
Freshkills Park

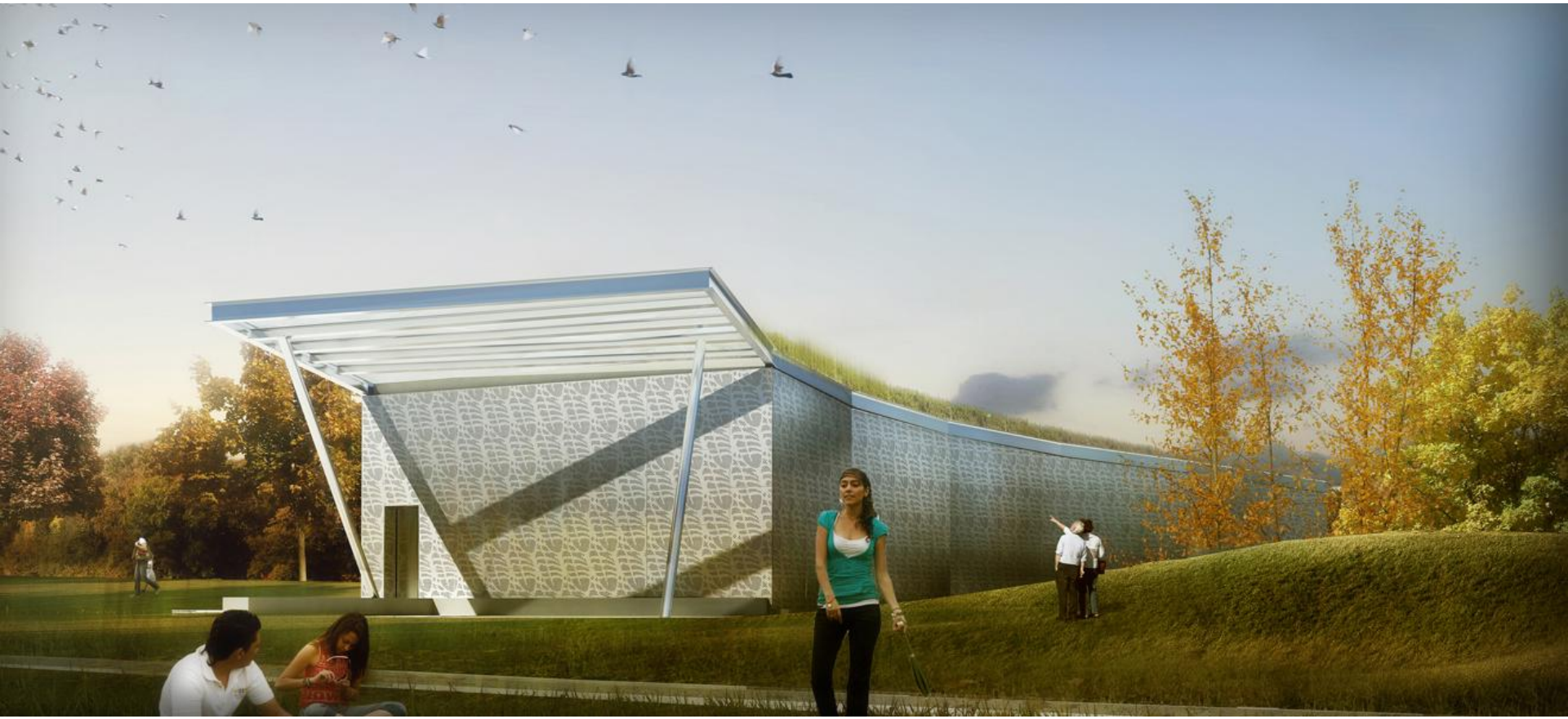
Near-Term Park Construction Projects

Schmul Park

Schmul Park

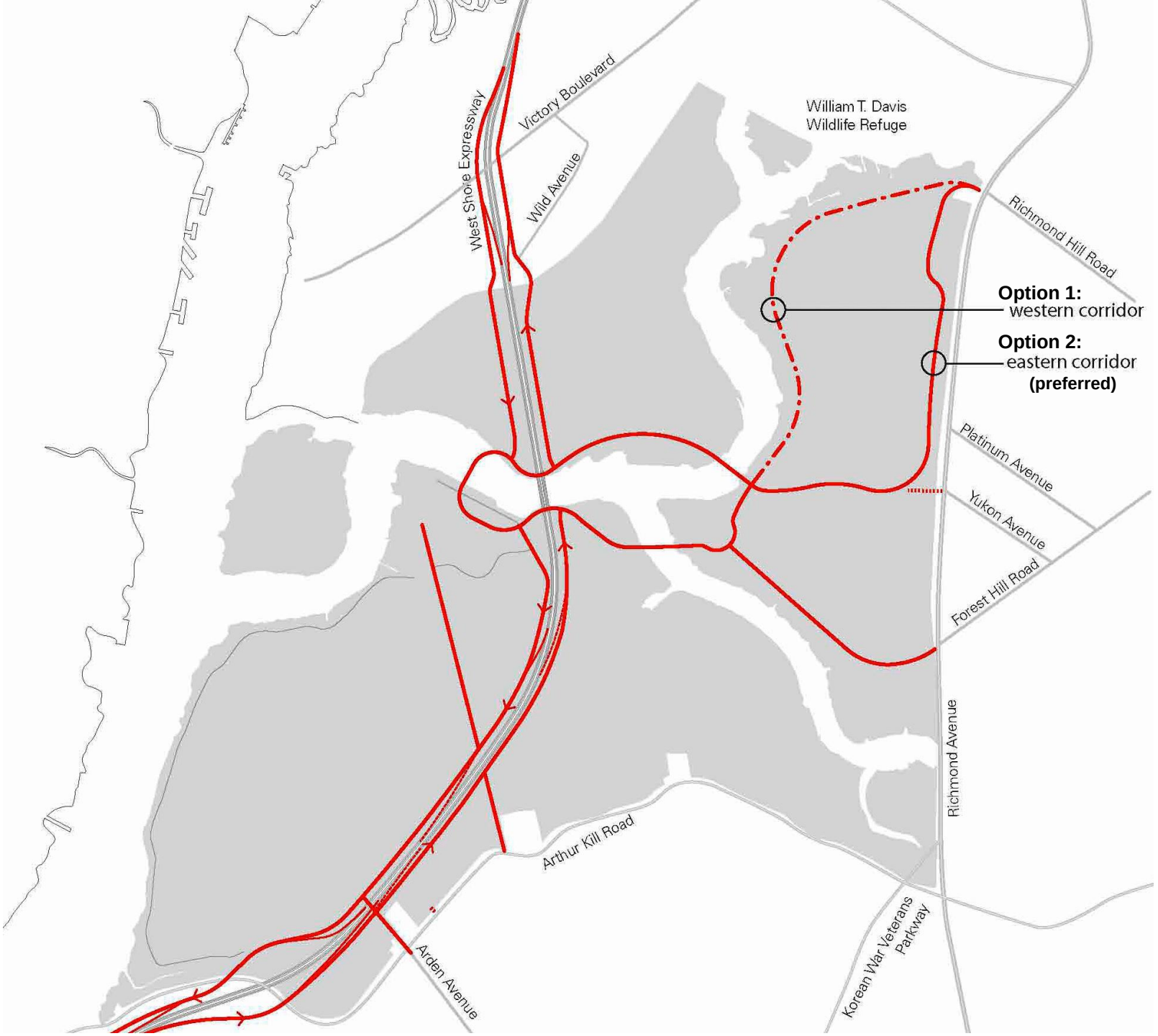
Schmul Park

Owl Hollow Comfort Station



Owl Hollow Comfort Station

Road System


William T. Davis
Wildlife Refuge
West Shore Expressway
Victory Boulevard
Wild Avenue
Richmond Hill Road
Option 1:
western corridor
Option 2:
eastern corridor
(preferred)
Platinum Avenue
Yukon Avenue
Forest Hill Road
Richmond Avenue
Arthur Kill Road
Arden Avenue
Korean War Veterans
Parkway

Road System: Objectives

- **Provide access to Park**
- Provide Park-like experience for drivers
- Connectivity to local/regional network
- Minimize or avoid impacts with landfill infrastructure and protected natural features

North Caldwell
Wallington
East Rutherford
Rutherford
Little Ferry
Palisades Park
Carlstadt
Ridgefield
Ft. Lee
Cliffside Park
Fairview
North Bergen
West New York
North Arlington
Secaucus
East Orange
Kearny
Union City
Harrison
Hoboken
Newark
MANHATTAN
Jersey City
Kenilworth
Roselle Park
Elizabeth
Roselle
Linden
Rahway
Carteret
New Jersey
Perth Amboy
STATEN ISLAND
BROOKLYN
New York
QUEENS
BRONX
Manorhaven
Great Neck
New Hyde Park
Floral Park
Valley Stream
Cedarhurst
Lawrence
Long Beach
N.Y.
N.J.
95
280
78
440
278
495
295
695
87
80
3
27
Holland Tunnel
Lincoln Tunnel
PULASKI SKYWAY
NEW JERSEY TPK
GARDEN STATE PKWY
STATEN ISLAND EXPY
GOWANUS EXPY
BELT PKWY
SHORE PKWY
BROOKLYN QUEENS EXPY
LONG ISLAND EXPY
GRAND CENTRAL PKWY
CROSS ISLAND PKWY
CLEARVIEW EXPY
CROSS-BRONX EXPY
BRUCKNER EXPY
NORTH STATE PKWY
SOUTHERN STATE PKWY
NASSAU EXPY
Korean War Veteran's Memorial Hwy
Outerbridge Crossing

Road System: Objectives

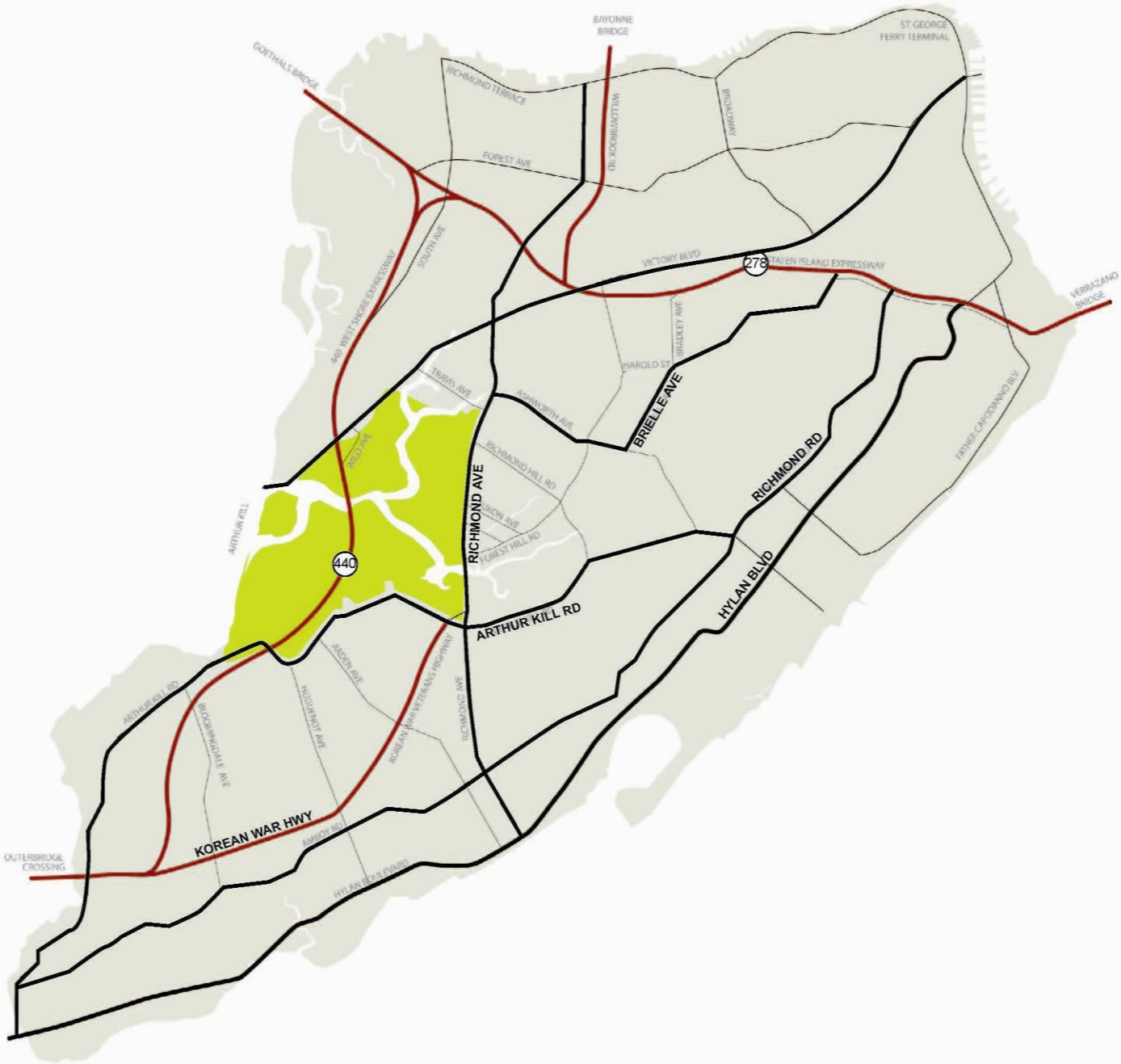
- Provide access to Park
- **Provide Park-like experience for drivers**
- Connectivity to local/regional network
- Minimize or avoid impacts with landfill infrastructure and protected natural features

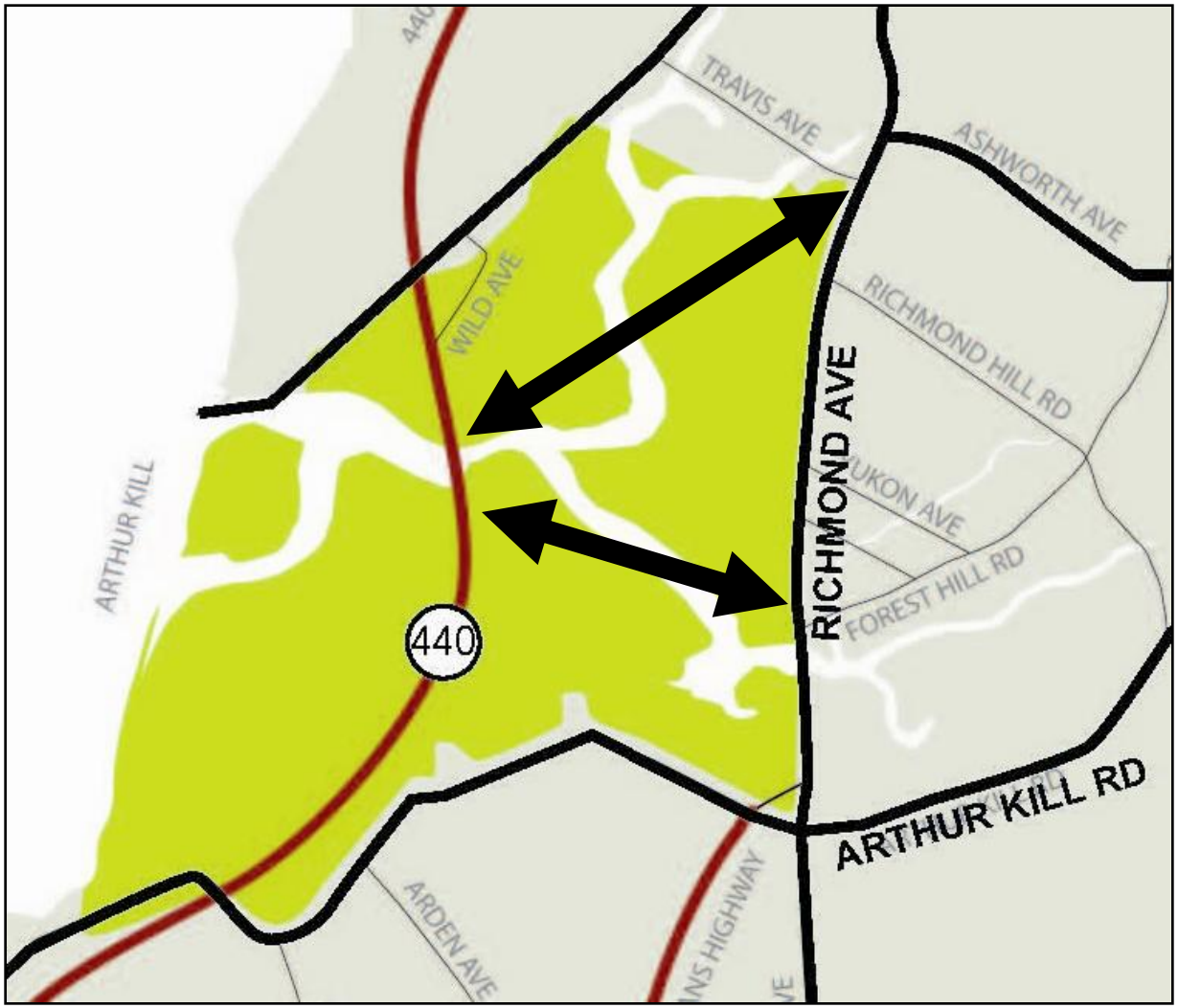
Rendering of possible 2-lane option

2-lane, 4-lane and hybrid system still being analyzed

Road System: Objectives

- Provide access to Park
- Provide Park-like experience for drivers
- **Connectivity to local/regional network**
- Minimize or avoid impacts with landfill infrastructure and protected natural features

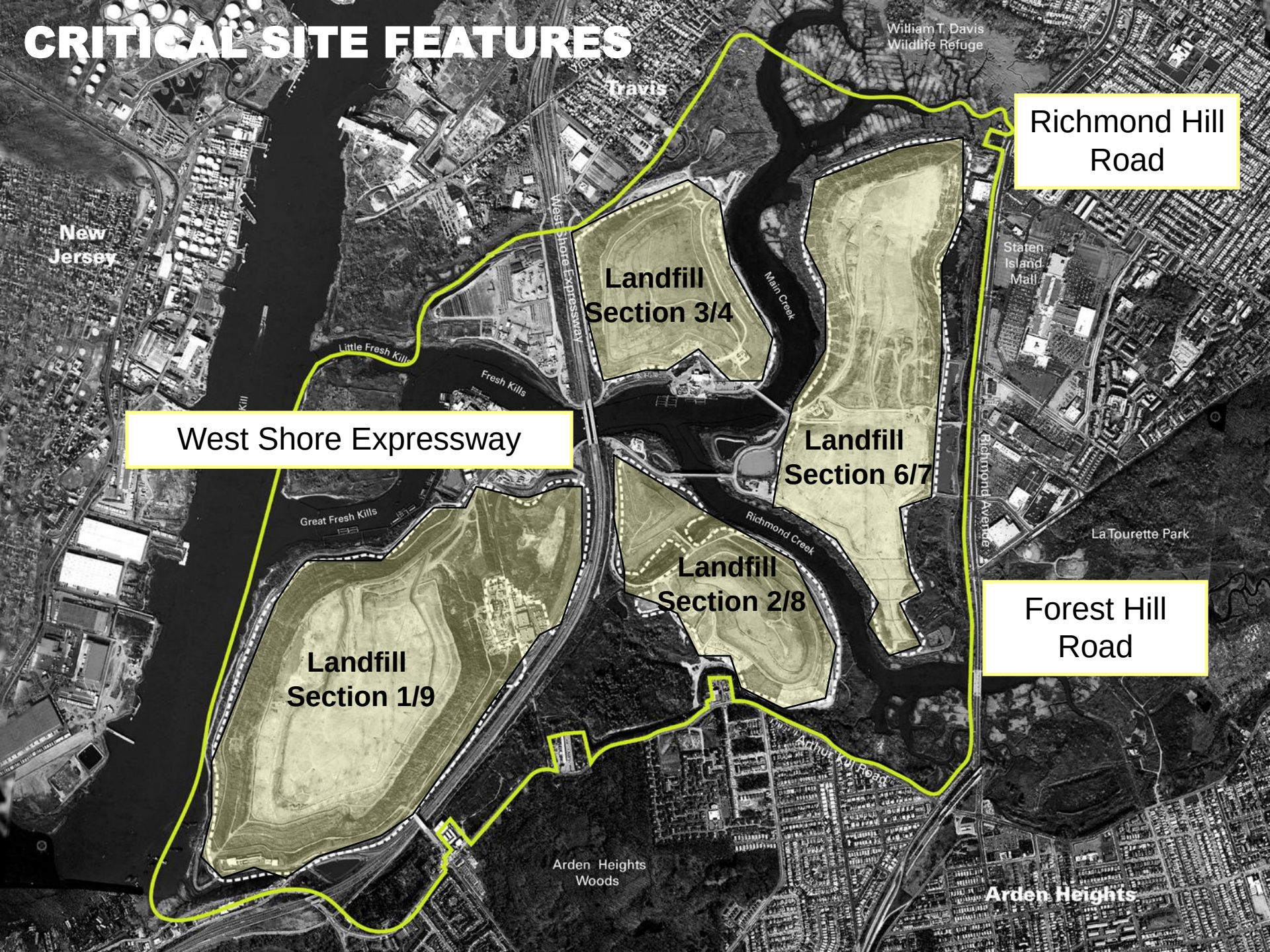

BAYONNE BRIDGE
ST. GEORGE FERRY TERMINAL
GOETHALS BRIDGE
RICHMOND TERRACE
FOREST AVE
VICTORY BLVD
278
STATEN ISLAND EXPRESSWAY
VERRAZANO BRIDGE
BRIELLE AVE
RICHMOND AVE
RICHMOND RD
HYLAN BLVD
ARTHUR KILL RD
440
KOREAN WAR HWY
OUTERBRIDGE CROSSING
HYLAN BLVD


TRAVIS AVE
ASHWORTH AVE
WILD AVE
RICHMOND HILL RD
RICHMOND AVE
YUKON AVE
FOREST HILL RD
ARTHUR KILL
440
ARTHUR KILL RD
ARDEN AVE

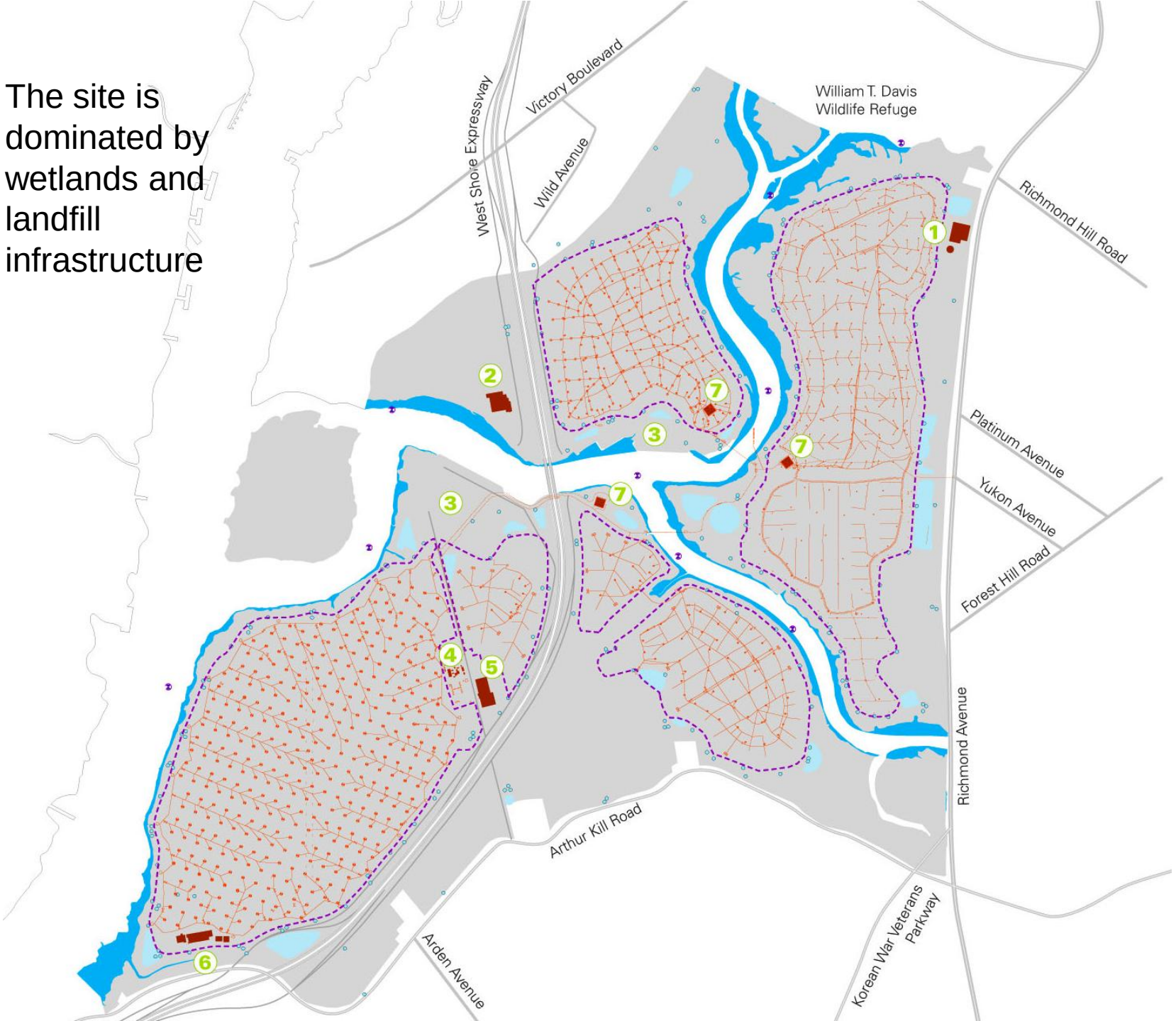
Road System: Objectives

- Provide access to Park
- Provide Park-like experience for drivers
- Connectivity to local/regional network
- **Avoid or minimize impacts with landfill infrastructure and protected natural features**


Technical Constraints


CRITICAL SITE FEATURES
William T. Davis Wildlife Refuge
Travis
Richmond Hill Road
New Jersey
West Shore Expressway
Landfill Section 3/4
Main Creek
Staten Island Mall
Little Fresh Kills
Fresh Kills
West Shore Expressway
Landfill Section 6/7
Richmond Avenue
Great Fresh Kills
Richmond Creek
La Tourette Park
Landfill Section 2/8
Forest Hill Road
Landfill Section 1/9
Arthur Kill Road
Arden Heights Woods
Arden Heights

The site is dominated by wetlands and landfill infrastructure



Wetland Systems

Tidal Wetland
Freshwater Wetlands

EAST MOUND

Richmond Hill Road

Tidal Wetlands

Freshwater Wetlands

Forest Hill Road

Landfill Systems

Leachate Management
Landfill Gas Management
Final Cover + Drainage Systems

Landfill Systems

Leachate Management

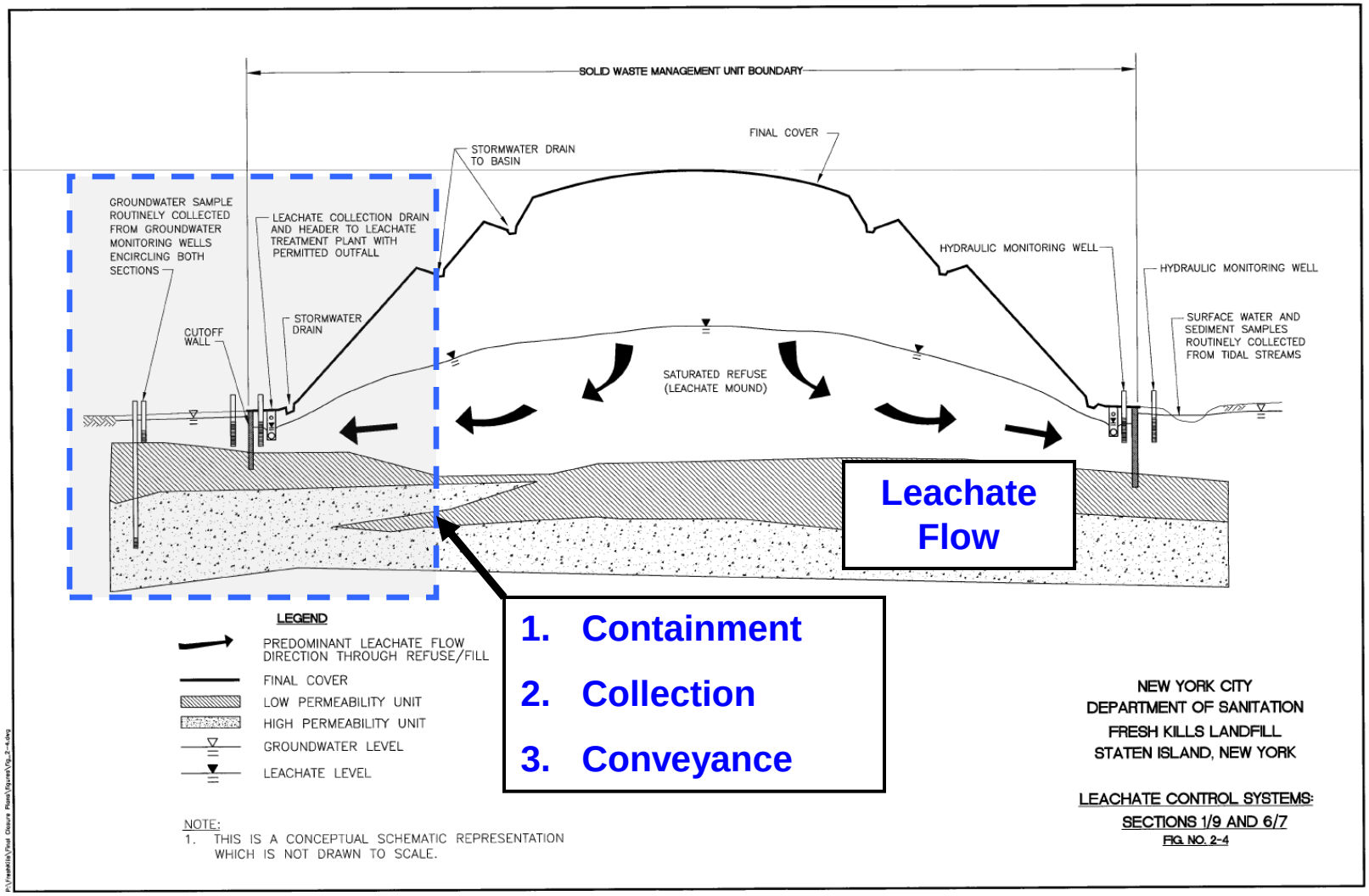
Landfill Gas Management

Final Cover + Drainage Systems

LEACHATE MANAGEMENT SYSTEM

- Containment
  - Cutoff Wall
- Collection
  - Leachate Collection Drain
- Conveyance
  - Leachate Collection Pump Stations
  - Leachate Force Main

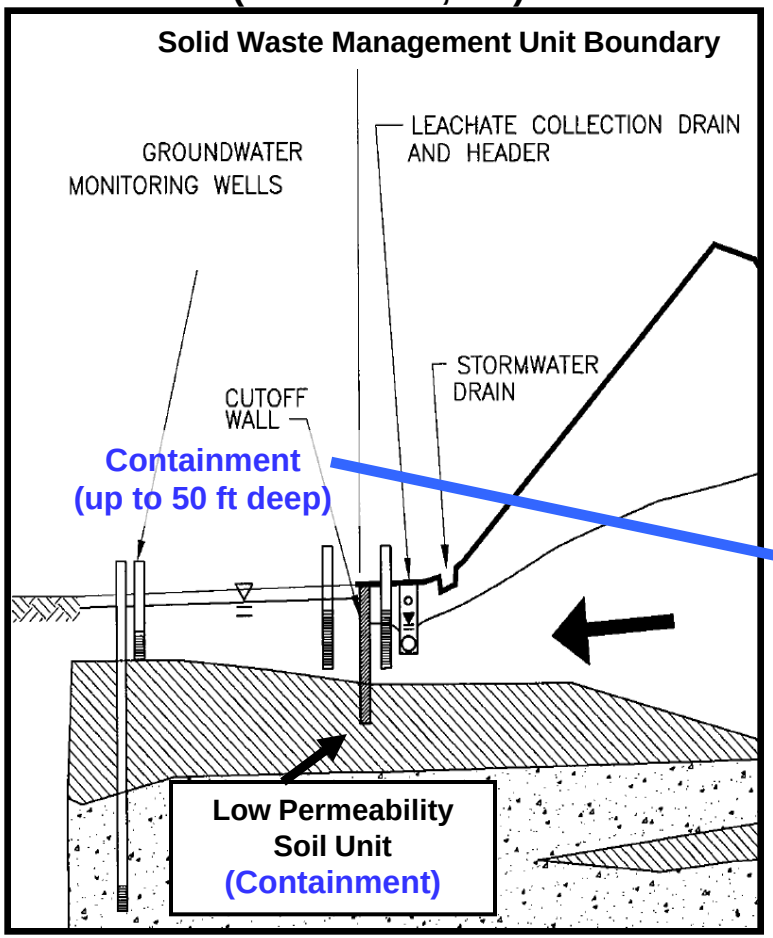
LEACHATE MANAGEMENT SYSTEM



LEACHATE MANAGEMENT SYSTEM

Containment

Typical Cross Section FKLF (Section 1/9, 6/7)

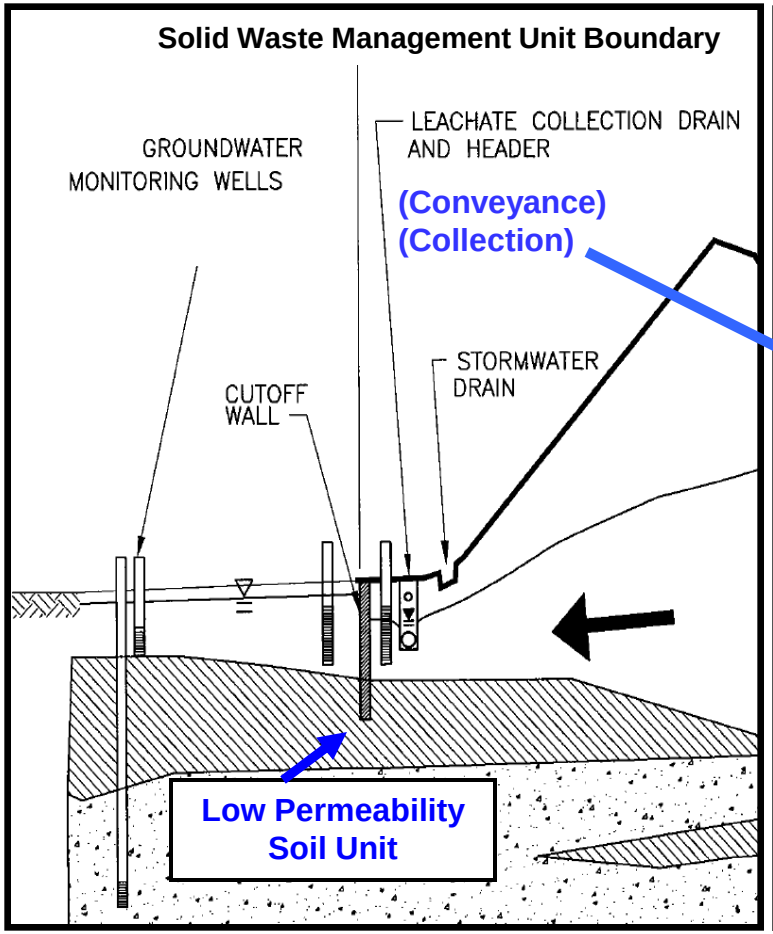


Typical Cutoff Wall Construction

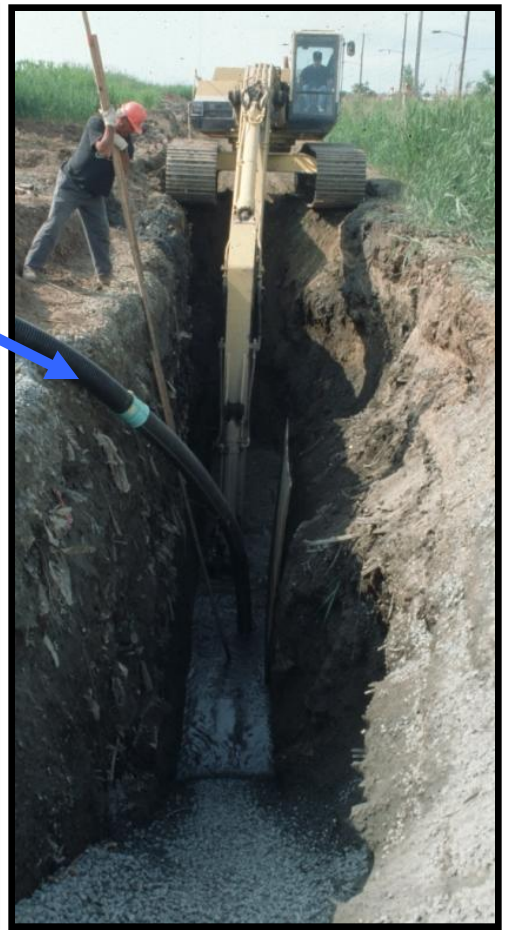
LEACHATE MANAGEMENT SYSTEM

Collection - Conveyance

Typical Cross Section FKLF (Section 1/9, 6/7)



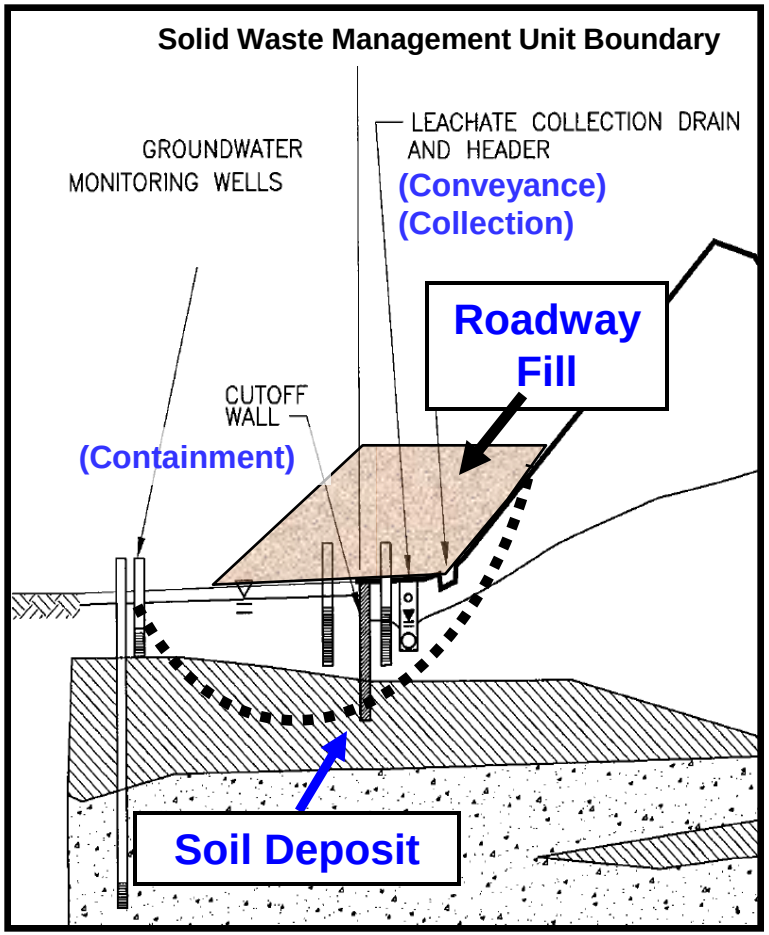
Leachate Collection Drain Construction



- **Collection Drain** - Stone backfill with perforated pipe
- Gravity drainage to **Leachate Collection Pump Station**
- Pump stations - 6 ft x 12 ft plastic lined concrete vault
- Pressure flow through **Leachate Collection Header**

LEACHATE MANAGEMENT SYSTEM

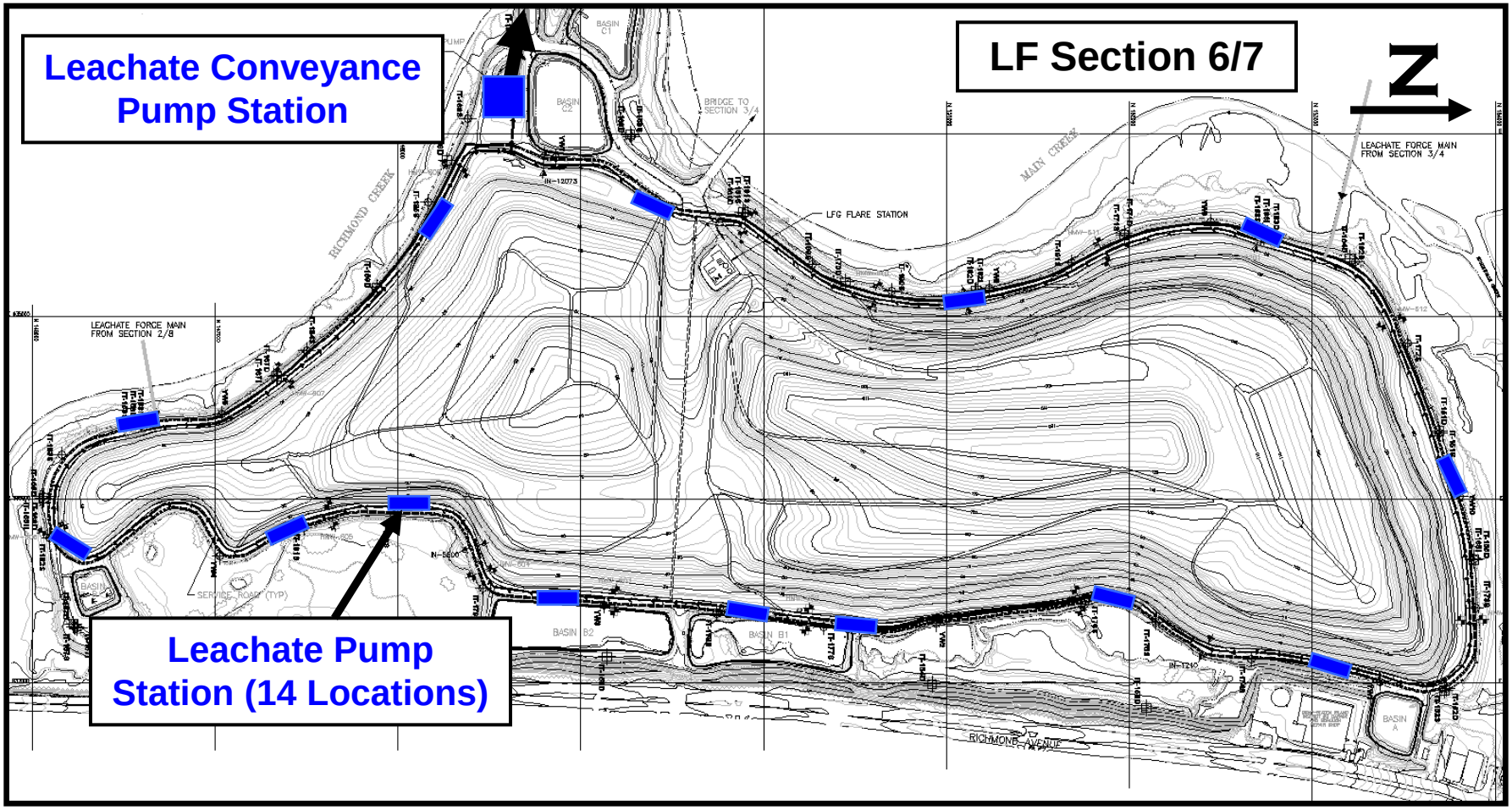
Typical Cross Section FKLF
(Section 1/9, 6/7)



- **Constraints**
  - Road construction must ***NOT*** compromise the integrity of the Leachate Management System
  - Cutoff Wall and Collection Drain are permanent features
  - Cannot bury Leachate Collection Pump Stations
- **Mitigation Measures**
  - Demonstrate acceptability of the design
  - Analyze slope stability
  - Monitor Cutoff Call for movement

LEACHATE MANAGEMENT SYSTEM

Cannot Bury Leachate Collection Pump Stations



Landfill Systems

Leachate Management

Landfill Gas Management

Final Cover + Drainage Systems

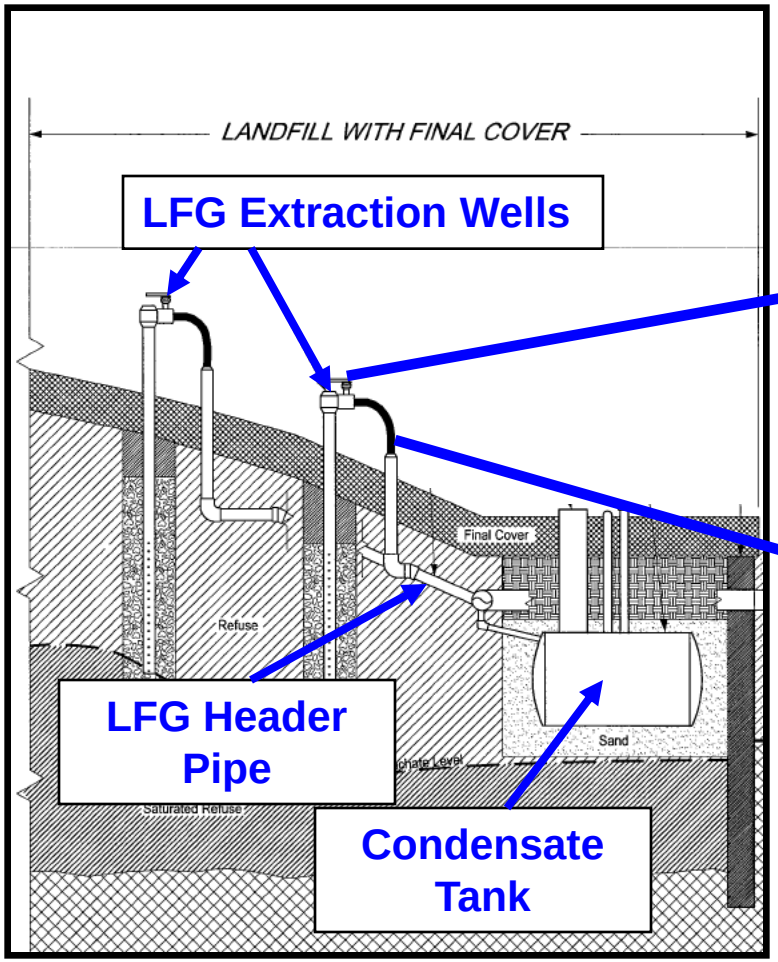
LANDFILL GAS (LFG) MANAGEMENT SYSTEM

- Gas Collection
  - LFG Extraction Wells
  - LFG Flare Stations
- Gas Migration
  - LFG Interceptor Venting System
  - LFG Migration Monitoring Wells

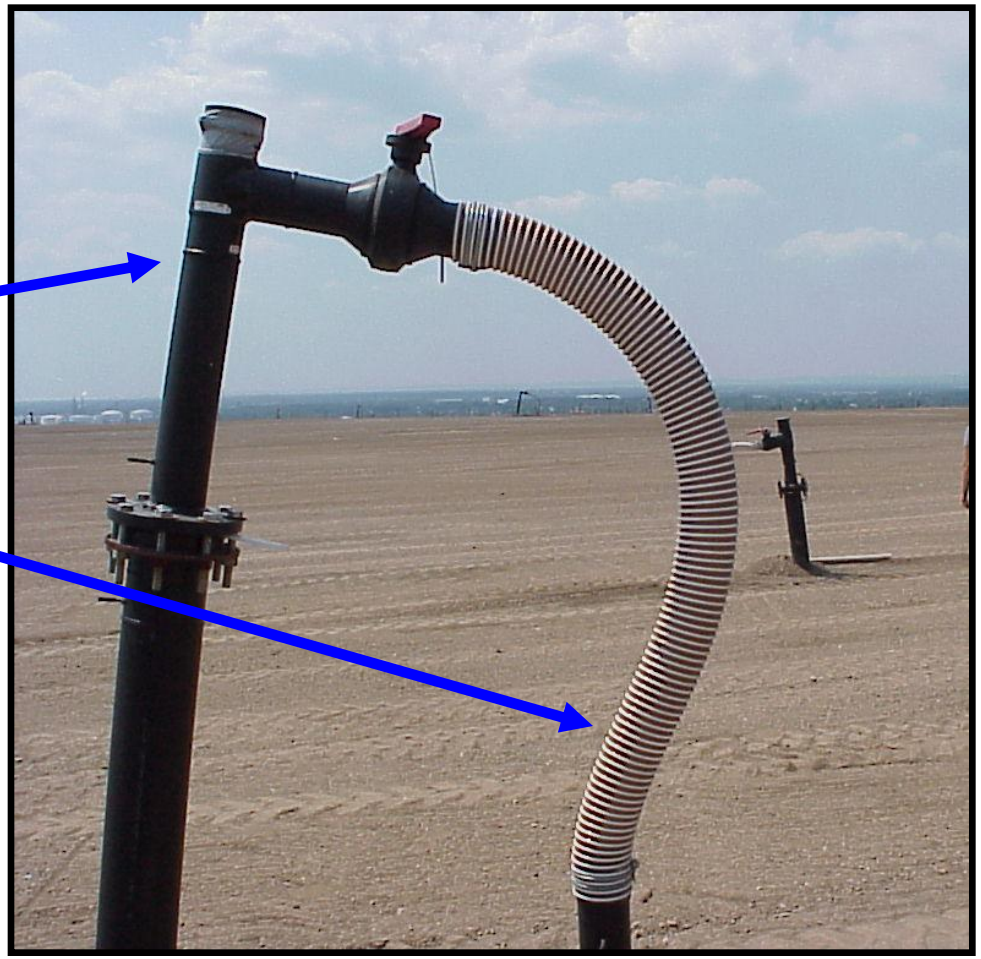
LANDFILL GAS MANAGEMENT SYSTEM

LFG Gas Collection

Typical LFG Collection Components



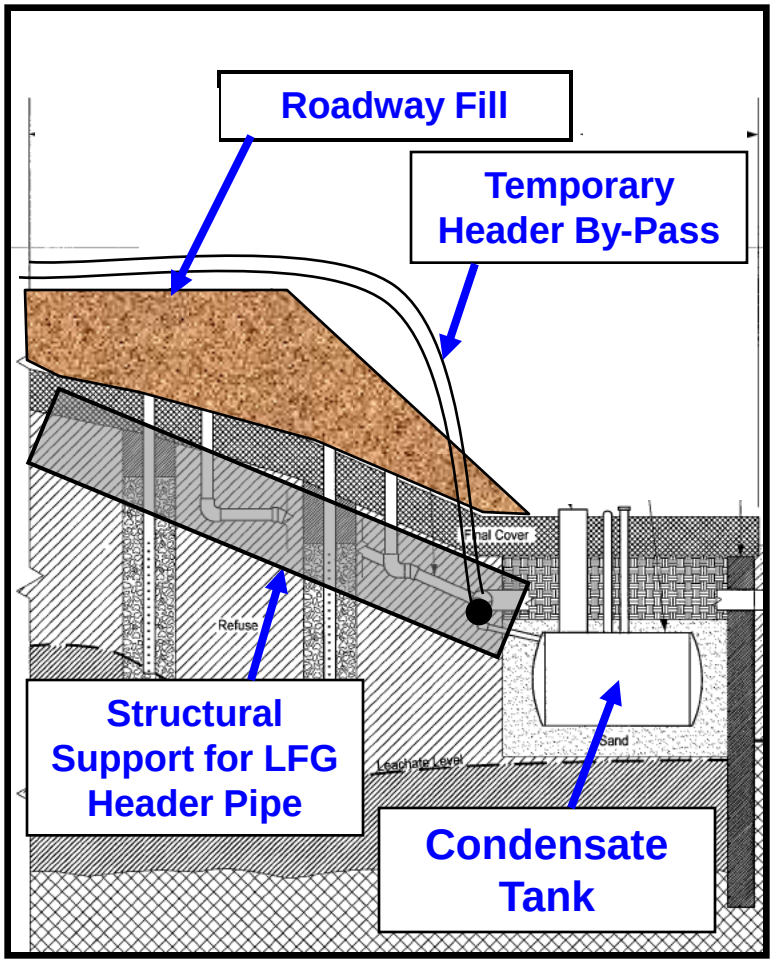
Typical LFG Extraction Well Head



LANDFILL GAS MANAGEMENT SYSTEM

LFG Collection

Typical LFG Collection Components



- **Constraints**
  - Road construction must ***NOT*** compromise the integrity of the LFG Management System
  - Cannot bury access to Condensate Tanks
- **Mitigation Measures**
  - Demonstrate acceptability of the design
  - Strategic abandonment and relocation of LFG Extraction Wells, or LFG Header Pipes
  - Provide structural reinforcement to LFG Header Pipes

LANDFILL GAS MANAGEMENT SYSTEM

LFG Collection

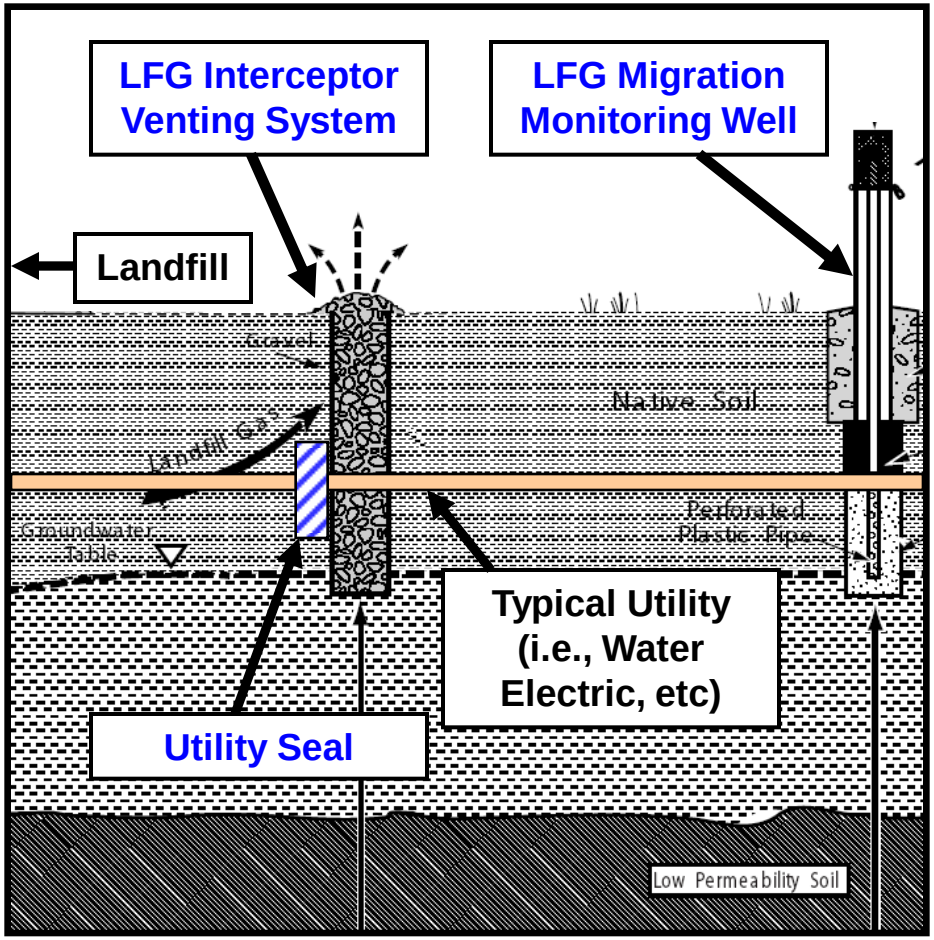
FKLF Section 6/7 LFG Flare Station

- **Constraints**
  - LFG Flare Stations are permanent structures
  - Multiple utility connections points (firewater, LFG header pipe, condensate tanks, electricity)
  - Must maintain vehicle access
  - Provide crash protection, as necessary
- **Mitigation Measures**
  - Road alignment should avoid LFG Flare Stations

LANDFILL GAS MANAGEMENT SYSTEM

LFG Migration Control

Typical LFG Migration Components

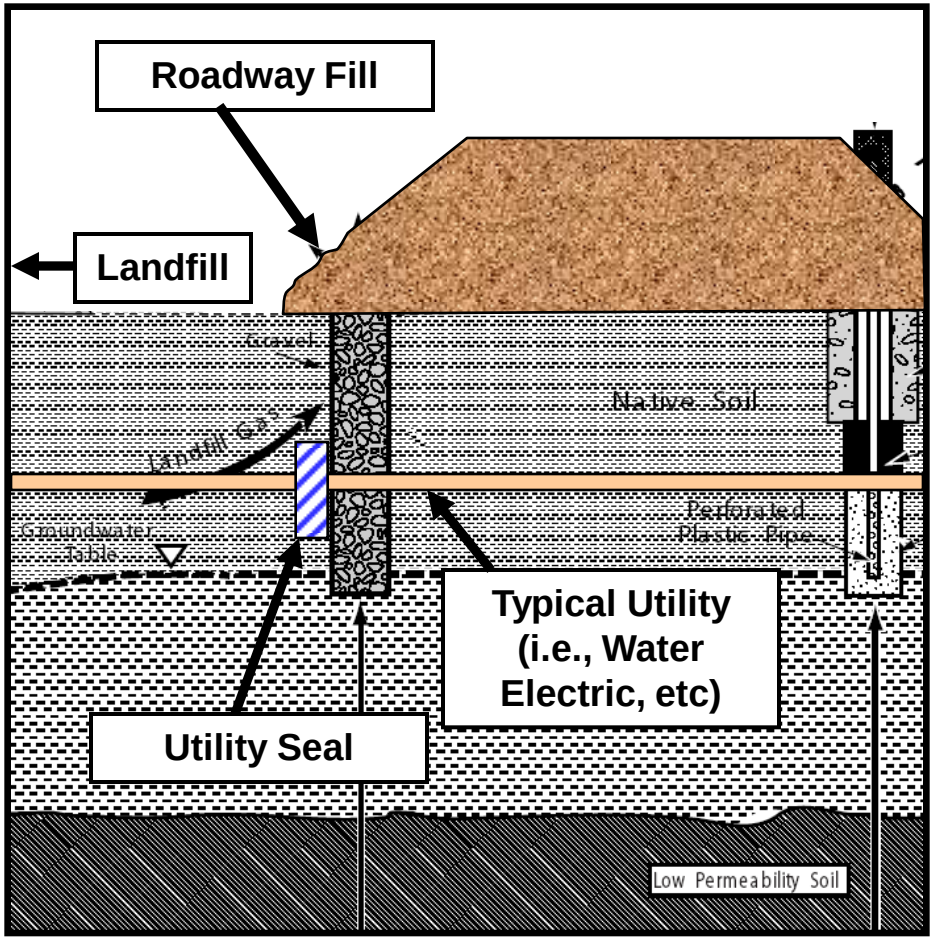


- **LFG Interceptor Venting System** – Trench with stone backfill. Extends to groundwater of low permeability soil layer
- **LFG Utility Seal** – Low permeability soil-cement backfill to prevent gas migration
- **LFG Migration Monitoring Well** – Quarterly Inspection required

LANDFILL GAS MANAGEMENT SYSTEM

LFG Migration Control

Typical LFG Migration Components



- **Constraints**
  - Road construction must ***NOT*** compromise the integrity of the LFG Management Syst**em**
- **Mitigation Measures**
  - Demonstrate acceptability of the design
  - Reconstruct LFG Interceptor Venting System and/or LFG Migration Monitoring Wells
  - Augment venting system with lateral vent layer

Landfill Systems

Leachate Management
Landfill Gas Management
Final Cover + Drainage Systems

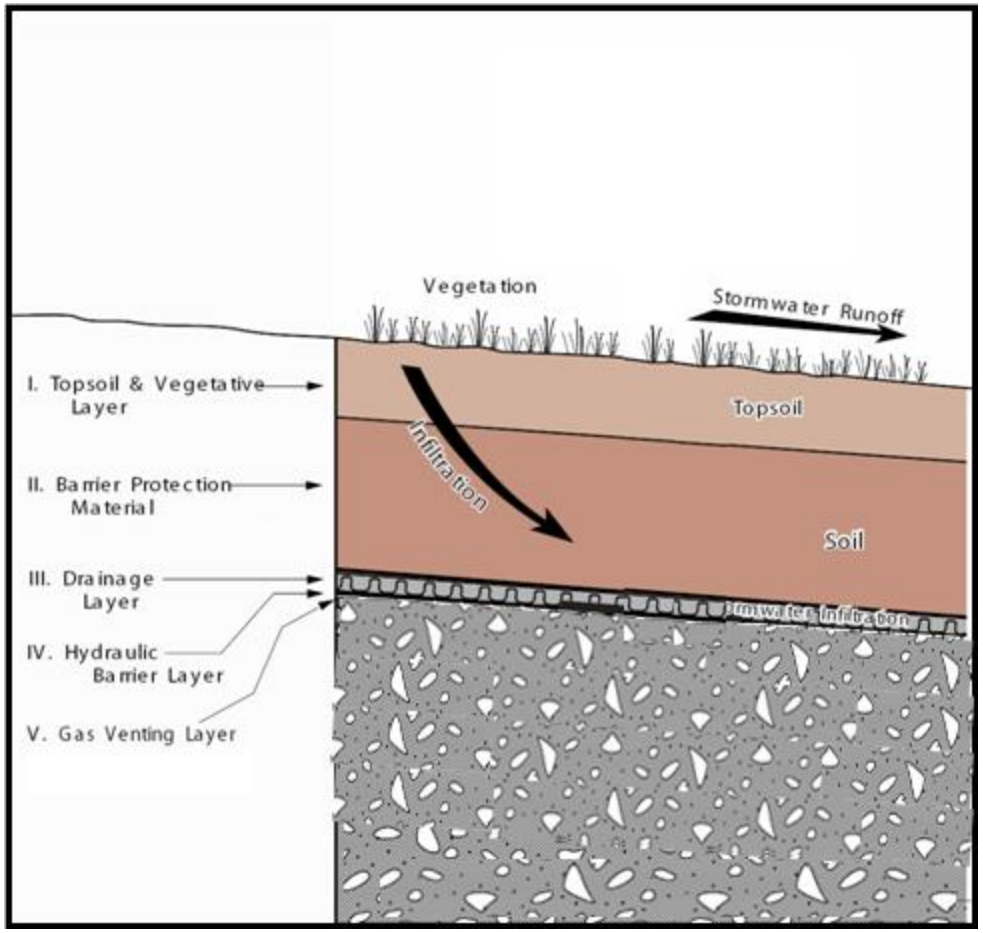
FINAL COVER & DRAINAGE SYSTEM

- Waste Containment
  - Multi-Layered Soil/Aggregate and Geosynthetic Cover System
- Stormwater Management
  - Swales
  - Culverts
  - Downchutes
  - Drop Inlets
  - Basins and Outfalls

FINAL COVER & DRAINAGE SYSTEM

Waste Containment

Typical Final Cover System Components

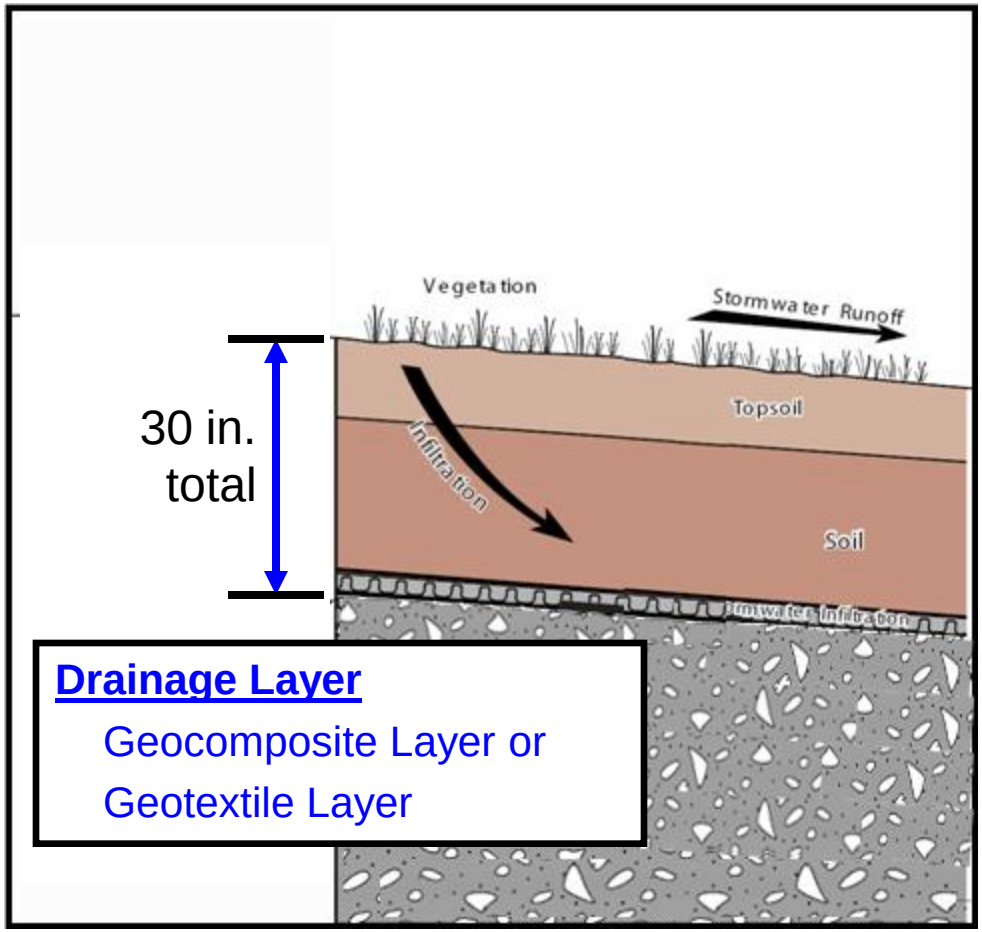


- **Topsoil & Vegetative Layer** – Promote vegetation for resistance to soil erosion
- **Barrier Protection Material** – Physical separation and protection of underlying geosynthetic materials
- **Drainage Layer** – Release infiltration water
- **Hydraulic Barrier Layer** – Reduce infiltration and leachate generation
- **Gas Venting Layer** – Dissipate LFG pressure

FINAL COVER & DRAINAGE SYSTEM

Waste Containment

Typical Final Cover System Components



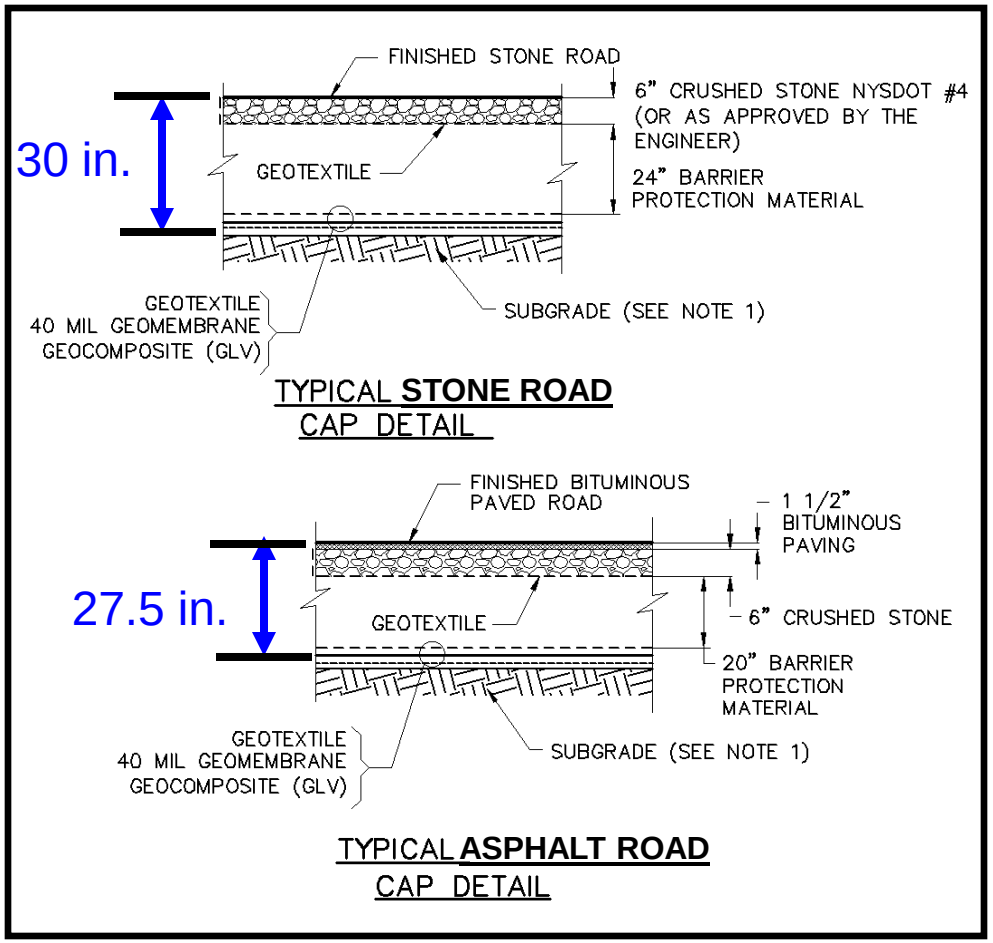
Five (5) Different Final Cover Systems Approved for Landfill Section 6/7

- **Vegetated Area Final Cover**
  - (1) Slopes 4 to 15 percent
  - (2) Slopes 15 to 33 percent
- **Driving Surfaces Final Cover**
  - (3) Asphalt Roads
  - (4) Gravel Roads
- **Perimeter Cutoff Wall**
  - (5) Soil or Asphalt

FINAL COVER & DRAINAGE SYSTEM

Waste Containment

Typical Final Cover System Components



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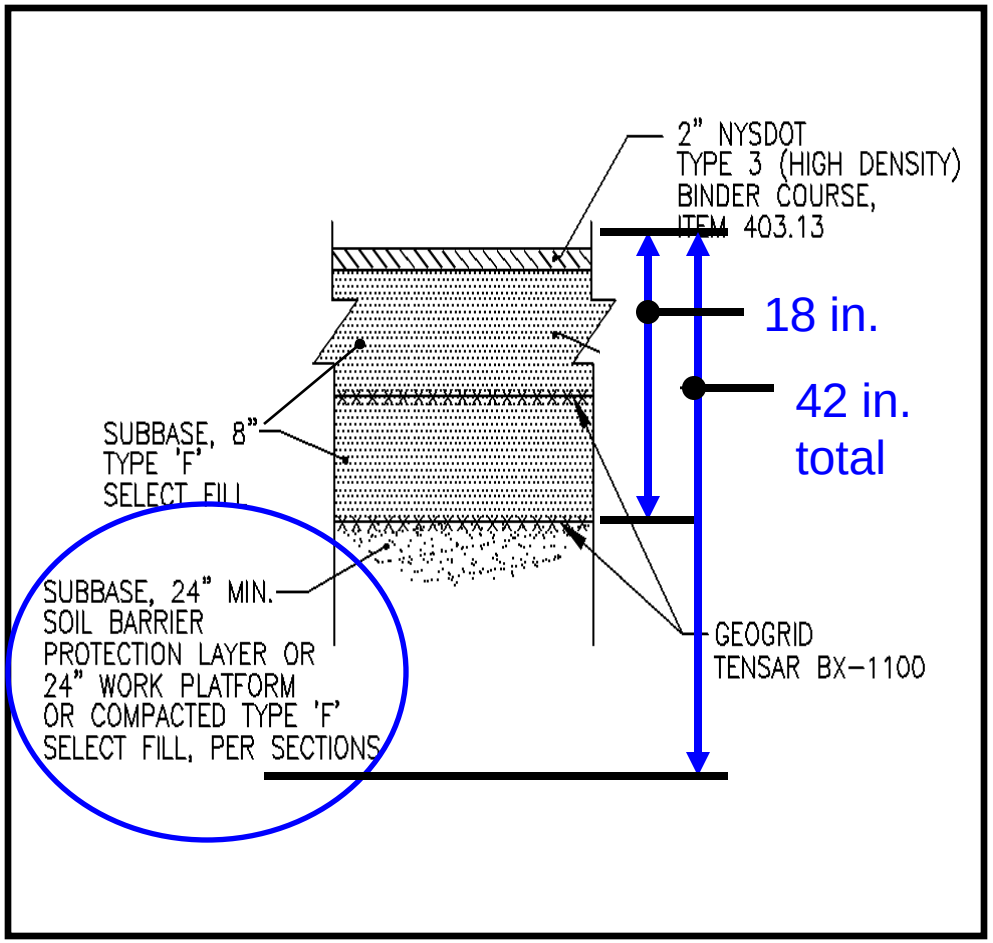
FINAL COVER & DRAINAGE SYSTEM

Waste Containment

Typical Final Cover System Components



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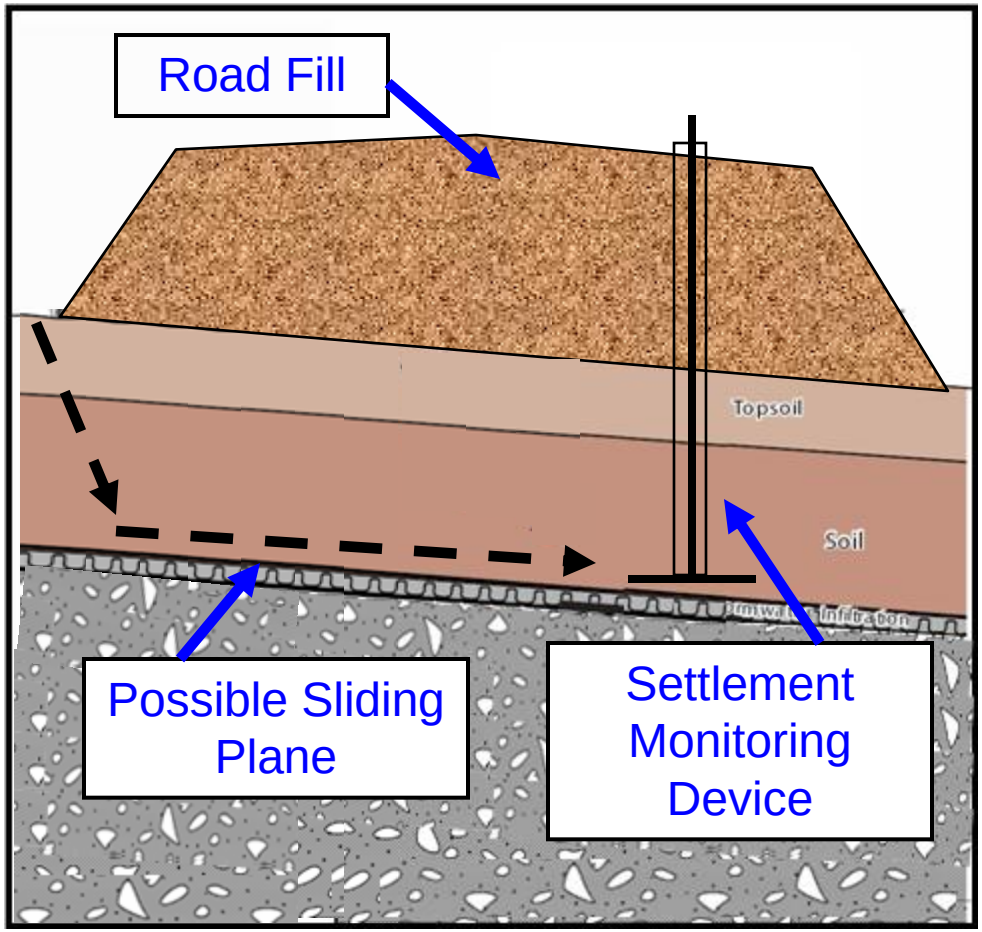
FINAL COVER & DRAINAGE SYSTEM

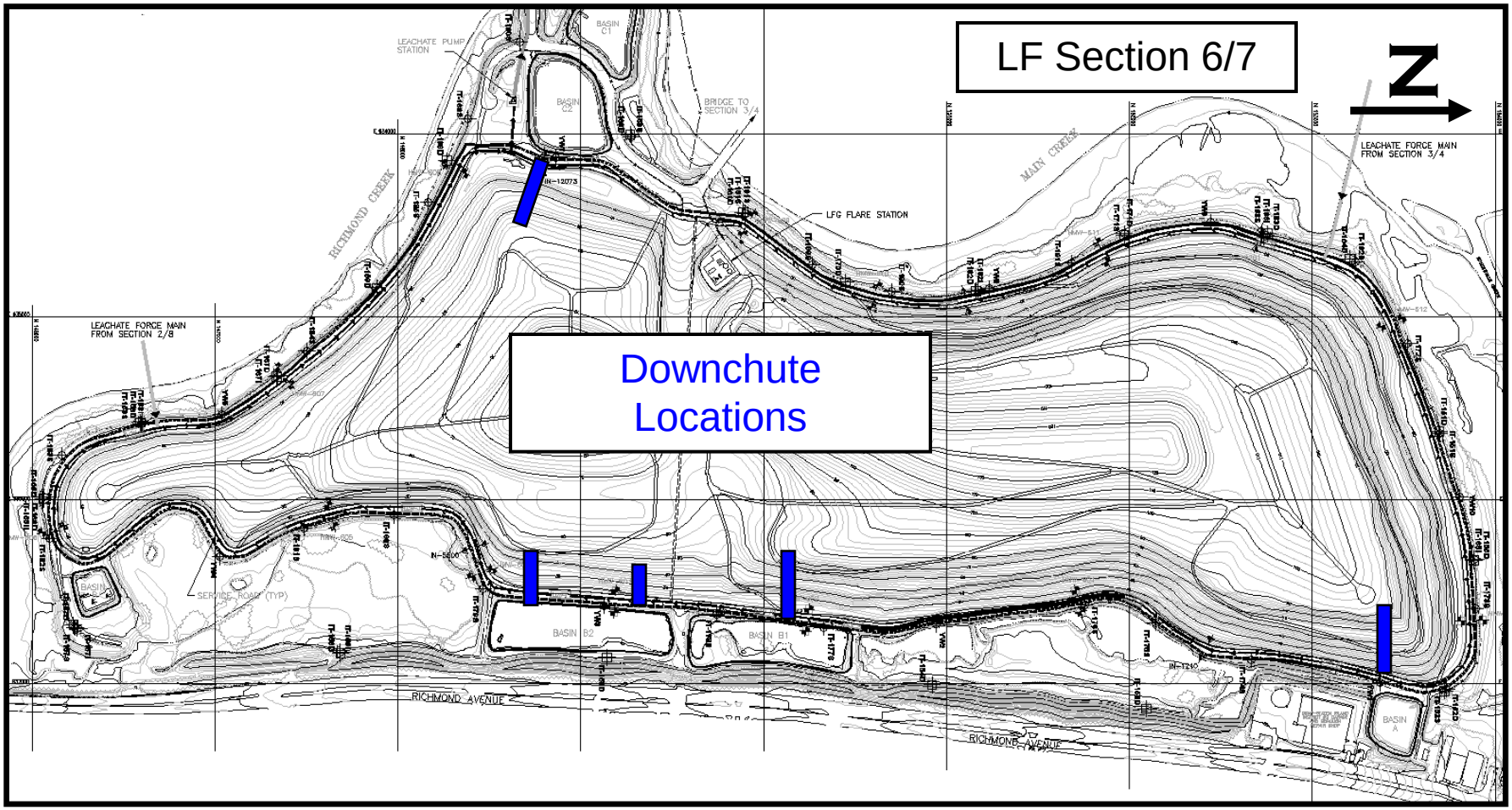
Waste Containment



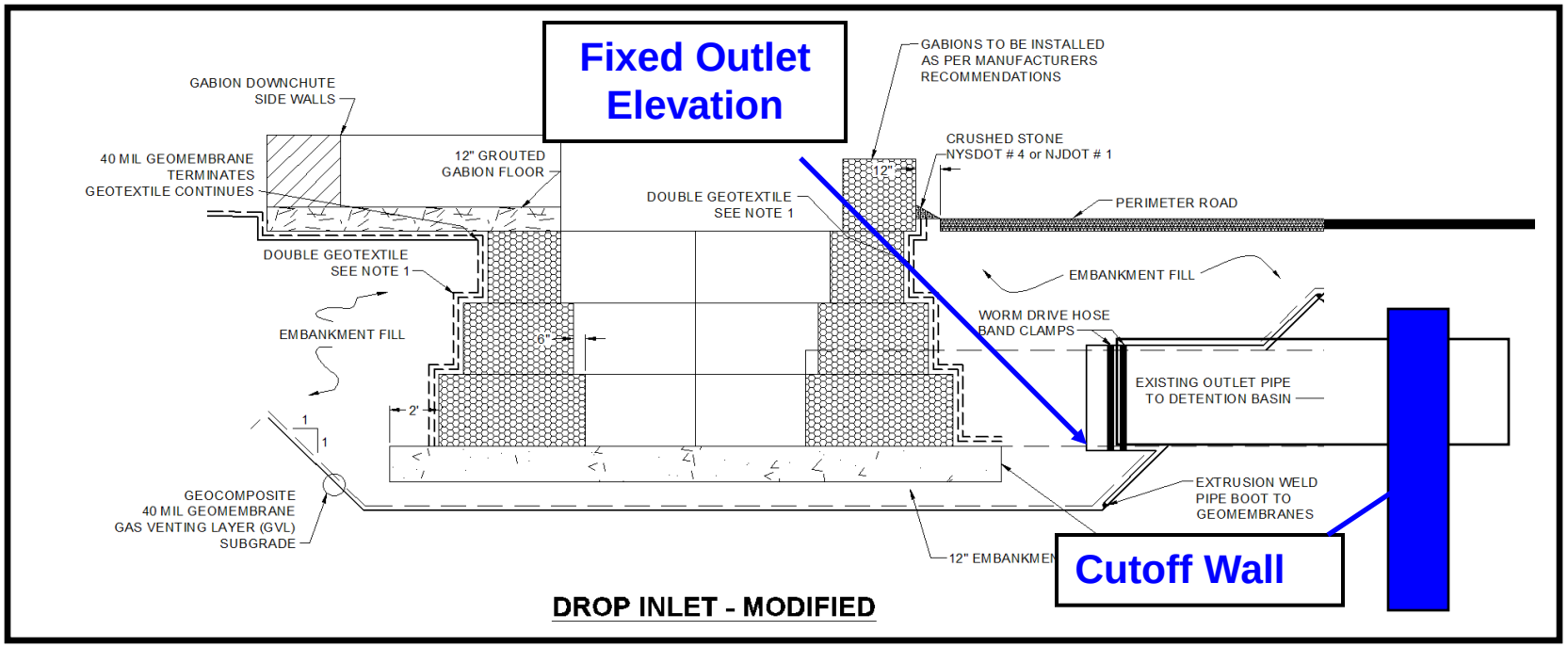
- **Constraints**
  - Road construction must ***NOT*** compromise the integrity of the Final Cover System
- **Mitigation Measures**
  - Monitor geosynthetic layer for settlement
  - Analyze for stability

FINAL COVER & DRAINAGE SYSTEM

Stormwater Management System - Downchutes



FINAL COVER & DRAINAGE SYSTEM



- **Constraints**
  - Some downchutes connect to fixed discharge points connected to the Cutoff wall
- **Mitigation Measures**
  - Road alignment should avoid disturbing drop inlet locations

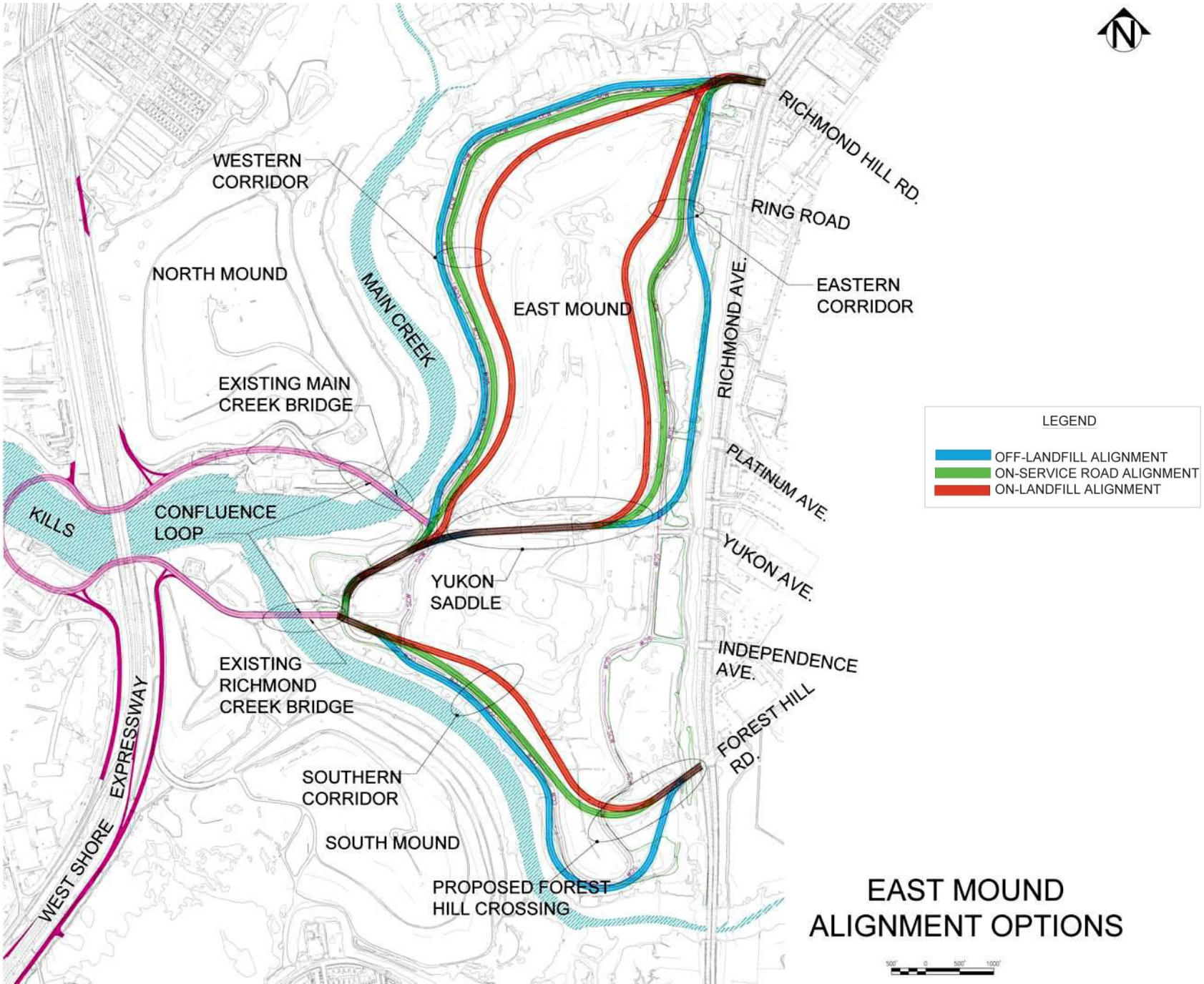
LANDFILL SYSTEMS / ROAD DESIGN INTERACTION

- Leachate Management
  - Not easily modified.
  - Demonstration/monitoring likely required.

- Landfill Gas Management
  - More easily modified.
  - Temporary by-pass options exist.

- Final Cover & Drainage Systems
  - Multiple cover system concepts established.
  - Demonstration and monitoring likely required.


Freshkills Park Roads


WESTERN CORRIDOR
NORTH MOUND
MAIN CREEK
EAST MOUND
RICHMOND HILL RD.
RING ROAD
EASTERN CORRIDOR
RICHMOND AVE.
EXISTING MAIN CREEK BRIDGE
KILLS
CONFLUENCE LOOP
PLATINUM AVE.
YUKON AVE.
YUKON SADDLE
INDEPENDENCE AVE.
EXISTING RICHMOND CREEK BRIDGE
FOREST HILL RD.
SOUTHERN CORRIDOR
SOUTH MOUND
WEST SHORE EXPRESSWAY
PROPOSED FOREST HILL CROSSING
LEGEND
OFF-LANDFILL ALIGNMENT
ON-SERVICE ROAD ALIGNMENT
ON-LANDFILL ALIGNMENT
EAST MOUND ALIGNMENT OPTIONS

East Mound Alignments

Three Corridors

Western

Eastern

Southern

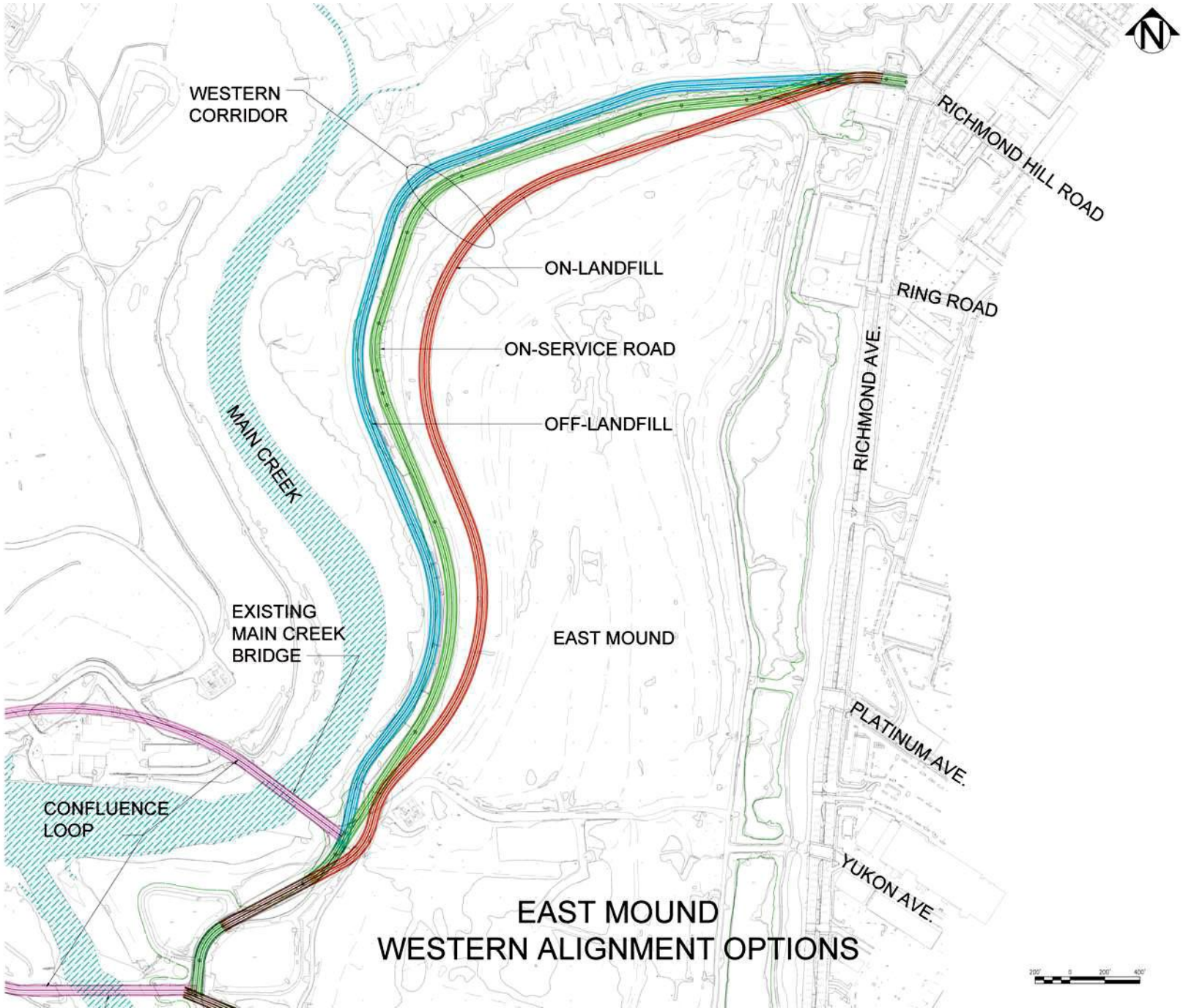
Each With Three Placements

Off-Landfill

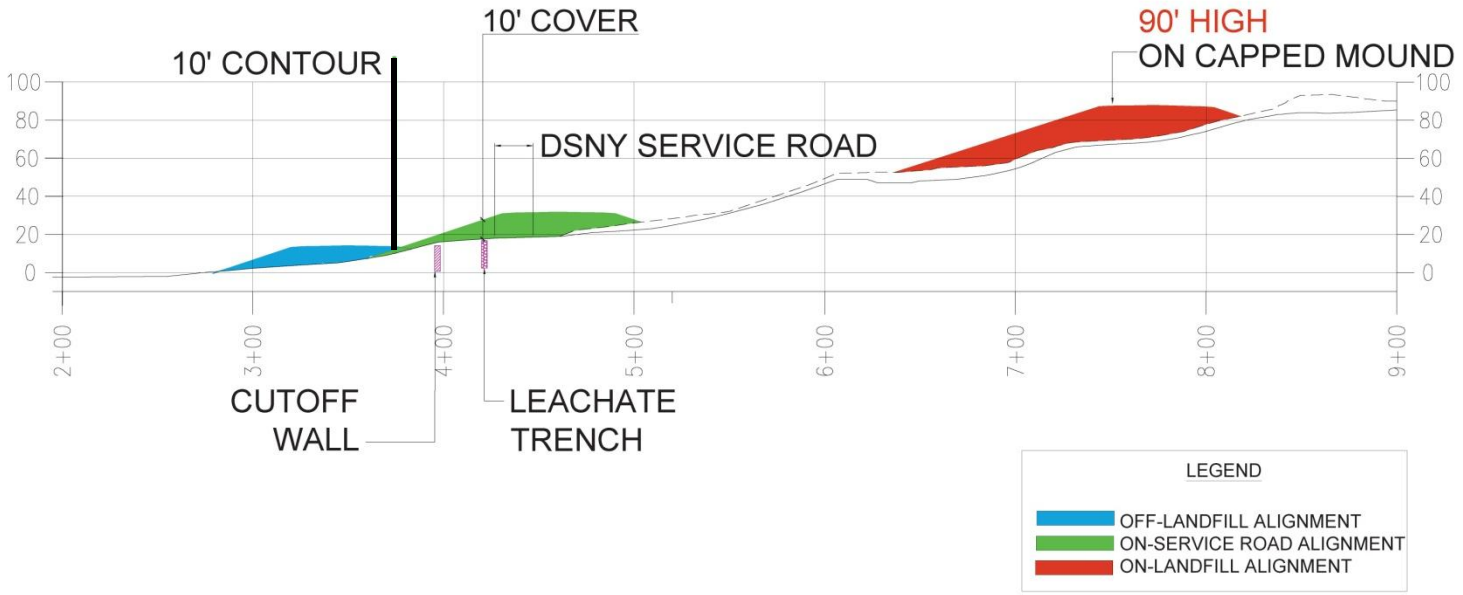
On-Service Road

On-Landfill

Western Corridor

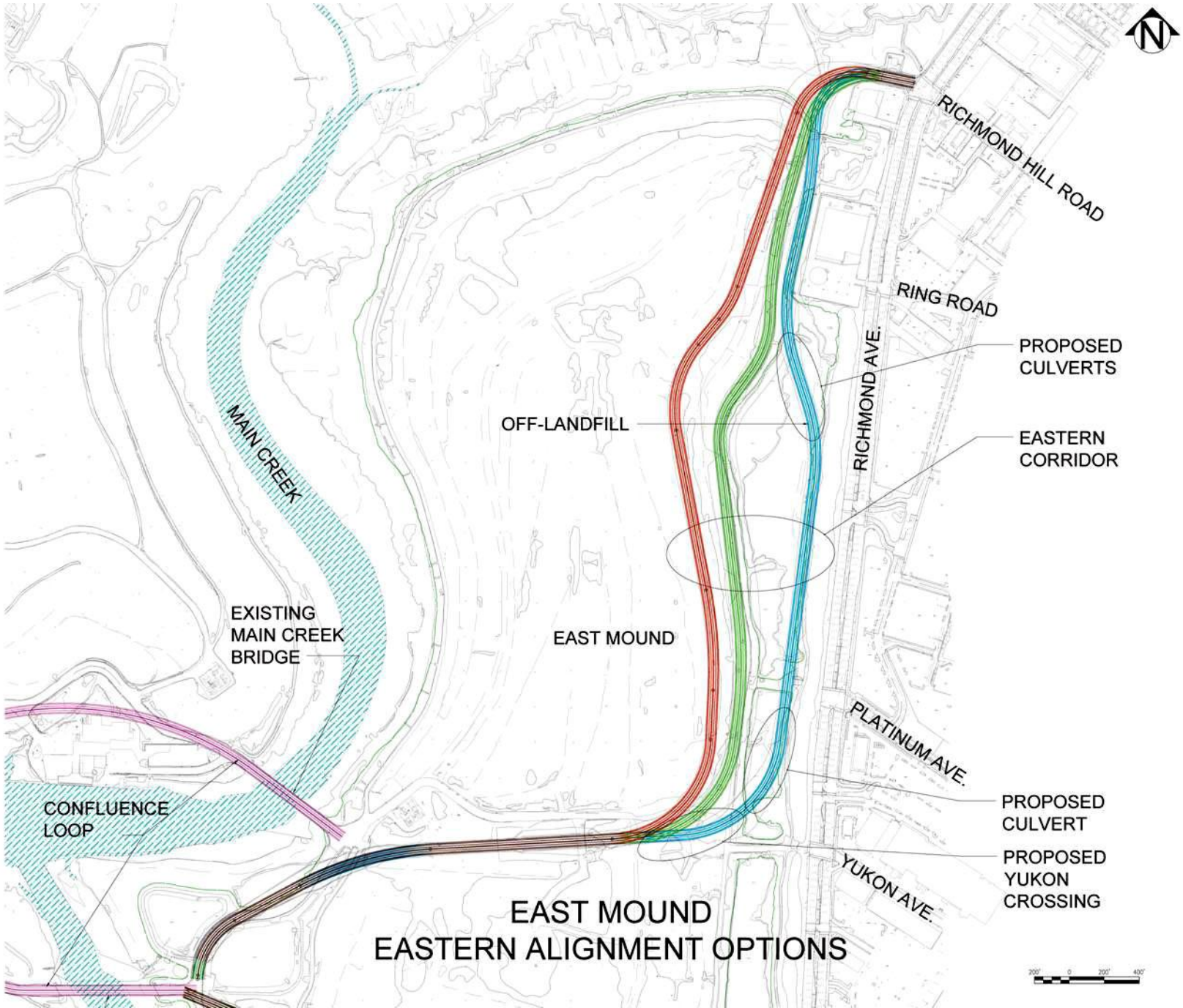


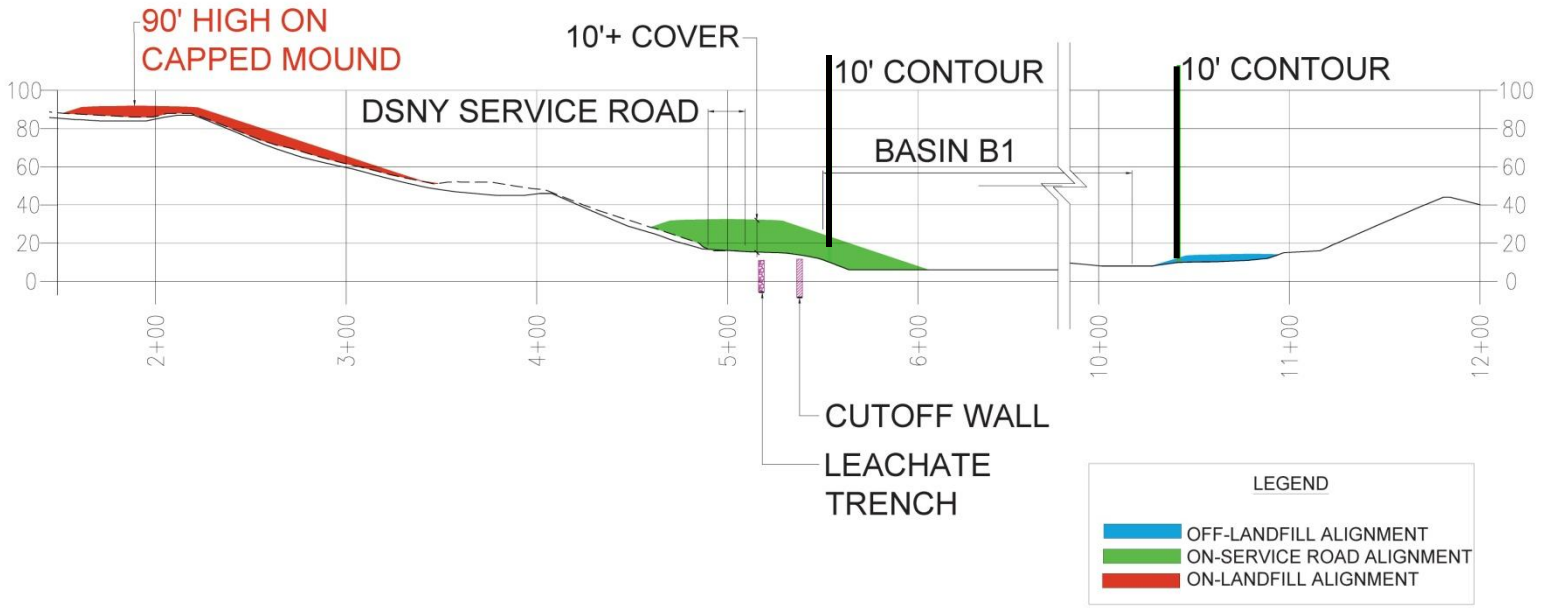
EAST MOUND
WESTERN ALIGNMENT OPTIONS



OFF-LANDFILL	ON-SERVICE ROAD	ON-LANDFILL
• Tidal wetlands	• Leachate pump stations • Leachate cutoff wall • Operations and Maintenance	• Excessive fill • Stability • Long-term settlement • Crossing leachate cutoff wall
(difficult)	(difficult)	(difficult)

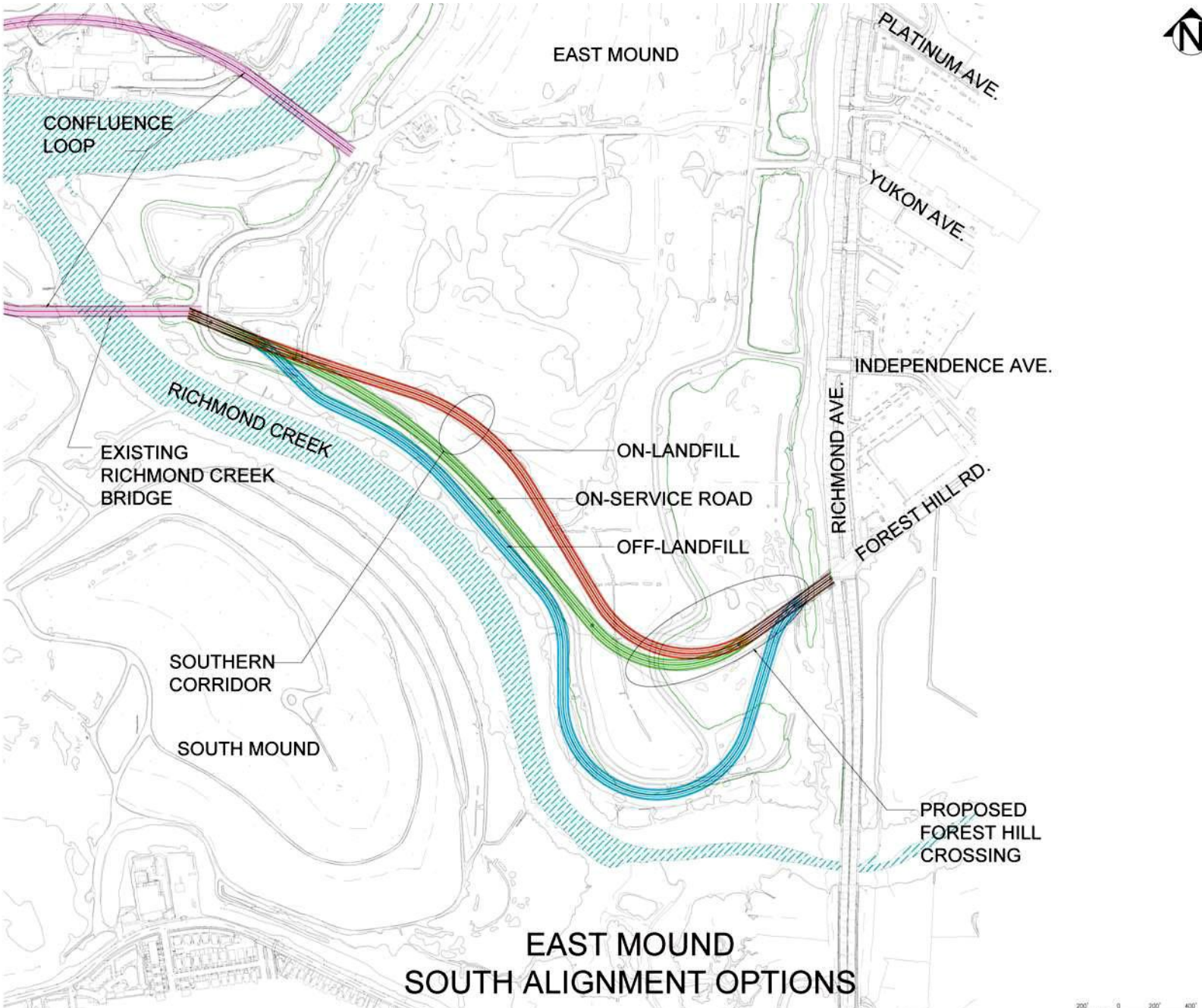
Eastern Corridor


N
RICHMOND HILL ROAD
RING ROAD
RICHMOND AVE.
PROPOSED CULVERTS
OFF-LANDFILL
EASTERN CORRIDOR
MAIN CREEK
EXISTING MAIN CREEK BRIDGE
EAST MOUND
PLATINUM AVE.
PROPOSED CULVERT
CONFLUENCE LOOP
PROPOSED YUKON CROSSING
YUKON AVE.
EAST MOUND
EASTERN ALIGNMENT OPTIONS
200' 0 200' 400'

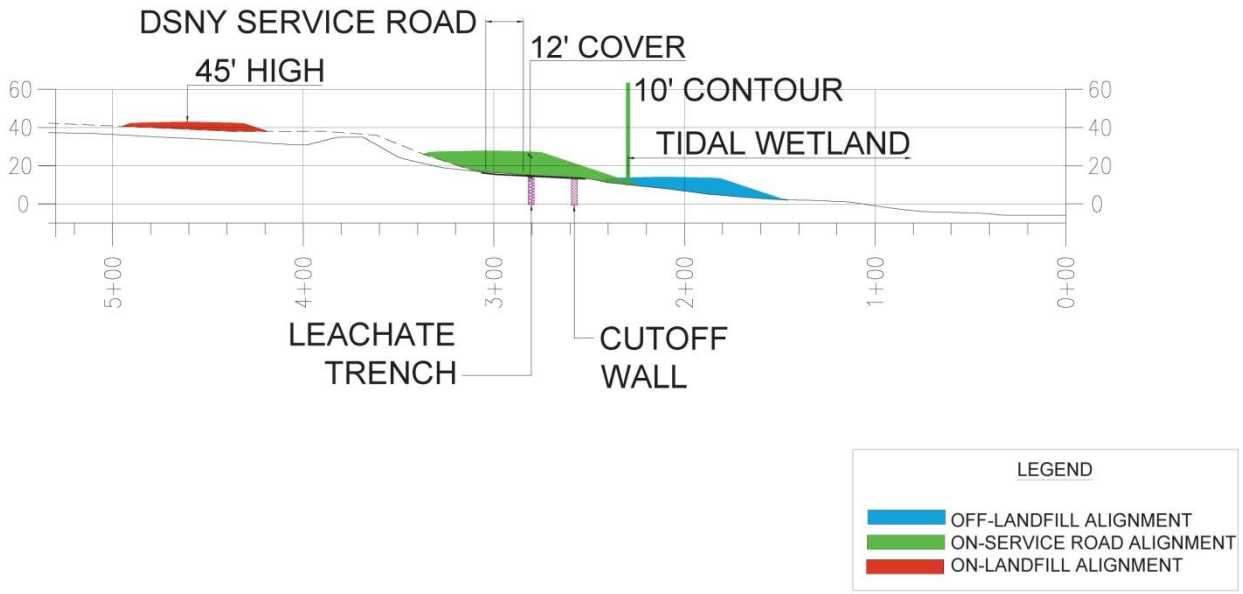


ON-LANDFILL	ON-SERVICE ROAD	OFF-LANDFILL
• Excessive fill • Stability • Long-term settlement • Stormwater downchute	• Leachate pump stations • Stormwater downchute • Operations and Maintenance	• Fresh water wetlands • Crossing leachate cutoff wall • Stormwater basin
(difficult)	**(difficult)**	**(less difficult)**

Southern Corridor



EAST MOUND
SOUTH ALIGNMENT OPTIONS



ON-LANDFILL

- **Landfill gas header and wells**
- **Crossing leachate cutoff wall**

(less difficult)

ON-SERVICE ROAD

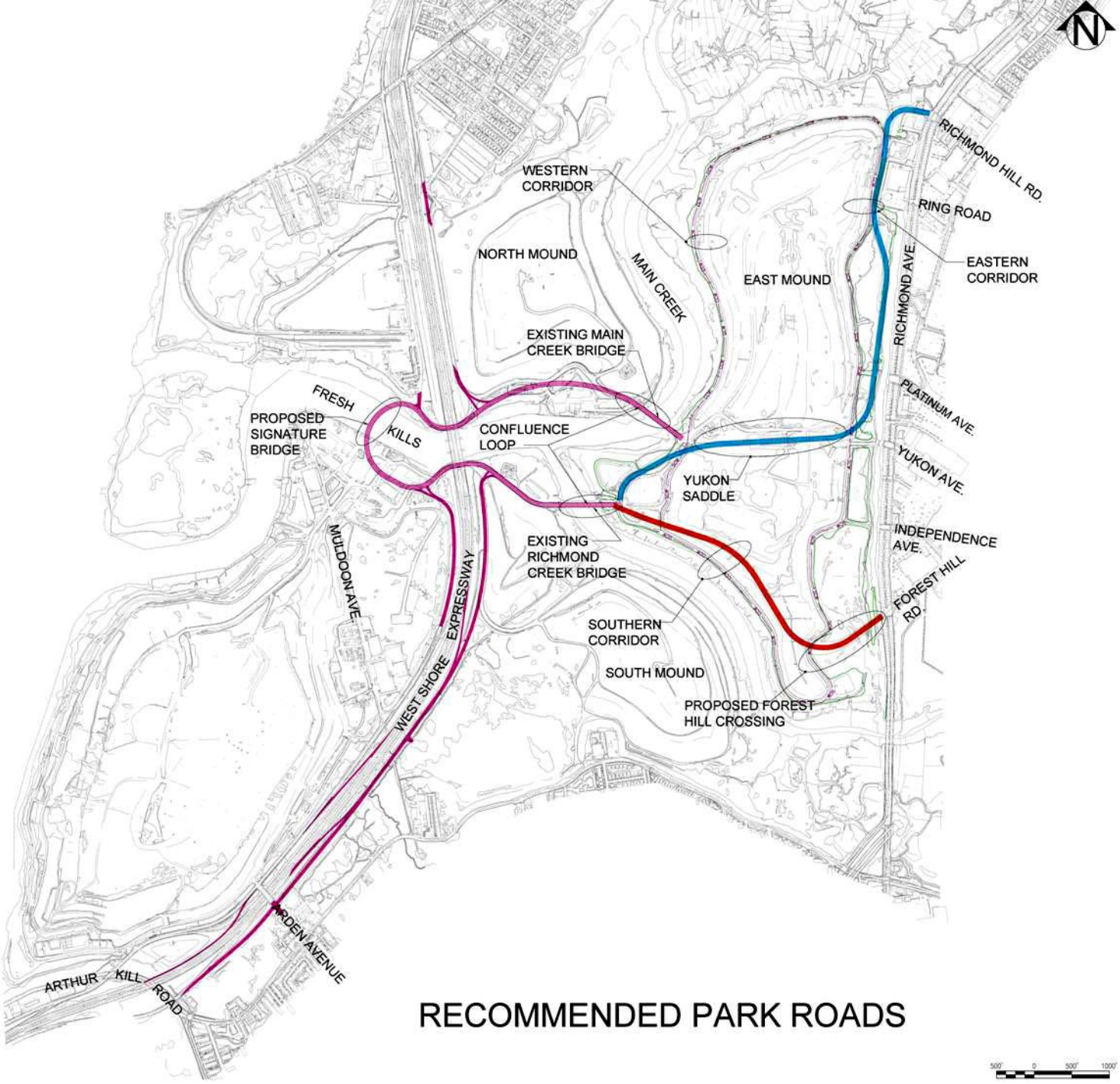
- **Leachate pump stations**
- **Crossing leachate cutoff wall**
- **Operations and Maintenance**

(difficult)

OFF-LANDFILL

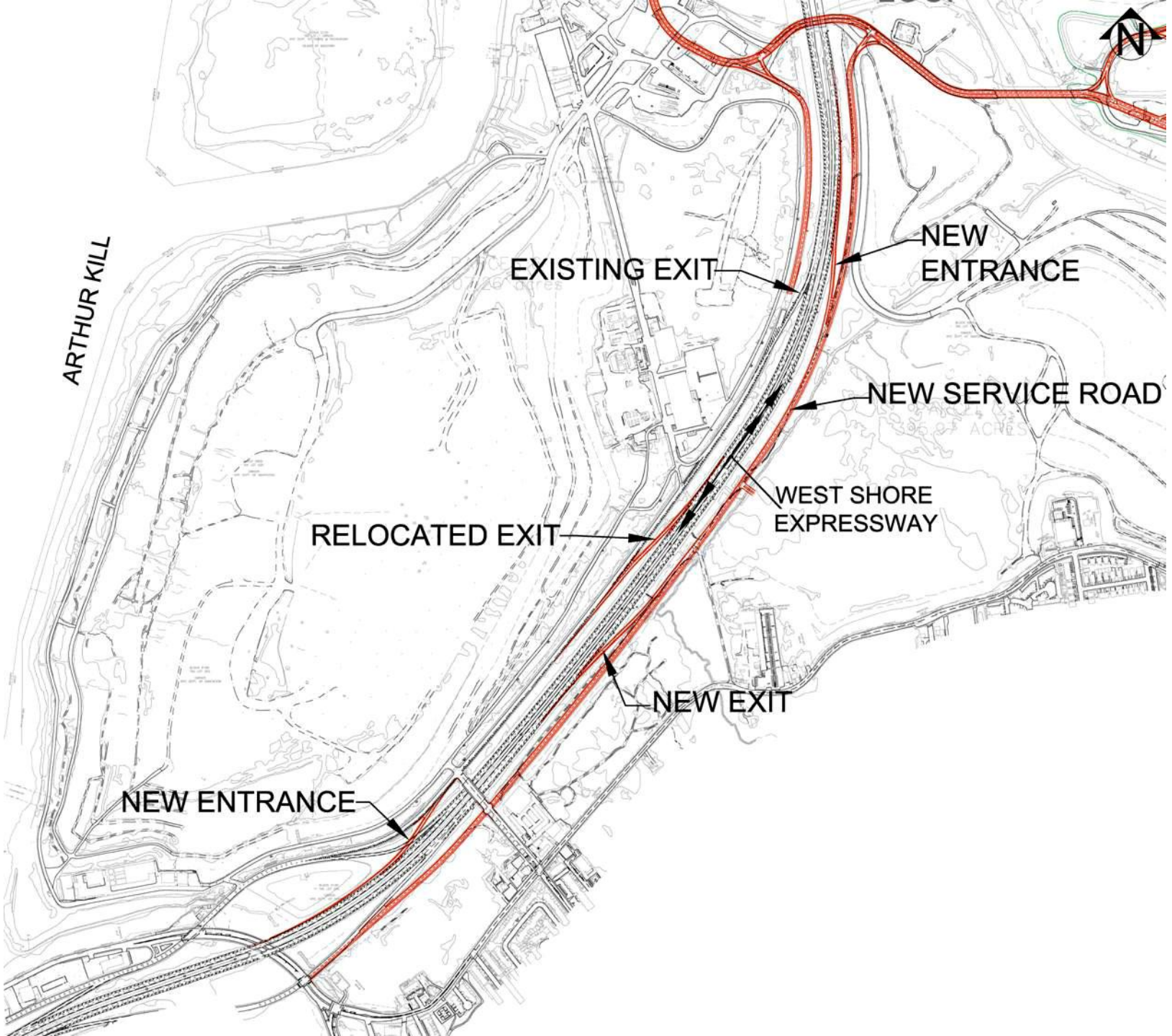
- **Tidal wetlands**
- **Stormwater basin**

(difficult)



RECOMMENDED PARK ROADS

Proposed
West Shore Expressway
Improvements


N
ARTHUR KILL
EXISTING EXIT
NEW
ENTRANCE
NEW SERVICE ROAD
WEST SHORE
EXPRESSWAY
RELOCATED EXIT
NEW EXIT
NEW ENTRANCE


VICTORY BLVD.
WILD AVE.
WEST SHORE EXPRESSWAY
EXISTING SERVICE ROAD
RECONSTRUCTED SERVICE ROAD
MAIN CREEK
FRESH KILLS
PARCEL 7
100.49 ACRES

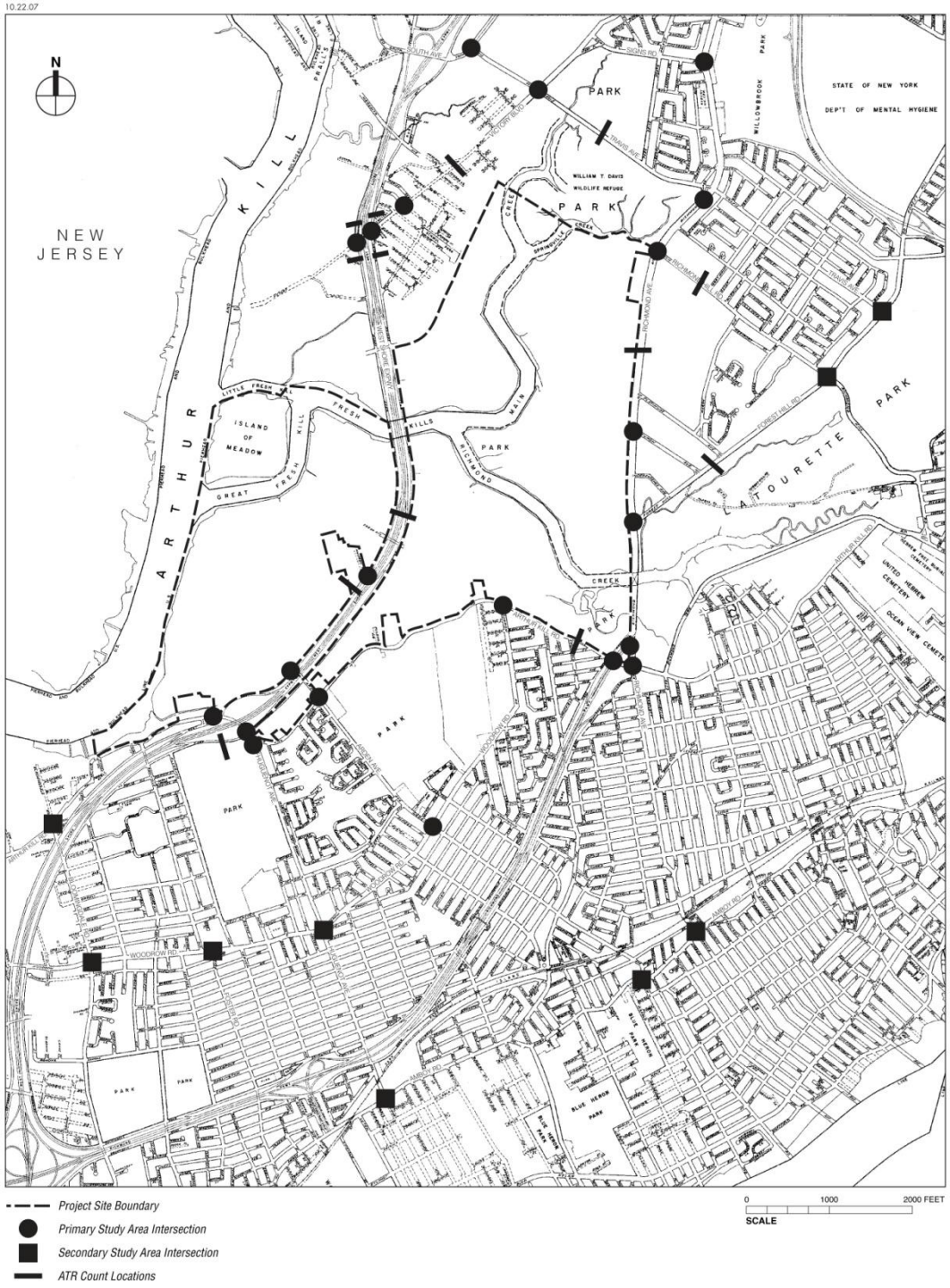
Traffic Analysis

Overview of the EIS Traffic Impact Analysis

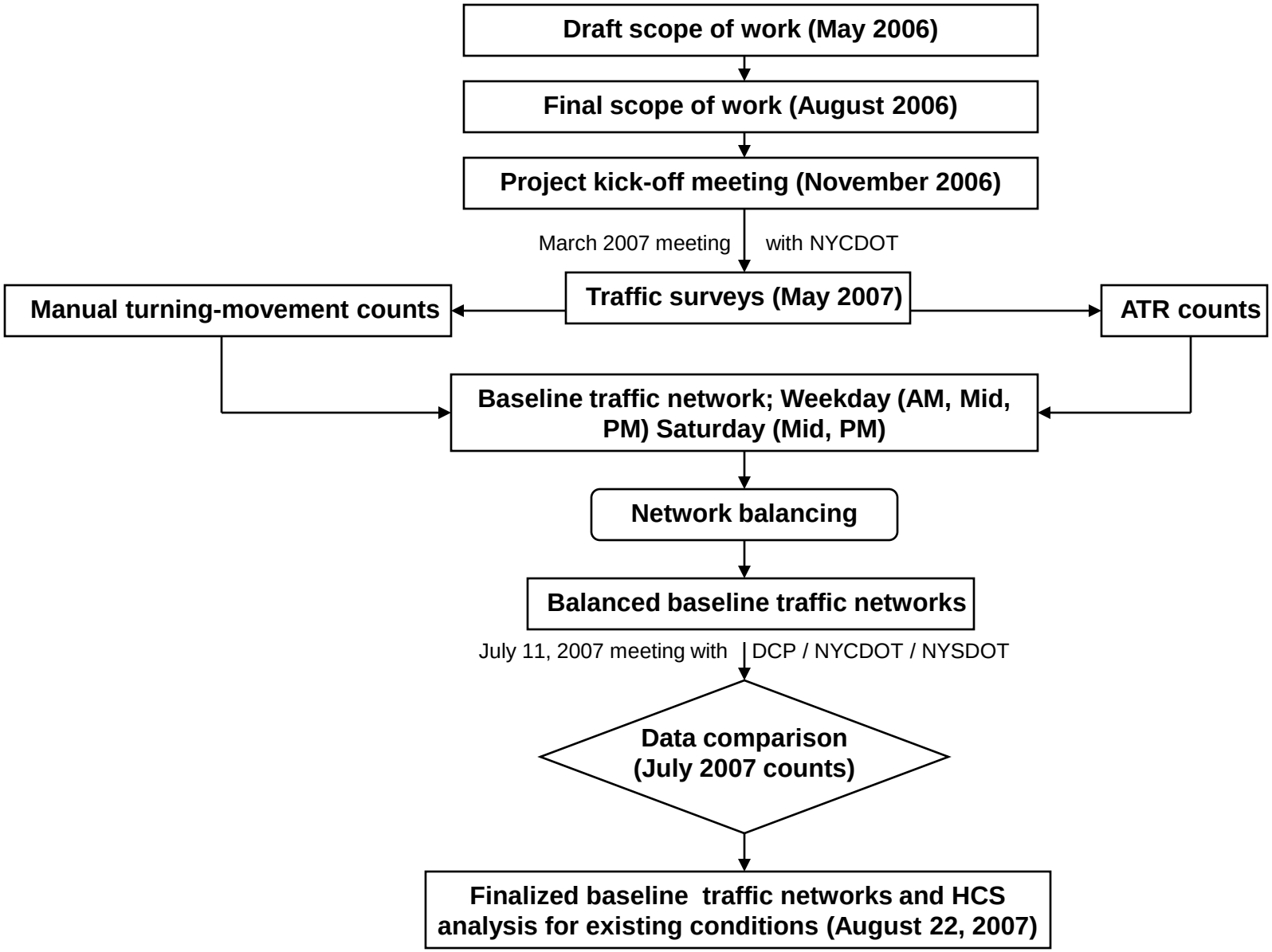
EIS Traffic Chapter will address these technical areas:

- Traffic flow and operating conditions for the existing, future No-Build and proposed project (Build)
- Assessment of the impact of traffic diversions from park roads
- Coordination with planning and design efforts to ensure adequate park access and traffic circulation
- Maximization of operations and presentation of mitigation/improvement measures

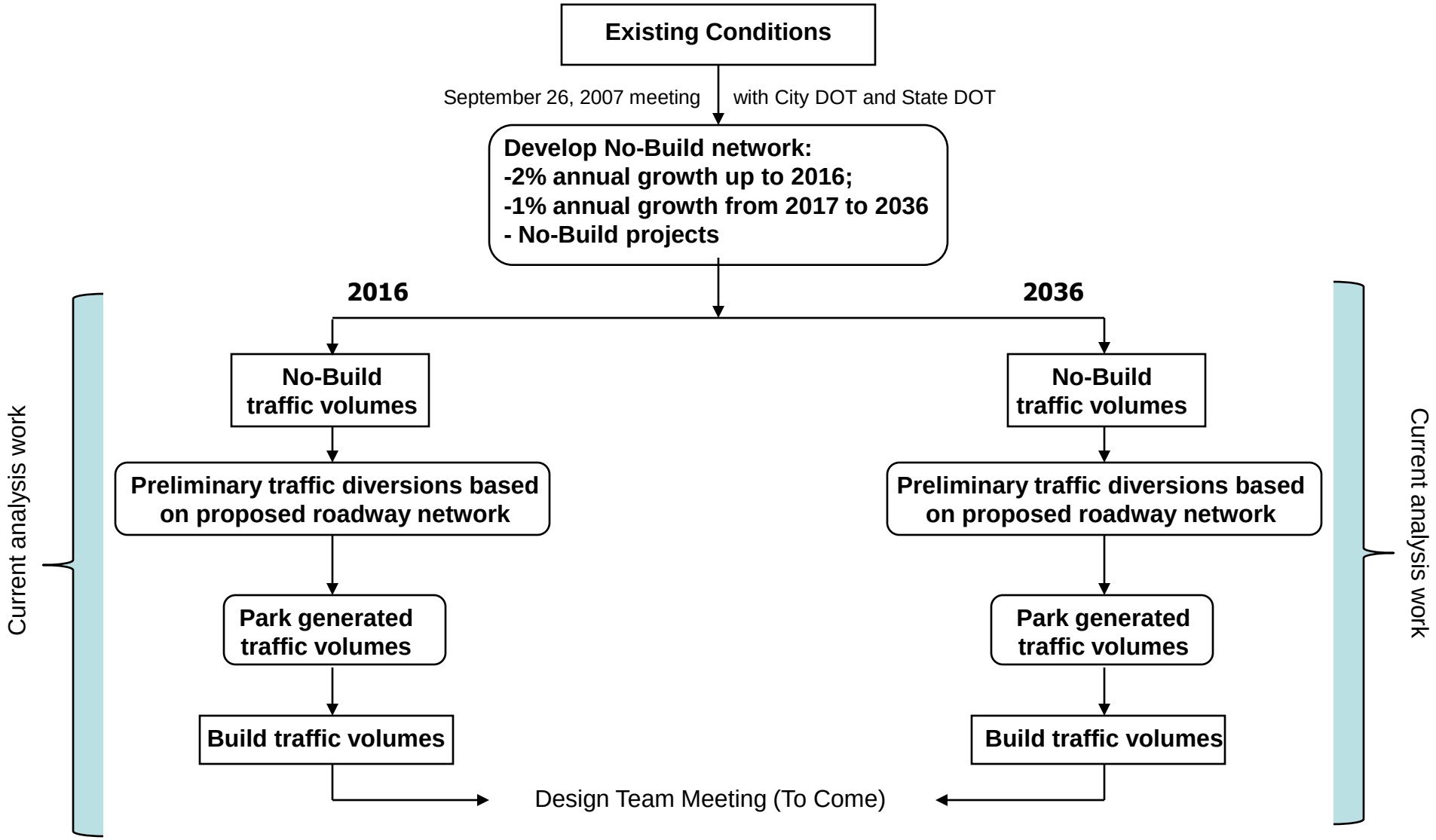
Intersections Under Analysis



FRESH KILLS PARK GEIS
TRAFFIC ANALYSIS FRAMEWORK



FRESH KILLS PARK GEIS
TRAFFIC ANALYSIS FRAMEWORK (continued)



Roadway Improvement Projects Planned for the Area

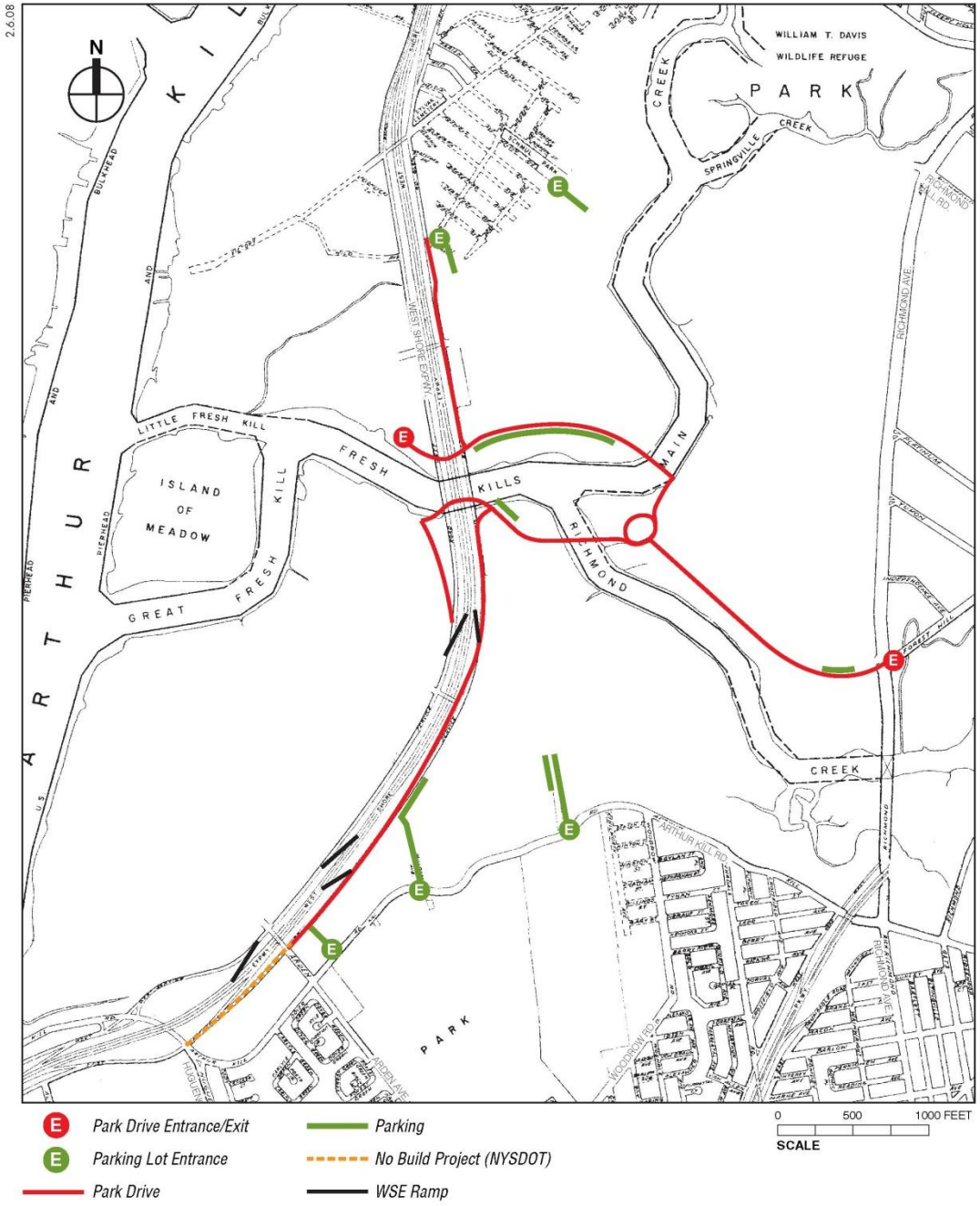
New York City Department of Transportation (NYCDOT)

- Arthur Kill Road Improvement Project
- Victory Boulevard and Travis Avenue Intersection Design
- Richmond Hill Road Study
- Forest Hill Road Improvement Project
- Richmondtown Roadway Improvement Study
- Rockland Avenue and Manor Road Improvement Project
- Woodrow Road Improvement Project
- Bloomingdale Road Improvement Project
- Arden Avenue/Amboy Road Intersection Improvement Project

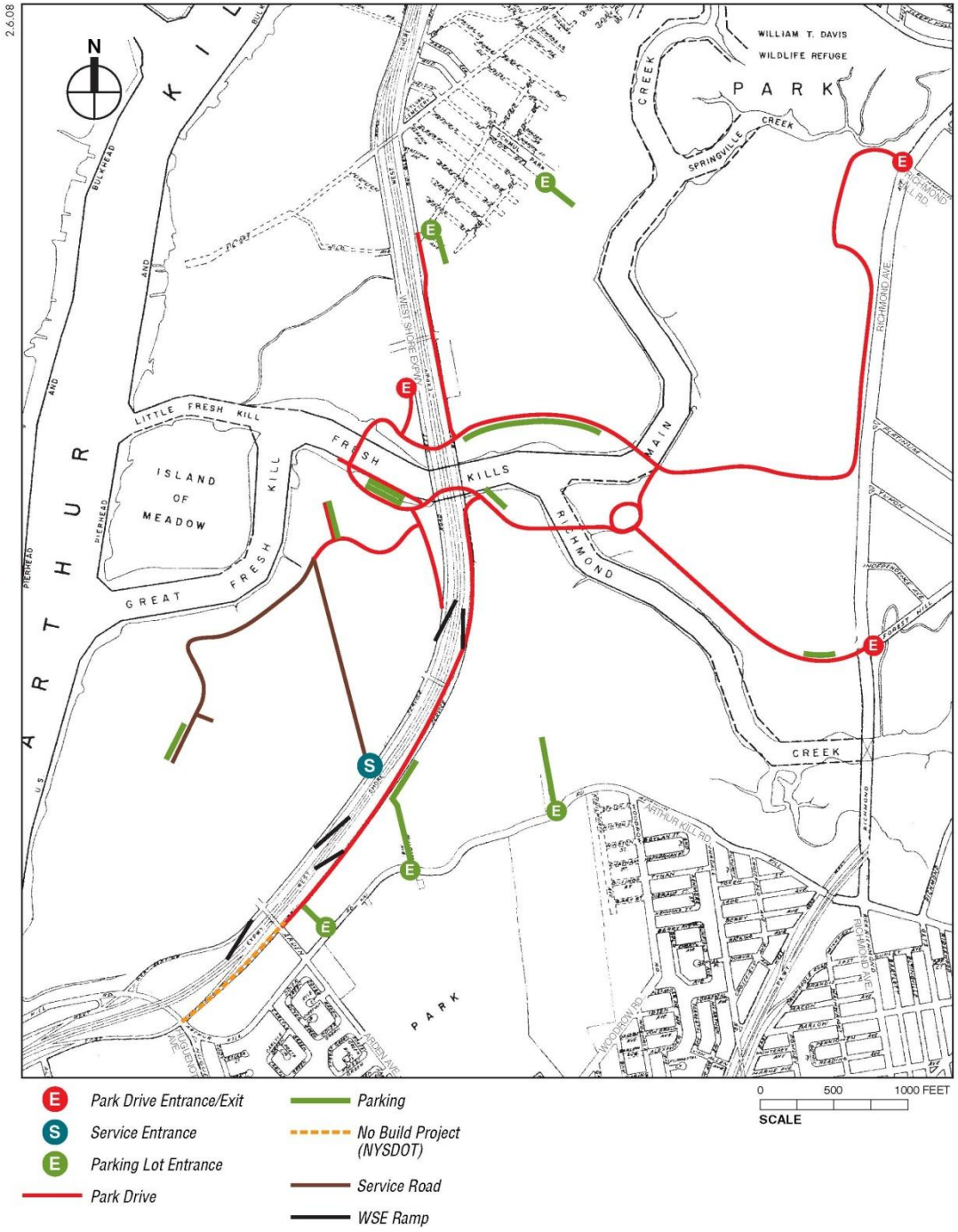
New York State Department of Transportation (NYSDOT)

- Korean War Veterans Parkway Ramp
- West Shore Expressway Improvements
- Arthur Kill Road Park and Ride Facility

2016
Park Roads



2036
Park Roads



Next Steps

- Complete traffic modeling and analysis
- Review and coordinate Traffic Impact Analysis with NYCDOT and NYSDOT
- Conduct CORSIM Analysis for West Shore Expressway segment
- Identify Mitigation/Improvement Measures
- Complete Draft Generic EIS and begin public review process


Freshkills Park