

4.0 RESEARCH DESIGN AND METHODS

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The purpose of the Phase I archaeological resources identification survey was to identify archaeological resources in the SR 1 South Frederica Grade Separated Intersection project APE. The survey aimed to determine the range of historic and precontact-era activities that occurred in the APE and in the broader project area. The survey also intended to preliminarily assess the integrity of archaeological deposits that might be identified in the APE, if possible. A.D. Marble & Company performed the investigation in a staged manner that included Phase IA background research and Phase IB field work, artifact processing and cataloging, artifact curation and deed of gift acquisition (if necessary), and report writing.

4.1 Background Research

The investigation commenced with a review of archaeological literature relevant to the study area and the scrutiny of relevant Delaware archaeological site files, National Register of Historic Places (NRHP) files, and cultural resource management reports. Research also included a review of current and past aerial photographs, historic maps and atlases, and an examination of environmental attributes (e.g., water, slope of terrain, soil types) that pertained to the geographic and ecological makeup of the project area. A.D. Marble & Company also gathered information about the precontact and historic periods to generate a holistic and relevant culture history for the investigations.

The background information supplied investigators with an idea of the archaeological properties that might be encountered in the APE, helped assess the suitability of the Phase I field work methods, and led to the preparation of a sampling design for the Phase I field work. The results of the background research were discussed with DelDOT Cultural Resources Professional David Clarke, who assessed and approved the field work methods proposed in the Phase I work plan.

4.2 Field Work Sampling Design

The approximately 176-ac APE had low to moderate potential for containing archaeological resources (David Clarke, DelDOT archaeologist, personal communication August 2009). Based on discussions with David Clarke and given the low to moderate potential, it was determined that

only a fraction of the APE would undergo Phase I survey (field work). Therefore, a sample area of the APE was surveyed. Note that the extent of the sample survey area was limited by the anticipated limits of construction because areas that were inside the APE but outside of the anticipated limit of construction will not be disturbed.

A.D. Marble & Company employed a sampling design that is based on a synthesized set of predictive models for identifying precontact and historic archaeological properties that have been located in similar physiographic settings in Delaware, Maryland, and Pennsylvania (see Archaeological and Historical Consultants, Inc. [AHC] 1993; Baublitz 2006; Kellogg and Custer 1994; Lenert 2010; Wescott and Kuiper 2000; see also Egghart 2008). DelDOT and DESHPO approved this sampling design in August 2009.

The parameters for predicting precontact-era site locations were that sites would be identified within 100 m of a water source (unless they have been channelized and are currently manifested as modern ditches (see AHC 1993; Baublitz 2006; Lenert 2010; Wescott and Kuiper 2000; see also Kellogg and Custer 1994); and within 50 m of a bay/basin feature (includes the actual bay/basin; essentially a wet/dry ecotone per Egghart 2008; Kellogg and Custer 1994).

The parameters for identifying historic-era site locations were that sites would be located within 100 m of a historic road (AHC 1993); within 100 m of a historic-era road intersection (AHC 1993); and within 100 m of a historic property mapped via historic atlas (AHC 1993; Lenert 2010; Wescott and Kuiper 2000). Note that in the case of the South Frederica project, these parameters were determined with the aid of the Byles 1859 and Beers 1868 atlas mapping. Note also that in a few cases (e.g., the test area defined below as SR 1 – West Field) where historic structures are clearly situated inside the APE, they received no survey attention because they fell outside of the sample survey area that was defined by the limit of project construction.

In general, eighteenth-century historic sites were expected to be located adjacent to historic-era roads as well as in settings at some distance from roads (Craig Lukezic [DESHPO] to David Clarke, personal communication, August 2009) but within 100 m of a water source; both

precontact and historic sites were expected to be located in high elevations relative to the surrounding landscape (AHC 1993; Wescott and Kuiper 2000).

Based on the sampling design, it was determined that approximately 132 higher-probability acres of the 176-ac APE (75 percent of the total APE acreage) would undergo Phase IB field work. Approximately 12 ac evinced higher probability for containing only precontact archaeological resources, and approximately 77 ac evinced higher probability for containing only historic archaeological resources; approximately 43 ac evinced higher probability for containing both precontact and historic archaeological resources (Figure 2).

4.3 Field Methods

Archaeological survey was undertaken using: 1) STPs in areas not under cultivation (e.g., in wooded portions and residential front yards in the APE); and 2) pedestrian survey in the areas under cultivation.

4.3.1 Shovel Test Pit Survey

In areas not under cultivation, testing was conducted via a systematic sampling strategy employing 15-m interval STP excavations. A.D. Marble & Company excavated a total of 186 STPs during the survey. All STPs measured approximately 30 cm in diameter and were excavated at least 10 cm into culturally sterile deposits. All excavated sediments were sifted through 0.25-in wire mesh cloth. Excavation data from all STPs were recorded on standard field forms. With the exception of modern debris (e.g., plastic, aluminum foil, etc.), which was noted on the field forms, all artifacts recovered from the tests were retained for processing and analysis. The locations of the STPs were recorded.

An estimated 4 ac of the APE were wooded and required shovel testing. An estimated 12,620 high probability linear feet consisting of approximately 50-ft wide margins of roadways and residential yards in the APE were also surveyed via STPs. When overtly disturbed areas were encountered, STPs were not excavated. Decisions to forego shovel testing were made at the discretion of the field director. Areas that went untested included those on roadsides that had been previously disturbed via modern drainage ditches and underground utilities.

STPs were also excavated in artifact concentrations that were identified during the pedestrian survey. It was determined that a minimum of two STPs could be excavated within the boundaries of each artifact concentration to gather information about the subsurface deposits and the potential for archaeological features (e.g., pits, postholes, foundations, etc.).

4.3.2 Pedestrian Survey

Approximately 82 ac of the APE underwent pedestrian survey. Century Engineering, Inc., staked out portions of fields constituting the total survey area. Local farmers then plowed and disked those areas. After the fields were subjected to a washing rain, archaeologists located the survey areas via project mapping (Figure 2) that was uploaded to a handheld sub-meter Global Positioning System (GPS) unit. The surface inspection then took place. Archaeologists examined the plowed fields in perpendicular 2-m transects. All artifacts were flagged, and their locations were recorded using a handheld GPS unit. The artifacts were then collected for processing and analysis.

4.3.3 Test Unit Excavations

It was determined that if archaeological features (e.g., foundations, pits, postholes, shaft features, middens, etc.) were encountered during pedestrian or STP survey, 1-m by 1-m TU excavations would take place to expose and characterize the features. No features were identified during the Phase I field work. However, a small area containing a precontact artifact concentration was identified, and in consultation with David Clarke, a single TU was excavated to gain a better understanding of the character of the archaeological deposits. The TU was placed at the discretion of the principal investigator and based on artifact densities revealed in the STPs at the precontact locus. The TU was excavated by individual strata to a point 10 cm into culturally sterile subsoil. Soil removed from the TU was screened through 0.25-in hardware cloth to ensure the uniform recovery of cultural materials. All recovered artifacts were retained in bags that were labeled with precise provenience information. Standardized forms were used to record data relating to depth of strata, soil Munsell color and texture, and artifact content of the TU.

4.4 Lab Methods

All artifacts recovered during the Phase IB testing were washed, inventoried, cataloged, and prepared for curation according to the most current standards of the Delaware Division of Historical and Cultural Affairs. It was anticipated that 1,500 artifacts would be recovered during the investigation. The total number exceeded this amount by approximately 500 artifacts, as 2,045 artifacts were recovered, processed, and cataloged. An artifact catalog and artifact distribution maps were generated. The distribution maps are presented in the following section of this report.

Artifacts were analyzed according to their type, function, period of attribution, and diagnostic features. Analyses included numerical and qualitative assessments of the artifacts to evaluate the nature of the artifact deposits and their depositional contexts. Coupled with stratigraphic and background research data, these analyses helped to determine if any artifact concentrations qualify per DESHPO definitions for archaeological properties (i.e., sites).

4.5 Deed of Gift and Artifact Curation

A.D. Marble & Company will not proceed with the Deed of Gift task until after DESHPO concurs that a site(s) was identified and concurs with the assemblage makeup of any identified site(s). Note also that CRS forms will not be prepared until after DESHPO concurs with the sites identified during the investigation and concurs with the assemblage makeup of each site. If archaeological properties are determined to have been identified during the archaeological investigations, A.D. Marble & Company will attempt to obtain Deed of Gift agreement(s) to curate the site artifacts.

It is the opinion of A.D. Marble & Company that five sites were identified during the survey. Contact with the five landowners may take the form of registered letters, phone calls, and face-to-face meetings. Landowners will be asked to donate the artifacts to the State Museum and to sign a Deed of Gift agreement form that will be prepared by A.D. Marble & Company. If landowners wish to retain the archaeological materials, they will be asked to sign a Rejection form that will also be prepared by A.D. Marble & Company. The Deed of Gift agreement or Rejection form will be included with the investigation documents that will ultimately be

submitted to the State Museum for curation. Copies of the Deed of Gift agreement or Rejection form will be provided to Century Engineering, Inc., and DeIDOT. Site artifacts will be curated according to Delaware Division of Historical and Cultural Affairs guidelines and delivered to the Delaware State Museum for long-term repository upon completion of the project.