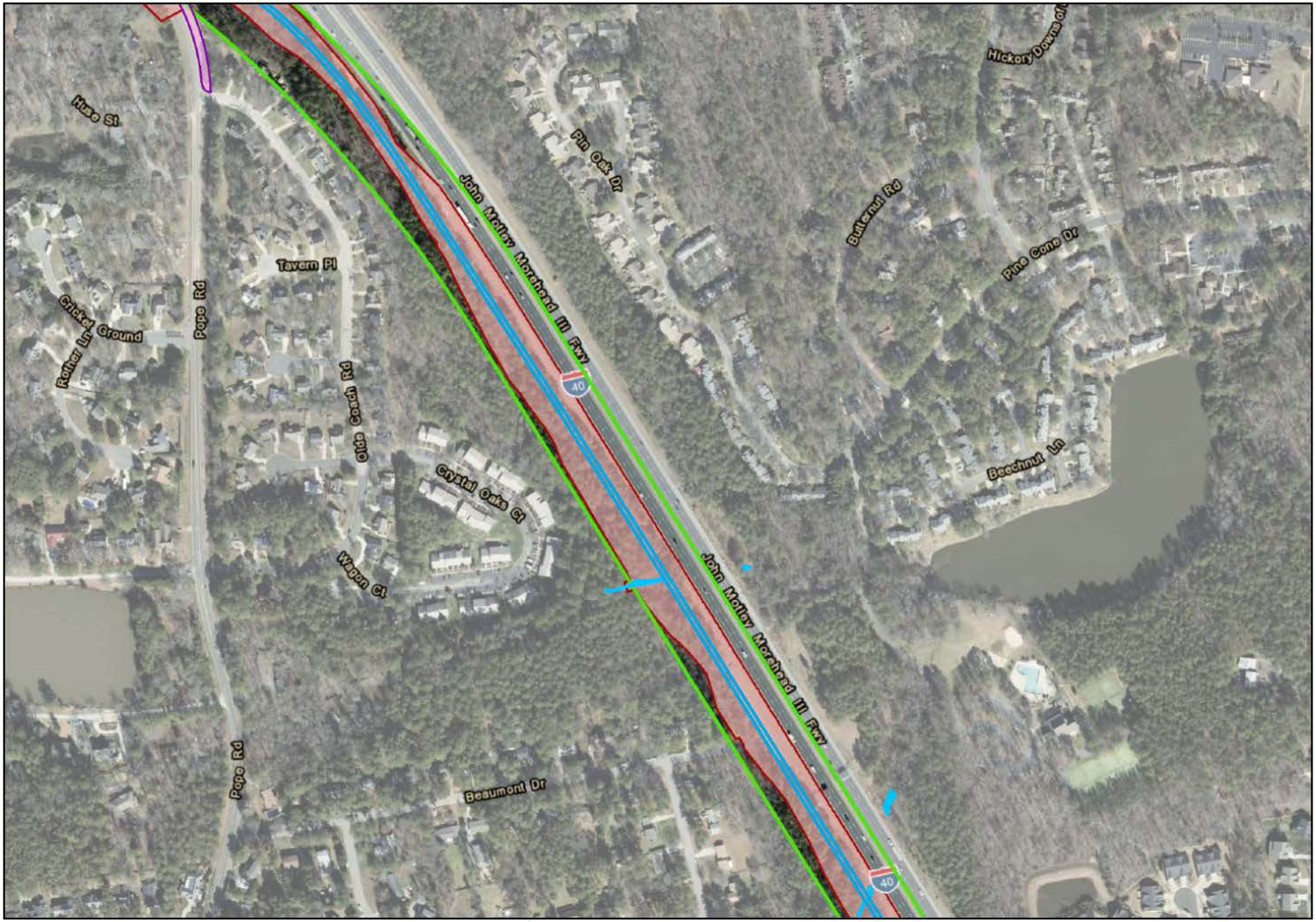

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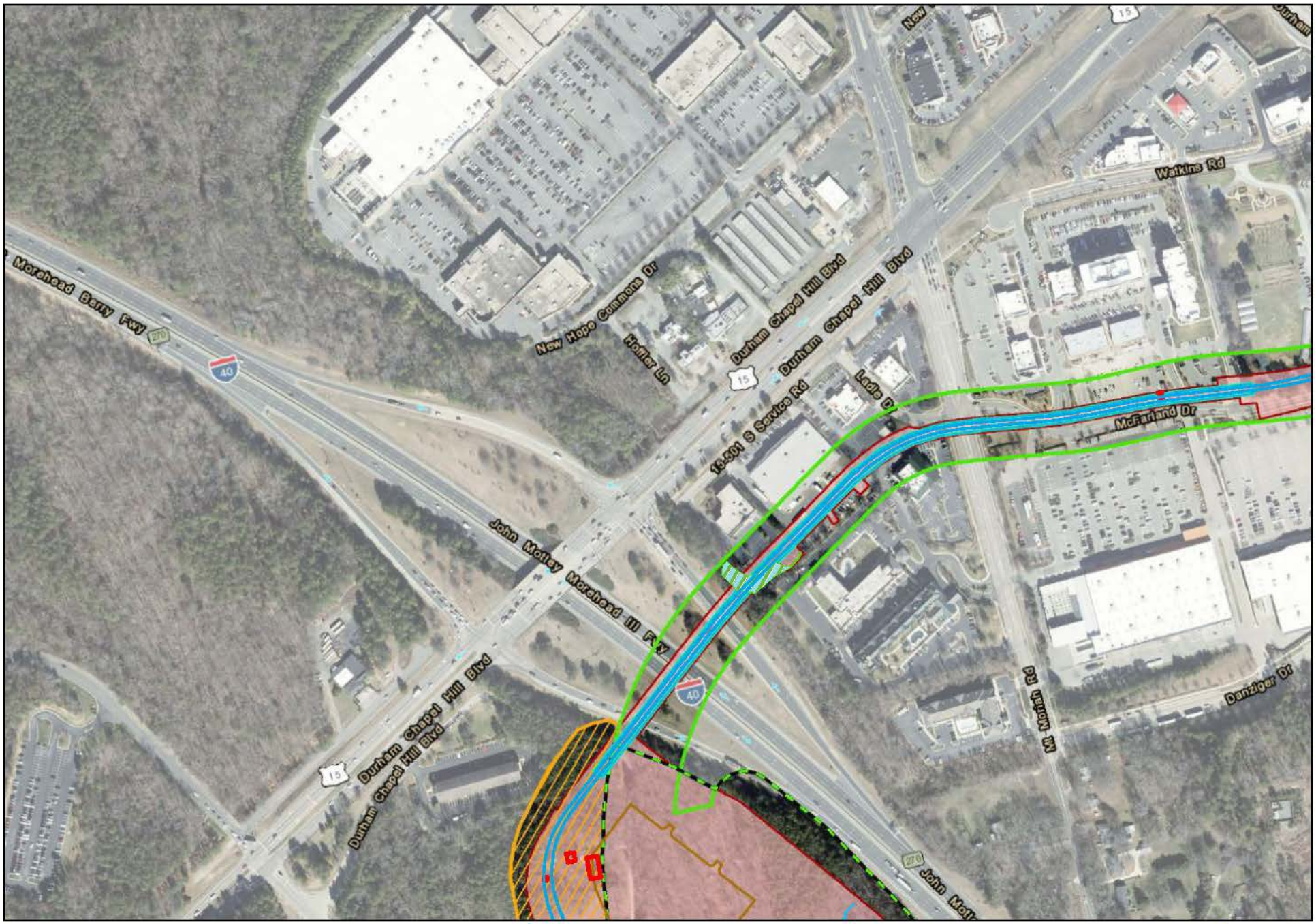

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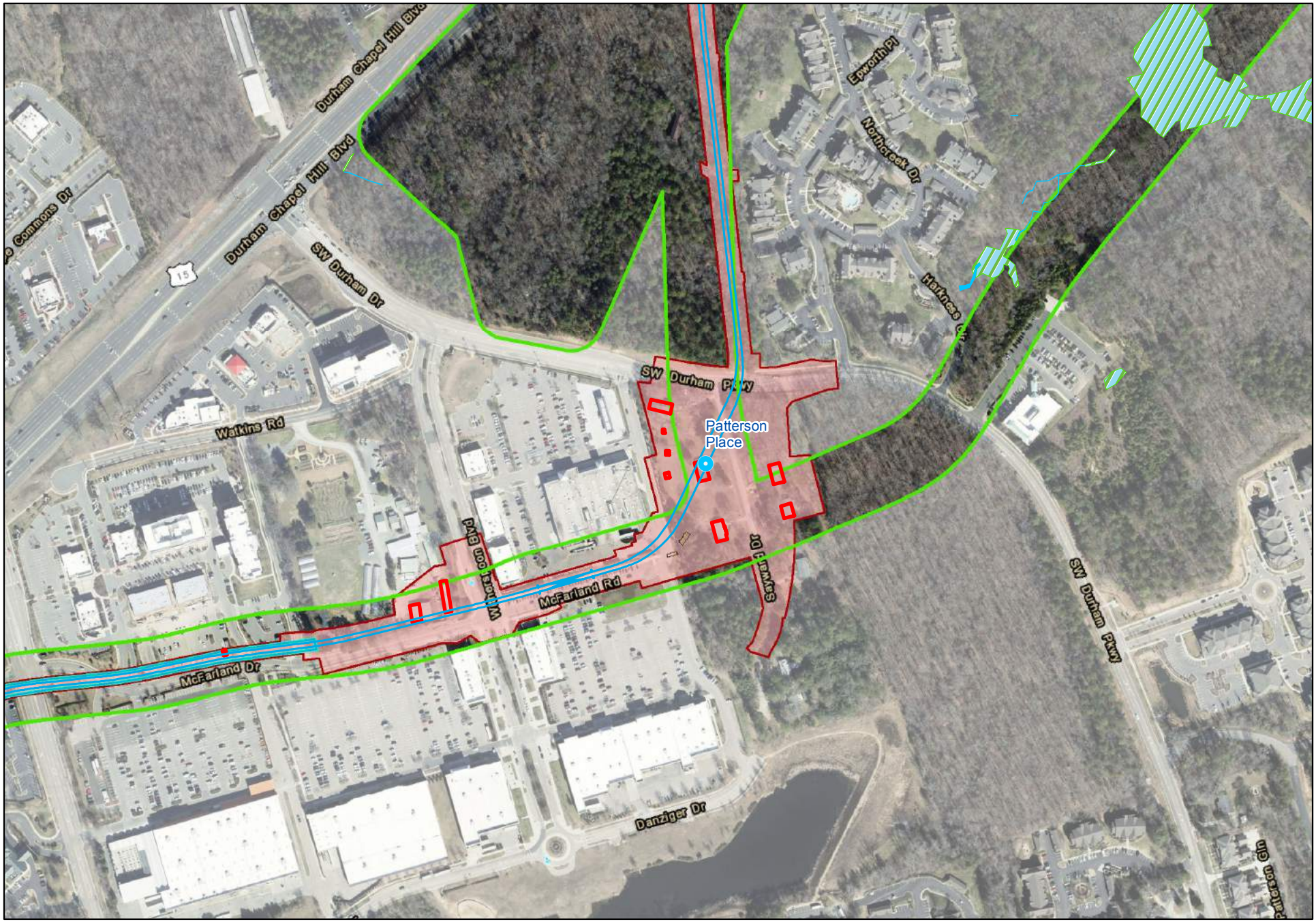

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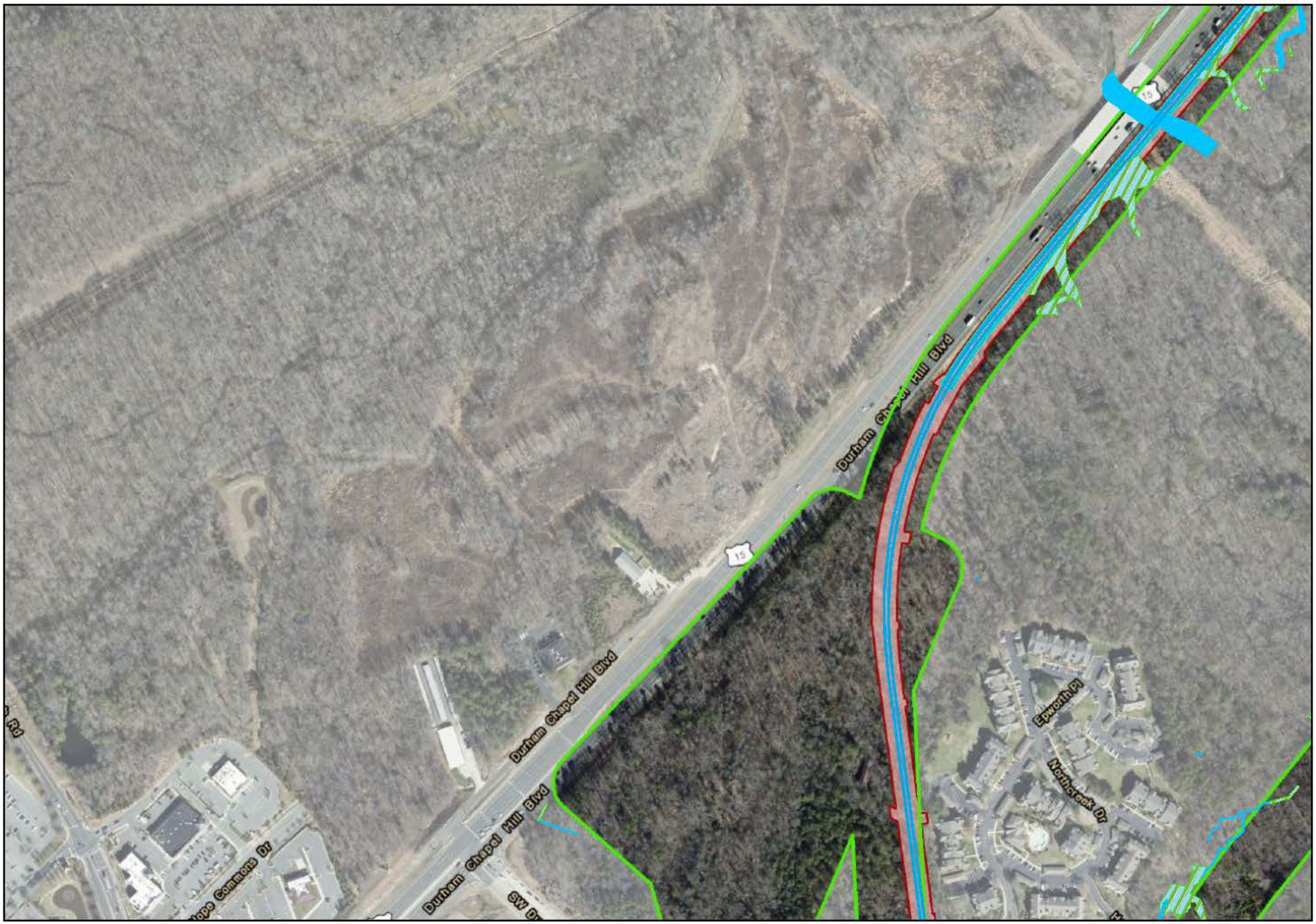

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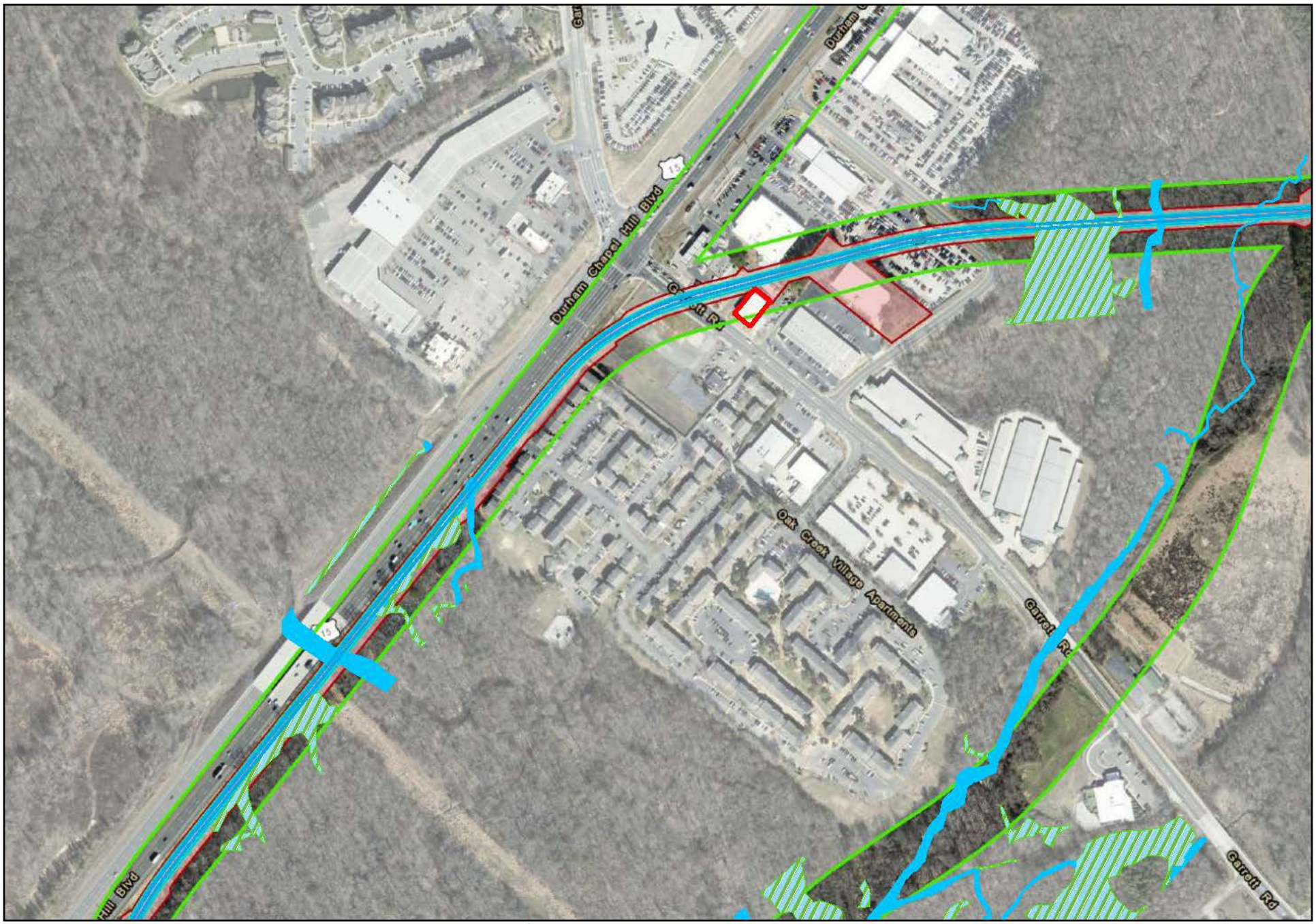

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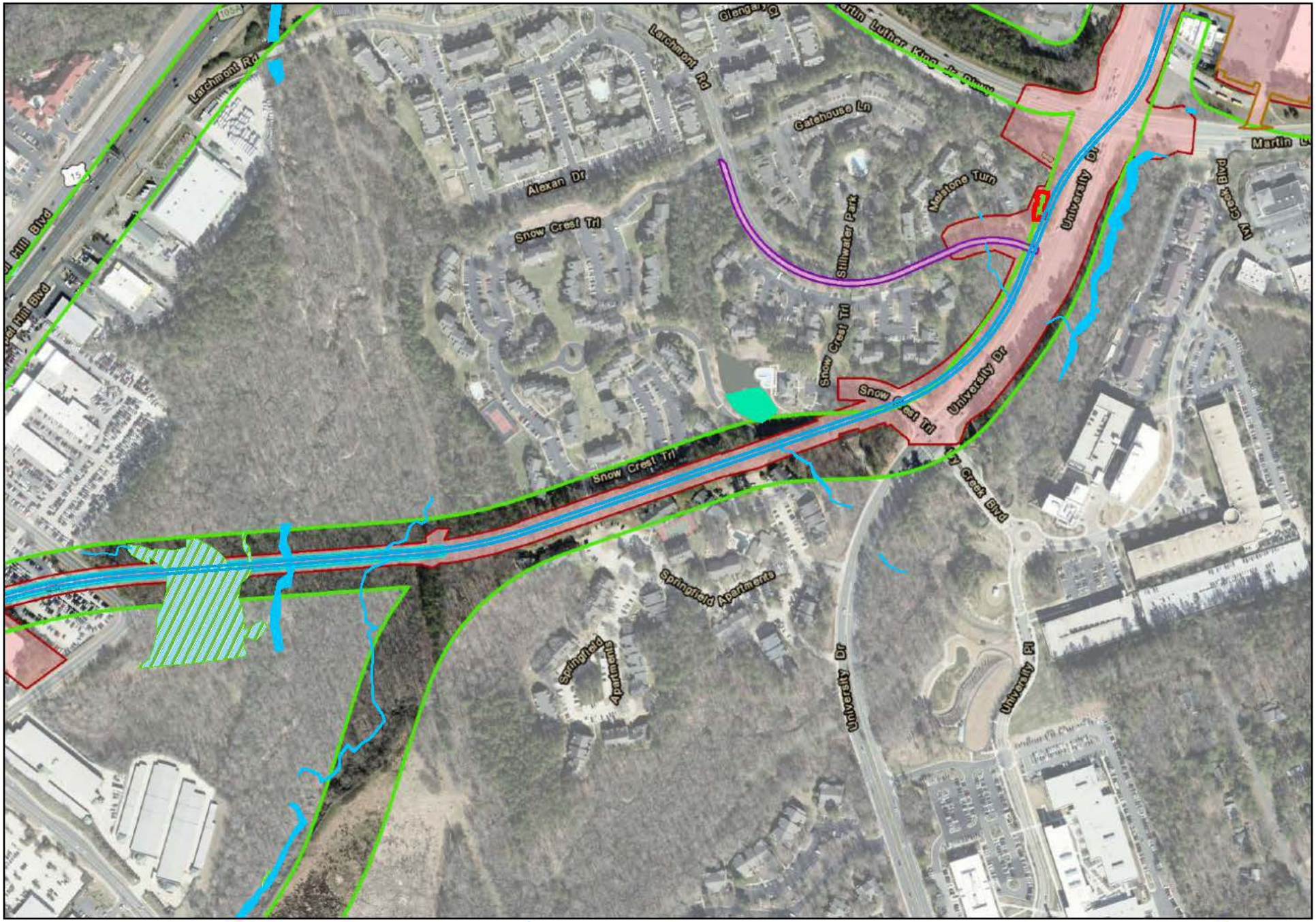

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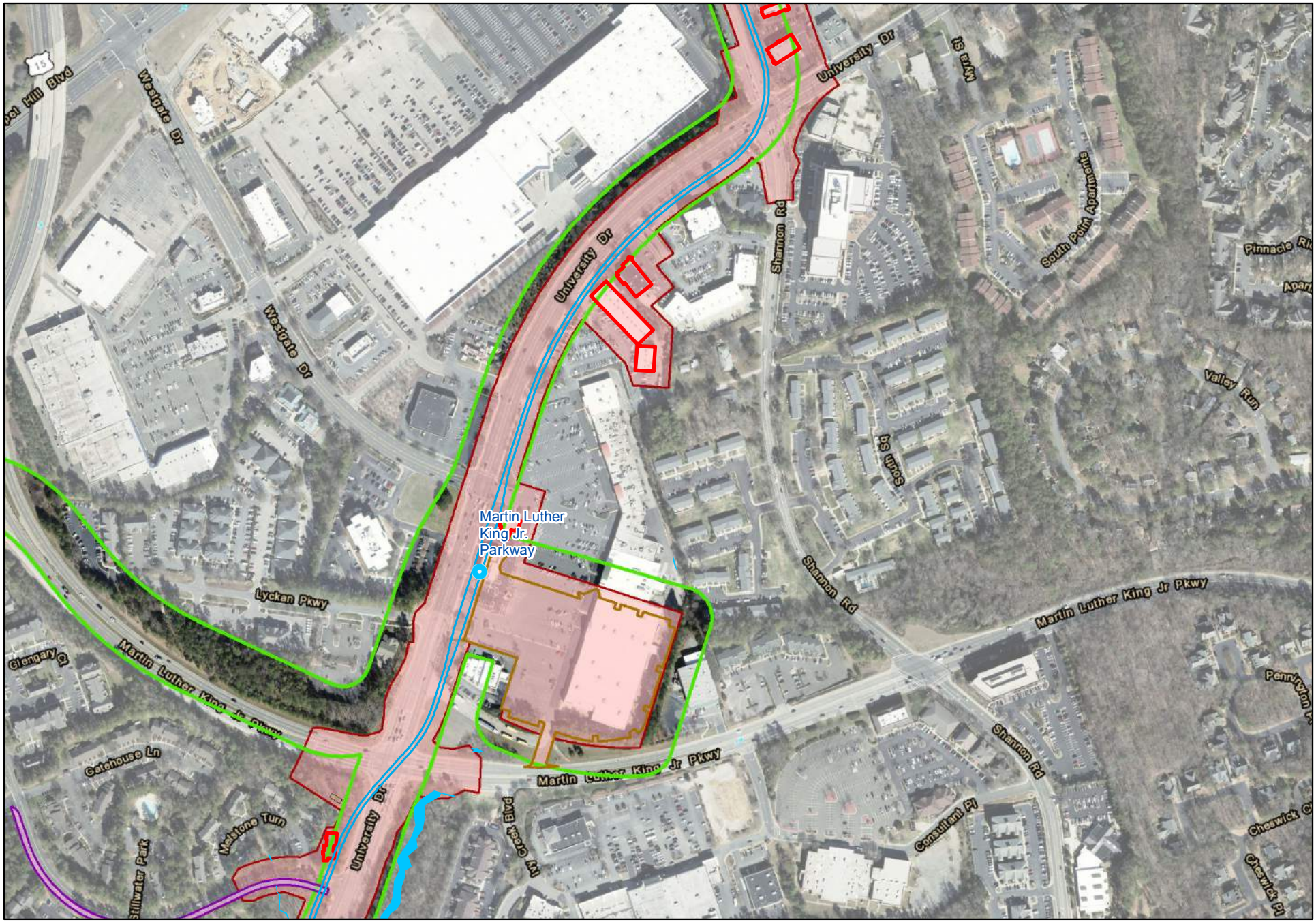

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DURHAM-ORANGE LIGHT RAIL TRANSIT PROJECT

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Phase I Field Evaluation Areas (AECOM)
Additional Survey Area

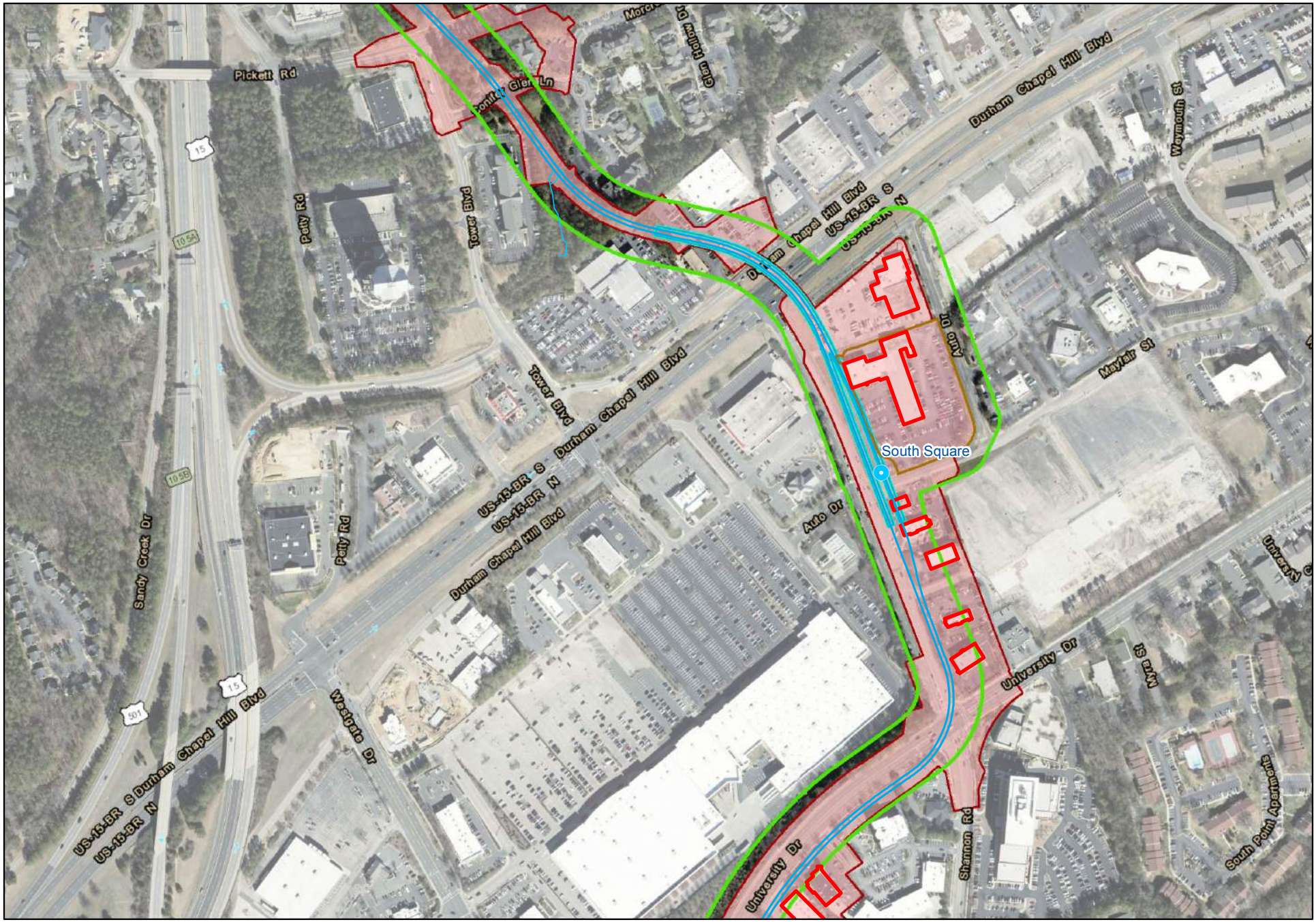
LEGEND

LRT Stations
Track
Aerial Sections
Right-of-Way Footprint 2018 (DRAFT)
Archaeological APE
ROMF Boundary
Park and Ride Lots
Bike/Ped Paths
Proposed Demolition
Demolition by Others
TPSS Locations
SWM Ponds (DRAFT)

USACE Verified Features

Ponds
Streams
Wetlands

GO Triangle



Archaeological Resources APE
Footprint Review
DURHAM-ORANGE LIGHT RAIL TRANSIT PROJECT

0 280 560 Feet

Phase I Field Evaluation Areas (AECOM)
Additional Survey Area

LEGEND

LRT Stations
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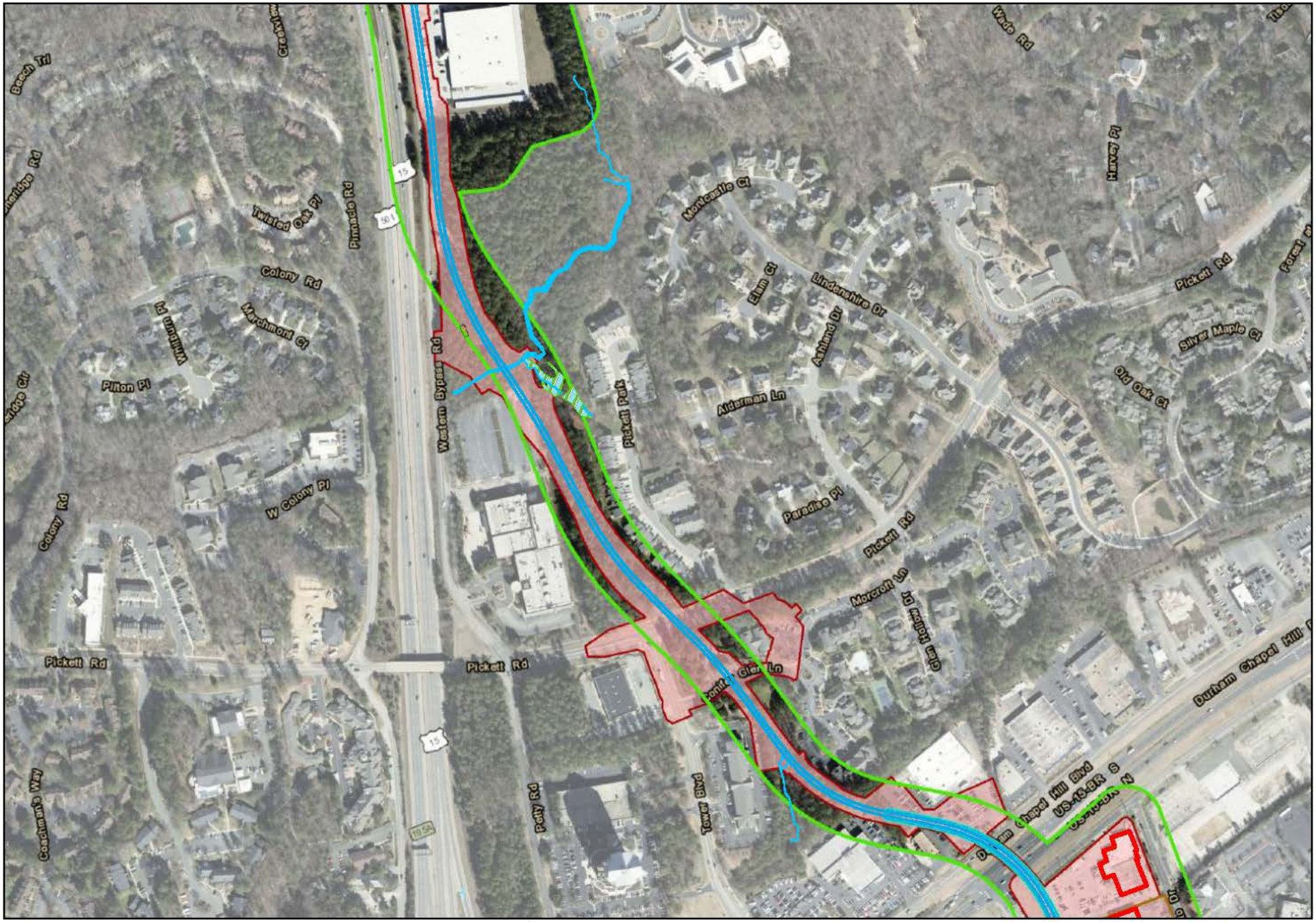
GO Triangle



Archaeological Resources APE
Footprint Review
DURHAM-ORANGE LIGHT RAIL TRANSIT PROJECT

0 280 560 Feet

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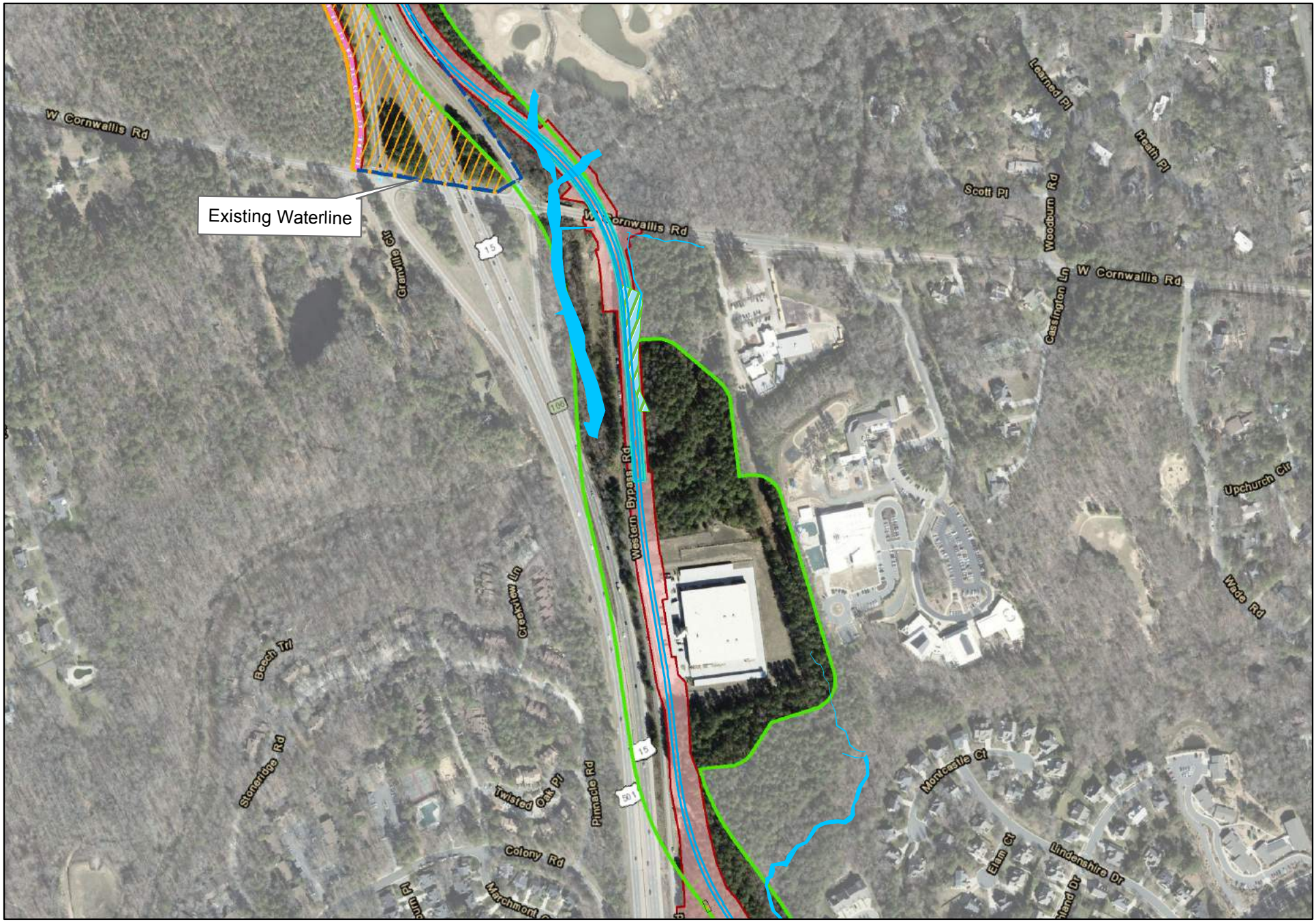

Archaeological Resources APE
Footprint Review
DURHAM-ORANGE LIGHT RAIL TRANSIT PROJECT

0 280 560 Feet

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Footprint Review
DURHAM-ORANGE LIGHT RAIL TRANSIT PROJECT

0 290 580 Feet

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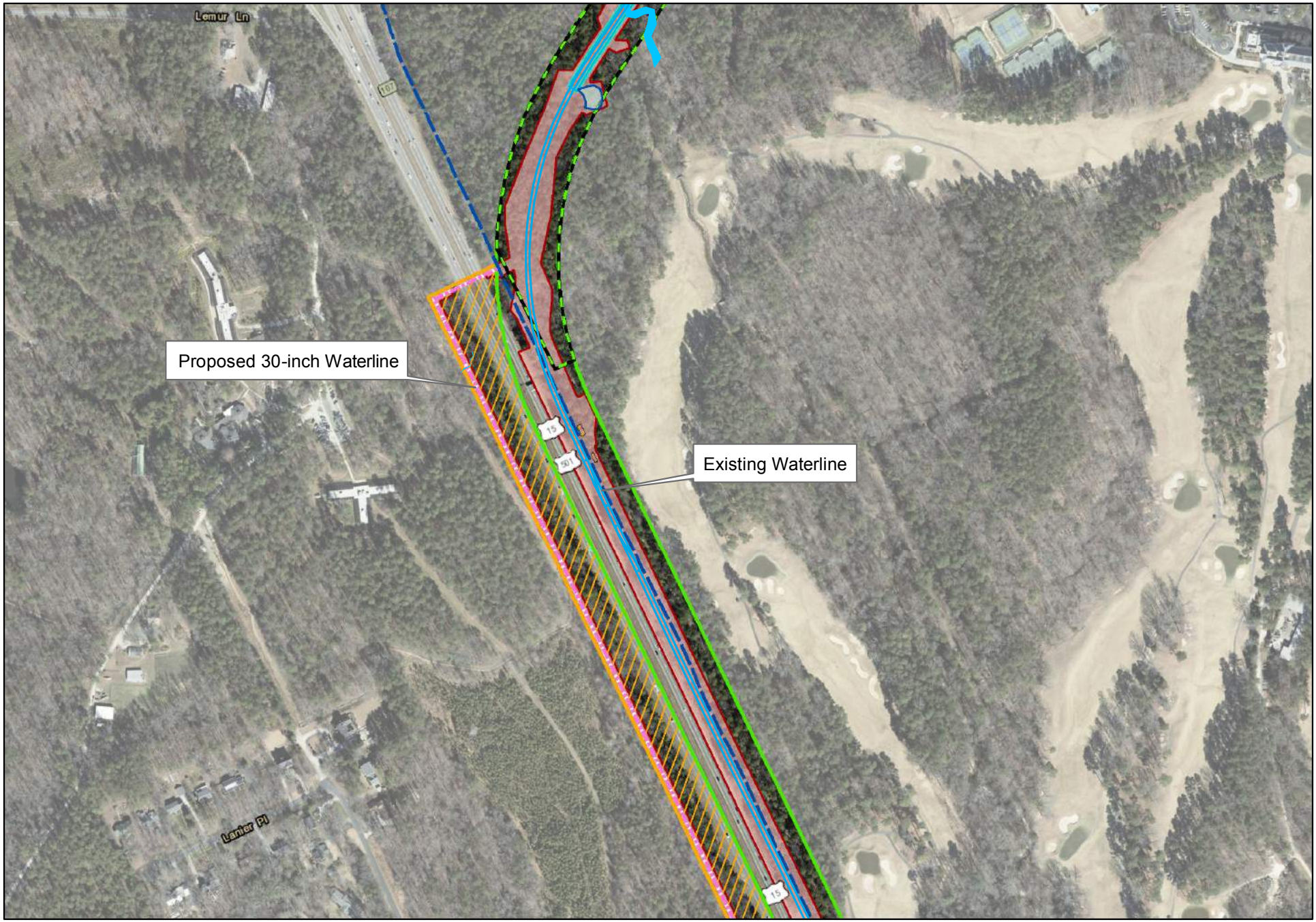

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Footprint Review
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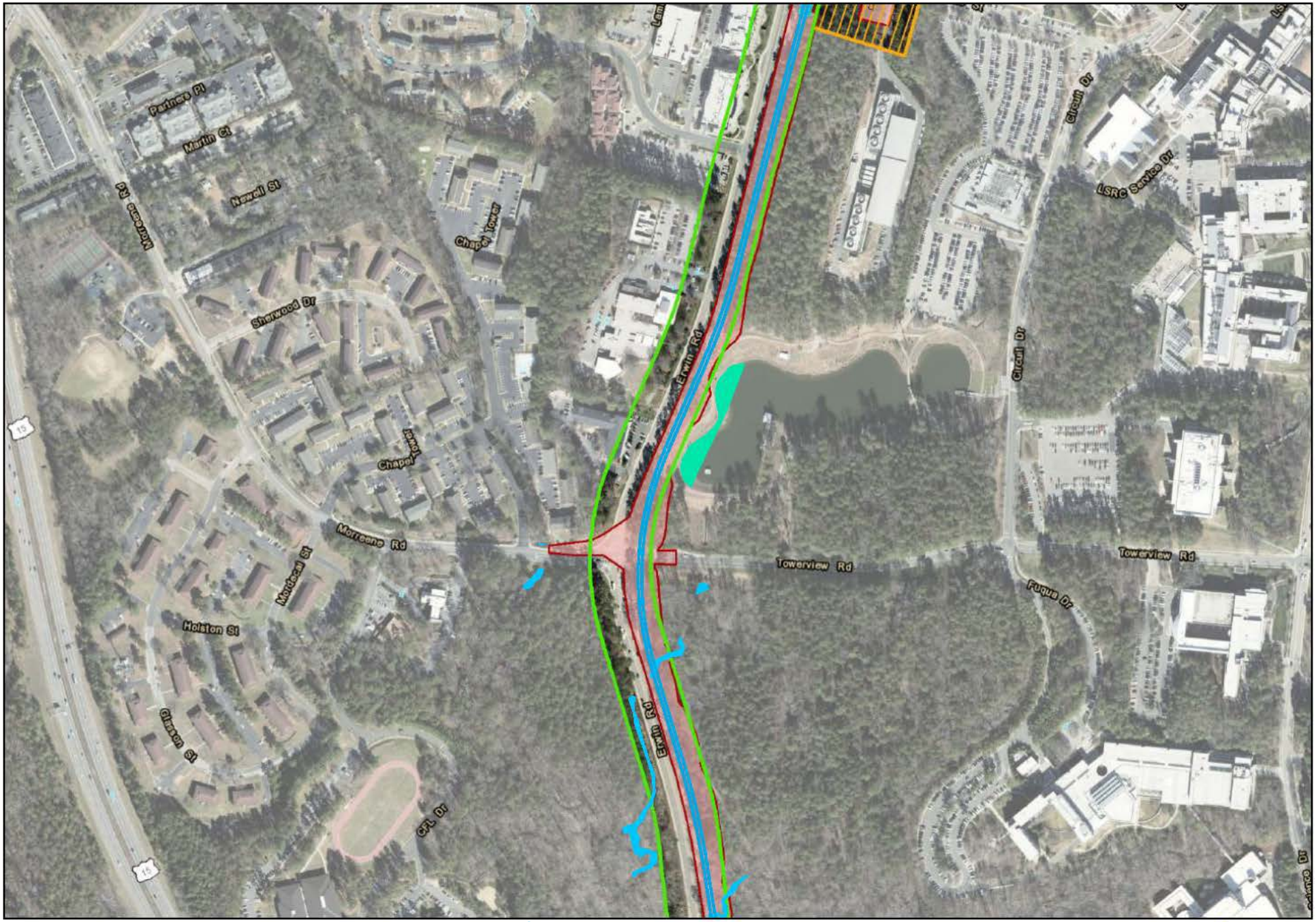

Archaeological Resources APE
Footprint Review
DURHAM-ORANGE LIGHT RAIL TRANSIT PROJECT

0 300 600 Feet

Phase I Field Evaluation Areas (AECOM)
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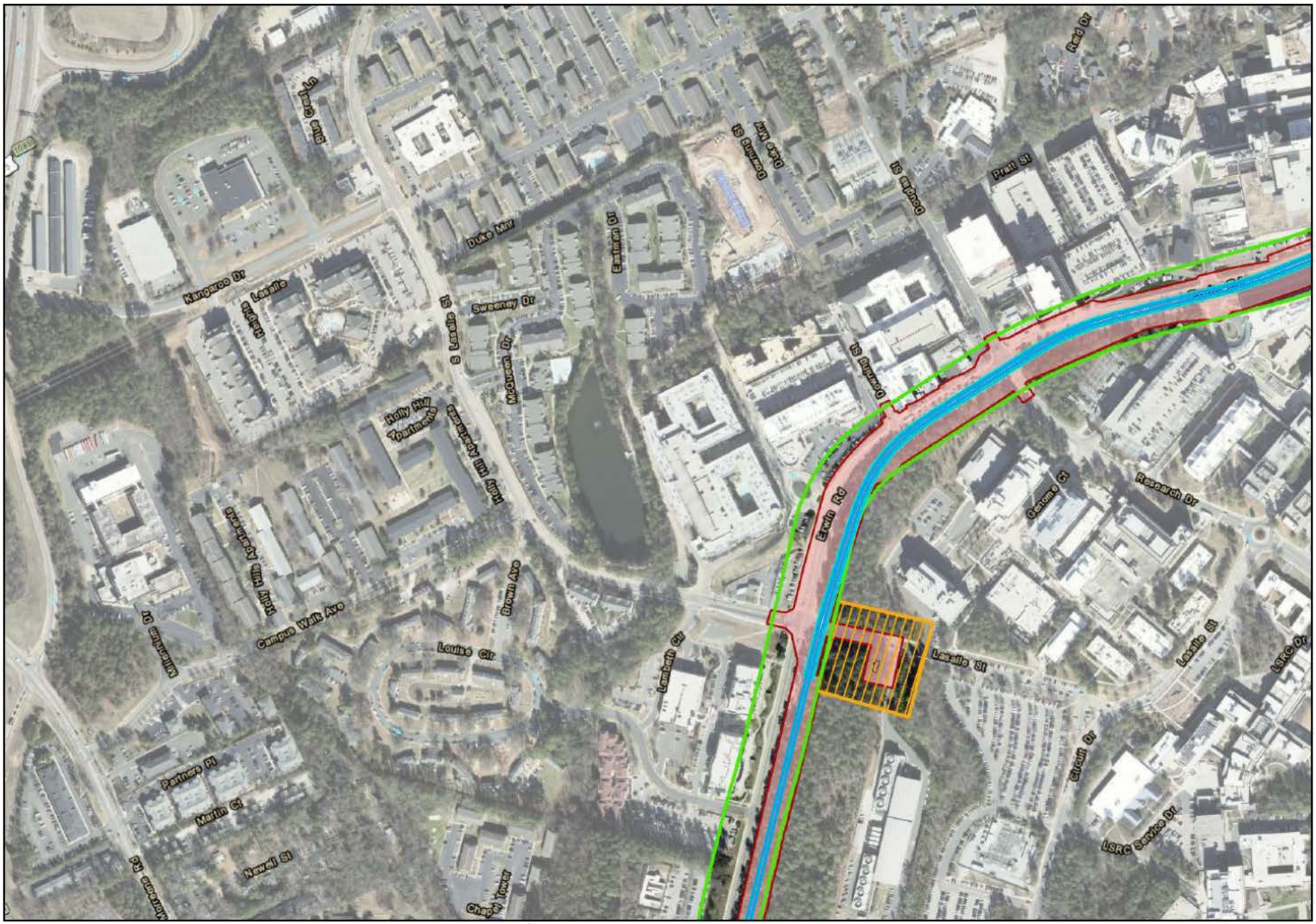

Archaeological Resources APE
Footprint Review
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0 300 600 Feet

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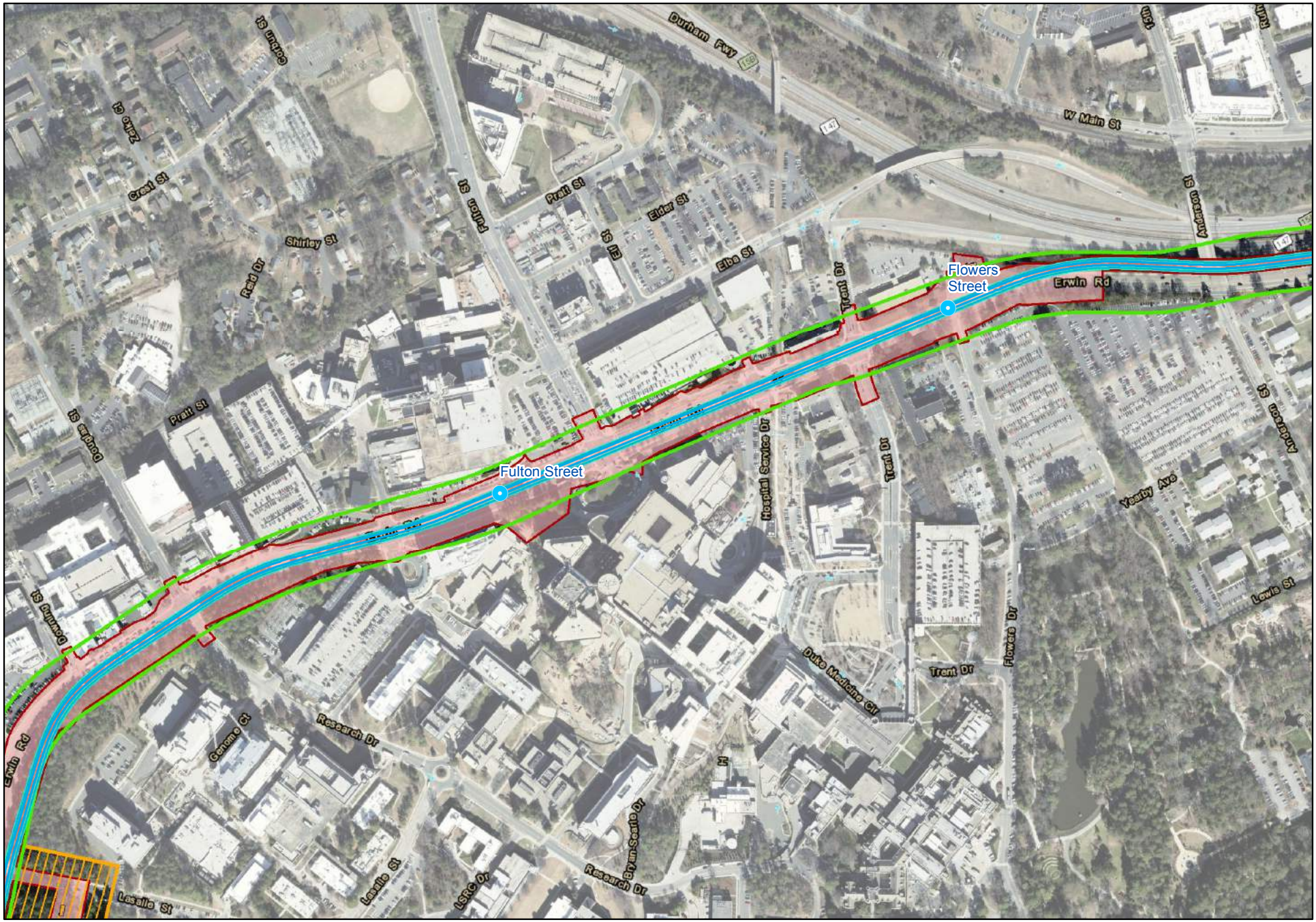

Archaeological Resources APE
Footprint Review
DURHAM-ORANGE LIGHT RAIL TRANSIT PROJECT

0 300 600 Feet

Phase I Field Evaluation Areas (AECOM)
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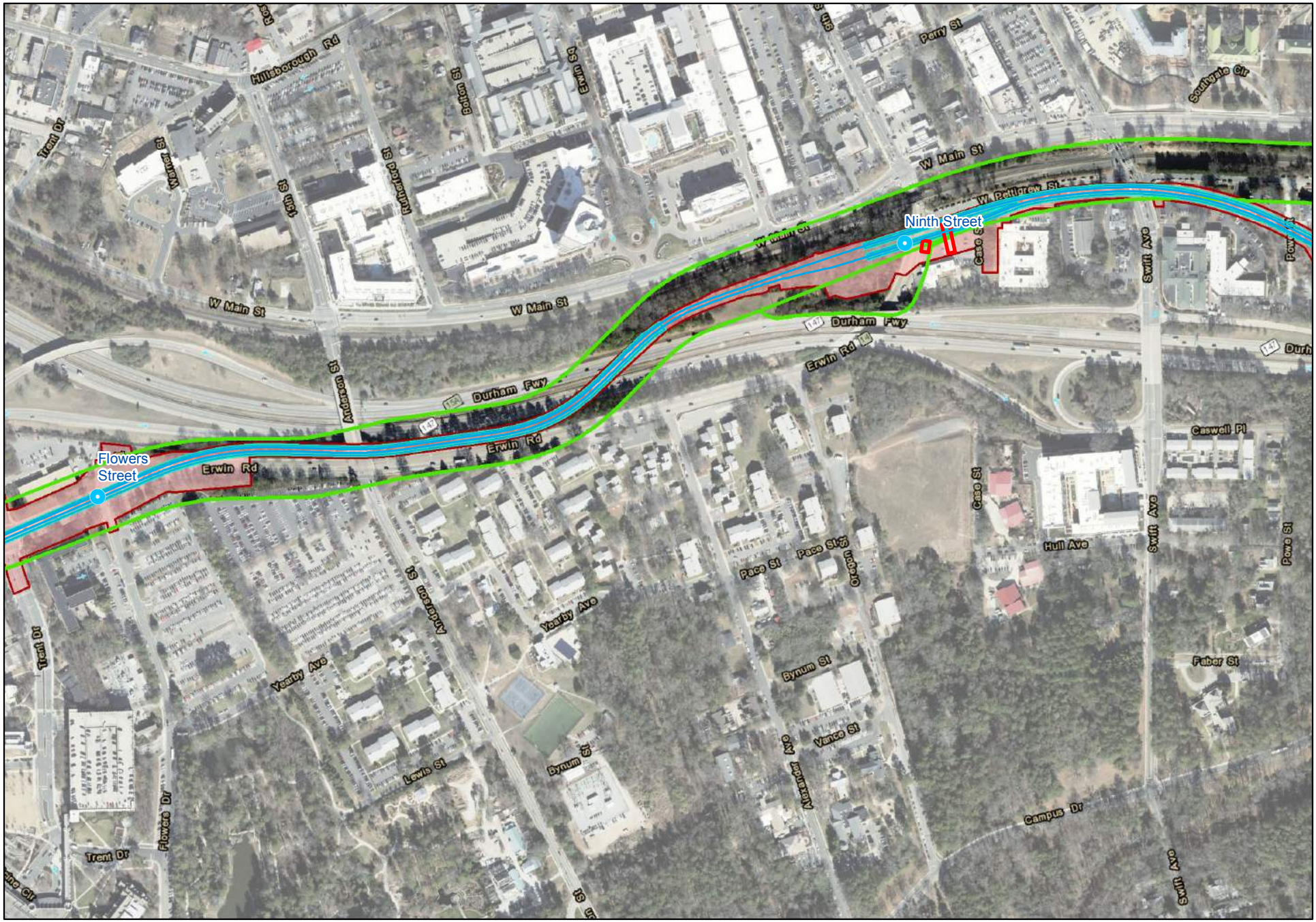

Archaeological Resources APE
Footprint Review
DURHAM-ORANGE LIGHT RAIL TRANSIT PROJECT

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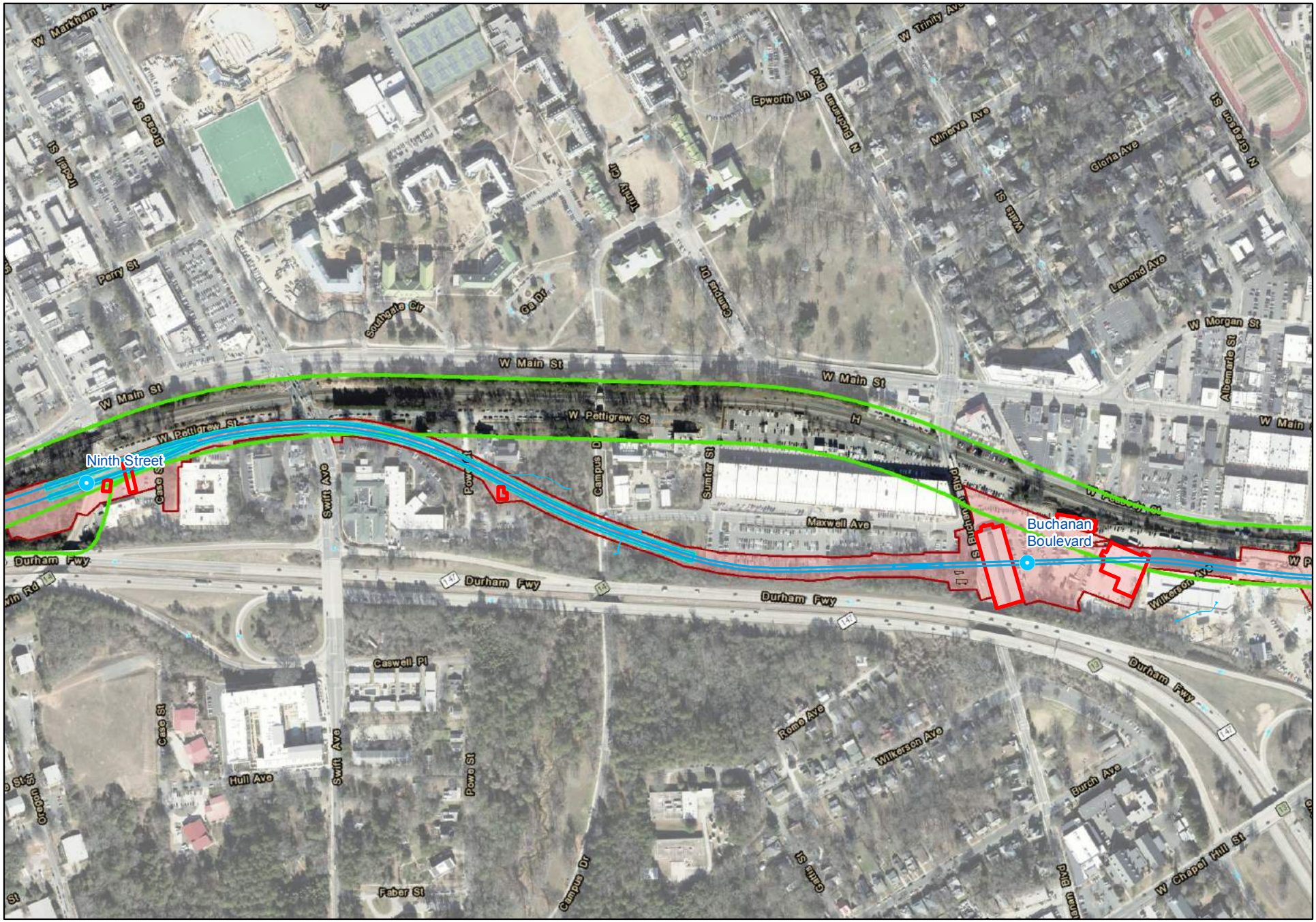

Archaeological Resources APE
Footprint Review
DURHAM-ORANGE LIGHT RAIL TRANSIT PROJECT

0 310 620 Feet

Phase I Field Evaluation Areas (AECOM)
Additional Survey Area

LEGEND

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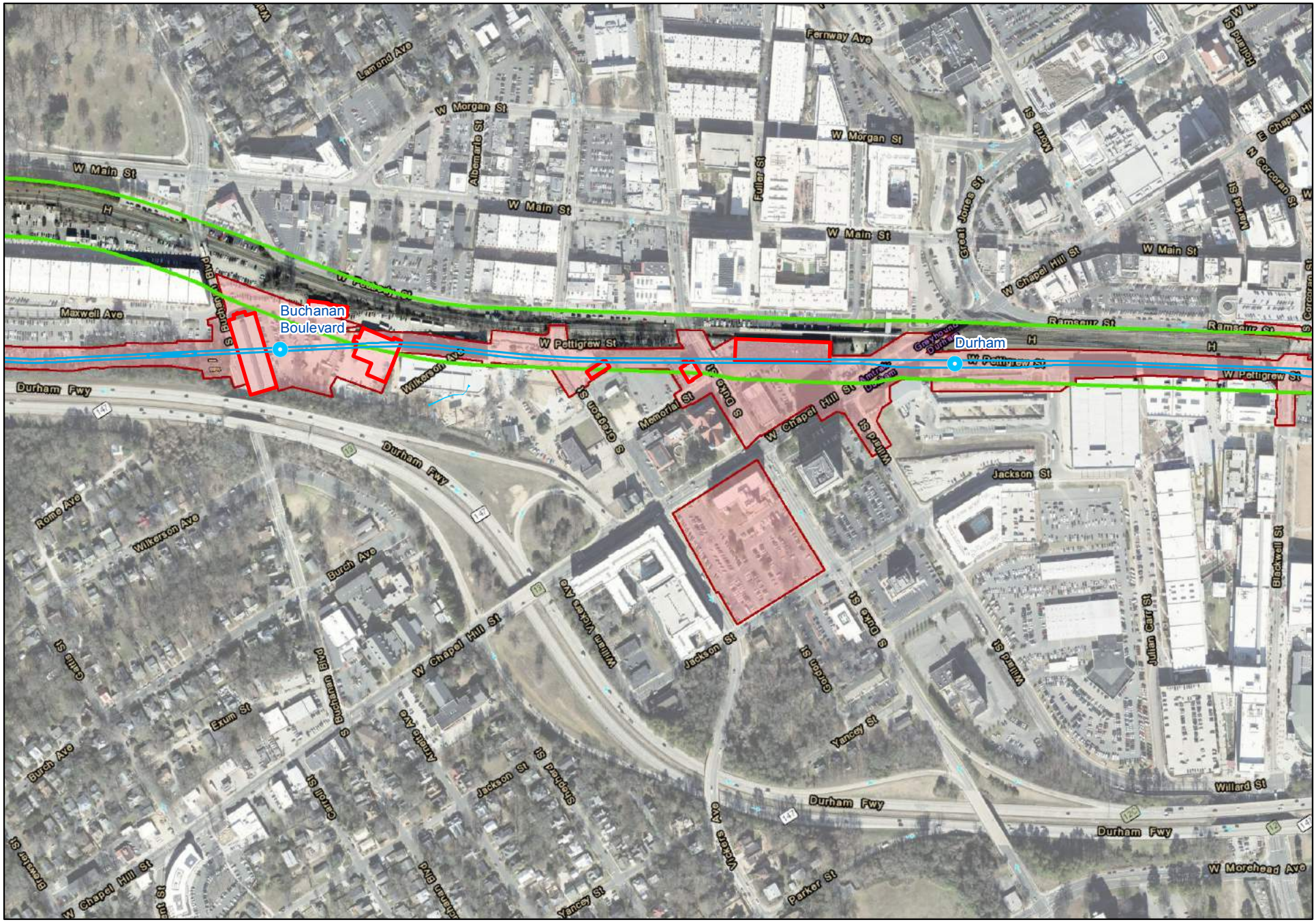

Archaeological Resources APE
Footprint Review
DURHAM-ORANGE LIGHT RAIL TRANSIT PROJECT

0 310 620 Feet

Phase I Field Evaluation Areas (AECOM)
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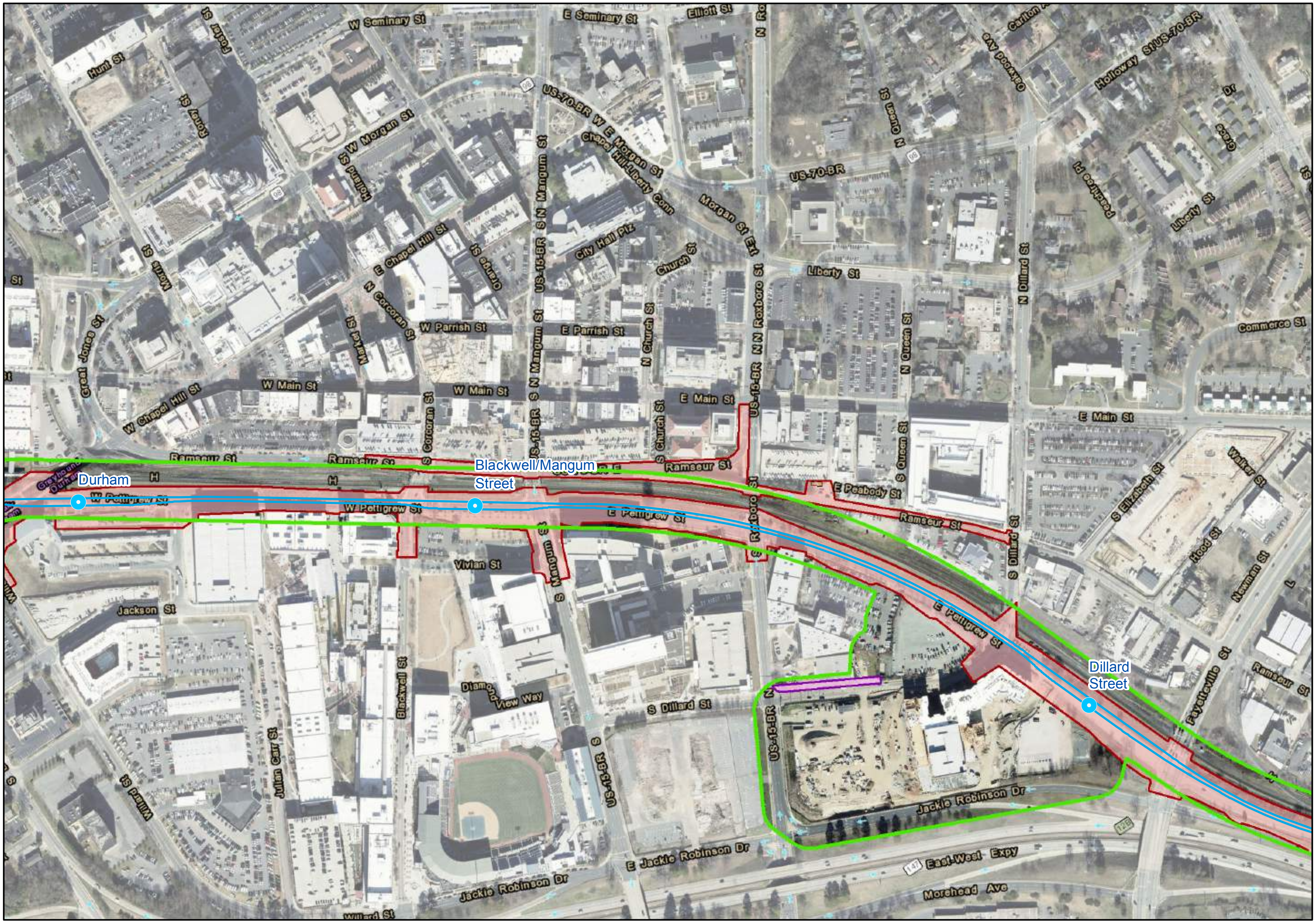

Archaeological Resources APE
Footprint Review
DURHAM-ORANGE LIGHT RAIL TRANSIT PROJECT

0 310 620 Feet

LEGEND

- LRT Stations
- Track
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USACE Verified Features

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GoTriangle

Archaeological Resources APE
Footprint Review
DURHAM-ORANGE LIGHT RAIL TRANSIT PROJECT

0 310 620 Feet

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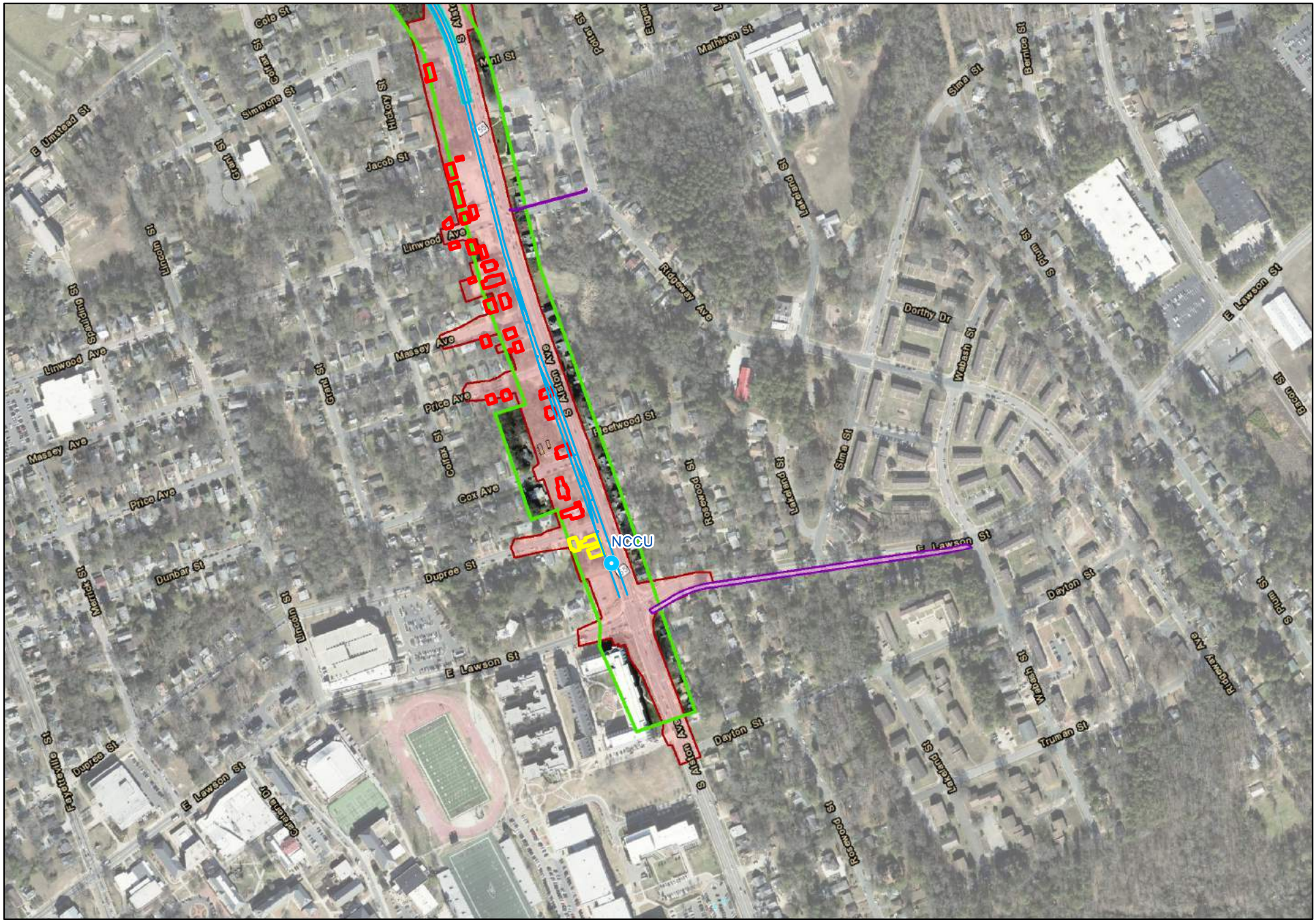

Archaeological Resources APE
Footprint Review
DURHAM-ORANGE LIGHT RAIL TRANSIT PROJECT

0 320 640 Feet

Phase I Field Evaluation Areas (AECOM)
Additional Survey Area

LEGEND

LRT Stations
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SWM Ponds (DRAFT)

USACE Verified Features

Ponds
Streams
Wetlands

GO Triangle

Attachment F-1b: Shovel Test Log

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STP_ID	Results	Unexcavate	Notes	Y	X	Level 1	Level 1 Notes	Level 2	Level 2 Notes	Level 3
33	Negative			35.91290059	-78.98998018	0, 15 cmbs, 7.5YR4/6 Strong Brown Clay	sub on surface. hydric			
34	Negative			35.91420267	-78.99051789	15 cmbs, 10YR3/3 Dark Brown Loam		25cmbs, 5YR4/4 Reddish Brown Clay Loam		
35	Negative			35.91272766	-78.98955252	12 cmbs, 10YR3/3 Dark Brown Loam		30cmbs, 10YR6/6 Brownish Yellow Loam		40 cmbs, 7.5YR6/8 Reddish Yellow Silty Loam
36	Negative			35.91298807	-78.98966006	5 cmbs, 10YR3/3 Dark Brown Loam		16cmbs, 10YR6/6 Brownish Yellow Loam		26 cmbs, 5YR5/6 Yellowish Red Clay Loam
37	Negative			35.91402974	-78.99009022	0, 20 cmbs, 10YR6/3 Pale Brown Silty Clay	hydric			
38	Negative			35.91429015	-78.99019777	5 cmbs, 10YR3/3 Dark Brown Silt		25cmbs, 7.5YR4/6 Strong Brown Clay Loam		
39	Negative			35.91533181	-78.99062794	10 cmbs, 7.5YR5/2 Brown Loam		20cmbs, 7.5YR5/8 Strong Brown Silty Loam		
40	Negative		disturbed. field road	35.91281514	-78.9892324	0, 20 cmbs, 10YR6/3 Pale Brown Silty Clay Loam	disturbed			
41	Negative			35.91411722	-78.9897701	0, 15 cmbs, 7.5YR4/6 Strong Brown Clay				
42	Negative			35.91437764	-78.98987764	10 cmbs, 10YR3/3 Dark Brown Loam		25cmbs, 10YR5/4 Yellowish Brown Silty Loam		35 cmbs, 10YR6/8 Brownish Yellow Silty Loam
43	Negative			35.9154193	-78.99030781	5 cmbs, 10YR3/3 Dark Brown Loam		20cmbs, 10YR6/6 Brownish Yellow Clay Loam		25 cmbs, 5YR4/6 Yellowish Red Clay
44	Negative			35.91212137	-78.98858967	10 cmbs, 10YR3/3 Dark Brown Loam		20cmbs, 10YR6/6 Brownish Yellow Loam		30 cmbs, 7.5YR6/6 Reddish Yellow Silty Loam
45	Negative			35.91238178	-78.9886972	5 cmbs, 10YR3/3 Dark Brown Loam		30cmbs, 10YR6/6 Brownish Yellow Loam	wet	
46	Negative			35.9126422	-78.98880474	10 cmbs, 10YR3/3 Dark Brown Loam		36cmbs, 10YR6/6 Brownish Yellow Silty Loam	wet	
47	Negative		non-archaeological faunal remains discarded	35.91290262	-78.98891228	0, 10 cmbs, 10YR4/3 Brown Silty Clay Loam		43393cmbs, 10YR5/3 Brown Silty Clay		0 cmbs, 10YR6/3 Pale Brown Silty Clay
48	Negative			35.91316304	-78.98901981	0, 17 cmbs, 10YR6/3 Pale Brown Silty Clay Loam		0cmbs, 7.5YR4/6 Strong Brown Clay		
49	Negative			35.9142047	-78.98944997	0, 15 cmbs, 10YR6/3 Pale Brown Silty Clay	hydric			
50	Negative			35.91550678	-78.98998768	10 cmbs, 10YR3/3 Dark Brown Loam		20cmbs, 2.5YR5/6 Red Clay		
51	Negative			35.9157672	-78.99009522	16 cmbs, 10YR6/6 Brownish Yellow Loam		26cmbs, 5YR4/6 Yellowish Red Clay		
52	Not Excavated	Building	house and yard	35.91194843	-78.98816202					
53	Negative			35.91220885	-78.98826955	5 cmbs, 10YR3/3 Dark Brown Loam		25cmbs, 10YR6/6 Brownish Yellow Loam		30 cmbs, 10YR7/1 Light Gray Silty Loam
54	Not Excavated	Surface Water		35.91246926	-78.98837709					
55	Negative		wet at botton	35.91272968	-78.98848462	10 cmbs, 10YR3/3 Dark Brown Loam		30cmbs, 10YR6/6 Brownish Yellow Silty Loam		
56	Negative					cmbs,		cmbs,		
57	Negative			35.91325052	-78.98869969	0, 24 cmbs, 10YR4/2 Dark Grayish Brown Silty Clay Loam		0cmbs, 7.5YR5/6 Strong Brown Clay		

STP_ID	Results	Unexcavate	Notes	Y	X	Level 1	Level 1 Notes	Level 2	Level 2 Notes	Level 3
58	Negative			35.91351093	-78.98880723	0, 32 cmbs, 10YR3/3 Dark Brown Silty Clay Loam	hydric			
59	Negative			35.91377135	-78.98891476	10 cmbs, 10YR3/3 Dark Brown Loam		30cmbs, 10YR6/6 Brownish Yellow Loam		
60	Negative			35.91403177	-78.9890223	0, 25 cmbs, 10YR6/3 Pale Brown Silty Clay				
61	Not Excavated			35.91429218	-78.98912984					
62	Not Excavated			35.9145526	-78.98923738					
63	Not Excavated			35.91481301	-78.98934492					
64	Negative			35.91507343	-78.98945246	10 cmbs, 10YR3/3 Dark Brown Loam		20cmbs, 10YR4/4 Dark Yellowish Brown Clay Loam	wet	
65	Not Excavated			35.91533385	-78.98956					
66	Not Excavated			35.91559426	-78.98966755					
67	Not Excavated			35.91585468	-78.98977509					
68	Negative			35.91281716	-78.9881645	10 cmbs, 10YR3/3 Dark Brown Loam		20cmbs, 10YR6/6 Brownish Yellow Loam		30 cmbs, 10YR6/8 Brownish Yellow Loam
69	Not Excavated			35.91307758	-78.98827203					
70	Negative			35.91411925	-78.98870218	10 cmbs, 10YR3/3 Dark Brown Loam		23cmbs, 10YR6/6 Brownish Yellow Loam		30 cmbs, 5YR4/6 Yellowish Red Clay Loam
71	Negative			35.91437966	-78.98880971	10 cmbs, 10YR3/3 Dark Brown Loam		27cmbs, 10YR6/6 Brownish Yellow Loam		32 cmbs, 5YR4/6 Yellowish Red Clay Loam
72	Not Excavated			35.91594216	-78.98945495					
73	Not Excavated			35.91264422	-78.98773684					
74	Not Excavated	Building	back yard	35.91290464	-78.98784437					
75	Not Excavated			35.91602964	-78.98913482					
76	Not Excavated			35.9127317	-78.98741672					
77	Not Excavated	See Notes	residential	35.91299211	-78.98752425					
78	Not Excavated			35.91611712	-78.98881468					
79	Not Excavated			35.91281917	-78.98709659					
80	Not Excavated	See Notes	construction	35.91307959	-78.98720412					
81	Negative		mottled fill	36.00661944	-78.94574359	0, 20 cmbs, 10YR6/4 Light Yellowish Brown Sandy Clay Loam		cmbs,		
82	Negative		mottled fill	36.00682822	-78.94552387	0, 20 cmbs, 10YR6/4 Light Yellowish Brown Sandy Clay Loam				
83	Negative			36.00679797	-78.94600055	0, 40 cmbs, 10YR5/4 Yellowish Brown		cmbs,		
84	Negative		built-up from road construction	36.00700675	-78.94578083	0, 100 cmbs, 10YR5/4 Yellowish Brown Sandy Loam	fill			
85	Negative			36.00718528	-78.9460378	0, 25 cmbs, 7.5YR5/6 Strong Brown Silty Clay Loam		40cmbs, 10YR6/2 Light Brownish Gray Clay Loam	mottled gray/red fill	
1	Negative			0	0					
2	Negative			0	0					
4	Negative			0	0					
3	Negative			0	0					
5	Not Excavated			0	0					
7	Negative			0	0					
6	Not Excavated			0	0					
8	Negative			0	0					
10	Negative			0	0					
11	Negative			0	0					
9	Not Excavated			0	0					
12	Negative			0	0					
14	Negative			0	0					

STP_ID	Results	Unexcavate	Notes	Y	X	Level 1	Level 1 Notes	Level 2	Level 2 Notes	Level 3
13	Negative			0	0					
15	Negative			0	0					
16	Negative			0	0					
18	Negative			0	0					
20	Negative			0	0					
17	Negative			0	0					
19	Negative			0	0					
22	Not Excavated			0	0					
24	Negative			0	0					
21	Negative			0	0					
26	Negative			0	0					
23	Negative			0	0					
28	Negative			0	0					
30	Negative			0	0					
29	Not Excavated			0	0					
25	Negative			0	0					
27	Negative			0	0					

Attachment F-1c: Resumes of Principal Investigator and Co-Authors

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SHAWN M. PATCH, RPA
PRINCIPAL INVESTIGATOR/REMOTE SENSING SPECIALIST
NEW SOUTH ASSOCIATES, INC.
1006 Yanceyville Street
Greensboro, North Carolina 27405
336-379-0433 (Phone)
336-379-0434 (Fax)
spatch@newsouthassoc.com

EDUCATION
M.A., Anthropology, Eastern New Mexico University - 2000
B.A., Anthropology, University of North Carolina at Greensboro - 1996

YEARS EXPERIENCE: 19 years **with New South Associates:** 9 years

SUMMARY OF EXPERIENCE

Shawn M. Patch has directed survey, testing, data recovery, public outreach, contract management, and consultation with state, federal, and tribal agencies. Mr. Patch has experience with a range of site types including prehistoric, historic domestic, urban, industrial, military, and funerary sites. Mr. Patch has conducted projects on behalf of numerous state and federal agencies including: several state Departments of Transportation; the U.S. Army Corps of Engineers; and the National Park Service. Mr. Patch has worked in Georgia, North Carolina, South Carolina, Florida, Tennessee, New York, U.S. Virgin Islands, Colorado, and New Mexico. His active research interests include lithic studies and he has experience with an array of technical applications including ground penetrating radar (GPR), geographic information systems (GIS), global positioning systems (GPS), and total station operation. Mr. Patch's areas of expertise include: Section 106 Compliance, Southeastern Archaeology, Transportation Archaeology, Lithic Technology, Ground Penetrating Radar (GPR), Geographic Information Systems (GIS), Global Positioning Systems (GPS), and Quantitative Applications in Archaeology.

KEY EXPERIENCE

2017 **Principal Investigator and Co-Author.** Archaeological Investigations at Hiwassee Island (40MG31). The study conducted limited archaeological investigations of the Hiwassee Island, one of the most important precontact sites in the Southeast. The investigations were conducted within the parameters of an archaeological field school for Native American tribal participants. The study was prepared for the Tennessee Valley Authority.

2017 **Principal Investigator, Archaeologist, and Co-Author.** Magnetic Gradiometer Survey to Study the Effects of Controlled Vegetation Burning on Ledford Island (40BY13). The project was a case study to examine the effects of controlled vegetation burning on magnetic gradiometer results. The study was performed on behalf of the Tennessee Valley Authority.

2017 **Principal Investigator, Archaeologist, and Co-Author.** Cultural Resources Survey of 413 Acres Surrounding a Section of the Trail of Tears National Historic Trail. The survey identified 10 new sites within one mile of the survey area in Tellico Ranger District of the Cherokee National Forest. The survey was conducted for the United States Department of Agriculture Forest Service.

2017 **Principal Investigator.** Geophysical and Archaeological Investigations of Site 44LE24 at Pennington Gap. The study identified Middle Woodland pottery and 12 precontact features including two earth ovens, eight thermal pits, and two burned stains of unknown use. The study was conducted for the Tennessee Valley Authority.

JOHN KANNADY
ARCHAEOLOGIST AND GIS SPECIALIST
NEW SOUTH ASSOCIATES, INC.
6150 East Ponce de Leon Avenue
Stone Mountain, Georgia 30083
jkannady@newsouthassoc.com

EDUCATION
M.S., Geography, University of Idaho - 2016
B.A., Anthropology and Art History, University of Tennessee - 1998

YEARS EXPERIENCE: 17 years **with NEW SOUTH ASSOCIATES:** 2 years

SUMMARY OF EXPERIENCE

John Kannady has extensive experience in conducting archaeological surveys, testing, and data recovery, as well as archival research, report preparation, construction site monitoring, and site mapping with professional grade GPS units. Mr. Kannady worked in the Pacific Northwest (Washington, Oregon, and Idaho) and throughout the Southeastern U.S. and Eastern seaboard. His work has extended to spatial data management, analysis, and modeling. Mr. Kannady has been lead or co-author on several hundred CRM reports and has a thorough knowledge of Section 106, NEPA, and SEPA guidelines. Technical skills include:

- Geographic Information Systems
- Cultural Resource Management
- Data Collection
- Data Management

KEY EXPERIENCE

2018 **Archaeologist.** Phase I Archaeological Survey of the Bazemore Mitigation Bank/Surplus Tract, Screven County, Georgia. Performed a Phase I Archaeological survey of a 222-acre parcel to be used for wetlands mitigation, reviewed laboratory data, delineated and assessed NRHP eligibility of newly identified site, authored report. Work conducted for Georgia Department of Transportation.

2018 **Archaeologist.** Phase I Archaeological Survey of the SR11/SR49/U.S.41 Bridge Replacement over Norfolk Southern Railroad, Bibb County, Georgia. Directed archaeological fieldwork for a proposed bridge replacement project and 2,900 feet of roadway, reviewed laboratory data, assessed significance of newly identified sites, co-authored report. Work completed for Georgia Department of Transportation.

2018 **Archaeologist.** Supplemental Environmental Assessment, Phase I Archaeological Survey, Durham-Orange Light Rail Transit Project. Conducted archaeological survey of design modifications as part of a 17-mile railway project and co-authored report. Completed on behalf of HDR Engineering.

2018 **Archaeologist.** Phase I Archaeological Survey, Interchange Reconstruction at I-185 and CS2228/Buena Vista Road. Performed Phase I Archaeological fieldwork for planned interchange modifications, assessed conditions, prepared report. Work completed on behalf of ATKINS.

Josh Fletcher, RPA

Cultural Resources Specialist

Josh Fletcher has more than 15 years of experience in contributions to NEPA documents and project management. Before joining HDR, Josh was a senior project manager for Brockington and Associates for 20 years and has worked with HDR on a large number of transportation and energy projects. His experience includes community outreach, extensive cultural resources management, consultation, and mitigation efforts, and coordination with SHPO offices.

EDUCATION
MA, Archaeology, University of South Carolina, 1999

BS, Architectural Design, Clemson University, 1993

REGISTRATIONS
Register of Professional Archaeologists, United States

OFFICE LOCATION
North Charleston, SC

INDUSTRY TENURE
20 years

HDR TENURE
<1 year

PAPERS
2010. *This Grand House--R. T. Wilson, Jr.'s Palmetto Bluff.* Paper presented at Forty-Third Annual Meeting of the Society for Historical Archaeology Conference, Amelia Island, Florida.

PROFESSIONAL MEMBERSHIPS
Council of South Carolina Professional Archaeologists

Register of Professional Archaeologists

RELEVANT EXPERIENCE

SC 41 Improvements, Charleston and Berkeley Counties, SC
Charleston County, the Town of Mount Pleasant and SCDOT are partnering to improve capacity and ease traffic congestion within the SC 41 corridor. The project study area extends from Clements Ferry Road in Berkeley County to US 17 in Charleston County. Proposed improvements may include improvements to SC 41 and/or other existing roadways within the corridor. Alternatives that include segments of new location roadways are also being considered. The NEPA process is underway and preliminary alternatives are being developed based on collected data.
Role: Community Characterization Report Lead and QA/QC for Cultural Resources Technical Reports

Berlin G. Myers Parkway, Phase III, Summerville, SC
This project is a new location, limited access roadway that runs parallel to the existing Sawmill Branch. Sawmill Branch was channelized more than forty years ago as part of a federal flood control project. Josh led the writing for the Environmental Justice document for the EA and was a QA/QC reviewer for the cultural resource sections.
Role: Lead Writer and QA/QC

Carolina Crossroads (I-26/I-20/I-126) Environmental and Engineering Services, Columbia, SC
HDR is providing engineering and environmental services for the preparation of an EIS, right of way plans and final construction plans for improvements to the I-20/26/126 corridor in Richland and Lexington Counties. Relevant services include notice of intent, project scoping (surveying and mapping, public involvement, purpose and need, traffic studies and analysis, and alternatives analysis), preparation of draft and final EIS, technical memorandums, assistance with record of decision and administrative record.
Role: NEPA Writer and QA/QC Reviewer for Cultural Resources Technical Documents and EIS Chapter

Silicon Ranch Corporation (SRC) and Tennessee Valley Authority (TVA), Jonesborough Solar Tract, Washington County, TN

As a subconsultant to HDR, Josh managed the cultural resources survey for a potential solar farm in Jonesborough. The cultural resources team used new GIS modeling technology to determine if the proposed solar farm would have a visual effect on nearby historic architectural resources identified and assessed during the cultural resources survey.
Role: Cultural Resources Project Manager

UC Synergetic, Summerville-Pepperhill 230 kV Transmission Line, Berkeley and Charleston Counties, SC
Josh managed the cultural resources survey for UC Synergetic and SCE&G. The transmission line corridor stretched for 7.5 miles and passed through several previously recorded archaeological sites and historic districts. Josh consulted with the SC State Historic Preservation Office (SC SHPO) and the clients to minimize effects to these historic resources.
Role: Cultural Resources Project Manager

Charleston County, Palmetto Commerce Parkway Extension Phase II Project, Charleston County, SC
Phase II extended four lanes of all new roadway beginning where Phase I ended and continuing to Ashley Phosphate Road at North Spartan Road. The project included an additional 3.9 miles of roadway, landscaped median, divided four-lane roadway, multi-use path and traffic signals. Josh managed the cultural resources survey and consulted extensively with the client and the SC SHPO, since it was determined that the project would have an adverse effect on NRHP-eligible 18th century inland rice fields identified during the cultural resources survey. The mitigation package included a number of products and outreach materials to educate the public about the rich and important history of the project area.
Role: Cultural Resources Project Manager

Charleston County, Palmetto Commerce Parkway Phase III Project, Charleston County, SC
Charleston County proposed to develop the Palmetto Commerce Parkway Phase 3 Project in North Charleston in order to develop a connection from Ladson Road to Aviation Avenue. Josh managed the cultural resources survey and consulted with the USAF and local historical groups.
Role: Cultural Resources Project Manager

US 21 Harbor River Bridge Replacement Design-Build Preparation Services, Beaufort County, SC
This historic US 21 bridge, built in 1939, connects St. Helena Island with Harbor Island. The main crossing is over the Harbor River. The project lies in the Salkehatchie Coastal Frontage Basin watershed which is comprised of a collection of sea islands and Hunting Island State Park. Josh managed the cultural resources survey, consulted with the Gullah Geechee Heritage Corridor organization, and aided in completing the Section 4(f) document.
Role: Cultural Resources Project Manager

Charleston County, Maybank Highway Improvements Project, Johns Island, SC
Charleston County's proposed improvements along Maybank Highway from River Road extends approximately one mile east and ends at the Paul J. Gelegotis Bridge over the Stono River. Josh managed the cultural resources survey and consulted with the SC SHPO on possible effects that the project may have on the surrounding Fenwick Historic District.
Role: Cultural Resources Project Manager

Charleston County, I-526 Improvements Project, North Charleston, SC
This eight-mile segment of Interstate I-526 was identified by the SCDOT for evaluation of future improvements to reduce congestion. To identify the many strategies available for congestion relief and improved capacity of I-526, the project will be pursued in three phases of work. As a subconsultant, Josh managed the cultural resources survey for the SCDOT and consulted with cultural resources staff at the SCDOT and SC SHPO on possible project effects on an NRHP-eligible archaeological site identified during the survey.
Role: Cultural Resources Project Manager