1.0 INTRODUCTION

1.1 Project Need

The Route 40 Improvements Project, State Route (S.R.) 896 to S.R. 1, covers approximately 9.5 km (5.9 mi) of existing highway in New Castle County, Delaware (Figure 1). The road today is a four-lane highway, with all intersections at grade. This portion of New Castle County is undergoing rapid population growth and concomitant residential and commercial development. The traffic volume is approaching levels beyond the capacity of the roadway, the at-grade intersections disrupt traffic flow and create dangerous conditions, the lack of turn lanes at certain intersections results in stopped traffic in the through-travel lanes, and an at-grade railroad crossing disrupts traffic flow with each train.

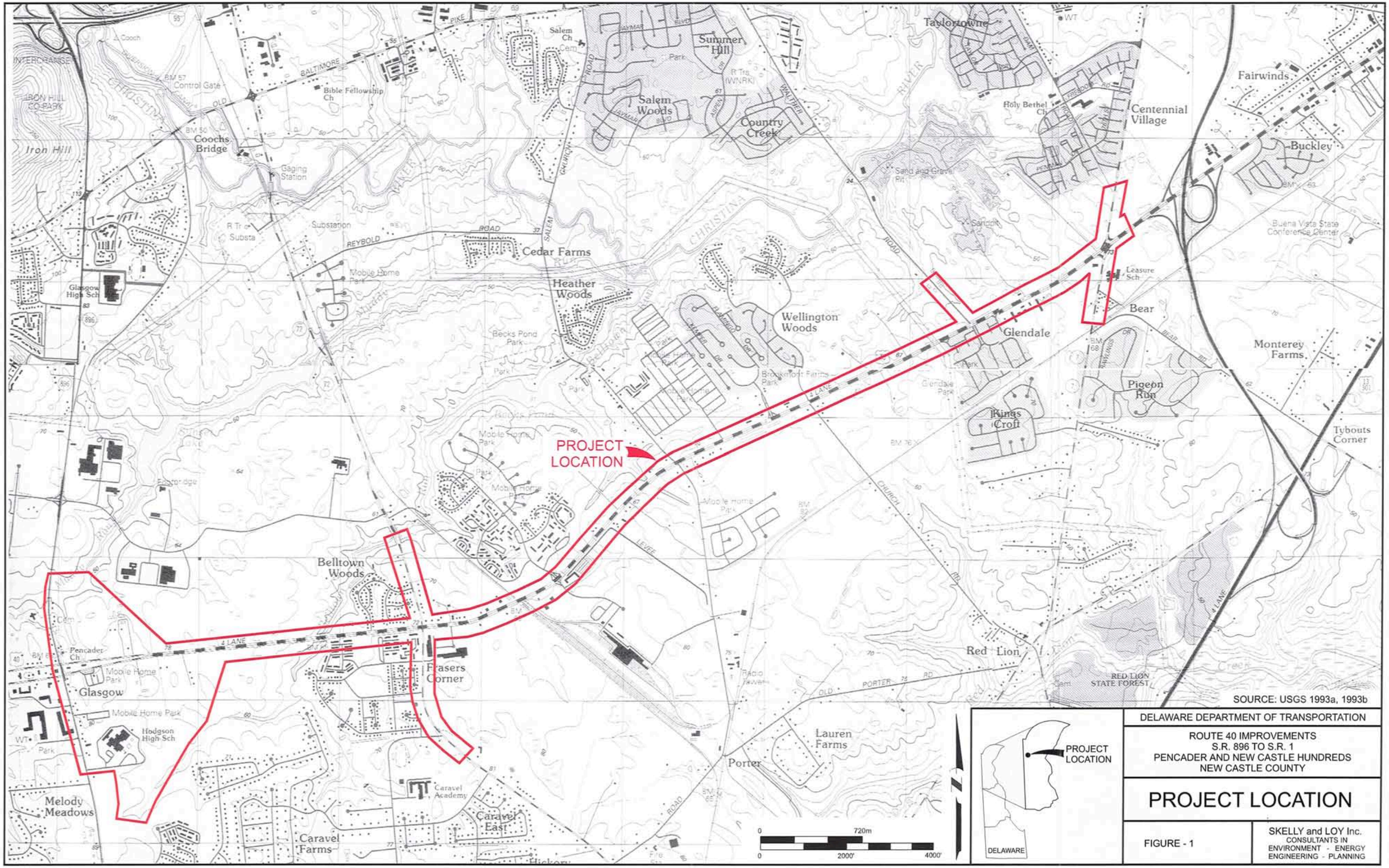
Although not a part of the Route 40 Improvements project, a survey of the Walther Sidewalk project, which is north of and proximal to the planned Route 40 Improvements along Walther Road, was also completed by Skelly and Loy. The results of the Walther Sidewalk Phase I archaeological survey are presented in Appendix A of this report in order to reduce the duplication of efforts for both projects.

1.2 Project Description

The Route 40 Improvements Project will add an eastbound travel lane and a westbound travel lane for the entire length of the project (Figure 2). Turn lanes will be added and/or extended at key intersections. A ramped, fly-over juncture is proposed for the intersection of Route 40 and S.R. 896. A bridged crossing is also being considered for Route 40 over the railroad.

A Phase I archaeological survey was undertaken to identify archaeological sites within the Area of Potential Effects (APE). The APE was defined as the footprint of proposed ground-disturbing activity. Phase II investigations were completed to assess the archaeological sites discovered in the APE during the Phase I survey.

The APE is generally comprised of narrow strips of land located adjacent to the existing edge of pavement. Exceptions to this include two proposed stormwater retention ponds. The APE included developed residential and commercial properties, paved parking lots, cable and pipeline corridors, agricultural fields, and areas significantly impacted by previous highway construction. The APE is 104.85 ha (259.08 ac) in area, of which 84.43 ha (208.62 ac) are disturbed, 0.65 ha (1.60 ac) are wet, 6.88 ha (17.0 ac) are previously surveyed, 1.43 ha (3.53 ac) are previously access denied,



SOURCE: USGS 1993a, 1993b

DELAWARE DEPARTMENT OF TRANSPORTATION

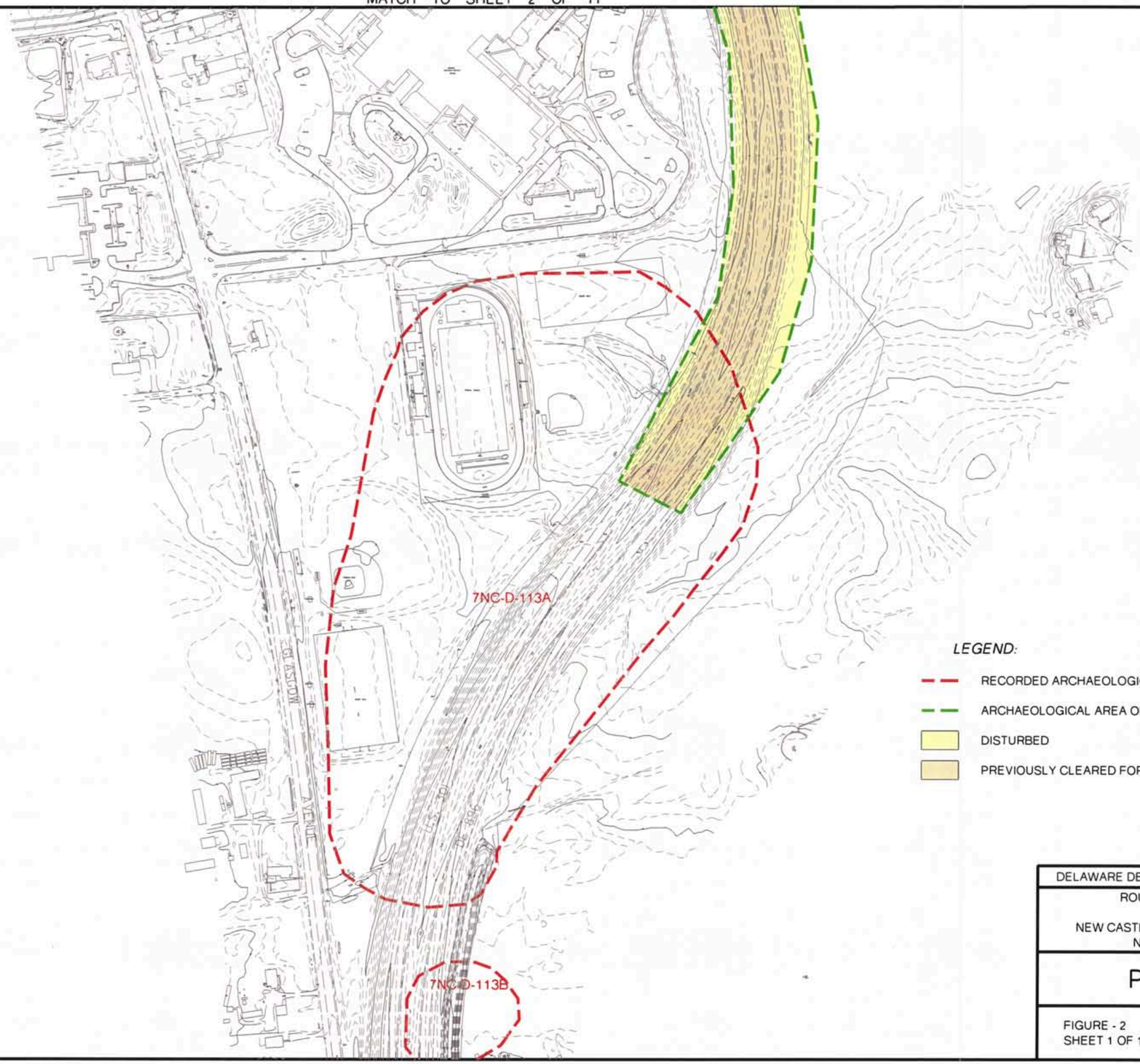
ROUTE 40 IMPROVEMENTS
S.R. 896 TO S.R. 1
PENCADER AND NEW CASTLE HUNDREDS
NEW CASTLE COUNTY

PROJECT LOCATION

FIGURE - 1

SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING

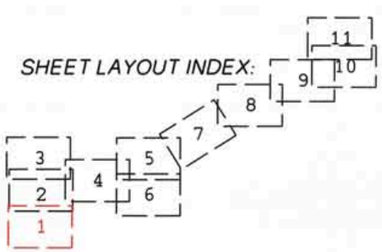
MATCH TO SHEET 2 OF 11



LEGEND:

- RECORDED ARCHAEOLOGICAL SITE
- ARCHAEOLOGICAL AREA OF POTENTIAL EFFECTS (APE)
- DISTURBED
- PREVIOUSLY CLEARED FOR ARCHAEOLOGY

SHEET LAYOUT INDEX:



0 108m
0 300' 600'

DELAWARE DEPARTMENT OF TRANSPORTATION

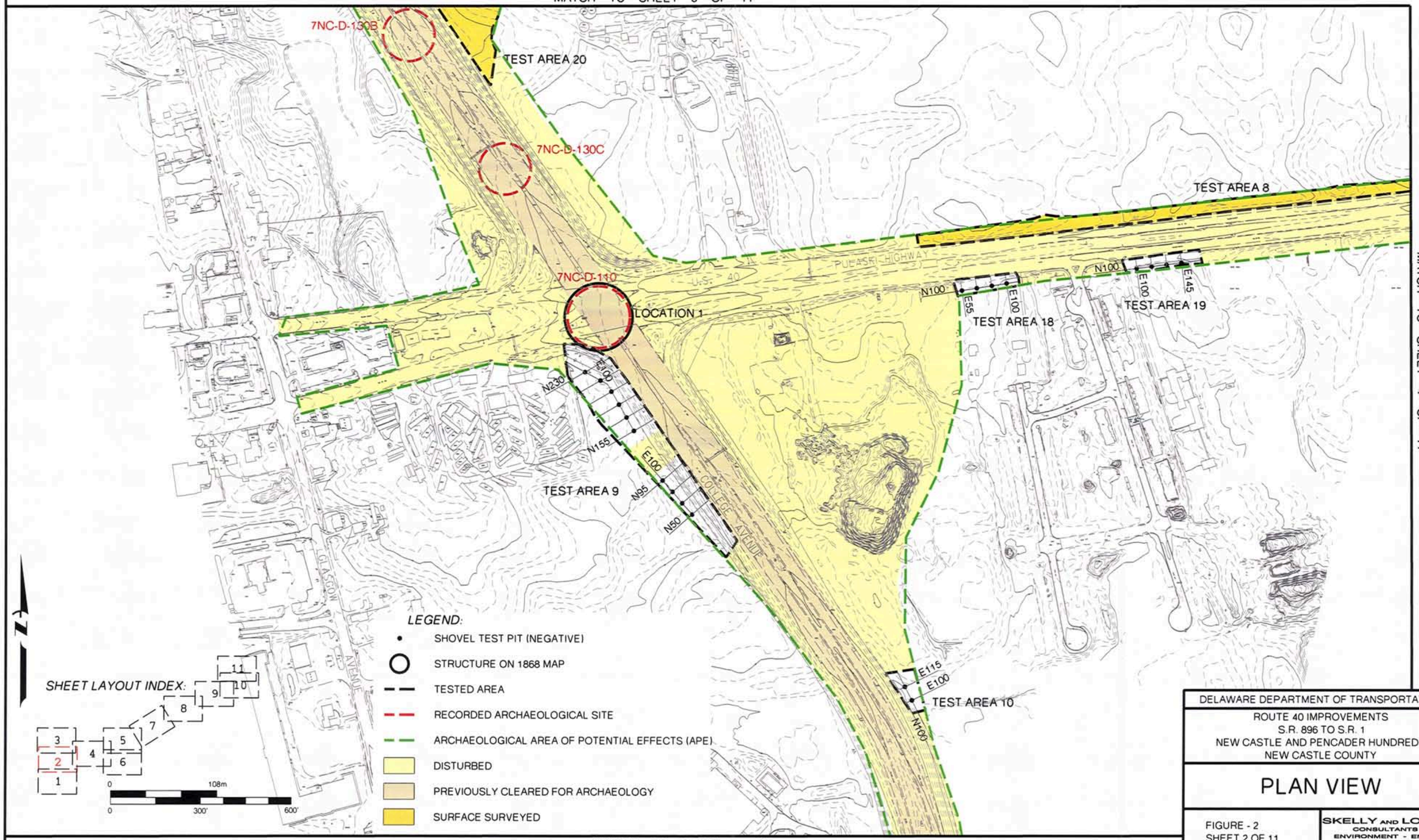
ROUTE 40 IMPROVEMENTS
S.R. 896 TO S.R. 1
NEW CASTLE AND PENCADER HUNDREDS
NEW CASTLE COUNTY

PLAN VIEW

FIGURE - 2
SHEET 1 OF 11

SKELLY AND LOY, INC.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING

MATCH TO SHEET 3 OF 11



MATCH TO SHEET 4 OF 11

MATCH TO SHEET 1 OF 11

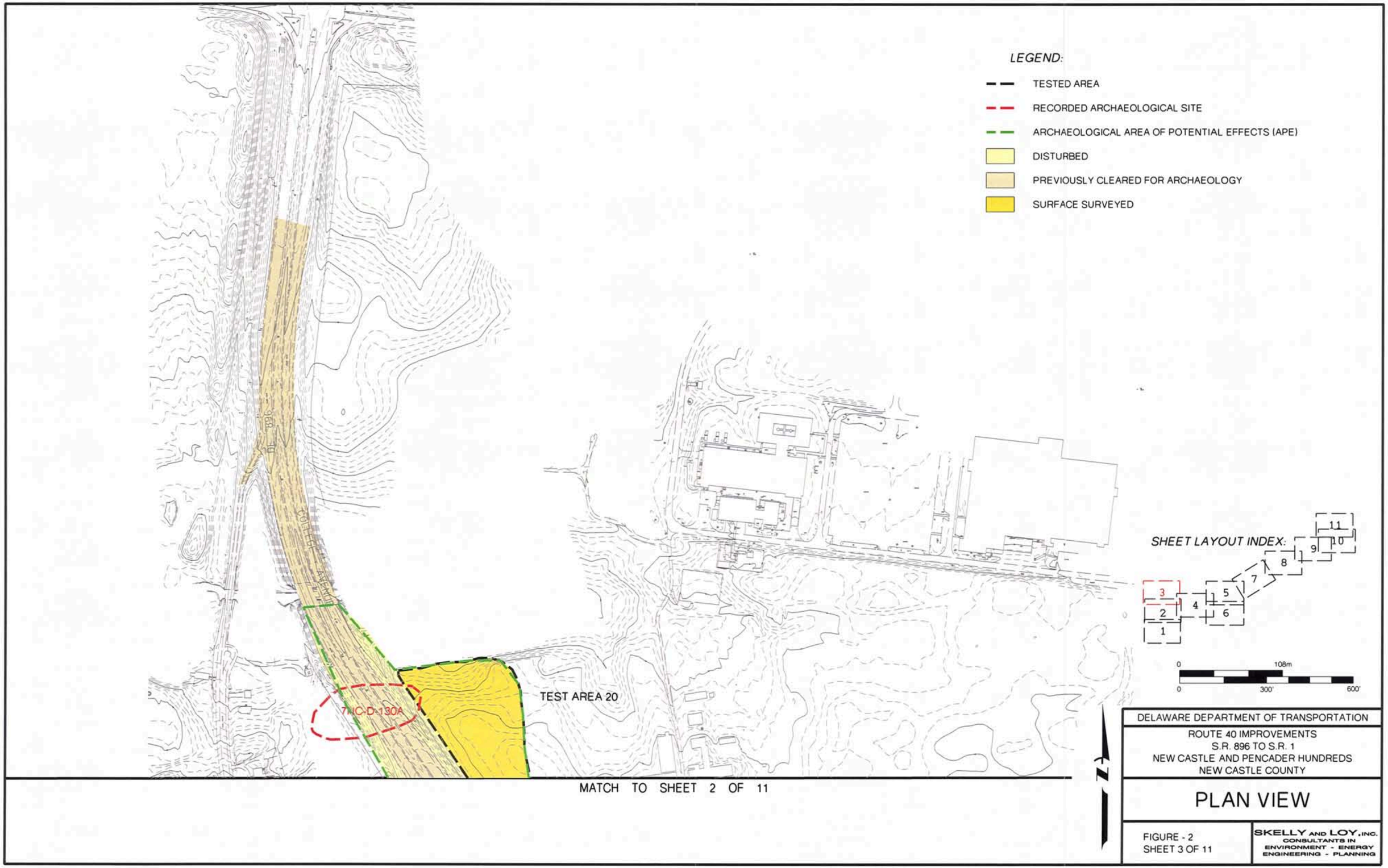
DELAWARE DEPARTMENT OF TRANSPORTATION

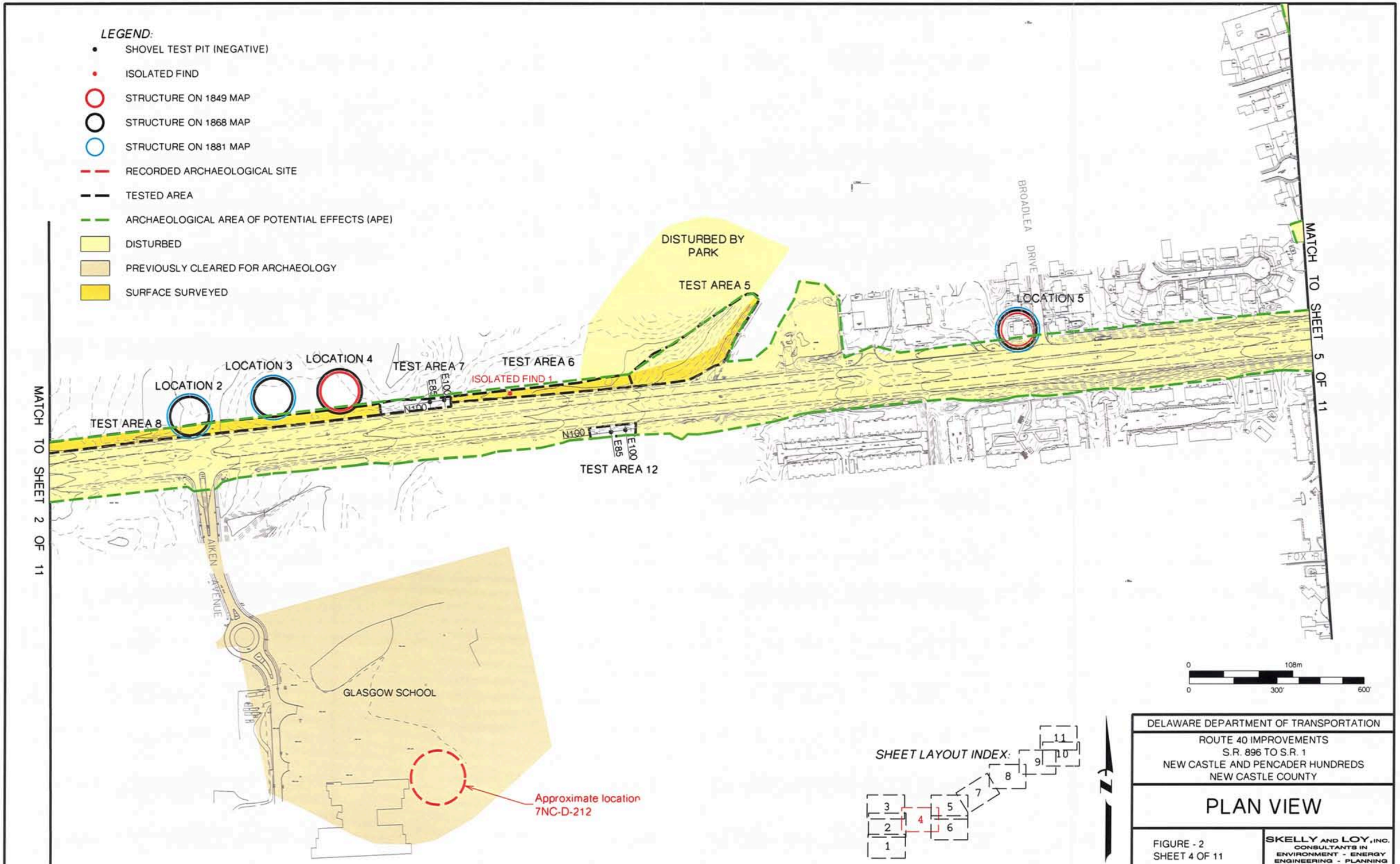
ROUTE 40 IMPROVEMENTS
S.R. 896 TO S.R. 1
NEW CASTLE AND PENCADER HUNDREDS
NEW CASTLE COUNTY

PLAN VIEW

FIGURE - 2
SHEET 2 OF 11

SKELLY AND LOY, INC.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING


LEGEND:
TESTED AREA
RECORDED ARCHAEOLOGICAL SITE
ARCHAEOLOGICAL AREA OF POTENTIAL EFFECTS (APE)
DISTURBED
PREVIOUSLY CLEARED FOR ARCHAEOLOGY
SURFACE SURVEYED
SHEET LAYOUT INDEX:
1
2
3
4
5
6
7
8
9
10
11
0
108m
0
300'
600'
7NC-D-130A
TEST AREA 20
MATCH TO SHEET 2 OF 11
N
DELAWARE DEPARTMENT OF TRANSPORTATION
ROUTE 40 IMPROVEMENTS
S.R. 896 TO S.R. 1
NEW CASTLE AND PENCADER HUNDREDS
NEW CASTLE COUNTY
PLAN VIEW
FIGURE - 2
SHEET 3 OF 11
SKELLY AND LOY, INC.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING



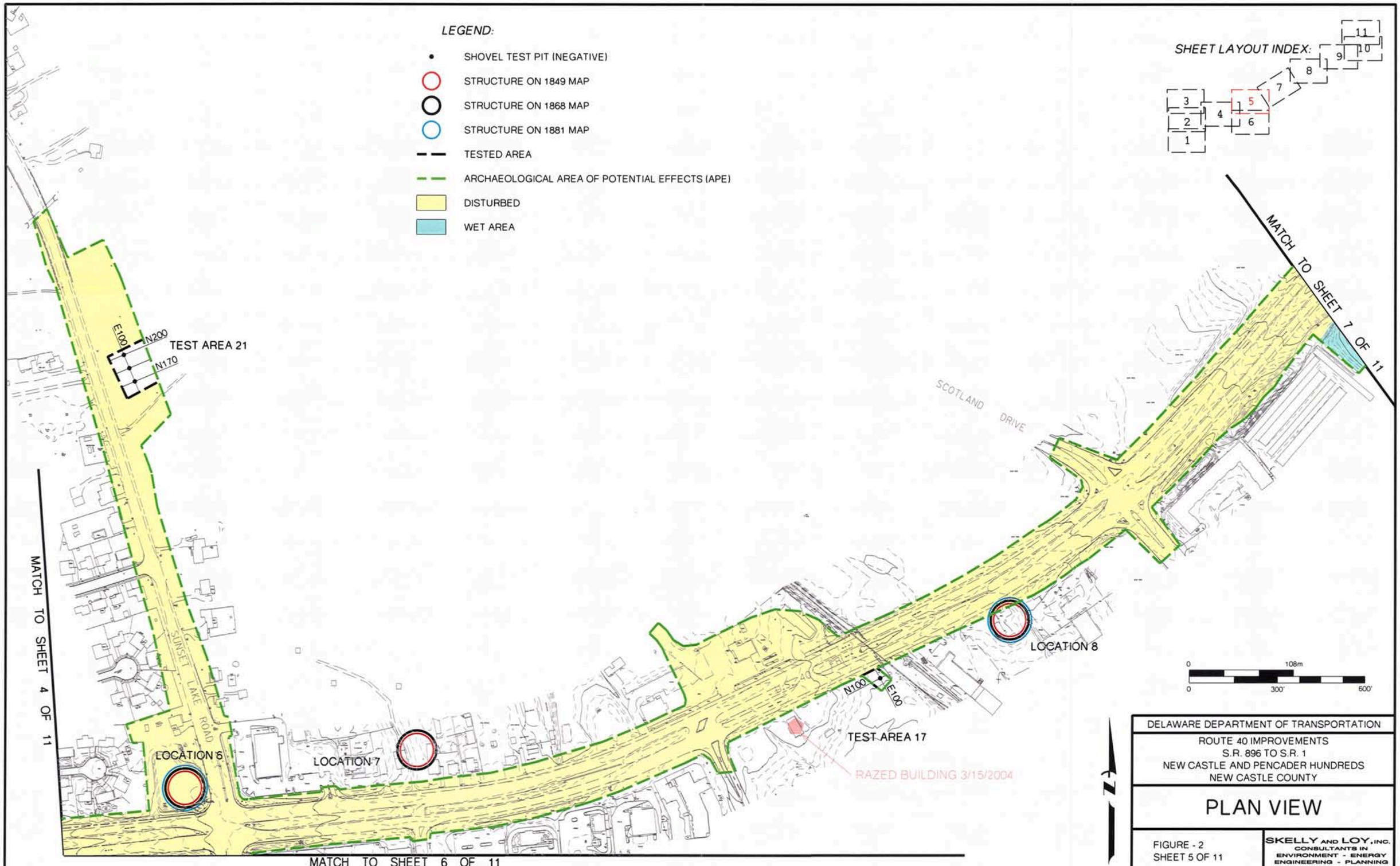
DELAWARE DEPARTMENT OF TRANSPORTATION

ROUTE 40 IMPROVEMENTS
S.R. 896 TO S.R. 1
NEW CASTLE AND PENCADER HUNDREDS
NEW CASTLE COUNTY

PLAN VIEW

FIGURE - 2
SHEET 4 OF 11

SKELLY AND LOY, INC.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING



DELAWARE DEPARTMENT OF TRANSPORTATION

ROUTE 40 IMPROVEMENTS
S.R. 896 TO S.R. 1
NEW CASTLE AND PENCADER HUNDREDS
NEW CASTLE COUNTY

PLAN VIEW

FIGURE - 2
SHEET 5 OF 11

SKELLY AND LOY, INC.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING

MATCH TO SHEET 5 OF 11

MATCH TO SHEET 4 OF 11

WRANGLE HILL ROAD

FOX RUN CIRCLE

FOX RUN CIRCLE

FOX CHASE CIRCLE

RINGNECK PLAZA

DELAWARE ROAD

LEGEND:

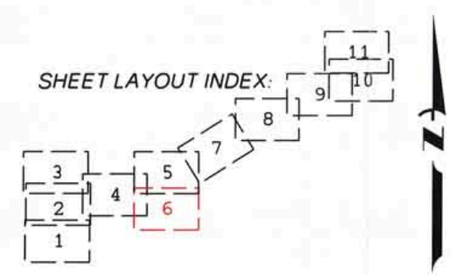
ARCHAEOLOGICAL AREA OF POTENTIAL EFFECTS (APE)

DISTURBED

0 108m

0 300' 600'

SHEET LAYOUT INDEX:



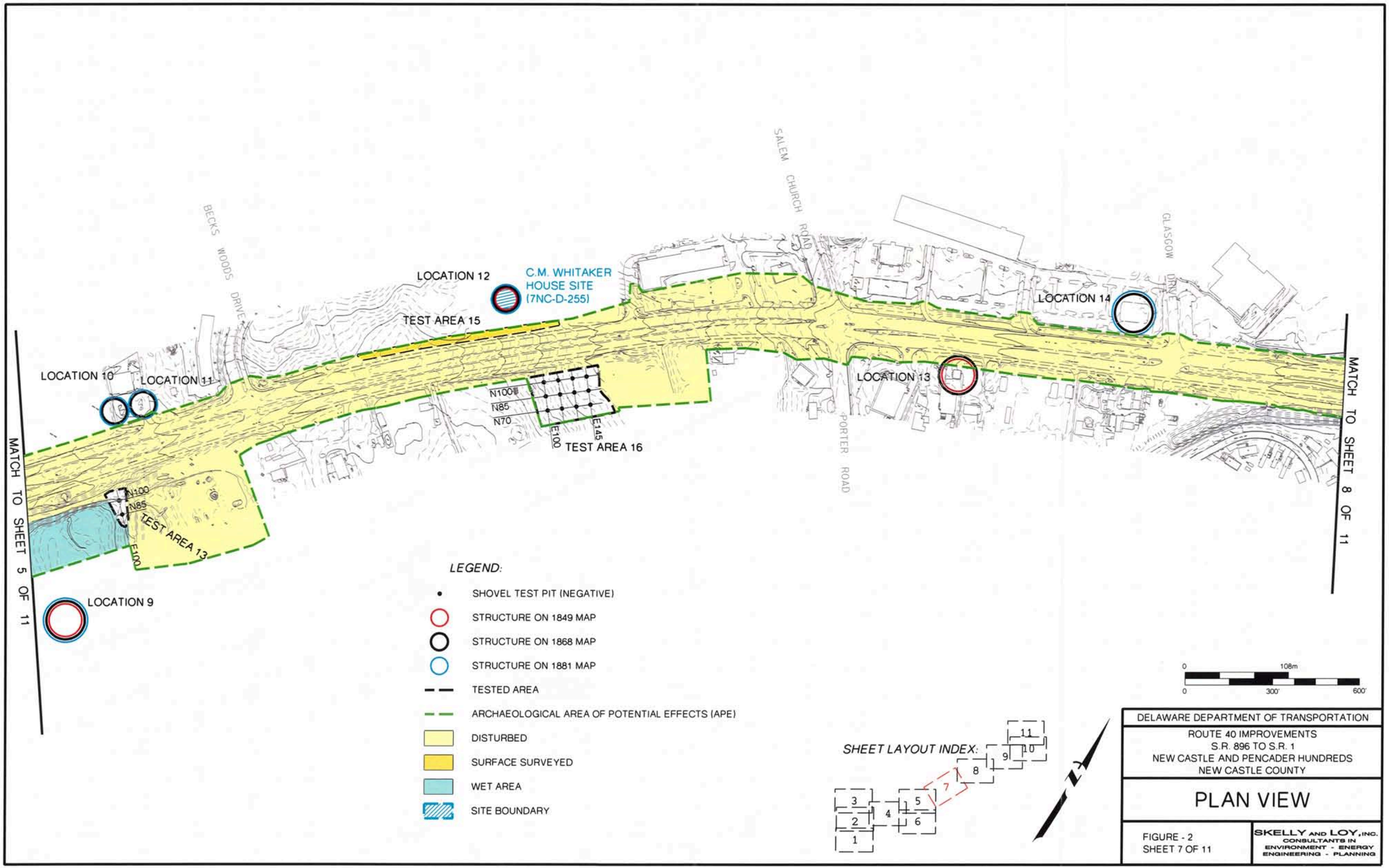
DELAWARE DEPARTMENT OF TRANSPORTATION

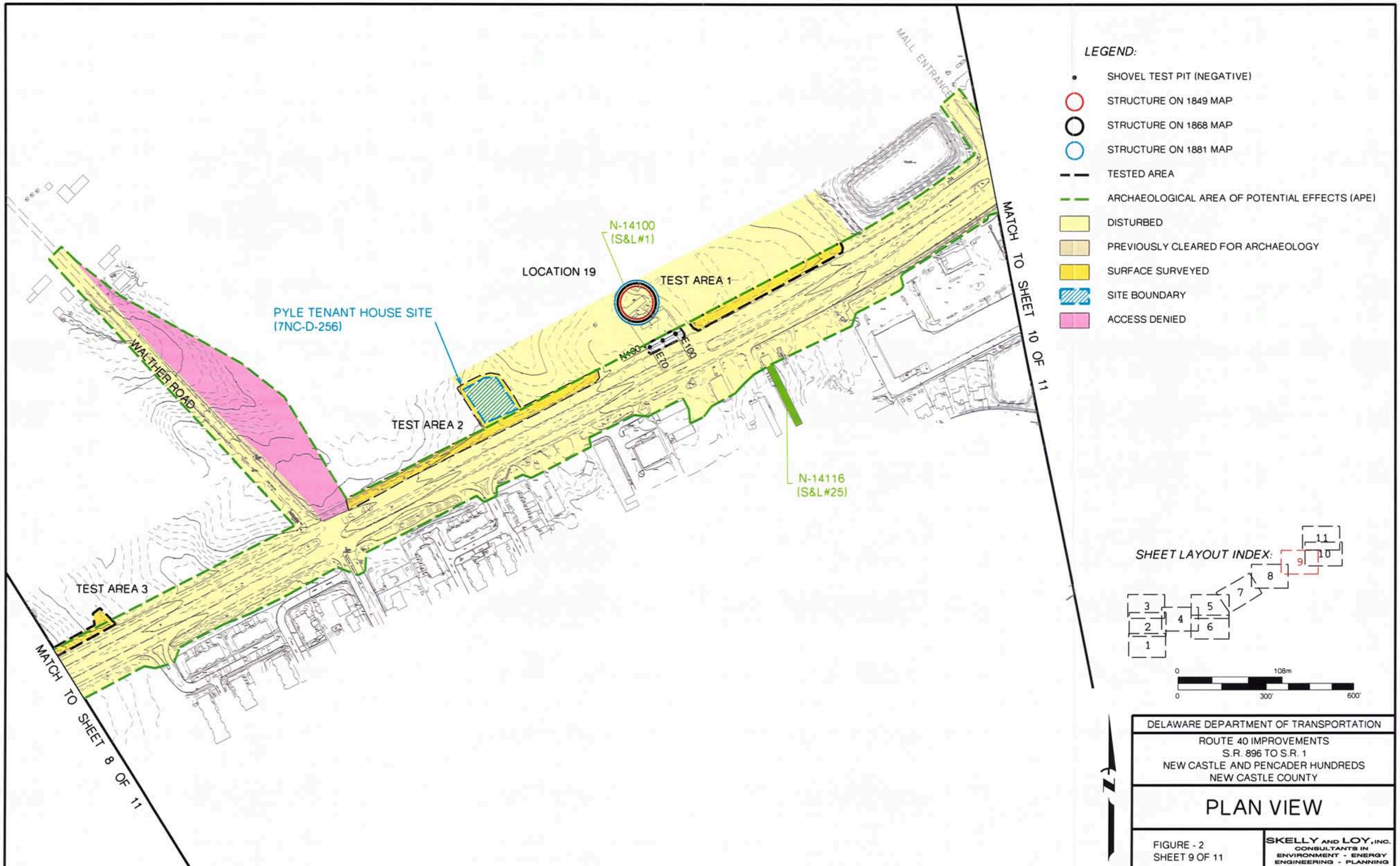
ROUTE 40 IMPROVEMENTS
S.R. 896 TO S.R. 1
NEW CASTLE AND PENCADER HUNDREDS
NEW CASTLE COUNTY

PLAN VIEW

FIGURE - 2
SHEET 6 OF 11

SKELLY AND LOY, INC.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING


BECKS WOODS DRIVE
SALEM CHURCH ROAD
PORTER ROAD
GLASGOW DRIVE
LOCATION 12
C.M. WHITAKER HOUSE SITE (7NC-D-255)
TEST AREA 15
LOCATION 14
LOCATION 10
LOCATION 11
LOCATION 13
N100
N85
N70
E100
E145
TEST AREA 16
N100
N85
E100
TEST AREA 13
LOCATION 9
MATCH TO SHEET 5 OF 11
MATCH TO SHEET 8 OF 11
LEGEND:
SHOVEL TEST PIT (NEGATIVE)
STRUCTURE ON 1849 MAP
STRUCTURE ON 1868 MAP
STRUCTURE ON 1881 MAP
TESTED AREA
ARCHAEOLOGICAL AREA OF POTENTIAL EFFECTS (APE)
DISTURBED
SURFACE SURVEYED
WET AREA
SITE BOUNDARY
SHEET LAYOUT INDEX:
1
2
3
4
5
6
7
8
9
10
11
0
108m
0
300'
600'
DELAWARE DEPARTMENT OF TRANSPORTATION
ROUTE 40 IMPROVEMENTS
S.R. 896 TO S.R. 1
NEW CASTLE AND PENCADER HUNDREDS
NEW CASTLE COUNTY
PLAN VIEW
FIGURE - 2
SHEET 7 OF 11
SKELLY AND LOY, INC.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING



DELAWARE DEPARTMENT OF TRANSPORTATION

ROUTE 40 IMPROVEMENTS
S.R. 896 TO S.R. 1
NEW CASTLE AND PENCADER HUNDREDS
NEW CASTLE COUNTY

PLAN VIEW

FIGURE - 2
SHEET 9 OF 11

SKELLY AND LOY, INC.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING

MATCH TO SHEET 11 OF 11

LOCATION 21

LOCATION 20

LOCATION 22

TEST AREA 14

E100

N175

N100

U.S. ROUTE 40

STATE ROUTE 7

CHRISTIANA

PULASKI

GLENDALE CONNECTOR

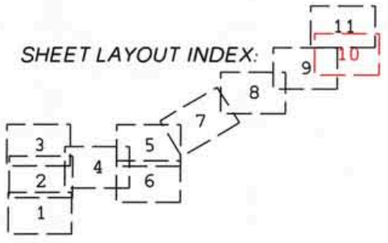
BEAR CORNER ROAD

MATCH TO SHEET 9 OF 11

LEGEND:

- SHOVEL TEST PIT (NEGATIVE)
- STRUCTURE ON 1849 MAP
- STRUCTURE ON 1868 MAP
- TESTED AREA
- ARCHAEOLOGICAL AREA OF POTENTIAL EFFECTS (APE)
- DISTURBED

SHEET LAYOUT INDEX:



0 108m

0 300' 600'

N

DELAWARE DEPARTMENT OF TRANSPORTATION

ROUTE 40 IMPROVEMENTS
S.R. 896 TO S.R. 1
NEW CASTLE AND PENCADER HUNDREDS
NEW CASTLE COUNTY

PLAN VIEW

FIGURE - 2
SHEET 10 OF 11

SKELLY AND LOY, INC.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING

and 11.48 ha (28.36 ac) were tested. Much of the APE has not yet been purchased by the Delaware Department of Transportation (DelDOT), and over the three-year duration of the archaeological project, one archaeological site and one isolated find located in the APE have been lost to non-DelDOT earth disturbing activities related to the ongoing commercial development in this corridor.

The use of federal-aid highway funds on the project dictates that DelDOT consider the effects of the Route 40 Improvements Project on archaeological and historic resources. DelDOT called on Skelly and Loy, Inc., to conduct cultural resources investigations, and this report documents the Phase I survey and Phase II archaeological testing. Historic resources survey, evaluation, and assessment of effect were also undertaken by Skelly and Loy, and are reported in a separate volume (Kuncio and Hyland 2006).

1.3 Research Design

This narrow, linear corridor study was undertaken to provide data to address generic research issues of pre-contact period adaptation and settlement (essentially placing components on the landscape), historic settlement between rural hubs (Glasgow and Bear), and post-depositional processes. The APE is generally rated low to moderate for pre-contact period site potential by the Custer (1986) mapping, and only occasional, limited-activity use probably occurred during the pre-contact period. The historic maps indicated several loci of historic activity, but their survival in the heavily developed corridor was to be addressed.

The majority of the APE is paved road, parking lots, or beneath modern buildings (Photograph 1). The APE is generally limited to within 4.0 m (13.1 ft) of existing edge of pavement for most of the APE, and this narrow strip has been disturbed by the placement of natural gas pipelines, fiber optic cables, and other utilities (Photograph 2). The previously recorded sites and models of pre-contact settlement suggest that the APE, at best, had only a moderate probability of containing pre-contact sites. The historic maps and surviving historic structures indicate that most of the historic houses along the APE were set back from the road and were never present in the APE.

1.4 Summary of Methods

The archaeological survey began with background research to establish previously recorded archaeological sites and cartographically indicated locations of historic activity. In addition, the

Photograph 1. Typical areas of modern disturbance in the Route 40 Improvements project APE.

Photograph 2. Typical area of disturbed road shoulder. Note the buried fiber-optic cable.

background research established the compliance status of all previously examined sites in or near the APE.

A geomorphological reconnaissance began the fieldwork. Hand-placed auger borings were used to examine the geomorphological conditions within the APE, to verify suspected areas of modern disturbance, and to determine the most appropriate testing methods. A total of 20 test areas was defined. No landforms with alluvial, colluvial, or aeolian deposits were discovered; therefore, no deep testing was necessary.

The Phase I survey used surface survey in areas with greater than 70 percent surface visibility and shovel test pits (STPs) in areas with lower visibility. STPs were generally placed at 15.0 m (49.2 ft) intervals. STPs measured 50.0 x 50.0 cm (19.7 x 19.7 in) and were excavated at least 10.0 cm (3.9 in) into sterile subsoil. All soil was screened through 0.64 cm (0.25 in) mesh hardware cloth. Notes were made on the soil stratigraphy and artifact content of each STP. STP and surface collection transects were plotted on project mapping. Access to the property was denied by the landowner for one test area located along the northeast side of Walther Road. This test area was not surveyed.

Subsequent to the Phase I survey and identification of archaeological resources, Phase II research efforts at the Pyle Tenant House site (7NC-D-256) and the Corrie House/Cumberland Farm site (7NC-D-242) were determined in consultation with DelDOT and the State Historic Preservation Office (SHPO). At the Pyle Tenant House site (7NC-D-256), the Phase II testing research included oral history collection, archival research, site mapping, surface collection, and the excavation of eight STPs. State Highway Department (1922, 1946) maps provided data on the configuration and past ownership of the site. Field methods at the Pyle Tenant House site (7NC-D-256) are detailed in Section 5.0. At the Corrie House/Cumberland Farm site (7NC-D-242), the Phase II testing research included archival research, review of previously conducted archaeological work, chain-of-title and tax record research, and the excavation of seven STPs and five 1.0 x 1.0 m (3.3 x 3.3 ft) units. A State Highway Department (1933) map allowed the plotting of the location of the nineteenth century house on the modern mapping.

The previously recorded sites in the APE had all either been deemed not eligible for listing in the NRHP, or had been subjected to Phase III excavations. The survey resulted in the discovery of two sites and one isolated find in the APE; an additional site was found outside the APE. The two sites and the isolated find are recommended not eligible for listing in the NRHP. One of the sites and the isolated find were subsequently destroyed by non-DelDOT earth moving activities.

The only remaining archaeological issue (other than late discovery cases that might arise) is the small area northeast of Walther Road for which access was denied. DelDOT plans to have

Phase I survey completed for this area once the property has been purchased by DelDOT. Assuming the survey of this area reveals no eligible resources, the proposed undertaking will have no effects on any NRHP-listed or -eligible archaeological resources. Table 1 outlines the specific survey and testing methods used throughout the project APE. The sheet numbers in Table 1 reference the sheet numbers included in Figure 2.

Table 1.
Phase I Archaeological Survey Methods

Sheet/Test Area	Methods
Sheet 1	
Untestable	Verified disturbed through geomorphology reconnaissance.
Sheet 2	
Untestable	Verified disturbed through geomorphology reconnaissance.
Test Area 20 (partial)	Surface survey.
Test Area 9	10 STPs.
Test Area 10	2 STPs.
Test Area 18	4 STPs.
Test Area 19	4 STPs.
Test Area 8 (partial)	Surface survey.
Sheet 3	
Untestable	Verified disturbed through geomorphology reconnaissance.
Test Area 20 (partial)	Surface survey.
Sheet 4	
Untestable	Verified disturbed through geomorphology reconnaissance.
Test Area 8 (partial)	Surface survey.
Test Area 7	2 STPs.
Test Area 6	Surface survey.
Test Area 5	Surface survey.
Test Area 12	2 STPs.
Sheet 5	
Untestable	Verified disturbed and wet through geomorphology reconnaissance.
Test Area 21	3 STPs.
Test Area 17	1 STP.
Sheet 6	
Untestable	Verified disturbed and wet through geomorphology reconnaissance.
Sheet 7	
Untestable	Verified disturbed and wet through geomorphology reconnaissance.
Test Area 13	2 STPs.
Test Area 15	Surface survey. House depression and well (C.M. Whitaker House site [7NC-D-255]) recorded outside APE.
Test Area 16	8 STPs.
Sheet 8	
Untestable	Verified disturbed through geomorphology reconnaissance.
Test Area 21	Corrie House site (7NC-D-242) discovered and evaluated with 11 STPs and five 1 x 1 m units.
Test Area 3 (partial)	Surface survey.
Sheet 9	
Untestable	Verified disturbed through geomorphology reconnaissance.
Test Area 3 (partial)	Surface survey.
Test Area 2	Pyle Tenant House site (7NC-D-256) discovered and evaluated with surface survey, 8 STPs, oral history, and archival research.

Sheet/Test Area	Methods
Test Area 1 NE of Walther Road	Surface survey, 3 STPs. Access denied. Will require Phase I survey after DelDOT purchase.
Sheet 10 Untestable Test Area 14	 Verified disturbed through geomorphology reconnaissance. 5 STPs.
Sheet 11 Untestable	 Verified disturbed through geomorphology reconnaissance.

During the Phase I survey and Phase II testing in the APE, the one pre-contact period lithic artifact identified was described by morphology and raw material. The historic period artifacts recovered were analyzed by material class, South (1977) artifact pattern class, and temporally and functionally diagnostic attributes. Appendix B contains the artifact catalogs from the Route 40 Improvements Project Phase I survey and the Corrie House/Cumberland Farm site (7NC-D-242) Phase II testing. The artifacts, project notes, and photographic material associated with this project were prepared for curation at the Delaware State Museum according to their guidelines (Delaware State Historic Preservation Office 1993:47-54).