

A. INTRODUCTION AND METHODOLOGY

This chapter describes the analysis of potential effects of the No Build and Build Alternatives on archaeological resources. Each area where the Build Alternative would cause ground disturbance, e.g., excavation of fan plants/construction access shafts from the surface to tunnels caverns, as well as excavation of station entrances and underpinning to protect and support buildings and other structures, below or adjacent to where Build Alternative tunnels would be located has been identified. The proposed depth and surface area of the future disturbance is also noted. This chapter identifies whether any archaeological resources that could be contained within any of these areas, and whether the Build Alternative would have the potential to affect any of these extant resources. Additional information on the archaeological assessment process, including a description of the assessment methodology, is contained in Appendix 6.

Section 106 of the National Historic Preservation Act of 1966, the New Jersey Register of Historic Places Act, and the New York State Historic Preservation Act of 1980 require federal and state agencies to consider the effects of their actions on any properties listed on or determined eligible for the National and State Registers of Historic Places. Properties listed on or eligible for the State and National Registers include archaeological resources and historic architectural resources. The National Environmental Policy Act (NEPA) also requires such consideration. To streamline the NEPA and Section 106 Process, review and public outreach requirements under Section 106 can be conducted in coordination with analyses and the public outreach process conducted for NEPA and for Section 106. In addition, archaeological resources listed on or eligible for the National Register, and that warrant preservation in place, are protected from adverse effects by Section 4(f) of the Department of Transportation Act of 1966 (see Appendix 8 and the Section 4(f) Evaluation for more information on potential use of Section 4(f) land relative to the Build Alternative).

Consistent with these regulations, the analysis of Build Alternative effects on archaeological resources is being conducted in coordination with the Advisory Council on Historic Preservation (ACHP), as well as the New Jersey and New York State Historic Preservation Offices (NJSHPO and NYSHPO). Consultation has also taken place with the New York City Landmarks Preservation Commission (LPC). Extensive consultation to discuss the archaeological analysis was held with NJSHPO and NYSHPO from 2004 to 2008. A list of these meetings is included in Chapter 13 of the FEIS. This consultation is on going. Correspondence from NJSHPO, NYSHPO, LPC and ACHP are included in Appendix 6.

Implementing regulations for Section 106 define four types of participants in the Section 106 process (§800.2): (1) the federal agency official; (2) the ACHP; (3) consulting parties; and (4) the public. Consulting parties are defined in §800.2(c) as including: (1) the SHPO, who “advises and assists” the federal agency and is responsible for representing the interests of the State; (2) Indian tribes and native Hawaiian organizations, which are responsible for consultation regarding tribal lands and historic properties of interest to tribes and Native Hawaiian organizations; (3) representatives of local government, who are responsible for representing the interests of municipalities; (4) “applicants for federal assistance, permits, licenses, and other approvals”; and (5) additional consulting parties, who are defined as individuals or organizations that have “a demonstrated interest in the undertaking...due to the nature of their legal or economic relation to the undertaking or affected properties, or their concern with the undertaking’s effects on historic properties”.

The federal agency, in consultation with SHPO, undertakes the activity of identifying those individuals or organizations who qualify to be consulting parties. The federal agency is required to consider any written requests by individuals or organizations to participate as consulting parties. Once the consulting parties have been identified, they are afforded opportunities to express their concerns regarding historic properties within a project's Area of Potential Effects (APE), comment on the effects a project might have on such properties, and comment on the resolution of any adverse effects. As described in Chapters 12 and 13, NJ TRANSIT, in coordination with FTA, has included Section 106-related issues in its outreach efforts with the project's Technical Advisory Committee, Regional Citizens Liaison Committee and affected public and stakeholders. In addition, FTA has also initiated contact with Native American tribes and groups, as part of coordination with consulting parties. Below is a list of Native American tribes and groups that were contacted by FTA for this project:

- Federally-Recognized Native American Tribes
 - Absentee-Shawnee Tribe of Oklahoma
 - Cayuga Nation
 - Delaware Nation of Oklahoma
 - Delaware Tribe of Oklahoma
 - Eastern Shawnee Tribe of Oklahoma
 - Oneida Nation
 - Oneida Tribe of Indians of Wisconsin
 - Onondaga Nation
 - Seneca Nation
 - Seneca-Cayuga Tribe of Oklahoma
 - Shawnee Tribe of Oklahoma
 - St. Regis Band of Mohawk Indians
 - Tonawanda Band of Seneca
 - Tuscarora Nation
- State-Recognized Native American Tribes
 - Cherokee Nation of New Jersey
 - Eastern Delaware Nation
 - Eastern Lenape Nation of Pennsylvania
 - Nanticoke Association
 - Nanticoke Lenni-Lenape Indians
 - Powhatan Renape Nation
 - Ramapough Mountain Indians
 - Shinnecock Indian Nation

Potential consulting parties, as well as federally and state-recognized Native American tribes and groups were provided a Project Initiation Package (PIP) and Phase 1A Archaeological Survey Report. These documents provide information on the Build Alternative, the APE for archaeological resources, a list of Register-eligible and potentially eligible resources, and an assessment of effects of the Build Alternative on these resources. The parties receiving these documents were invited to be consulting parties. The following organizations expressed an interest and have been designated as consulting parties:

- Amtrak
- New York City Landmarks Preservation Commission
- Township of Kearny
- Hudson River Park Trust
- Pennsylvania Railroad Technical and Historical Society
- Hackensack Riverkeeper

The Eastern Shawnee Tribe of Oklahoma does not wish to participate, but does wish to participate as a consulting party and be notified and further consulted with if items falling under the Native American Graves Protection and Repatriation Act (NAGPRA) are found during construction.

The Seneca Nation does not wish to participate because the project location is outside of their area of focus, and they do not have any further concerns regarding the project.

Consultation with the above parties to investigate further the presence of significant archaeological resources and to develop appropriate mitigation measures would continue through the final design and construction phases, as stipulated in the Programmatic Agreement (PA) executed by FTA, ACHP, NJ TRANSIT, NJSHPO and NYSHPO for this project. The PA is contained within this FEIS following Chapter 18.

TYPES OF ARCHAEOLOGICAL RESOURCES

Archaeological resources, as generally accepted, are defined as physical remains, usually buried, of past activities on the current or former land surface. They can include remains from Native Americans' activities at a specific location (referred to as a "site"), which include middens (refuse piles, such as shell heaps), tools, and refuse from tool-making activities, food preparation, habitation, or any other activities. These resources are referred to as "precontact" or "prehistoric," since they were deposited before Native Americans' contact with European settlers.

Archaeological resources can also be remains from activities that occurred during the "historic" period (beginning with European colonization of the New Jersey and New York areas), such as battle sites, house sites, mills, and almost any other activity which left a physical presence on the landscape that is recoverable through archaeological investigation. Cemeteries are also considered archaeological resources.

PRECONTACT RESOURCES

Before Europeans arrived in New York and New Jersey, and continuing into the eighteenth century, Native Americans lived throughout the region. Native American sites identified in northern New Jersey and New York City are typically located on high ground near freshwater ponds, streams, and tidal inlets and coves. The limited number of precontact archaeological resources found to date have typically been buried within three or four feet of the pre-development surface. As a result, these sites have been vulnerable to disturbance by later activities. Surviving sites of this type would be considered most likely eligible for inclusion on the State and National Registers.

HISTORIC-PERIOD RESOURCES

Buried remains from the historic period can provide information about the daily lives of previous inhabitants or about important historical events. In the Build Alternative project area, historic-period archaeological resources can include early Dutch colonial artifacts (seventeenth century), Revolutionary War-period objects, nineteenth-century residential artifacts, and seventeenth- to nineteenth-century burials. Industrial and transportation-related remains could also be important. Types of historic archaeological resources that could be present in the project area include artifacts relating to dwellings, workplaces, and factories, which could be preserved in buried building foundations, yards, old privies, and cisterns, or wells. Historic-period archaeological resources are considered significant, and eligible for the State and National Registers, if they have the potential to provide valuable new information about the past.

CEMETERIES/BURIAL GROUNDS

Cemeteries and burial grounds may be either precontact- or historic-period resources. The Build Alternative has been designed to avoid the Historic Cemeteries of Hudson County, a set of three historic burial grounds in Secaucus, New Jersey. Given their sensitive nature, human remains buried below ground are considered archaeological resources likely to meet eligibility requirements for the State and National Registers. Any ground-disturbing activities in registered cemeteries also fall within the jurisdiction of the New Jersey Cemetery Board. As described later in this chapter, the Historic Cemeteries of Hudson County date to the historic period, following European contact.

FACTORS AFFECTING SURVIVAL OF RESOURCES

On potentially sensitive sites where later development has occurred, archaeological resources could have been disturbed or destroyed by grading, excavation, installation of utilities, construction of subway lines, and building foundation construction. Some resources survive these disturbances in an urban developed environment, protected by landfilling, paving or later buildings with shallow foundations.

Where cemeteries or other burial grounds were once located, it is possible that unmarked burials or interments could have been missed during their movement prior to road or other project construction. If any unmarked burials occurred outside of the boundaries of more officially designated cemeteries, such as the Historic Cemeteries of Hudson County, the remains could also be present beneath sidewalks or other similar street features.

METHODOLOGY AND DATA COLLECTION

In accordance with Section 106, the analysis of the Build Alternative relative to archaeological resources involved defining an APE, or study area for analysis, identifying whether that APE contains any archaeological resources that are listed on or eligible for the State and National Registers, and evaluating the Build Alternative's effects on such resources. Most archaeological resources are buried beneath the surface, and research and/or subsurface investigations must be undertaken to determine whether any resources are present, and whether they are significant.

FTA, ACHP, NJ TRANSIT, NJSHPO and NYSHPO have agreed to enter into a Programmatic Agreement (PA) in accordance with Section 106 of the National Historic Preservation Act (36 CFR 800.14(b)(1)). The PA contains measures and procedures for further consultation/coordination among FTA, ACHP, NJ TRANSIT, NJSHPO, NYSHPO, LPC, consulting parties, and other appropriate New Jersey and New York agencies with respect to field testing and mitigation for effects to archaeological resources. The PA is included in this FEIS following Chapter 18.

Archaeological resources are typically evaluated through a three-step process:

- Phase I consists of documentary research into development history to determine the likelihood of archaeological resources in the APE. This step is divided into two phases: Phase IA, which requires identifying areas that could contain archaeological resources; and Phase IB, which involves subsurface testing to determine the presence or absence of such resources.
- Phase II consists of more extensive subsurface investigations and additional research to establish the age, integrity and research potential of the resources, and whether they could be National Register-eligible. At the conclusion of Phase II studies a determination is made as to the project's effects on any eligible archaeological resources within the APE.
- Phase III involves mitigation of adverse effects to National Register-eligible resources, either through data recovery excavations or through the generation of an alternative mitigation appropriate to the age, character, and research significance of the eligible or listed resources that will be adversely affected by the undertaking.

For the Build Alternative, Phase IA documentary research was undertaken in August 2005 and updated in January 2008. Key secondary source documents reviewed included Potter's Field Disinterment/Re-interment Secaucus Interchange Project (2005), and Final Generic Environmental Impact Statement (FGEIS) for the Proposed No. 7 Subway Extension and Hudson Yards Rezoning and Development Program (2004), among others listed in **Tables 6-1 and 6-2**. A complete list of reports and surveys researched appears in Appendix 6.

TABLE 6-1: SELECTED ARCHAEOLOGICAL SURVEYS RESEARCHED RELATIVE TO BUILD ALTERNATIVE CONSTRUCTION – NEW JERSEY

Author	Date	Abbreviated Title	Resource(s) Evaluated
Raber and Associates	1986	Assessment of Cultural Resources in the Lincoln Harbor Development Site, Township of Weehawken and City of Hoboken	Prehistoric site; Weehawken Ferry; Hackensack Plank Road
Geismar, Joan	1992	Phase IA Cultural Resources Survey of the Impact Area of New Jersey Turnpike, Secaucus Interchange Project	Historic Cemeteries of Hudson County
Greenhouse Consultants	1996	Phase IB Archaeological Investigations of the New Jersey Turnpike Secaucus Interchange Project Potter's Field Portion	Historic Cemeteries of Hudson County
Louis Berger Associates	2005	Potter's Field Disinterment/Re-interment Secaucus Interchange Project	Historic Cemeteries of Hudson County

Source: Transit Link Consultants, 2008

TABLE 6-2: SELECTED ARCHAEOLOGICAL SURVEYS RESEARCHED RELATIVE TO BUILD ALTERNATIVE CONSTRUCTION – NEW YORK

Author	Date	Abbreviated Title	Resource(s) Evaluated
Historic Conservation and Interpretation	1983	Westside Highway	Prehistoric, domestic, industrial
Hartgen Archaeological Associates and Historical Perspectives	1990, 1992	Route 9A Reconstruction Project	Prehistoric, wharves, fill-retaining devices, fill, sunken ships
Historical Perspectives	1997	Hudson River Park Project	Prehistoric, wharves, fill-retaining devices, fill
Hudson River Park Trust	2003	Hudson River Park Segment 6 SHPO Submission Bulkhead Rehabilitation from 25 th Street to 44 th Street	Hudson River Bulkhead, pier ruins
Historical Perspectives	2004	No. 7 Subway Extension – Hudson Yards Rezoning and Redevelopment Program	Prehistoric, wharves, fill-retaining devices, fill, domestic and industrial sites, transportation-related sites, religious sites

Source: Transit Link Consultants, 2008

The following historic maps, atlases and other cartographic materials were consulted to analyze archaeological sensitivity within the APE in New Jersey:

- 1811. Eddy, John H. Map of the Country Thirty Miles Round the City of New York.
- 1841. Douglass, L.F. Topographical Map of Jersey City, Hoboken and the Adjacent Country.
- 1873. Hopkins, G.M. Combined Atlas of the State of New Jersey and the County of Hudson.
- 1880. Spielmann and Brush. Sanitary & Topographical Map of Hudson County, N.J.
- 1909. Hopkins, G.M. Atlas of Hudson County, New Jersey.
- 1930. Sanborn Map Company. Insurance Maps of Palisades, New Jersey.

- 1936. Sanborn Map Company. Fire Insurance Maps of Hudson County, New Jersey.
- 1950. Sanborn Map Company. Insurance Maps of Palisades, New Jersey.

The following chart was consulted to analyze archaeological sensitivity within the APE in the Hudson River:

- 1990. National Ocean Service. New York Harbor Navigation Chart.

The following historic maps and atlases were consulted to analyze archaeological sensitivity within the APE in New York:

- 1836. Colton, J.H. Topographical Map of the City and County of New-York, and the adjacent Country.
- 1852. Harrison, John F. Map of the City of New-York[sic] Extending Northward to Fiftieth St. (a.k.a. the “Dripps” map)
- 1865. Viele, Egbert L. Sanitary and Topographical Map of the City and Island of New York.
- 1891. Bromley, G.W. Atlas of the City of New York, Manhattan Island.
- 1920. Bromley, G.W. Atlas of the City of New York, Manhattan Island.

Findings of the Phase IA report (August 2005 and January 2008), as summarized in this chapter, have been reviewed by NJSHPO and NYSHPO. Both SHPOs have provided written comments on the Phase IA reports (see correspondence dated March 20, 2006, and March 14, 2006 – Appendix 6).

The archaeological analysis conducted to date has encompassed five steps:

- 1. Definition of the Area of Potential Effects (APE).** This is an area where project activities could disturb the ground to the extent that if any archaeological resources are present, they could be affected. To complete a comprehensive analysis of areas that could contain archaeological resources, the APE for archaeological resources was defined for the full alignment of the Build Alternative.

In the New Jersey portion of the project area, the APE consists of two discontinuous sections (**Figure 6-1**). The western section extends approximately 200 feet from the existing Northeast Corridor (NEC) and proposed tracks in Kearny, Secaucus and North Bergen. It also includes the area within 200 feet of proposed track connections at the Frank R. Lautenberg Station, and in the proposed rail storage and maintenance facility in Kearny. In North Bergen, the APE includes the proposed fan plant/construction access shaft location on the east side of Tonnelle Avenue. The eastern section of the APE, in Hoboken, is located between the base of the Palisades and the proposed fan plant location, construction staging area and access shaft.

In the Hudson River portion of the project area, the APE for the Build Alternative extends approximately 200 feet north and south from the proposed tunnels.

In the New York portion of the project area, between the Hudson River shoreline and Fifth Avenue, the APE for the Build Alternative extends approximately 400 feet from the proposed tracks (**Figure 6-2**).

- 2. Preliminary identification of the possibility of archaeological resources within the APE.** Documentary research was conducted to identify areas where precontact or historic-period activities could have left archaeological evidence in the soils. Research regarding the locations of former cemeteries or burial grounds, including the Historic Cemeteries of Hudson County in Secaucus, New Jersey, was also conducted. Documentary research and review of historic maps provided the basis for identifying already known archaeological sites, and areas that have the potential to contain archaeological resources. This identification was based on original topography (for precontact resources) or site development history (for historic-period resources).

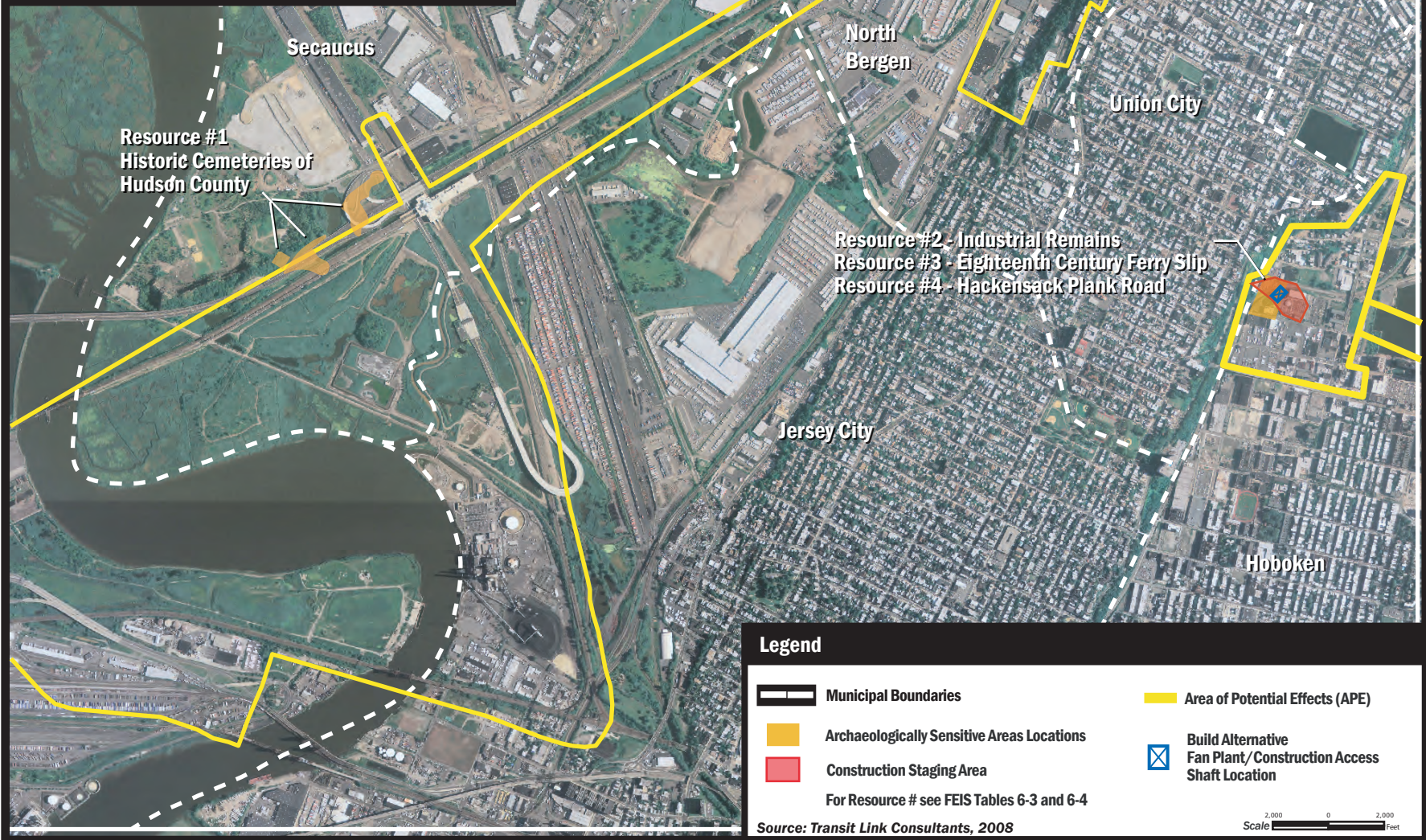


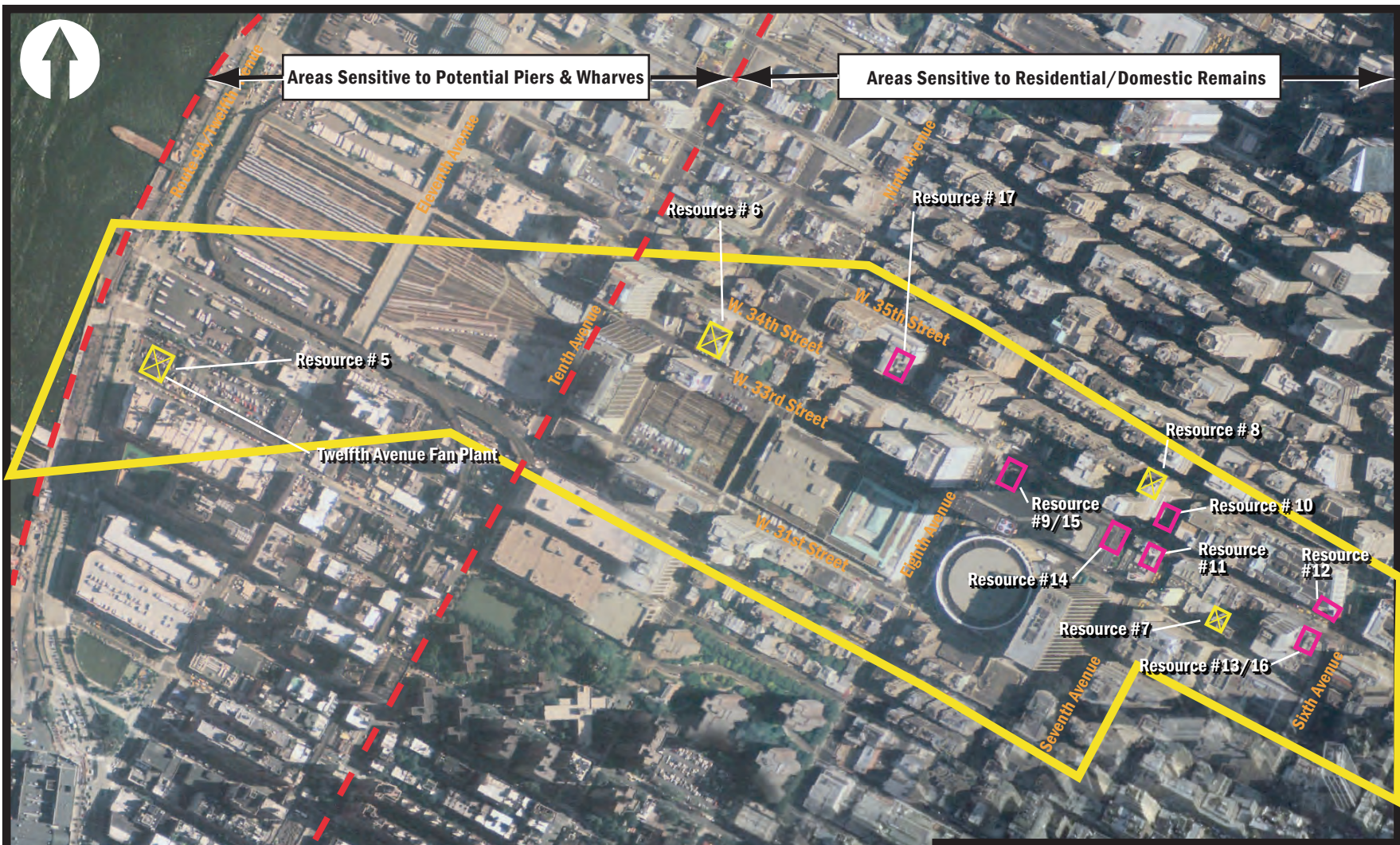
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Figure 6-1

ARC Build Alternative APE and Archaeological Sensitivity
in the Project Area - New Jersey





Legend

- ARC Build Alternative Fan Plant/Construction Access Location Shaft
- ARC Build Alternative Station Entrance Location
- Boundary of Area of Archaeological Sensitivity
- Area of Potential Effects (APE)

For Resource # FEIS see Tables 6-3 and 6-4

Source: Transit Link Consultants, 2008

Not to Scale



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Figure 6-2
ARC Build Alternative APE and Areas of Archaeological Sensitivity in the Project Area - New York

With respect to the Hudson River channel, previously completed cultural resources surveys and reports at the NJSHPO and NYSHPO were reviewed, as well as internet resources and archaeological site files at the New Jersey State Museum, to identify previously documented archaeological resources within the Hudson River portion of the project APE. Areas within the APE that exhibited appropriate topographical features that would have been attractive to Native Americans before historic and modern development took place, or were known former sites of Native American camps, villages, or middens, were considered sensitive to precontact archaeological deposits, unless the areas were documented to have been comprehensively disturbed by historic or modern activities. For historic-period resources, cartographic research provided the basis for compiling a development history that was used to identify where archaeological resources from historic-period uses could have been deposited within the APE. Archaeologically sensitive areas within the APE are presented in Table 6-3.

3. **Documentation of disturbance and identification of potential undisturbed resources.** For each area where research indicated the potential for archaeological resources, review of original site topography and any subsequent alterations through filling, grading, development, or other activities was completed. Where available, as in Manhattan, limited boring logs were reviewed to develop an understanding of past grading and filling activities at the proposed locations of the Dyer Avenue Fan Plant/Construction Access Shaft, Eighth Avenue Southeast Station Entrance and adjoining ADA Access/Emergency Entrance, Seventh Avenue Northwest Station Entrance, and the Seventh Avenue Southwest Station Entrance and adjoining ADA Access/Emergency Entrance. Topographic maps (Viele, Dripps, Coulton and Bromley) were compared to current elevations to identify changes to the landscape through past grading and/or filling. This assessment was completed to identify locations where any archaeological resources, if originally present, could have survived later disturbances. It was also completed in response to NYSHPO comments on resource potential that could exist anywhere within the Manhattan portion of the APE, as contained in correspondence dated March 14, 2006 in Appendix 6.

Areas that could contain archaeological resources are considered to be archaeologically “sensitive.” These sites contained topography that would have been conducive to prehistoric use, or once had historic-period uses that could have resulted in significant archaeological resources, which later development would not have disturbed. Archaeological resources within these “sensitive” sites are considered “potential” resources, or archaeologically “sensitive” areas, since the presence of resources is not yet known.

4. **Resources in the APE and assessment of effect.** An adverse effect is defined as any disturbance or damage to potential archaeological resources. Such an effect would occur if a resource was located in soil, and if the Build Alternative construction would disturb the soil at a depth of the resource. No adverse effect would occur if the resource was located above or below the depth at which the Build Alternative construction would occur and was not disturbed.

Following the identification of possible archaeological resources within the APE and documentation of disturbances, as described in 2 and 3 above, the effect of the Build Alternative on 17 identified potential archaeological resources was analyzed. An effect would occur if construction or operation of the Build Alternative would disturb the soil in the area to the depth and surface area coverage within which the potential resource could be located. The potential for adverse effects to those possible archaeological resources was assessed for each area identified as archaeologically “sensitive”. Some Build Alternative components would not cause effects to any potential archaeological resources. For example, no effects would occur where new tunnels would be dug through bedrock with tunnel boring machines (TBMs) and mining.

TABLE 6-3: AREAS OF POTENTIAL ARCHAEOLOGICAL SENSITIVITY WITHIN THE APE IN NEW JERSEY AND NEW YORK

Resource # (See Figures 6-1 and 6-2)	Name and Location of Potential Resource	Type of Potential Resource
New Jersey APE		
1	Historic Cemeteries of Hudson County in Secaucus, NJ	Historic burial ground
2	Industrial Remains in Hoboken, NJ: 16 th and Jefferson Street, at Hoboken Fan Plant/Construction Access Shaft and staging area	19 th century historic industrial remains
3	Eighteenth-Century Ferry Slip in Hoboken, NJ: 16 th and Jefferson Street, at Hoboken Fan Plant/Construction Access Shaft and staging area	18 th century historic transportation facility remains
4	Hackensack Plank Road in Hoboken: 16 th and Jefferson Street, at Hoboken Fan Plant/Construction Access Shaft and staging area	19 th century historic transportation facility remains
New York APE		
5	Potential Piers and Wharves: at Twelfth Avenue Fan Plant/Construction Access Shaft – (281–295 Eleventh Avenue) (formerly Hudson River Shoreline to Tenth Avenue in Manhattan)	Historic piers, wharves fill retaining devices
6	Residentially Related or Domestic Archaeological Resources: 431 West 33 rd Street at Dyer Avenue Fan Plant/Construction Access Shaft	Historic 19 th century domestic remains
7	Residentially Related or Domestic Archaeological Resources: 137-139 West 33 rd Street, at 33 rd Street Fan Plant/Construction Access Shaft	Historic 19 th century domestic remains
8	Residentially Related or Domestic Archaeological Resources: 218 West 35 th Street, at 35 th Street Fan Plant/Construction Access Shaft	Historic 19 th century domestic remains
9	Residentially Related or Domestic Archaeological Resources: Southeast corner of Eighth Avenue and West 34 th Street (462–474 Eighth Avenue), at Eighth Avenue Southeast Station Entrance	Historic 19 th century domestic remains
10	Residentially Related or Domestic Archaeological Resources: Northwest corner of Seventh Avenue and West 34 th Street (442 Seventh Avenue), at Seventh Avenue Northwest Station Entrance	Historic 19 th century domestic remains
11	Residentially Related or Domestic Archaeological Resources: Southwest corner of Seventh Avenue and West 34 th Street (420 Seventh Avenue), at Seventh Avenue Southwest Station Entrance	Historic 19 th century domestic remains

Source: *Transit Link Consultants, 2008*

Note: Secaucus Potter's Field has received an opinion of eligibility for listing on the National Register of Historic Places (NJSHPO April 24, 2008) (see Appendix 6).

TABLE 6-3: AREAS OF POTENTIAL ARCHAEOLOGICAL SENSITIVITY WITHIN THE APE IN NEW JERSEY AND NEW YORK (CONTINUED)

Resource # (See Figures 6-1 and 6-2)	Name and Location of Potential Resource	Type of Potential Resource
New York APE (continued)		
12	Residentially Related or Domestic Archaeological Resources: Northwest corner of Broadway and West 34 th Street (1313 Broadway), at Broadway Northwest Station Entrance	Historic 19 th century domestic remains
13	Residentially Related or Domestic Archaeological Resources: Southwest corner of Broadway and West 34 th Street (1293 – 1311 Broadway), at Broadway Southwest Station Entrance	Historic 19 th century domestic remains
14	Residentially Related or Domestic Archaeological Resources: Southwest corner of Seventh Avenue and West 34 th Street (East Side One Penn Plaza), at ADA Access/Emergency Entrance	Historic 19 th century domestic remains
15	Residentially Related or Domestic Archaeological Resources: Southeast corner of Eighth Avenue and West 34 th Street (West Side One Penn Plaza), at ADA Access/Emergency Entrance	Historic 19 th century domestic remains
16	Residentially Related or Domestic Archaeological Resources: Southeast corner of West 34 th Street and Broadway (108–110 West 34 th Street), at ADA Access/ Emergency Entrance	Historic 19 th century domestic remains
17	Residentially Related or Domestic Archaeological Resources: Midblock on West 34 th Street between Eighth and Ninth Avenues (323 West 34 th Street), at Employee Only/Emergency Personnel Access entrance	Historic 19 th century domestic remains

Source: *Transit Link Consultants, 2008*

Note: Secaucus Potter's Field has received an opinion of eligibility for listing on the National Register of Historic Places (NJSHPO April 24, 2008) (see Appendix 6).

5. **Additional Evaluation for Archaeologically Sensitive Areas.** At locations of potential for adverse effects, NJ TRANSIT's professional archaeologists have outlined a process describing field testing and/or mitigation measures that would be completed during the final design or construction phases, to avoid adverse effects from Build Alternative construction or operation. The PA in this FEIS describes the required next steps. Additional documentary research and impact analysis will be undertaken by NJ TRANSIT and their Cultural Resources Manager.

Further archaeological evaluation for any area within the APE identified as potentially sensitive for human remains will be undertaken by NJ TRANSIT. The results of the non-intrusive investigation will be presented in the form of a Documentary Analysis Report. The research for the one identified potential resource, the Historic Cemeteries of Hudson County in Secaucus, New Jersey, will include, to the extent that documents will be available for review, interment and re-interment records to establish the number of burials and reburials, and conveyance records and cartographic sources to establish cemetery boundaries. NJ TRANSIT will provide an evaluation of the site's potential to contain human remains and potential Build Alternative effects to FTA and NJSHPO.

Additional investigations, including further research, and field testing will be undertaken by NJ TRANSIT for any areas that may be identified as sensitive for industrial archaeological remains and eighteenth-century transportation facilities, including near the proposed fan plant and construction access shaft sites in Hoboken.

For sites in New York that may be identified as sensitive to nineteenth-century domestic remains, a monitoring protocol will be developed that will stipulate the methodologies to be employed to identify any potentially significant archaeological features (e.g., privies, wells, building foundations), assess their significance, and identify mitigation measures. Mitigation could entail document research into the history of the properties under investigation, the identity of the individuals and families that occupied the sites, their occupations, and the communities of which they were a part. It could also include archaeological sampling of the site or sites through hand excavation, analysis and curation of artifacts and report preparation. The New York State Museum in Albany or any other approved repository will curate and store the artifacts.

A process has been developed to ensure that potential cultural resources impacts are considered prior to any ground disturbance tied to the soil boring program. Future soil boring efforts and their potential involvement with cultural resources are elaborated in the PA (Exhibit J), contained in this FEIS.

At each site in New Jersey and New York where the potential for archaeological resources has been identified and ARC may affect such resources, NJ TRANSIT and their Cultural Resources Manager, in consultation with NJSHPO and/or NYSHPO will prioritize the sites for testing, and then undertake field testing to identify the presence or absence of potential Archaeological Resources.

If during the course of the project additional areas are incorporated into the APE and are considered to be potentially sensitive for archaeological resources, additional background research will be conducted to identify the types of archaeological resources that may be present and assess the need to conduct further studies to confirm the presence or absence of NR-eligible archaeological properties in the additional area(s). Research may include, but is not limited to the following: historic map collection and analysis; reconstruction of Chain-of-Title; soil borings; Ground Penetrating Radar Survey; oral informant interviews; background documentary research (local or state libraries, SHPO offices, LPC).

B. DESCRIPTION OF POTENTIAL ARCHAEOLOGICAL RESOURCES EXISTING CONDITIONS

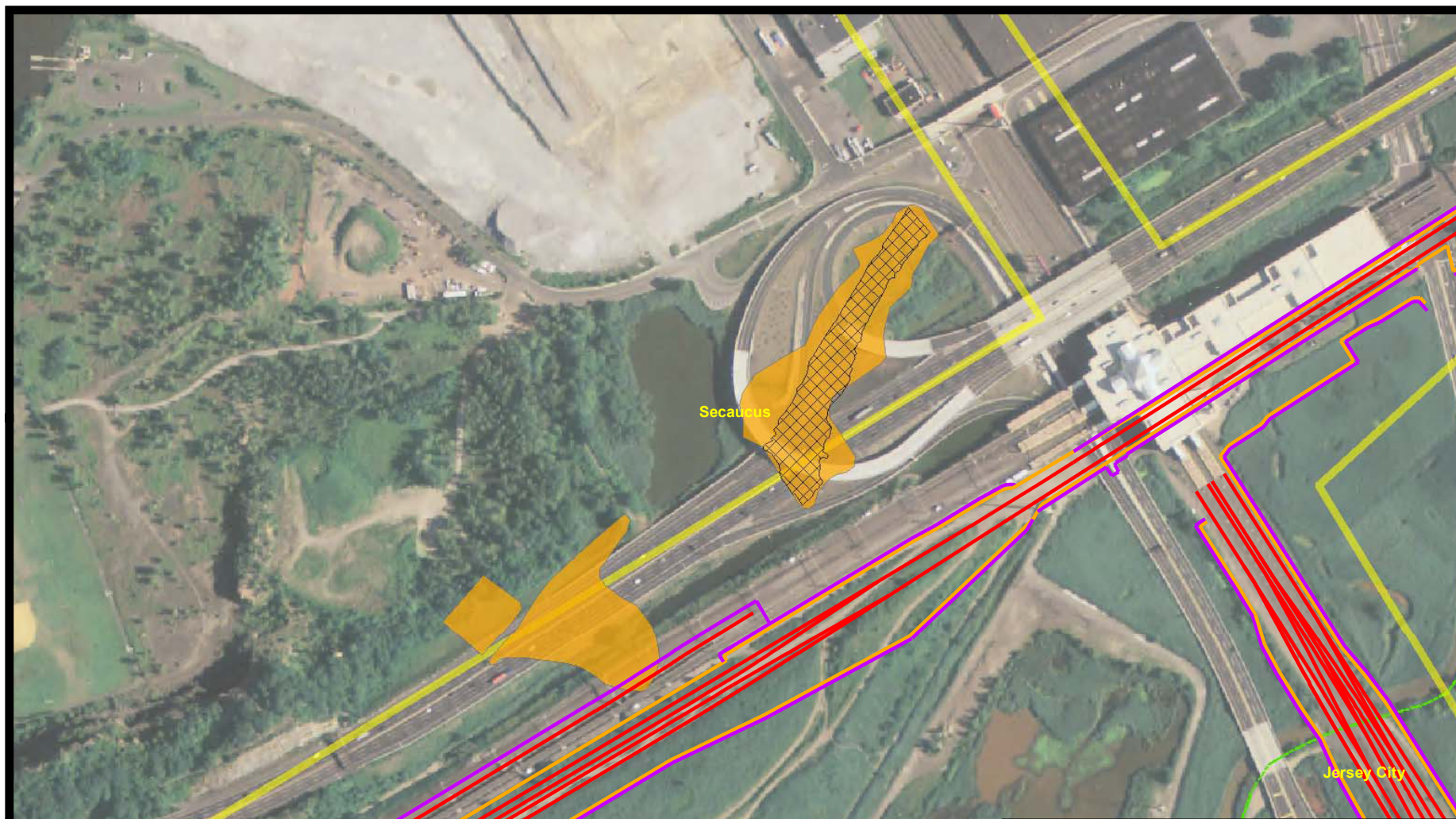
The archaeological resources analysis conducted for the Build Alternative described above identified 17 locations within the APE with the potential to contain archaeological resources (see **Figures 6-1 and 6-2 and Table 6-3**). The depths at which these potential archaeological resources could be encountered in the APE varies depending on the resource and the location. Some historic period resources may be expected beneath fill layers, if they were deposited prior to land manipulation, while other historic-period resources would be buried. An extensive soil-boring program was conducted in 2007 to support Preliminary Engineering, and to identify geotechnical and environmental subsurface conditions along the project alignment, such as previous disturbance, including filling and grading, and/or the presence of original soils. Preliminary review by the project archaeologists and geomorphologists of soil borings taken in Manhattan indicates the presence of intact prehistoric soils below modern fill levels in several locations of Build Alternative construction. This finding suggests that some locations within the APE in Manhattan retain archaeological sensitivity, and would require archaeological monitoring and/or mitigation during construction. Archaeological monitoring and mitigation procedures are specified in the PA contained in the FEIS.

RESOURCE POTENTIAL IN THE NEW JERSEY APE

RESOURCE 1: HISTORIC CEMETERIES OF HUDSON COUNTY IN SECAUCUS, NJ

Portions of the known limits of the Historic Cemeteries of Hudson County, a set of three nineteenth- and twentieth-century cemeteries in Secaucus, lie within the APE (see **Figure 6-3**). Professional archaeologists and osteologists were employed between 2003 and 2005 in the disinterment of human remains from one of the cemeteries, known as “Potter’s Field,” for the construction of the NJ Turnpike Interchange 15X Project. A total of 4,571 burials were exhumed during that project. On April 24, 2008, the NJSHPO determined the Secaucus Potter’s Field to be eligible for listing on the National Register of Historic Places under Criterion D “for having yielded information important to our understanding of nineteenth and twentieth century life (nutrition, health and demographics) in Hudson County, New Jersey” (see correspondence dated April 24, 2008 in Appendix 6). Secaucus Potter’s Field is one of the three cemeteries that comprise the Historic Cemeteries of Hudson County.

The burial grounds within the Historic Cemeteries of Hudson County were associated with several nearby Hudson County public institutions: the Asylum of the Insane, Alms House, Tuberculosis Hospital, Small Pox Hospital and Children’s Eye Infirmary. It is believed that this resource was established during the mid-nineteenth century, and continued to grow in size as Hudson County buried the indigent, the diseased, the lost, the drowned, and the unknown in this cemetery. The burial grounds included in the Historic Cemeteries of Hudson County remained active until the early 1950s (Geismar 1992:38-45) or possibly until the early 1960s (Louis Berger Group 2005:4-11).



Legend

- Limit of Construction
- Limit of Infrastructure
- ARC Build Alternative
- Area of Potential Effects (APE)
- Municipal Boundary
- Historic Cemeteries of Hudson County, as Depicted on the 1906/1907 Map of the Hudson County Complex at Laurel Hill
- Extent of Internments Excavated by LBG / Potter's Field

Source: Transit Link Consultants, 2008



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Figure 6-3

Historic Cemeteries of Hudson County



200 0 200
Feet

The Historic Cemeteries of Hudson County are recorded as consisting of three separate cemeteries spread across the south side of Snake Hill to the north of the project's APE. The relationship between the three cemeteries and their institutional affiliations is unknown. Historic maps typically referred to each of them simply as a "Burial Ground". As depicted on Figure 6-3, the already excavated three acres represents only a part of this resource. An important finding during the recent investigations was that historic mapping of the cemeteries' boundaries is inaccurate, and that "none of these maps depicted Potter's Field to be as extensive as excavations subsequently revealed" (LBA 2005:7-5). Few boundary markers for the cemeteries remain in place, and human remains may be found as deep as six feet below the current ground surface. Consequently, historic mapping of the cemeteries should be considered to serve only as an approximation to the location of human remains. As mentioned previously, one of the three cemeteries, Secaucus Potter's Field, has received a determination of eligibility for listing on the National Register. The other two cemeteries that comprise the Historic Cemeteries of Hudson County have not yet been determined eligible for listing on the National Register. Human remains from either of these cemeteries would be considered potentially significant, as they could potentially yield information about the nutrition, health, and demographics of a segment of Hudson County's population during the late nineteenth and twentieth centuries.

RESOURCE 2: INDUSTRIAL REMAINS IN HOBOKEN, NJ

The APE for the Hoboken Fan Plant/Construction Access Shaft and construction staging area is situated in a historically sensitive area, which has the potential to contain archaeological deposits associated with late nineteenth- to early twentieth-century industrial manufacturing buildings (Figure 6-4). By 1909, much of the area still remained undeveloped, although lots had been laid out. Tracks for the Erie Railroad had been constructed over the southern end of the APE by this time and the plant of the "Pierson & Goodrich Iron Works" had been constructed within the footprint of the proposed construction staging and building demolition areas. In 1936, this industrial concern was no longer present, but other industrial buildings such as "Steel Sash Warehouse," on a different footprint to the south, are situated within the APE (Figure 6-4). The "Steel Sash Warehouse" is no longer extant, and should be considered a possible industrial archaeological resource, as well as the site of the earlier Pierson & Goodrich Iron Works. Physical remains of the building foundations of the 1909 Pierson and Goodrich Iron Works building and the 1936 Steel Sash Warehouse could provide information on how these facilities operated. Remains that could be encountered in this area could include building walls, floors and foundations. This resource has not yet been determined eligible for listing on the National Register. Archaeological remains of these manufacturing buildings would be considered potentially significant.

RESOURCE 3: EIGHTEENTH-CENTURY FERRY SLIP IN HOBOKEN, NJ

The APE for the Hoboken Fan Plant/Construction Access Shaft and construction staging area is situated in a historically sensitive area associated with an eighteenth-century ferry slip (Figure 6-5). The original channel of the Weehawken Creek could have traversed the APE, although the 1841 Douglas Topographical Map shows the creek channel terminating just north of the APE. During the construction of the fan plant/construction access shaft a potential exists for encountering the original bed of Weehawken Creek, along which the piers and wharves of the eighteenth-century Weehawken Ferry landing. The landing could have been located downstream, closer to the creek's mouth where it emptied into the Hudson River, but considering the marshy conditions near the creek mouth, it might just as well have been located upstream. Consequently, it might be located in the APE and would be of interest as an indicator of past transportation-related activities within this area. This resource has not yet been determined eligible for listing on the National Register. The Weehawken Ferry Slip would be considered a potentially significant archaeological resource.



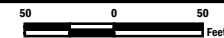
Legend

- 1909 Industrial Plant
- Proposed Building Demolition
- Area of Potential Effects (APE)
- 1936 Industrial Plants
- Hoboken Fan Plant

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Figure 6-4
Potential Industrial Remains Hoboken, New Jersey

Source: Transit Link Consultants, 2008/1909 Hopkins Map





Legend

- ARC Build Alternative
- Limits of Marsh (could contain remnants of the Weehawken Ferry Slip)
- Area of Potential Effects (APE)
- Proposed Building Demolition
- Fan Plant

Source: Transit Link Consultants, 2008; 1841 Douglass Map.



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Figure 6-5
Potential 18th Century Ferry Slip - Hoboken, New Jersey



300 0 300
Feet

RESOURCE 4: HACKENSACK PLANK ROAD IN HOBOKEN, NJ

The APE for the Hoboken Fan Plant/Construction Access Shaft and construction staging area is situated in a historically sensitive area associated with the nineteenth-century Hackensack Plank Road (**Figure 6-6**). The roadway was constructed as a toll road between Hackensack, New Jersey and the ferry at Hoboken, New Jersey in the nineteenth-century and is representative of early plank construction. This resource has not yet been determined eligible for listing on the National Register.

Historic maps depict two distinct alignments for this historically-significant roadway. The 1811 Eddy Map depicts the roadway adjacent to the proposed footprint for Hoboken Fan Plant. Later maps (Burr 1832; Coulton 1836; Watson 1874) depict the roadway further to the east and well outside the proposed Fan Plant location. The plank road was originally of gravel construction and laid in 1804; it was modified at least on one occasion (1853) when planking replaced the gravel road bed. Additional changes between 1804 and 1853 may have occurred, and the possibility exists that the different alignment between the 1811 Eddy map and subsequent maps reflects alignment changes and not merely differences in the accuracy of the maps. Archaeological remains of this roadway would be considered potentially significant.

RESOURCE POTENTIAL IN THE HUDSON RIVER APE

WESTERN SECTION

The proposed Build Alternative tunnels invert at the west shore of the Hudson River and would be between 100 and 120 feet below mean sea level, deep into bedrock, and well below the level of the historic river channel. The potential to disturb submerged archaeological sites, including a possible shipwreck near the west shore would be minimal, with low archaeological sensitivity noted.

MID-RIVER

Files at NJSHPO, NYSHPO, LPC, the New Jersey State Museum, and the National Ocean Service (a division of the National Oceanic and Atmospheric Administration) were reviewed for potential submerged cultural resources in the Hudson River. The National Ocean Service chart for New York Harbor, no. 12327, depicts a “dangerous wreck [with masts], depth unknown” near the middle of the Hudson River channel. Immediately adjacent to the wreck is the abbreviation “PD,” which means “Position Doubtful” (National Ocean Service 1990:10, 44). It is unclear what ship this wreck represents or when it sank to the river bottom. However, it is located near the northern limit of the ARC APE within the Hudson River.

A bathymetric survey of the Hudson River using multibeam sonar was conducted by Dr. Roger Flood of the Marine Sciences Research Center of the State University of New York at Stony Brook (Ladd 2005). A digital elevation model (DEM) with a 1-meter cell size relief map of the Hudson River bottom was also reviewed for possible submerged cultural resources within the APE (Ladd 2005). One anomaly, situated approximately 300 feet north of ARC APE limits, exhibited 3.3 to 6.5 feet of relief above the surrounding river bottom, and measured on average 33 to 43 feet in length. Based on review of this map, this anomaly is likely a natural formation on the river bottom, as opposed to shipwrecks or other significant cultural resources. The edges of the anomaly exhibit a gradual slope in height, and not the sharp relief of a solid object.

Two additional anomalies suggestive of cultural remains were found adjacent to, but outside of, the ARC APE. A linear anomaly was noted in the eastern third of the river channel, approximately 150 feet north of the APE, and 820 feet from the east shore, and oriented perpendicularly to the shoreline. This signature could indicate the presence of pier remains or a derelict vessel sunken at a pier. The 1989 navigation chart of New York Harbor shows that a pier once stood in this area. A second linear anomaly was recorded approximately 60 feet north of the APE in the mid-channel of the river.



Legend

 Area of Potential Effects (APE)  ARC Build Alternative



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Figure 6-6
Potential Hackensack Plank Road -
Hoboken, NJ

Source: Transit Link Consultants, 2008/1811 Eddy Map



1,000 0 1,000
Feet

Scouring of the riverbed is evident upriver and downriver from this object. The anomaly recorded just outside the APE could represent the wreck illustrated on the 1989 navigation chart, since it exhibits sharp, defined contours indicative of a solid object. Subsequent studies by Alpine Ocean Seismic Survey, Inc. (2007) undertaken in association with the current project included bathymetric, side-scanning sonar, and magnetometric surveys. These studies indicated the presence of no topographic or magnetic anomalies that might represent potential historic resources along the Hudson River bottom within the APE.

EASTERN SECTION

Given the exposed position of an existing pier ruin in the river, it is either contemporaneous with or post-dates the latest in-filling of the shoreline in this area in the early twentieth century. Use of mechanically driven piles to construct piers and wharves by the mid-nineteenth century would preclude a great deal of the potential for this feature to provide information on human craftsmanship in pier construction, but could provide comparative information. Construction methods and materials used in the mid-nineteenth and early-twentieth centuries in this section of New York Harbor (as represented by the pier ruins and bulkhead) could be compared to earlier piers, wharves, bulkheads, or other retaining devices encountered in the ARC APE, to develop a full understanding of the developmental sequence of waterfront construction in this area.

All potential historic archaeological features within the Hudson River section of the APE lie outside the horizontal and vertical envelope for impacts generated by the TBM. The top of the proposed Build Alternative tunnels is 90 feet below the water surface and 40 feet below the underlying bedrock at the western shore of the Hudson River. The more recent bathymetric survey undertaken during Preliminary Engineering suggests that there is no potential to disturb submerged archaeological sites.

RESOURCE POTENTIAL IN THE NEW YORK APE

RESOURCE 5: POTENTIAL PIERS AND WHARVES AT TWELFTH AVENUE FAN PLANT/CONSTRUCTION ACCESS SHAFT (FORMERLY HUDSON RIVER SHORE TO TENTH AVENUE IN MANHATTAN)

The area from the current Hudson River shoreline to approximately mid-way between Tenth and Eleventh Avenues is designated as made land, i.e., in-filled during the third quarter of the nineteenth century (HCI 1983:Figure 4; Hartgen Archaeological Associates and HPI 1990, 1992a, 1992b; HPI 1997; 2004:IIIG-5). Consequently, this portion of the APE has no potential to contain prehistoric or early historic archaeological deposits. The No. 7 Subway/Hudson Yards Rezoning Archaeological Study concluded that the late-nineteenth century fill used to extend the Manhattan shoreline in this area is devoid of archaeological potential, and that no early nineteenth-century wharves or docks are believed to be intact in this portion of the archaeological APE for the Build Alternative. Since the APE for the No. 7 Subway/Hudson Yards project and the Build Alternative cover much of the same section of in-filled shoreline (**Figure 6-2**), findings of the No. 7 Subway/Hudson Yards project would apply for a portion of the Build Alternative APE. For portions of the APE outside the No. 7 Subway/Hudson Yards study limits, archaeological resources that would be located beneath the current ground surface but above bedrock could be sensitive to near-surface construction (fan plants/construction access shafts).

Comments by NYSHPO (see correspondence dated March 14, 2006 in Appendix 6) indicated that the APE on the west side of Manhattan, east to Tenth Avenue, should be considered sensitive to the remains of piers, wharves, fill-retaining devices, and other waterfront construction. Uncovering these remains could lead to a better understanding of the expansion of Manhattan during the later quarter of the nineteenth and early twentieth centuries. These resources have not yet been determined eligible for listing on the National Register.

RESOURCES 6–17: RESIDENTIALLY-RELATED OR DOMESTIC ARCHAEOLOGICAL RESOURCES: SITES OF PROPOSED FAN PLANT/CONSTRUCTION ACCESS SHAFTS AND STATION ENTRANCES

Nineteenth-century maps depict the general area of the proposed fan plant/construction access shaft sites and NYPSE entrances in Manhattan as occupying relatively low or higher elevations on the landscape. Intact archaeological features associated with the antebellum structures depicted on Colton and Dripps maps (such as privies, wells and building foundations) may have been buried and preserved on these sites, if fill had been introduced from adjacent higher elevations for construction later in the nineteenth century (as depicted on Bromley maps). Archaeological resources could be located below the basement levels of the buildings on these properties, or could have been removed when basements were constructed. These resources have not yet been determined eligible for listing on the National Register.

The addresses listed below for the fan plant/construction access shafts in Manhattan could change during design, but would remain in the same general locations. Fan plant/construction access shafts are proposed at the following locations:

- Dyer Avenue Fan Plant/Construction Access Shaft (431 West 33rd Street)
- 33rd Street Fan Plant/Construction Access Shaft (137–139 West 33rd Street)
- 35th Street Fan Plant (218–222 West 35th Street)

NJ TRANSIT has identified station entrances at particular building locations. As additional design progresses, the locations would be finalized; however, they would remain in the vicinity of the identified corners. NYSHPO has stated that any land contained within the project area in Manhattan has the potential for the presence of intact archaeological resources (March 2006 correspondence – Appendix 6 of the FEIS). Station entrances for NYPSE are proposed at the following locations:

- Eighth Avenue Southeast: Southeast corner of Eighth Avenue and West 34th Street (460 – 474 Eighth Avenue)
- Seventh Avenue Northwest: Northwest corner of Seventh Avenue and West 34th Street (442 Seventh Avenue)
- Seventh Avenue Southwest: Southwest corner of Seventh Avenue and West 34th Street (420 Seventh Avenue)
- Broadway Northwest: Northwest corner of Broadway and West 34th Street (1313 Broadway)
- Broadway Southwest: Southwest corner of Broadway and West 34th Street (1293 – 1311 Broadway)

Three Americans with Disabilities Act (ADA) Access/Emergency Entrances are proposed at the following locations:

- Southeast corner of Eighth Avenue and West 34th Street (West Side One Penn Plaza)
- Southwest corner of Seventh Avenue and West 34th Street (East Side One Penn Plaza)
- Southwest corner of Broadway and West 34th Street (108–110 West 34th Street)

One Employee Only/Emergency Personnel Entrance is proposed at the following location:

- Mid-block on West 34th Street between Eighth and Ninth Avenues (323 West 34th Street)

Historic map analysis provides information on the historical use of each of the locations identified above. From Tenth Avenue eastward, the 1836 Coulton map shows very few potential archaeological features in this portion of the APE. With the exception of an individual structure located at or near the site of the proposed Dyer Avenue/Construction Access Shaft, none of the structures depicted on the 1836 Coulton map are near construction areas, proposed fan plant/construction access shafts or station entrances for

NYPSE. However, the 1852 Harrison map, the 1891 Bromley atlas and the 1920 Bromley map depict structures at the locations of proposed fan plants and station entrances for NYPSE. The locations of the three ADA Access/Emergency entrances, the one Employee Only/Emergency Personnel Access Entrance, and the Broadway Northwest entrance were not found to have any structures on them in 1852; although structures were present by 1891.

The 1865 Viele map, which illustrates the natural topography of the area before it was redeveloped, depicts the areas of the Dyer Avenue, 33rd Street, and 35th Street Fan Plants/Construction Access Shafts as occupying different elevations on the landscape. The proposed locations for the 33rd Street and 35th Street Fan Plants incorporate what appear to be level land adjacent to a low-order stream, which would be considered to have high potential for prehistoric archaeological deposits. The Dyer Avenue Fan Plant/Construction Access Shaft appears to be situated on a very uneven landform including the base of a hill slope and a glacial feature, possibly a drumlin (a low ridge of gravels left by a melting glacier). This area appears to have less potential to contain prehistoric archaeological resources. The 1865 Viele map provides information about the locations of the proposed station entrances for NYPSE. Locations of the proposed entrance at Eighth Avenue and the two proposed entrances along Broadway were low-lying areas, and in the case of Broadway, were adjacent to a small stream. The ADA Access/Emergency Entrances and the Employee Only/Emergency Personnel Access Entrance are located on what were the sides of hills according to the Viele map, and the Seventh Avenue entrance locations were situated on what were the tops of low hills.

Intact archaeological features such as privies, wells and building foundations associated with the antebellum structures depicted on the Coulton and Harrison maps are more likely to have been buried and preserved in low-lying areas that would have been infilled prior to the dense development of midtown Manhattan, as depicted on the Bromley maps. Remains of prehistoric human activities would also more likely be preserved *in situ* in similar settings and for similar reasons. This situation is also likely to be the case for the proposed NYPSE entrances located on Eighth Avenue and along Broadway, as well as the proposed 35th Street Fan Plant and the Employee Only/Emergency Personnel Access entrance. The reverse would be the case for the proposed entrances along Seventh Avenue, where the naturally high ground was probably disturbed by late nineteenth-century construction. The location of the proposed ADA Access at the southwest corner of Seventh Avenue and West 34th Street (East Side One Penn Plaza) on what was the side of a hill is also considered to have low potential for archaeological resources, since this setting was not attractive for most human uses. Nonetheless, as stated by NYSHPO, in any location in the APE in Manhattan where Build Alternative-related ground disturbance would occur, a potential to uncover archaeological resources would exist.

Research for the ARC FEIS has revealed that structures that currently occupy the proposed fan plant/construction access shaft and station entrance locations most likely post-date the 1880s and are the structures depicted on the 1891 and 1920 Bromley maps and the 1936 Sanborn map. Ground disturbances that would have occurred during construction of these structures (basement construction and/or use of pilings) or paved areas (utility lines, existing subway lines) could have destroyed prehistoric or historic archaeological deposits.

Review of soil boring data near the Dyer Avenue Fan Plant/Construction Access Shaft, Eighth Avenue Southeast Station Entrance and adjoining ADA Access/Emergency Entrance, Seventh Avenue Northwest Station Entrance, and the Seventh Avenue Southwest Station Entrance and adjoining ADA Access/Emergency Entrance indicate the potential for archaeological sensitivity in these areas. Geomorphological borings during design phases would further determine the presence or absence of sensitive soil strata at these locations. These data would assist in the determination of archaeological sensitivity of these locations, and could guide the decision for further archaeological testing and/or monitoring.

C. FUTURE NO BUILD CONDITIONS

In the future without the Build Alternative, archaeological resources buried in the APE would most likely remain in place, although disturbance could occur from future activities that would not be related to the Build Alternative.

D. CONSTRUCTION IMPACTS OF THE BUILD ALTERNATIVE

PRELIMINARY ANALYSIS OF ADVERSE EFFECTS

Archaeological field testing and monitoring as described in the PA would determine whether the resources identified during the Phase 1A assessment and subsequent archaeological analyses are present. The methods and timing for these investigations are stipulated in the PA and would occur during final design and construction. Until such testing is complete, adverse effects have been assumed to occur at each of the identified 17 locations where Build Alternative construction would occur. An adverse archaeological effect has been defined as any disturbance or damage to an eligible or listed archaeological resource. Such an effect would occur if a resource was located in soil, and if Build Alternative construction would disturb the soil at the depth of the resource. No adverse effect would occur if the resource was located above or below the depth at which Build Alternative construction would take place, or if the resource would lie outside the footprint of direct construction impacts. Similarly, in areas where no archaeological resources have been identified, no effects would occur.

The analysis conducted for the APE identified those effects to archaeological resources that could occur as a result of Build Alternative construction. Archaeologically “sensitive” areas and the potential for construction effects within the APE are listed in **Table 6-4**, and shown on **Figures 6-1 and 6-2**. For each area of the APE where the potential for archaeological resources was identified, the table shows the location, type of resource, and depth of resource, as well as potential adverse effects from construction disturbance.

Construction impacts of the Build Alternative on the 17 archaeological resources are described below.

RESOURCE 1: HISTORIC CEMETERIES OF HUDSON COUNTY IN SECAUCUS, NJ

New Build Alternative trackage would be constructed to the south of the NEC and would avoid the known boundaries of the cemeteries, which are believed to be limited in their southernmost extent to an area north of the NEC (Figure 6-3). The new trackage on the south side of the NEC would cross the Malanka Landfill and would enter the south side of the Frank R. Lautenberg Station (Figure 6-3). Immediately to the south of the NEC this trackage would be carried on a trestle structure supported on piles, and the driving of these piles could have an adverse effect on archaeological resources. The potential that additional burials may extend into the area of the Malanka Landfill should be considered to be low. Much of the area within which the landfill is located was previously a part of the Meadowlands and would have been a wetland during the period when the Historic Cemeteries of Hudson County were established. The work done by the Louis Berger Group on the Secaucus Potter’s Field burials suggests that only higher ground was used for internment activities. In addition, the original land surface of the area in which the Malanka Landfill is now located is deeply buried under fill, making it less likely that burials would be impacted by construction activities. However, given the lack of accurate mapping of both the topography of the area before the construction of what became the NEC and the extent of the historic cemeteries themselves, the potential that some burials may extend south of the NEC cannot be entirely dismissed.

TABLE 6-4: AREAS OF POTENTIAL ARCHAEOLOGICAL SENSITIVITY AND POTENTIAL BUILD ALTERNATIVE EFFECTS WITHIN THE APE – NEW JERSEY AND NEW YORK

Resource # (See Figures 6-1 and 6-2)	Name and Location of Potential Resource	Type of Potential Resource	Depth of Potential Resource/ Depth of Construction (feet)	Potential Cause of Adverse Effects from Construction
New Jersey APE				
1	Historic Cemeteries of Hudson County in Secaucus, NJ*	Historic burial ground	6/30	Trestle construction
2	Industrial Remains in Hoboken, NJ: 16 th and Jefferson Street, at Hoboken Fan Plant/Construction Access Shaft and staging area	19 th century historic industrial remains	45/125	Shaft excavation and laydown/staging area
3	Eighteenth-Century Ferry Slip in Hoboken, NJ: 16 th and Jefferson Street, at Hoboken Fan Plant/Construction Access Shaft and staging area	18 th century historic transportation facility remains	45/125	Shaft excavation and laydown/staging area
4	Hackensack Plank Road in Hoboken: 16 th and Jefferson Street, at Hoboken Fan Plant/Construction Access Shaft and staging area	19 th century historic transportation facility remains	45/125	Shaft excavation and laydown/staging area
New York APE				
5	Potential Piers and Wharves: at Twelfth Avenue Fan Plant/Construction Access Shaft – (281-295 Eleventh Avenue) (formerly Hudson River Shoreline to Tenth Avenue in Manhattan)	Historic piers, wharves fill retaining devices	10–20/160	Shaft excavation
6	Residentially Related or Domestic Archaeological Resources: 431 West 33 rd Street at Dyer Avenue Fan Plant/Construction Access Shaft	Historic 19 th century domestic remains	10–20/205	Shaft excavation
7	Residentially Related or Domestic Archaeological Resources: 137–139 West 33 rd Street, at 33 rd Street Fan Plant /Construction Access Shaft	Historic 19 th century domestic remains	10–20/160	Shaft excavation
8	Residentially Related or Domestic Archaeological Resources: 218 West 35 th Street, at 35 th Street Fan Plant/Construction Access Shaft	Historic 19 th century domestic remains	10–20/160	Shaft excavation
9	Residentially Related or Domestic Archaeological Resources: Southeast corner of Eighth Avenue and West 34 th Street (462–474 Eighth Avenue), at Eighth Avenue Southeast Station Entrance	Historic 19 th century domestic remains	10–20/30	Shaft excavation

Source: Transit Link Consultants, 2008

Note: Secaucus Potter's Field has received an opinion of eligibility for listing on the National Register of Historic Places (NJSHPO April 24, 2008) (see Appendix 6).

TABLE 6-4: AREAS OF POTENTIAL ARCHAEOLOGICAL SENSITIVITY AND POTENTIAL BUILD ALTERNATIVE EFFECTS WITH THE APE IN NEW JERSEY AND NEW YORK (CONTINUED)

Resource # (See Figures 6-1 and 6-2)	Name and Location of Potential Resource	Type of Potential Resource	Depth of Potential Resource/ Depth of Construction (feet)	Potential Cause of Adverse Effects from Construction
New York APE (continued)				
10	Residentially Related or Domestic Archaeological Resources: Northwest corner of Seventh Avenue and West 34 th Street (442 Seventh Avenue), at Seventh Avenue Northwest Station Entrance	Historic 19 th century domestic remains	10–20/25	Shaft excavation
11	Residentially Related or Domestic Archaeological Resources: Southwest corner of Seventh Avenue and West 34 th Street (420 Seventh Avenue), at Seventh Avenue Southwest Station Entrance	Historic 19 th century domestic remains	10–20/31	Shaft excavation
12	Residentially Related or Domestic Archaeological Resources: Northwest corner of Broadway and West 34 th Street (1313 Broadway), at Broadway Northwest Station Entrance	Historic 19 th century domestic remains	10–20/16	Shaft excavation
13	Residentially Related or Domestic Archaeological Resources: Southwest corner of Broadway and West 34 th Street (1293–1311 Broadway), at Broadway Southwest Station Entrance	Historic 19 th century domestic remains	10–20/20	Shaft excavation
14	Residentially Related or Domestic Archaeological Resources: Southwest corner of Seventh Avenue and West 34 th Street (East Side One Penn Plaza), at ADA Access/Emergency Entrance	Historic 19 th century domestic remains	10–20/120	Shaft excavation
15	Residentially Related or Domestic Archaeological Resources: Southeast corner of Eighth Avenue and West 34 th Street (West Side One Penn Plaza), at ADA Access/Emergency Entrance	Historic 19 th century domestic remains	10–20/140	Shaft excavation
16	Residentially Related or Domestic Archaeological Resources: Southeast corner of West 34 th Street and Broadway (108–110 West 34 th Street), at ADA Access/Emergency Entrance	Historic 19 th century domestic remains	10–20/155	Shaft excavation
17	Residentially Related or Domestic Archaeological Resources: Midblock on West 34 th Street between Eighth and Ninth Avenues (323 West 34 th Street) at Employee Only/Emergency Personnel Access entrance	Historic 19 th century domestic remains	10–20/160	Shaft excavation

Source: *Transit Link Consultants, 2008*

Note: Secaucus Potter's Field has received an opinion of eligibility for listing on the National Register of Historic Places (NJSHPO April 24, 2008) (see Appendix 6).

RESOURCES 2-4: INDUSTRIAL REMAINS IN HOBOKEN, NJ/EIGHTEEN-CENTURY FERRY SLIP/HACKENSACK PLANK ROAD IN HOBOKEN, NJ

The proposed location for the Hoboken Fan Plant/Construction Access Shaft and adjacent staging area in Hoboken has the potential to encounter an eighteenth-century ferry slip, an early nineteenth-century plank road, and later industrial archaeological resources. The Build Alternative would involve construction of tunnels under the Palisades in New Jersey and the Hudson River, which must be ventilated in compliance with National Fire Protection Association (NFPA) 130. Fan plants would be sited at both ends of the respective tunnels, including one facility proposed in Hoboken. The Hoboken Fan Plant would vent both sets of tunnels. With regard to the construction method, the only method available is excavation of the fan plant and access shaft in place, within a relatively constricted area of about 250 feet by 300 feet. The access shaft would be excavated to a depth of approximately 125 feet, to meet the eastern edge of the Palisades tunnels, and create a means by which tunnel boring machines can be lowered and assembled, to excavate the bored tunnels under the Hudson River. To do this, the fan plant and construction access shaft must be located above the footprint of the tunnels. The ground disturbance activities associated with the proposed access shaft excavation, fan plant construction, and associated staging area layout could have an adverse effect on archaeological resources. Specifically, construction would require excavation to a depth (125 feet) that could disturb portions of the Weehawken ferry slip, Hackensack Plank Road, and industrial areas referenced previously. Once the tunnels are completed, the fan plant would be constructed on the shaft site. This proposed fan plant in New Jersey would be up to 56 feet in height and cover a 160-foot diameter area. This facility could be built entirely above-ground, but the access shaft on the site (constructed first) would extend below-ground to the tunnels. The fan plant building would contain the following internal components: transformers for power supply, staircases for access/egress, four fans, a battery room and a series of silencers above the fans to attenuate noise from them.

Based on the tunnels' ventilation requirements, a fan plant must be sited just west of the Hudson River shoreline, but east of the Palisades cliffs. A fan plant could not be constructed in the Hudson River east of the proposed site in Hoboken, due to navigational conflicts within this heavily trafficked channel of the Hudson River and permanent river bottom disturbance and associated loss of benthic and other organisms and their habitat. A fan plant could not be constructed west of the proposed site above the tunnels through the Palisades, due to the significant depth (up to 100 to 140 feet) of the tunnels at that point, and the rock that would need to be mined to create a shaft from the ground surface to the tunnels. Construction of a vertical shaft through the Palisades would also disrupt residential neighborhoods and increase capital and operating costs. Construction of a fan plant on a site 140 feet to the north would impact an established residential area of single- and multi-family dwellings in Weehawken. The proposed fan plant site is in an underutilized industrial area adjacent to the existing Hudson-Bergen Light Rail right-of-way and the Adams Street Wastewater Treatment Plant. No other sites are available that would both meet the operating requirements of the Build Alternative and avoid the potential impact to these resources.

RESOURCE 5: POTENTIAL PIERS AND WHARVES AT TWELFTH AVENUE FAN PLANT (FORMERLY HUDSON RIVER SHORE TO TENTH AVENUE IN MANHATTAN)

The Twelfth Avenue Fan Plant and Construction Access Shaft and construction staging area are proposed at the southwest corner of the block bounded by Twelfth and Eleventh Avenues and West 28th and West 29th Streets (Block 674). This site is occupied by the Con Edison "Workout" Facility, in an area designated as made land, i.e., in-filled during the third quarter of the nineteenth century.

The access shaft would be used for construction access in Manhattan, including tunnels and cavern construction, and would enable construction of rock tunnels in Manhattan using TBMs. The shaft would also be used for material delivery and removal. The Twelfth Avenue Fan Plant would ventilate the

tunnels when it is completed. The ground disturbance activities associated with the proposed access shaft excavation, fan plant construction, and associated staging area layout could have an adverse effect on archaeological resources. Specifically, these activities would have the potential to disturb archaeological remains situated in the nineteenth-century fill that constitutes the made land in this area. The proposed fan plant would be up to 106 feet in height and 39 feet wide and 181 feet deep. This facility would be built entirely above-ground; however, since it would be connected to the tunnels to ventilate them, shaft construction could disturb below-ground areas that could potentially contain archaeological resources.

Consequently, archaeological monitoring of the Twelfth Avenue Fan Plant/Construction Access Shaft would be required. The PA specifies that a construction monitoring protocol be developed to appropriately determine the presence/absence and significance of any archaeological deposits present, and to serve as the basis for selecting measures to mitigate any adverse effects.

RESOURCES 6-17: RESIDENTIALLY-RELATED OR DOMESTIC ARCHAEOLOGICAL RESOURCES: SITES OF PROPOSED FAN PLANT/CONSTRUCTION ACCESS SHAFTS AND STATION ENTRANCES

Proposed fan plants would ventilate Build Alternative tunnels and NYPSE. The construction access shafts would be constructed first from street level to the depth of the proposed tunnels for access to the tunnels caverns that would be mined below. The ground disturbance activities associated with the proposed access shaft excavations, station entrance excavations, fan plant construction, and associated staging area layouts could have an adverse effect on archaeological resources. Specifically, these activities could disturb residentially related or domestic archaeological resources. Once the tunnels and the new station would be completed, the fan plants would be constructed on each of the shaft sites. The proposed fan plants in Manhattan would range from 113 to 129 feet in height and cover an area of 50 feet by 107 feet. These facilities would be built entirely above-ground but would be connected to the tunnels in order to ventilate them. Construction of the fan plants would result in the demolition of the buildings currently occupying these sites. The fan plant buildings would contain: transformers for power supply, staircases for access/egress, four fans, a battery room and a series of silencers above the fans to attenuate noise from them. Cooling towers are proposed atop the proposed 35th Street Fan Plant.

Proposed station entrances would include street level access, as well as vertical circulation elements connecting to the below-ground station. Five station entrances and three ADA Access/Emergency Personnel Entrances and one Employee Only/Emergency Personnel Access Entrance for NYPSE would be constructed either from the top down (using conventional excavation methods) or by the raise-bore technique, with mechanized raise-bore machines. Either method would completely disturb any soils beneath the existing structures or paved areas. Ground disturbances would include both the entranceways, as well as the escalators connecting the entranceways to the station. Archaeological resources could be located below utility conduits or below the basement levels of the buildings on these sites, or could have been removed when basements and utilities were constructed. Archaeological monitoring of these areas during construction would be required as specified in the PA.

ON-GOING AND FUTURE ANALYSES AND CONSULTATION

The potential adverse effects to the 17 possible archaeological resources discussed above from Build Alternative construction are identified in Table 6-4. As described in the PA, additional archaeological research would continue in final design and during construction for any new or revised project elements that would involve subsurface construction. In addition, if refinements to the Build Alternative would occur, other locations could be identified with the potential to affect archaeological resources. If those areas would be in the APE already evaluated, effects could be understood using the research to date. If they would be in new areas outside the ARC APE, additional research would be required to identify whether any resources could be present.

For any new ARC elements that would involve subsurface construction, potential effects on those archaeologically sensitive areas within the ARC APE would be assessed, following consultation requirements set forth in the PA. FTA and NJ TRANSIT would consult with NJSHPO and/or NYSHPO in identifying those archaeologically sensitive areas.

To further understand the Build Alternative relative to effects on archaeological resources, on-going consultation mandated by Section 106 would continue with FTA, NJSHPO, NYSHPO and, as appropriate, with the ACHP, to investigate further the presence of significant resources and to develop appropriate mitigation measures. Such planning would continue through design and construction

As part of the Section 106 consultation process, NJ TRANSIT would perform additional work at the 17 locations where the potential for adverse effects to archaeological resources has been identified, to determine whether any archaeological resources are present in those locations, and whether those resources are significant and eligible for the State and National Registers. As defined in the PA, the following activities relative to identifying archaeological resources would be completed:

- An extensive geotechnical boring program has been completed in support of preliminary engineering, and these borings have been reviewed to further assess archaeological sensitivity. NJ TRANSIT's professional archaeologists have reviewed the geotechnical boring logs for tests near the proposed Twelfth Avenue Fan Plant/Construction Access Shaft, Dyer Avenue Fan Plant/Construction Access Shaft, Eighth Avenue Southeast Station Entrance and adjoining ADA Access/Emergency Entrance, Seventh Avenue Northwest Station Entrance, and the Seventh Avenue Southwest Station Entrance and adjoining ADA Access/Emergency Entrance (locations listed in Table 6-3). This review has indicated that archaeological resources could be present. Results of the soil boring program are contained in the Phase 1A Archaeological Survey (May 2008) and have been shared with NJSHPO and NYSHPO.
- Since the results of the geotechnical investigations indicate that potential significant archaeological resources may be present, archaeological monitoring would occur during design and construction phases.

As specified in the PA contained in this FEIS, NJ TRANSIT, in consultation with the NJSHPO and NYSHPO, would develop a plan to conduct background research, archaeological investigations, and salvage activities within areas determined to have the potential to contain architectural elements and other remnants of the former New York Pennsylvania Railroad Station. It is anticipated that the area of concern for this activity lies between Tonnelle Avenue and the Amtrak/NJ TRANSIT right-of-way.

In addition, NJ TRANSIT has documented a process in the PA for meeting with descendant groups, as necessary, associated with any part of the Historic Cemeteries of Hudson County that could be located south of the NEC that could be affected by the Build Alternative. Wherever possible, locations identified as possibly containing burials would be avoided. Where avoidance would not be possible, such as within the constrained available space for additional tracks on a new trestle just south of the existing NEC (in the area of the Malanka Landfill), NJ TRANSIT would follow the testing and excavation plan developed in consultation with NJSHPO and the appropriate descendant communities, as described in the PA.

NJ TRANSIT, in consultation with FTA, NJSHPO and NYSHPO, would develop a plan to appropriately phase archaeological field analysis and data recovery with Build Alternative construction activities. NJ TRANSIT would initiate and complete archaeological field analysis and data recovery (depending on site access and testing feasibility) prior to and during Build Alternative construction activities in the vicinity of affected resources.

E. MITIGATION

Future research steps to be taken to refine the areas of archaeological sensitivity and any mitigation measures to be developed in consultation with NJSHPO and NYSHPO are included in the PA, executed by ACHP, FTA, NJSHPO, NYSHPO and NJ TRANSIT. Where possible and feasible, archeological testing will be undertaken in areas of archaeological sensitivity prior to construction activities. This would include areas where an archaeological testing program would not impair the functioning of the property during the investigation period. In other areas where ground disturbance would occur but there is uncertainty with regard to encountering archeological resources, archeological monitoring during construction would be implemented as part of construction activities.

Archaeological field testing plans will be developed for each area in the ARC APE for which additional evaluations and/or soil borings have determined or confirmed archaeological sensitivity. Archaeological investigations will be prioritized according to overall project schedule and are designed to identify the presence or absence of potential Archaeological Properties within the APE. The procedures to be employed may take the form of either archaeological testing prior to construction or, where necessary, archaeological monitoring during construction. The Testing Plan will include a description of all methodologies to be employed during the archaeological field investigation, subsequent laboratory processing of artifacts recovered, and reporting.

Prior to commencing any field testing and/or monitoring, NJ TRANSIT will submit the Field Testing Plan for NJSHPO and/or NYSHPO review. NJSHPO and/or NYSHPO review, comment and concurrence on all such submissions is required prior to the implementation of the Plan for any specific location.

For any areas within the ARC APE for which additional research has determined are archaeologically sensitive, but for which archaeological testing prior to construction is not feasible, archaeological monitoring during construction shall be performed. Plans for archaeological monitoring of specific locations will be developed and submitted to NJSHPO for review and comment. Archaeological monitoring plans will identify monitoring goals, monitoring personnel and methodologies. The archaeological monitoring team will consist of a Cultural Resources Manager CRM, a Principal Investigator, Field Director and Field Technicians.

NJ TRANSIT will appoint a Cultural Resource Manager to assure that any archaeological resources identified during the course of construction are appropriately evaluated; efforts will be undertaken to the extent possible to avoid or minimize impacts to any eligible archaeological resources, and any adverse effects project-associated construction activities might have on eligible archaeological resources are mitigated. The CRM will meet the qualifications specified in the Secretary of the Interior's Professional Qualifications for Archaeology (46 CFR 4471.6) and have the appropriate professional background experience for the types of resources anticipated at the work site. The CRM will be the point of contact between the monitoring team, NJ TRANSIT, officers of the Contractor, project sponsors and state and federal review agencies. They will be responsible for monitoring the progress of monitoring activities, adherence to the monitoring protocol by the archaeological team, schedule and budget. They will be the conduit for communicating issues originating within the monitoring team to the appropriate parties. Periodic status meetings among the CRM, NJ TRANSIT and review agencies may be advisable, depending on the length and complexity of the project. Brief status reports prepared by the CRM may be an appropriate alternative.

The Principal Investigator (PI) will also meet the qualifications specified in the Secretary of the Interior's Professional Qualifications for Archaeology (46CFR4471.6). The PI will be on site at all times specified in the monitoring protocol. They will be responsible for implementation of the protocol on site and the

quality of work performed by the monitoring team. The PI will confer with the Foreman for the Contractor (or other agreed upon person) on any decision to halt work and the Contractor will direct their personnel accordingly. The PI will be responsible for communicating to the Contractor's Foreman the need for a member of the monitoring team to provide guidance to excavators in areas of high sensitivity or where archaeological remains have already been found. In these circumstances, 'guidance' refers to telling where and how deep an excavator is to dig and when and for how long they are to stop. This level of communication is necessary for creating a safe work environment.

The PI is also responsible for being informed of any Health and Safety Plan (HASP) that is developed for the work site by the Contractor, know who the Health and Safety Officer is, and assure that the monitoring team is in compliance with its rules and regulations included in the HASP. The monitoring team will be equipped and wear all required personal protective equipment (PPE) as specified in the HASP. The monitoring team should also be notified of and included in any on-site meetings or briefings held by the Health and Safety Officer.

The Field Director (FD) will be responsible for assisting the PI in directing and managing the efforts, collecting and organizing equipment, paperwork, etc. on a daily basis. The FD will be competent to review and evaluate the accuracy and adequacy of field notes and drawings produced by the FTs. The FD should have a minimum two years experience investigating sites of comparable cultural affiliation, date and function.

Field technicians should have the requisite skills and experience to work with minimum supervision and produce acceptable field notes, scaled drawings or other forms of recordation required by the project. They will work under the direct supervision of the FD and the PI.

Archaeological monitoring will be accomplished through the formation of monitoring teams. Each team will be comprised minimally of three individuals and may involve more, depending on site conditions and requirements. Although any task assigned to the monitoring team is the responsibility of all team members to complete, one individual will be primarily responsible for any monitoring of the movement of any mechanical equipment in the area of the team's activities. A second individual will be primarily responsible for any hand-excavation tasks that are assigned to the team. The third individual will be responsible for assuring that all recordation tasks (e.g., photography, scale drawings, note-taking) assigned to the team are completed satisfactorily. All monitoring teams will be directed by the FD and/or PI and will report directly to them. The number of teams on site at any one time will be dictated by the pace of excavation and the number and size of finds made during the course of the monitoring project.

Recommended mitigation including either field testing or monitoring for each of the 17 resources is described below.

NEW JERSEY

RESOURCE 1: HISTORIC CEMETERIES OF HUDSON COUNTY IN SECAUCUS, NJ

New trackage would cross the Malanka Landfill and enter the south side of Frank R. Lautenberg Station. The potential for finding preserved elements of the cemeteries within the landfill is considered a low probability but cannot be ruled out entirely at this time.

Archaeological field testing of the area south of the NEC to determine the presence of resources associated with the cemetery will be undertaken in accordance with the work plan included as Exhibit L of the PA, "Protocol for Work in Areas with the Potential for Human Remains". Following the methodology already employed for other parts of the Historic Cemeteries of Hudson County, a Ground Penetrating Radar (GPR) survey will be completed once the original ground surface has been exposed.

Mechanical equipment will be used to remove overburden and to expose subsoils at a point where grave shafts will be discernable. If grave shafts are observed, and confirmed by limited testing, consultation will immediately be initiated under the New Jersey Cemetery Act, and all appropriate local, state, and federal agencies will be notified.

Archaeological monitors who satisfy the Secretary of the Interior's standards for archaeologists will be on site during construction to assure that the approach specified above is followed, if and when, any such burials are encountered. Mitigation of the adverse effects that this project might have on burials will include the establishment of a disinterment/re-interment protocol; de-watering of the site, if warranted; disinterment of all human remains and associated artifacts from the APE; study and analysis of the material removed from the graves; and re-interment at a designated location.

Previous experience of the NJ Turnpike Authority with the Historic Cemeteries of Hudson County for its nearby interchange project provides a basis for legal, regulatory, and logistical procedures surrounding the necessary and proper treatment of human remains. The Historic Cemeteries of Hudson County (with its undefined southern boundary) falls within the jurisdiction of the New Jersey Cemetery Act, Title 8A (Cemeteries) for the New Jersey Statutes (N.J.S.) (State of New Jersey 2002). The New Jersey Cemetery Board administers the Act and regulates cemetery companies and their property, as well as property rights, equipment, and facilities as required under the provisions of Title 8A. The New Jersey Attorney General oversees actions and proceedings of the Cemetery Board.

Disinterment of human remains that could be found in the Historic Cemeteries of Hudson County would be subject to N.J.S.A. 8A:8-3 (removal of bodies and sale of land; consents required; court order; procedure), and would fall under the jurisdiction of the Cemetery Board. Approval would also be required by the Chancery Division of the Superior Court of New Jersey for any disinterment and re-interment. As set out in the PA, a Disinterment/Re-interment Plan will be required, containing detailed explanations of Build Alternative construction and proposed treatment of human remains. Development of this plan will be based on coordination with FTA, NJ TRANSIT, NJSHPO, and interested lineal descendants of the deceased buried in the Historic Cemeteries of Hudson County.

This process of field testing, monitoring data recovery, mitigation, re-interment and coordination is described in the PA for the project contained in this FEIS.

*RESOURCES 2-4: INDUSTRIAL REMAINS/EIGHTEENTH-CENTURY FERRY SLIP/
HACKENSACK PLANK ROAD IN HOBOKEN, NJ*

Construction of the Hoboken Fan Plant/Construction Access Shaft and adjacent construction staging area could result in disturbance/displacement of historic archaeological resources associated with several industrial buildings, a nineteenth-century plank road, and an eighteenth century ferry slip that appear on maps spanning the nineteenth and early twentieth centuries and in eighteenth century textual references. Testing to determine if remains exist within the APE will begin with a review of soil borings by the project geomorphologist to determine the presence and depth of intact soil horizons within the APE. This effort will be followed by use of GPR survey, to identify the presence and depth of intact architectural features, such as building floors and wall and/or other subsurface cultural features. This non-intrusive survey will be followed by ground truthing through the subsequent mechanical stripping of overburden, and hand-dug excavations of any cultural features and deposits encountered to determine their National Register eligibility. The identification (Phase IB) and evaluation (Phase II) archaeological surveys will be conducted during final design or construction. Proposed mitigation measures, if eligible resources are found, will be developed by the Cultural Resource Manager in consultation with the NJSHPO. These measures are likely to include the undertaking of a data recovery excavation that will be intended to address specific research questions relevant to the character of the deposits identified during the Phase I/II studies. Artifacts recovered during these studies will be curated in the NJ State Museum or other

accepted repository (in accordance with the Secretary of Interior's Curation Standards (36 CFR 79). This approach and the implementation of a Construction Protection Plan are included in the PA.

A data recovery plan will provide a detailed discussion of the site-specific research questions deemed appropriate by the signatories to the Programmatic Agreement and considered important at the local, regional, and/or national level. The plan will provide a discussion of the research topics and questions to be addressed, the types of data that will be collected to address these questions; strategies and testing methodology for the recovery of the necessary data; methods of analyses and interpretation; and any other necessary information deemed appropriate by the NJSHPO and other involved state and federal agencies. The data recovery field excavations will be as complete as possible to address the research questions established in the plan. Detailed laboratory analysis will be performed on recovered cultural materials, followed by cataloguing and preparation for curation. A public education program will also be included in the data recovery investigations to disseminate the recovered information to the archaeological community and the public.

All data recovery investigations in New Jersey will follow the guidelines established in the *Guidelines for Preparing Cultural Resources Management Archaeological Reports* (NJSHPO 2000). The data recovery plans and investigations will also follow the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation* (48 CFR 44716) and the Advisory Council on Historic Preservation's 1980 *Treatment of Archaeological Properties*. The plan(s) will be developed and implemented by a Principal Investigator who meets the Secretary of the Interior's Professional Qualifications Standards (48 CFR 44738-44739). The data recovery report will also follow the Secretary of the Interior's Format Standards for Final Reports of Data Recovery Programs (42 CFR 5377-79).

All archaeological materials and records resulting from archaeological survey, evaluation, and data recovery investigations will be subjected to laboratory analysis, conservation, and curation. Laboratory processing and analysis will include cleaning, identification, and cataloging of any recovered cultural materials; cataloging and processing of select soil control and feature flotation samples, specialized analyses and interpretation of organic remains and in-depth analysis of the spatial distributions of archaeological materials and features. Appropriate conservation measures for artifacts will be taken as necessary. The disposition of archaeological remains and records will be completed following the completion of all laboratory analyses and conservation measures. NJ TRANSIT will identify an appropriate repository for curated archaeological collections in consultation with the NJSHPO. For collections recovered from archaeological sites in New Jersey, the New Jersey State Museum's 2005 draft guidelines, *Curation Guidelines: Preparing Compliance Archaeological Collections for Submission to the NJ State Museum*, will be followed.

Any data recovery effort will include public outreach. The purpose of the public outreach is to provide information on the data recovery effort and any archaeological resources uncovered as a result of that effort to the general public. Public outreach may take the form of the publication of a brochure or non-technical report, public lectures, information kiosk, or web page, but is not limited to those formats. The specific form that public information effort takes will depend on the nature of the resource and the design of the data recovery operation, and will be determined in consultation with the NJSHPO.

HUDSON RIVER

RESOURCE 5: POTENTIAL PIERS AND WHARVES AT TWELFTH AVENUE FAN PLANT (FORMERLY HUDSON RIVER SHORE TO TENTH AVENUE IN MANHATTAN)

Prior to shaft excavation, a construction monitoring protocol will be developed in coordination with NYSHPO and NYCLPC and implemented to appropriately determine the presence/absence and

significance of any archaeological deposits present, and to identify measures to mitigate adverse effects (see PA in this FEIS). This protocol will detail the phasing and methods to be employed in archaeological monitoring conducted during construction. It will describe the goals of monitoring, the methods to be used by archaeologists on the site, and the relationship of authority and responsibility of the archaeologists to the construction company, the project owner, and review agencies. It also will define the amount of time that archaeologists will be provided to conduct their work, and provision for unexpected finds during excavation. The document will be included in the bid package for construction companies, and will become part of their contract. Proposed mitigation measures, if eligible resources are found, will be developed by the Cultural Resource Manager in consultation with the NYSHPO and NYCLPC. These measures are likely to include the undertaking of a data recovery excavation that will be intended to address specific research questions relevant to the character of the deposits identified during the Phase I/II studies. An effort will be made to secure artifacts recovered during these studies for curation in an accepted repository (in accordance with the Secretary of Interior's Curation Standards (36 CFR 79). This approach and the implementation of a Construction Protection Plan are included in the PA.

NEW YORK

RESOURCES 6-17: RESIDENTIALLY-RELATED OR DOMESTIC ARCHAEOLOGICAL RESOURCES: SITES OF PROPOSED FAN PLANT/CONSTRUCTION ACCESS SHAFTS AND STATION ENTRANCES

Sites of proposed fan plants/construction access shafts and station entrances could contain historic archaeological deposits. Geotechnical information on the substrate beneath the existing on-site buildings that stand where the fan plants/construction access shafts and station entrances would be built, has been obtained through field borings completed during preliminary engineering. These have been reviewed by the project archaeologist and geomorphologist to determine archaeological sensitivity of soil deposits at these locations, as well as to ascertain whether these areas were filled prior to late-nineteenth century development. This review has indicated that in the vicinity of the proposed Dyer Avenue Fan Plant/Construction Access Shaft, Eighth Avenue Southeast Station Entrance and adjoining ADA Access/Emergency Entrance, Seventh Avenue Northwest Station Entrance, and the Seventh Avenue Southwest Station Entrance and adjoining ADA Access/Emergency Entrance a complex of silty-clay to gravelly-sand beds has been identified below capping historic and modern fills. This analysis has not yet determined whether formerly surficial or near-surficial strata are represented in these cores. However, should this condition be proven, a potential exists for early nineteenth-century (or earlier) archaeological features and deposits to be contained beneath the fill. A construction monitoring protocol will be developed in coordination with NYSHPO and NYCLPC, as described previously, to appropriately determine the presence/absence and significance of any archaeological deposits present, and to serve as the basis for selecting measures to mitigate any adverse effects, including implementation of a Construction Protection Plan. Proposed mitigation measures, if eligible resources are found, will be developed by the Cultural Resource Manager in consultation with the NYSHPO and NYCLPC. These measures are likely to include the undertaking of a data recovery excavation that will be intended to address specific research questions relevant to the character of the deposits identified during the Phase I/II studies. An effort will be made to secure artifacts recovered during these studies for curation in an accepted repository (in accordance with the Secretary of Interior's Curation Standards (36 CFR 79). This approach and the implementation of a Construction Protection Plan are included in the PA.

PROGRAMMATIC AGREEMENT STIPULATIONS

Since archaeological resources could be affected by the project, and to meet Section 106 consultation requirements, FTA, ACHP, NJ TRANSIT, NJSHPO and NYSHPO have developed a Programmatic

Agreement (PA). The PA, which is included in this FEIS, contains the following stipulations to implement the mitigation measures described above for each of the 17 archaeological resources:

- Continued consultation with NJSHPO and NYSHPO, submittal of design plans at various stages of completion (30 percent, 60 percent and 90 percent), and preparation of Construction Protection Plans for activities within 90 feet of archaeological resources identified in Table 6-4 of this chapter.
- Appointment of a Cultural Resource Manager for determining the nature of discoveries during Build Alternative construction to optimize construction progress while being sensitive to any potential archaeological resources uncovered in the field.
- Adherence to the New Jersey Cemetery Act regarding disinterment of human remains, including procedures for identifying and notifying descendants and determining a plan for disinterment/re-interment.
- Curation of artifacts in State Museums or other approved repositories once it is decided that archaeological resources should be removed, rather than left in place.
- Establishment of construction monitoring protocol to mitigate effects, addressing responsibilities of the contractors, and an in-field archaeologist, and the process for treating any discovered archaeological resources.

The following plans will be prepared and carried out, as necessary, during Build Alternative design and construction stages per archaeological resource, to prescribe the processes for identifying, evaluating and, if necessary, mitigating any disturbance of archaeological resources during Build Alternative construction:

- Construction Protection Plan – provides protocols and stipulations for protecting identified Archaeological Resources within the project area during demolition, excavation and construction phases of the project.
- Soil Boring Program – outlines a program to identify geotechnical and environmental subsurface conditions along the project corridor
- Field Testing Plan – details the protocols that will be followed to assess the presence or absence of subsurface archaeological.
- Data Recovery Plan – describes the process for recovery and preservation of data from archaeological sites.
- Curation Plan – describes how archaeological materials and records resulting from archaeological survey, evaluation and data recovery will be subject to laboratory analysis, conservation and curation at an appropriate repository.
- Public Interpretation Plan – describes process to provide interpretive material to the public regarding the data recovery effort.
- Unanticipated Discoveries Plan – details the protocol that will be followed in the event that new archaeological resources, including human remains, are discovered during construction.
- Construction and Archaeological Phasing Plan – outlines, by construction contract, the order and type of the archaeological investigations.

F. LONG-TERM IMPACTS OF THE BUILD ALTERNATIVE

Any potential archaeological resources that would be affected by the Build Alternative would be disturbed during construction. Once the Build Alternative would be operational, no further effects to archaeological resources would occur.