3. Geology, Soils and Topography

3.1. Geology

3.1.1. Existing Conditions

Long Island's geology is especially important as it relates to the population's source of drinking water. Because all of Nassau and Suffolk County drinking water is derived from groundwater, the geological formations that retain that water are referred to collectively as a sole-source aquifer. These aquifers are recharged by rainfall and consequently all activities that occur at the surface have the potential to impact the quantity and quality of the aquifers' recharge. Long Island ultimately rests on bedrock, impermeable rock composed of schist and gneiss.

The geology and hydrogeology of Long Island is summarized in a variety of reports. The stratigraphy of Long Island is illustrated in the general cross-section shown in Figure 3-1. [4]

A series of thick unconsolidated deposits overlie a basement bedrock complex of the pre-Cambrian period. The unconsolidated formations strike northeast and dip to the southwest.

The unconsolidated formations have their origin in the Cretaceous period and are comprised of the Raritan Formation, which immediately overlies the bedrock complex and the Magothy Formation, which overlies the Raritan Formation. The

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[4] Veatch, A.C., Slichter, C. S., Bowman, Isaiah, Crosby, W.D., and Horton, R. E., 1906, Underground Water Resources of Long Island, NY, U.S. Geological Survey Professional Paper 44, 394p. 34pl.

Fuller, M. L., 1914, The Geology of Long Island, New York, U.S. Geological Survey Professional Paper 82, 231p.

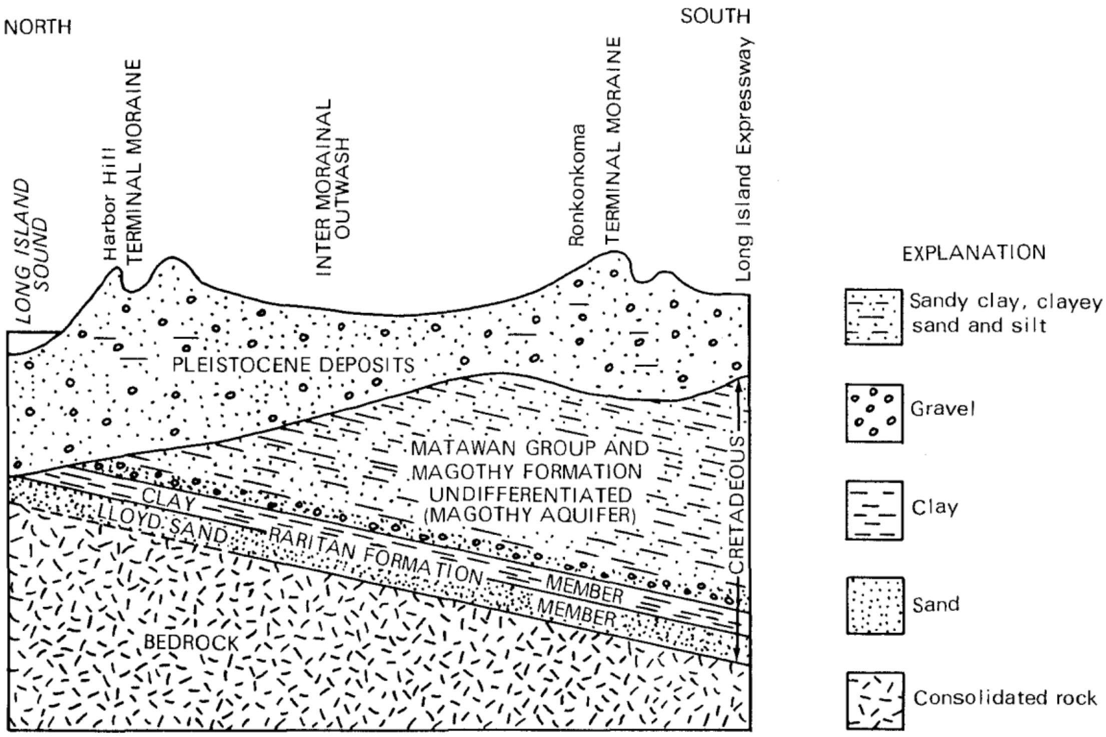
Sutter, Russell, deLaguna, Wallace, and Perlmutter, N.M., 1949, Mapping of Geologic Formations and Aquifers of Long Island, New York; New York State water Power and Control Commission Bulletin GW-18, 212 p, 25pl.

Cohen, Philip, Franke, O.L., and Foxworthy, B.L., 1968, An Atlas of Long Island's Water Resources: New York State Water resources Commission Bulletin 62, 117p.

Jensen, H.M., and Soren, Julian, 1974, Hydrogeology of Suffolk County, Long Island, New York: U.S. Geological Survey Hydrologic Investigations Atlas HA-510, 2 sheets.

Raritan Formation is consists of the Lloyd sand member and a clay member, which are approximately 200 ft. and 150 ft thick, respectively. A series of glacial deposits of the Pleistocene period overlie the Magothy. [5]

Figure 3-1: Generalized Geologic Cross Section



The ground water reservoir of Long Island principally resides in the sand member of the Lloyd Aquifer, Magothy Aquifer and Upper Glacial Aquifer. These aquifers are recharged from precipitation seeping into the subsurface. In the project area, the Upper Glacial Aquifer, also referred to as the water table aquifer, is encountered ranging from approximately 60-75 feet below land surface. Ground water within the aquifers moves horizontally and vertically. In the project

[5] Krulikas, Richard , K., and Koszalka, Edward, J., Geological Reconnaissance of an Extensive Clay Unit in North-Central Suffolk County, Long Island, New York, U.S. Geological Survey Water Resources Investigations 82-4075, 1983

area, ground water moves predominantly from west to east in Area A, and from north-northwest to south-southeast in Areas B through F (Figure 5-5).

3.1.2. Potential Impacts of Proposed Project

Only the surface glacial deposits would be impacted by the development of the site. Grading of the site would result in removal and deposition of material throughout the site (see following sections on Soils and Topography). Since only surface deposits would be modified, deeper geological layers would not be expected to be impacted by site development.

3.1.3. Proposed Mitigation

Mitigation for the effects of site grading is discussed in the following sections on Soils and Topography.

3.2. Soils

3.2.1. Existing Conditions

Soil series and their respective phases within the Study Areas were identified, mapped and quantified using the US Department of Agriculture soils database and are illustrated in Figure 3-2 and summarized in Table 3-1.

Table 3-1: Summary of Soil Types by Area

	Area A		**Area B**		**Area C**		**Area D**		**Area E**		**Area F**		**All Areas**	
Soil Symbol	**Area** (Acres)	**%** Area A	**Area** (Acres)	**%** Area B	**Area** (Acres)	% Area C	**Area** (Acres)	**%** Area D	**Area** (Acres)	**%** Area E	**Area** (Acres)	**%** Area F	**Area** (Acres)	**%** All Areas
CpA	3.79	11.1%	-	-	-	-	-	-	-	-	-	-	3.79	1.2%
CpC	2.01	5.9%	-	-	-	-	-	-	-	-	-	-	2.01	0.7%
CpE	-	-	0.27	0.2%	6.69	23.6%	0.55	0.6%	-	-	-	-	7.51	2.5%
CuB	6.25	18.3%	-	-	-	-	-	-	-	-	-	-	6.25	2.1%
HaA	-	-	42.96	35.5%	3.25	11.5%	20.05	21.1%	-	-	-	-	66.26	21.8%
PlA	9.33	27.3%	20.54	16.9%	2.66	9.4%	-	-	0.57	3.8%	-	-	33.09	10.9%
RdA	12.34	36.1%	57.37	47.4%	15.72	55.5%	74.16	78.3%	14.43	96.2%	10.49	100%	184.51	60.7%
RdB	0.44	1.3%	-	-	-	-	-	-	-	-	-	-	0.44	0.1%
Totals	**34.16**	100%	**121.13**	100%	**28.32**	100%	**94.75**	100%	**15.00**	100%	**10.49**	100%	**303.86**	100.0%

A series is a group of soils with similar composition characteristics and profiles through the soil strata. Series are broken down into phases based on differences in texture of the surface soil and in slope, stoniness, or some other difference that affects the use of the soil by man. Eight soil phases within five soil series are found in Areas A through F.

The soils are described by the USDA as follows:

Carver and Plymouth sands series. This soil class is very deep and excessively drained, and its parent material consists of coarse sandy glaciofluvial deposits. The depth to the top of a seasonal high water table is greater than 60 inches. Three soil phases within this class, CpA, CpC and CpE, are found within the study areas. Soil phases CpA, CpC and CpC are distinguished only by their slopes, i.e., 0 to 3 percent, 3 to 15 percent and 15 to 35 percent, respectively. These soils are classified as “4s” within the National Soil Survey Handbook (NSSH) Part 622. As such, these soils have “very severe limitations that restrict the choice of plants or require very careful management” and “have soil limitations within the rooting zone”. Thus, these soils are not classified as prime farmland soils. The suitability of this soil series for buildings, streets and parking lots varies from slight to moderate to severe for the soil phases CpA, CpC and CpE, respectively. This soil series imposes severe use limitations across all soil phases for pipelines, lawns, landscaping, athletic fields and play areas (i.e., intensive and extensive).

Haven loam series. This soil is very deep and well-drained, and the parent material consists of glaciofluvial deposits over sandy and gravelly glaciofluvial deposits. The depth to the top of a seasonal high water table is greater than 60 inches. The study areas contain only one soil phase within the Haven loam series, i.e., HaA, which is characterized by 0 to 2 percent slopes. This soil series is classified as “1” within NSSH Part 622, i.e., having only slight limitations for their agricultural use, and is thus categorized as a prime farmland soil. There are only slight, i.e., minimal, use limitations of the HaA soil phase for buildings, streets, parking lots, athletic fields and play areas (i.e., intensive and extensive) and moderate limitations for the installation of pipelines.

Plymouth loamy sand. This soil series is very deep and excessively drained, and the parent material consists of acid sandy glaciofluvial or deltaic deposits. The depth to the top of a seasonal high water table is greater than 60 inches. The study areas contain only one soil phase within the Plymouth loamy sand series, i.e., PlA, which is characterized by 0 to 3 percent slopes. These soils are classified as “3s” within the National Soil Survey Handbook (NSSH) Part 622. As such, this soils series has severe limitations that reduce the choice of plants or require special conservation practices, or both, and has soil limitations within the rooting zone. Thus, the soils of the Plymouth loamy sand series are not prime farmland soils. There are only slight, i.e., minimal, use limitations of the PlA soil phase for buildings, streets, and parking lots and the installation of pipelines. There are, however, severe use limitations for lawns and landscaping.

Riverhead sandy loam. This soil is very deep and well drained, and the parent material consists of loamy glaciofluvial deposits overlying stratified sand and gravel. The depth to the top of a seasonal high water table is greater than 60 inches. The study areas contain two phases within the Riverhead sandy loam series, i.e., RdA and RdB, that are characterized by 0 to 3 and 3 to 8 percent slopes, respectively. These soils are classified as "2s" within the National Soil Survey Handbook (NSSH) Part 622. As such, this series has soil limitations within the rooting zone but only moderate limitations that reduce the choice of plants or require moderate conservation practices. Thus, the soils of the Riverhead sand loam series are classified as prime farmland soils. The suitability of this soil series for streets and parking lots and intensive play areas varies from slight to moderate for the soil phases RdA and RdB, respectively. There are only slight, i.e., minimal, use limitations of the RdA and RdB soils phases for buildings, lawns, landscaping and extensive play areas. Moderate use limitations exist for the installation of pipelines.

Cut and fill. Cut and Fill land is a miscellaneous land type consisting of areas that have been altered by methods other than mining such that the original, i.e., pre-development or pre-disturbance, soil characteristics have been eliminated. In addition, for the aforementioned reason, these soils are not deemed prime farmland soils. No suitability limitations of these soils can be generally established either owing to the former alteration of the soil for the current uses (i.e., County maintenance facilities, storage yards, office buildings, roads, and parking areas).

3.2.2. Potential Impacts of Proposed Project

The potential impacts of the proposed project with respect to soils considers the suitability of the soil phases in Areas A through F for specific types of land uses.

The proposed land uses for this project comprise: 1) buildings, 2) roads and parking areas, 3) lawns and landscaping and 4) intensive play areas (e.g., athletic fields). The potential loss of farmland soils is also evaluated below.

Area A

This study area would support a variety of uses including an athletic field, roads, parking areas, buildings, lawns and landscaping. The proposed structures, including mixed-use commercial and residential buildings and an arena, would be situated on approximately 0.46, 0.95, 1.55 and 3.44 acres of CpA, CuB, PlA, and RdA soils, respectively. Soil phases CpA, PlA and RdA are suitable for structures, i.e., three stories or less in height, while the CuB soils currently support structures. Thus, there would be minimal impacts from the use of the soils (i.e., CpA, PlA and RdA) in Area A for buildings.

There would be a total of approximately 2.7 acres of athletic fields situated on 0.7 acres of CuB soils and 2.00 acres of RdA soils. The CuB soils – which are previously disturbed, cut-and-fill – currently support buildings and paved areas and may be suitable for athletic fields. However, since the cut-and-fill material is undetermined at this time, detailed geotechnical surveys would be required to confirm their suitability for intensive play areas. The RdA soil phase is suitable for intensive play areas, imposing only slight or no limitations on its use for athletic fields.

Lawns and landscaping would be distributed around Area A among buildings, paved areas and athletic fields such that six soil phases would be utilized. Lawns and landscaping would use approximately 1.01, 0.20, 3.10, 2.62, 5.49 and 0.23 acres of the CpA, CpC, CuB, PlA, RdA, and RdB soil phases, respectively. Soil phases RdA and RdB are suitable for lawns and landscaping while the CuB (cut-and-fill) soils are likely suitable, i.e., to be confirmed via detailed geotechnical investigations. However, the CpA, CpC and PlA soil phases are not suitable for lawns and landscaping. In effect, there are likely to be significant costs to overcome the particular soil characteristic(s) that limit their use for lawns and landscaping over a 3.83-acre area.

Roads and parking areas would be situated on approximately 1.52, 0.43, 1.52, 3.90 and 0.05 acres of CpA, CpC, CuB, PlA and RdB soils phases, respectively.

Soil phases CpA, PlA and RdB are suitable for roads and parking areas. The CuB (cut-and-fill) areas currently support both paved and unpaved lots. The CpC soil phases pose moderate limitations on use for roads and parking areas owing to its moderate slopes.

In summary, 1.01, 0.20 and 2.62 acres of CpA, CpC and PlA soils, respectively, impose significant limitations on their use for lawns and landscaping in Area A. The impacts of these soil limitations are financial only, owing to any improvements necessary to improve the soil characteristics to support this use. Prime farmland soils are found within this study area, consisting of 3.80, 2.01, 12.38 and 0.45 acres of CpA, CpC, RdA, and RdB soil phases, respectively for a total of 18.64 acres. 14.86 acres (79.7%) of the prime farmland soils on site would be utilized for the proposed development.

<u>Area B</u>

The proposed development of this study area would comprise residential buildings, roads, parking areas, lawns, landscaping and a recharge basin. The proposed structures (i.e., condominiums and townhouses) would be situated on 7.83, 1.95 and 10.16 acres of HaA, PlA and RdA soils, respectively. The HaA, PlA and RdA soil phases are considered suitable, i.e., pose only slight limitations, on their use for buildings less than three stories in height. In a like manner, these soil phases are also suitable for roads and parking areas that will cover 8.83, 3.67 and 9.90 acres of the HaA, PlA and RdA soil phases, respectively.

Approximately 41.04 acres of lawns and landscaping would be located within this study area. Soil phases HaA and RdA, both of which are suitable for lawns and landscaping, would support 14.04 and 20.85 acres, respectively, of this land use. The remaining 6.15 acres of landscaping would be situated within the PlA soil phase. The PlA soil phase imposes severe limitations for lawns and landscaping and would require improvements – and thus added costs – to support landscaping.

The HaA and RdA soil phases, which comprise a total of 100.33 acres in Area B, are classified as prime farmland soils. Approximately 30.7 acres of HaA and 40.91 acres of RdA soils, i.e., a total of 71.61 acres of prime farmland, would be utilized for the proposed project. In addition to the 71.61 acres of farmland soils directly affected by the proposed uses, there are an additional 28.72 acres of prime farmland soils on site that would remain undisturbed; however, these undisturbed soils would effectively be removed from farming owing to access and land use compatibility constraints.

Area C

The proposed development of this study area would primarily comprise athletic fields and lawns and, secondarily, roads, parking areas and auxiliary buildings. The proposed athletic fields would be situated on 1.91, 0.85, 1.34 and 5.49 acres of CpE, HaA, PlA and RdA soils, respectively. The suitability of these soils for athletic fields varies from slight limitations for HaA and RdA soils to moderate limitations for PlA soils to severe limitations for CpE soils. In the last instance, sandy surface layers and unfavorable slopes are the factors which pose severe limitations on the use of CpE soils for athletic fields. See Section 3.3, Topography, for a discussion of the required cut-and-fill operations required to establish an acceptable grade for athletic fields. Sandy surface layers also pose moderate constraints on the use of PlA soils for athletic fields. These soil limitations can be overcome, however, with an investment of labor and materials.

Lawns and other landscaped areas would be located on 1.96, 1.66, 0.37 and 5.26 acres of CpE, HaA, PlA and RdA soils within Area B. HaA and RdA soils pose only slight limitations for lawns and landscaping and are therefore well-suited for this use. However, the CpE and PlA soils are not suitable as-is for this use; the severe limitations of these soils for lawns and landscaping are due to sandy surface layers that may easily erode.

Approximately 2.43 acres of RdA soils would be used for roads and parking areas while auxiliary buildings (e.g., bathrooms, concession, and baseball dugouts) would occupy a mere 0.25 acres of CpE soils in this study area. The RdA and CpE soils pose only slight or minimal limitations for these uses and are therefore considered suitable.

The HaA and RdA soils, which encompass 3.25 and 15.72 acres, respectively, are classified as prime farmland soils. Approximately 2.51 acres of HaA soils and 13.19 acres of RdA soils would be utilized for the proposed athletic, landscaping, parking, road and auxiliary buildings in this study area. Thus, 15.70 acres (of a total of 18.97 acres) of prime farmland soils in this study area would be directly impacted by the proposed project and made unavailable for future agricultural production. The remaining 3.27 acres of undisturbed prime farmland soils, located along the periphery of the study area, would be too limited for agricultural use.

Area D

The proposed uses for this study area comprise industrial buildings, paved areas (i.e., roads and parking lots) and landscaped yards (i.e., side, rear and front yards). Buildings and paved areas would be situated entirely on 15.68 and 57.93 acres of HaA and RdA soils, respectively; these soils are suitable for buildings and paved areas, posing only slight limitations for such uses. A majority of the lawns and landscaping in this study area, i.e., 20.60 of a total of 21.14 acres, would be located on HaA and RdA soils which are suitable for such uses. The remaining landscaped area, or 0.56 acres, would utilize CpE soils which are unsuitable for such as use. The RdA soils, which comprise 74.16 acres of this study area are classified as prime farmland soils; these 74.16 acres of prime farmland soils would be unavailable to future agricultural production.

Area E

Buildings and paved areas would occupy the entire surface of this study area, utilizing 0.57 acres and 14.43 acres of PlA and RdA soils, respectively. These soils pose only slight limitations and are considered suitable for buildings and paved areas. The RdA soils, totaling 14.43 acres, are prime farmland soils that would be unavailable to future agricultural operations.

Area F

Buildings and paved areas would also occupy the entire surface of this study 10.45-acre area which is comprised entirely of RdA soils; these soils are suitable for buildings and paved areas, imposing slight or minimal impacts to development. As in Area E, the RdA soils that comprise Area F are prime farmland soils and would be unavailable to future agricultural uses.

3.2.3. Proposed Mitigation

The Selected Developer would be required to pay careful attention to soil conservation and erosion control techniques during grading activities. Final site design would need to incorporate methods to control erosion and sedimentation and limit transport of sediment to offsite areas. Guidance would be taken from the Best Management Practices (BMP's) recommended in the latest New York Guidelines for Urban Erosion and Sediment Control[6], the NYSDEC's Urban Stormwater Runoff Management Practices Catalogue[7] and other appropriate documents.

Disturbance to Study Area soils will be mitigated through implementation of an approved Soil Erosion and Sediment Control Plan. The Selected Developer would be required to utilize an extensive erosion control plan that would reduce runoff during construction. The plan will specify phasing of the construction to limit the overall amount of disturbed soils, permanent and temporary stabilization methods and measures to control surface runoff from the active construction areas. This plan would likely include the following or similar measures:

- A controlled sequence of measures would insure that runoff and sediment receiving areas are prepared in advance of major site disturbances.
- An erosion-control seed mixture such as 50% annual ryegrass and 50% perennial ryegrass would be used for quick and effective stabilization of the soils.
- A series of hay bales and silt fences would be placed to capture coarse and fine sediment.
- Silt fences would also be installed to prevent material from washing away.
- Earth stockpiled for longer than fifteen (15) days would be stabilized by either seeding it with the erosion control seed mixture referred to above, or mulching it with hay.

[6] *New York Guidelines for Urban Erosion and Sediment Control*, USDA, Natural Resources Conservation Service, Printed by the Empire State Chapter, Soil and Water Conservation Society, Fourth Printing, April 1997

[7] *Urban Stormwater Runoff Management Practices Catalogue for Nonpoint Source Pollution Prevention and Water Quality Protection in New York State*. NYS Department of Environmental Conservation, 1996.

- Maintenance of the erosion control measures would include removal of accumulated sediment and trash from all control structures and the basin, repair or replacement of damaged swales, diversions, silt fencing, hay bales, and reseeding where necessary.

- The construction entrance would be stabilized with crushed stone to prevent soil and debris from being carried onto roads.

- Construction-related erosion control measures would be removed during final landscaping.

The final grade surface, once established, would be stable, non-erosive, and fully vegetated, where appropriate.

3.3. Topography

3.3.1. Existing Conditions

Figure 3-3 depicts a topographic relief model of the Areas and their immediate vicinity. This topographic relief model was generated using the Suffolk County GIS (Geographic Information Systems) Department's high-resolution LIDAR (LIght Detection And Ranging) digital elevation model for ground surfaces (Datum: NGVD29). The high level of detail inherent in this digital elevation model is well-pronounced. Note that the model accurately captures the cut-and-fill, reshaped topography of the Long Island Rail Road line (along the northern boundary of Area B) and the Long Island Expressway (along the northern boundary of Area. The relief model can be used to quantify the elevation ranges (i.e., the lowest to highest elevations) within each of the Areas. The elevation ranges for each Area are provided in Table 3-2.

Table 3-2: Elevation Ranges

Area	Lowest Elevation (feet)	Highest Elevation (feet)	Range of Elevation Change (feet)
A	35.14	55.92	20.77
B	41.23	76.68	35.46
C	44.89	96.37	51.47
D	29.53	61.54	32.02
E	40.93	46.89	5.96
F	38.46	44.37	5.91

Note that within Area C, the smallest of the study areas, the elevation change is approximately 51.47 feet which significantly greater than that for Areas A, B, D, E and F. However, the elevation change occurs over a distance of approximately 1,200 feet, i.e., with an average slope of only 4.25 percent. Thus, except for Area C, whose elevation change is moderate, the elevation changes across Areas A, B, D, E and F are minimal.

Table 3-3 summarizes the slopes – expressed as "percent of slope" – for each of the Areas by three different "percent of slope ranges as follows:

- Less than 10%
- 10 to less than 25%
- 25% and greater

The last range, i.e., 25% and greater, is typically considered a steep slope, while the other two ranges are commonly regarded as flat to moderate slopes. These slope ranges are also depicted spatially in Figure 3-4 for each of the study areas and the project vicinity.

Table 3-3: Summary of "percent of slope" for the study areas, individually and collectively

	Area A		**Area B**		**Area C**		**Area D**		**Area E**		**Area F**		**Total (All Areas)**	
% of Slope	**Area (Acres)**	**% of Area A**	**Area (Acres)**	**% of Area B**	**Area (Acres)**	**%of Area C**	**Area (Acres)**	**%of Area D**	**Area (Acres)**	**%of Area E**	**Area (Acres)**	**%of Area F**	**Area (Acres)**	**% of All Areas**
Less than 10%	33.47	98.0%	119.60	98.7%	25.01	88.3%	94.45	99.7%	15.00	100%	10.49	100%	298.01	98.1%
10% to less than 25%	0.61	1.8%	0.92	0.8%	3.31	11.7%	0.31	0.3%	0.00	0.3%	0.00	0.0%	5.16	1.7%
25% and up	0.08	0.2%	0.60	0.5%	0.0	0.0%	0.00	0.0%	0.00	0.0%	0.00	0.0%	0.69	0.2%
Totals	34.16	100%	121.13	100 %	28.32	100%	94.75	100%	15.00	100%	10.49	100%	303.86	100%

A review of Table 3-3 reveals that Areas C through F do not contain any areas with steep slopes, i.e., 25% of slope and higher. Steep slopes represent an insignificant amount of land within Areas A and B, only 0.08 and 0.60 acres, respectively. It is important to note that the steep slopes within Area B are found only along the Long Island Rail Road and are likely due to previous cut-and-fill operations. That is, it is unlikely that steep slopes were extant in this study area prior to construction of the rail line. In addition, the relatively insignificant 0.08

acres (or only 3,500 square feet) of steep slopes within Area A is due to past earth-moving operations; here, the steep-sloped area is confined to one location within a clearly disturbed area adjacent to the County Farm.

There is a significant area (3.31 acres) of moderate slopes, i.e., 10% to less than 25% of slope, within the western portion of Area C; these moderate slopes comprise approximately 11.7% of Area C. There are also small areas (0.61 acres) of moderate slopes in the southeast portion of Area A which account for 1.8% of the total area. Minor extents of moderately-sloped areas are located in Areas B (0.92 acres) and D (0.31 acres), accounting for only 0.3% and 0.8% of these study areas, respectively.

In general, the entire study area is comprised of flat to minimal slopes. That is, land at less than 10% of slope, comprises approximately 98% of the entire study area. Only 0.2% of the total study area (or 0.69 acres) is considered steep while only 1.7% (51.6 acres) of the entire study area has moderate slopes.

3.3.2. Potential Impacts of Proposed Project

The existing topography would be graded and shaped to create the buildings, roads, parking areas, landscaped areas and drainage features. While the site plan has not been designed, it is anticipated that a majority of the property would be subjected to cut and fill earthwork. As part of the future design of the detailed site plan, cut and fill calculations would be done to determine if there would be an import or export of material from the site.

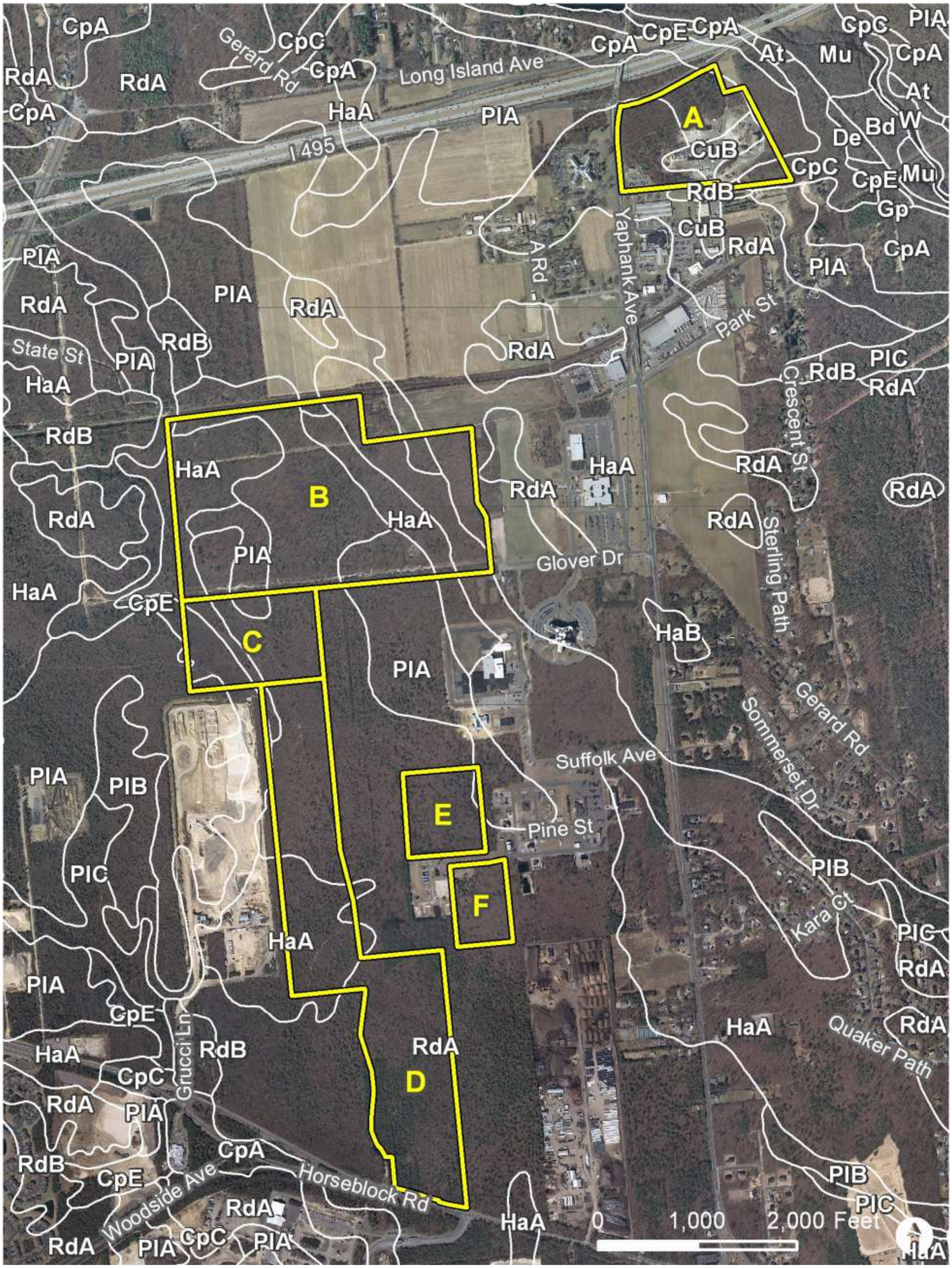
There are no significant areas of steep slopes which are in a natural condition or original setting (i.e., not previously disturbed by human activity) that would be affected by this project. There are two locations that have been previously altered by earth-moving equipment that comprise steep slopes and that would leveled for the purpose of installing a roadway and parking area. However, these human-altered, steeply-sloped areas are very limited in their extent. Area A contains a 2,500-square-foot soil mound that is not part of the original terrain of the site; it is located in the southeastern portion of the study area where a proposed parking lot would be constructed. In Area B, there are elongated soil mounds along the Long Island Rail Road resulting from the earthwork to construct the rail alignment. A limited, 3,000-square-foot portion of these mounds would be leveled to install a roadway. There are no other steeply-sloped areas in the remaining Areas C through F. Thus, there would be no significant impacts to any steeply-sloped areas as a consequence of this project.

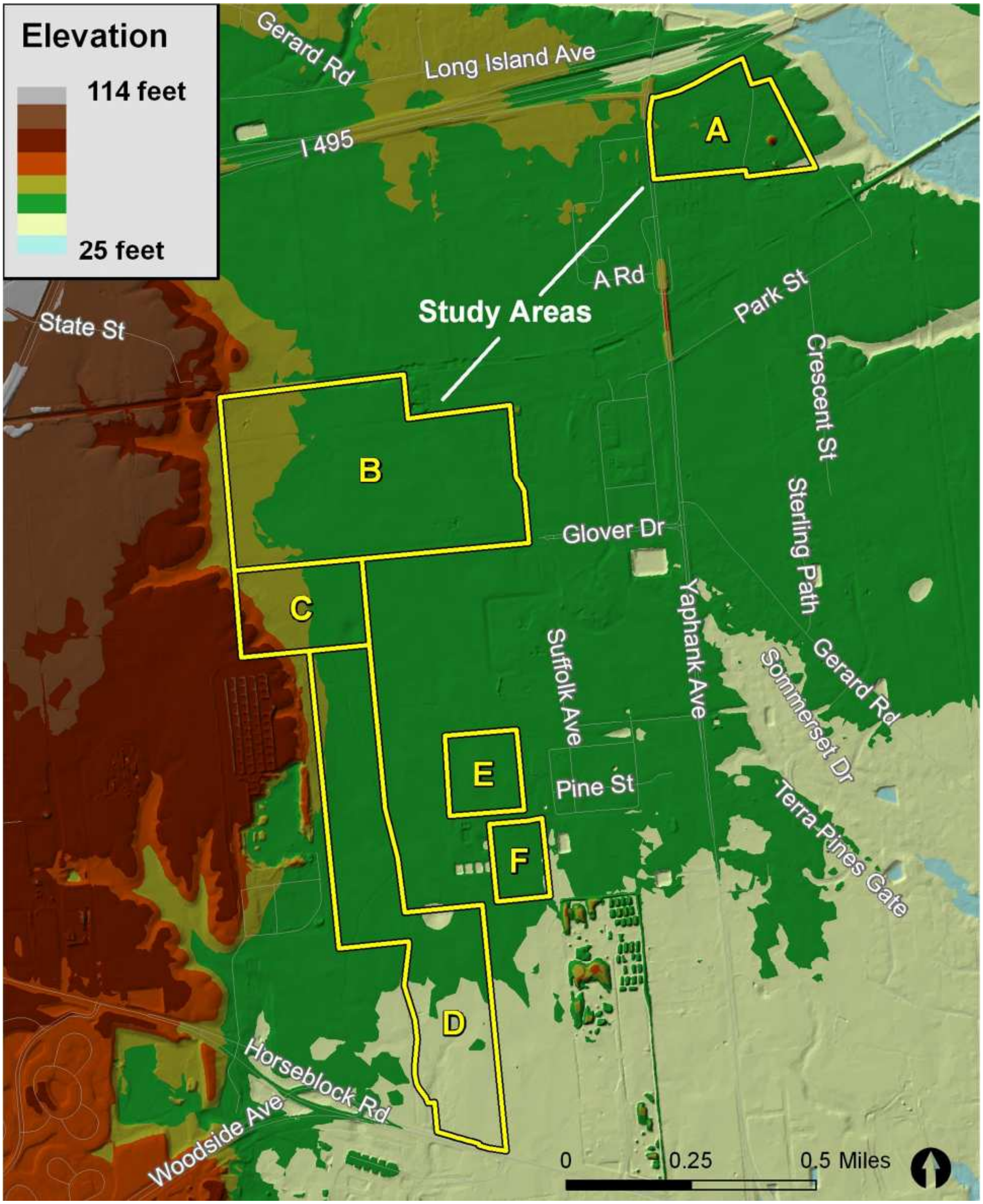
Because there are mostly flat to minimal slopes (i.e., less than 10% of slope) over 98.1% of the project area – and only 1.7% of the project area has moderate, 10% to less than 25% slopes – earthwork and disturbance of the terrain will be minimal. However, while Area C contains no steep slopes, the earthwork required to construct the playing fields is worthy of consideration. Figure 3-5 provides an overlay of the proposed playing fields on thematic slopes map.

Note that the two (2) soccer-lacrosse fields (shown in Figure 3-5) are located in a relatively flat portion of Area C, but the baseball-softball field is currently located in a moderately-sloped portion of this study area, with slopes in and around the baseball diamond ranging from 10 percent to less than 25 percent of slope. It is estimated based on a preliminary cut-and-fill analysis, that approximately 1.25 million cubic feet of soil would have to be cut in the western portion of the site and redistributed (i.e., filled) in the central portion of the site to establish an acceptable grade for the baseball-softball field. These 1.25 million cubic feet (i.e., 28.7 acre-feet or 46,300 cubic yards) could be distributed across all of the playing fields to establish a minimum 1 percent-of-slope grade to ensure proper drainage. There exists the potential for soil erosion during the required earth-moving operations. Construction impacts associated with import and export are discussed in Section 20.1.5. It is also possible that the final site plan would be redesigned to avoid the moderately sloped areas in order to minimize the need for extensive regrading.

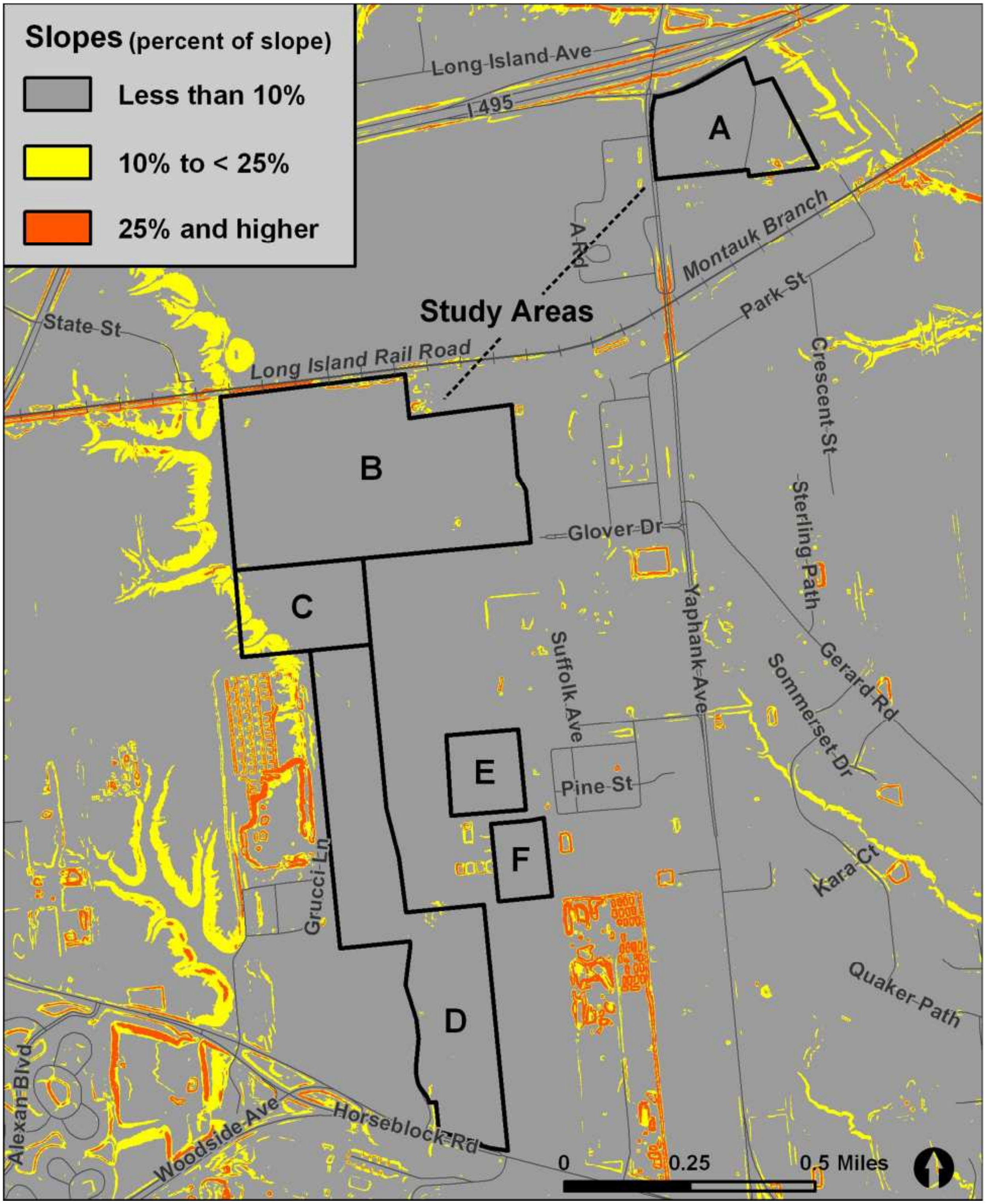
3.3.3. Proposed Mitigation

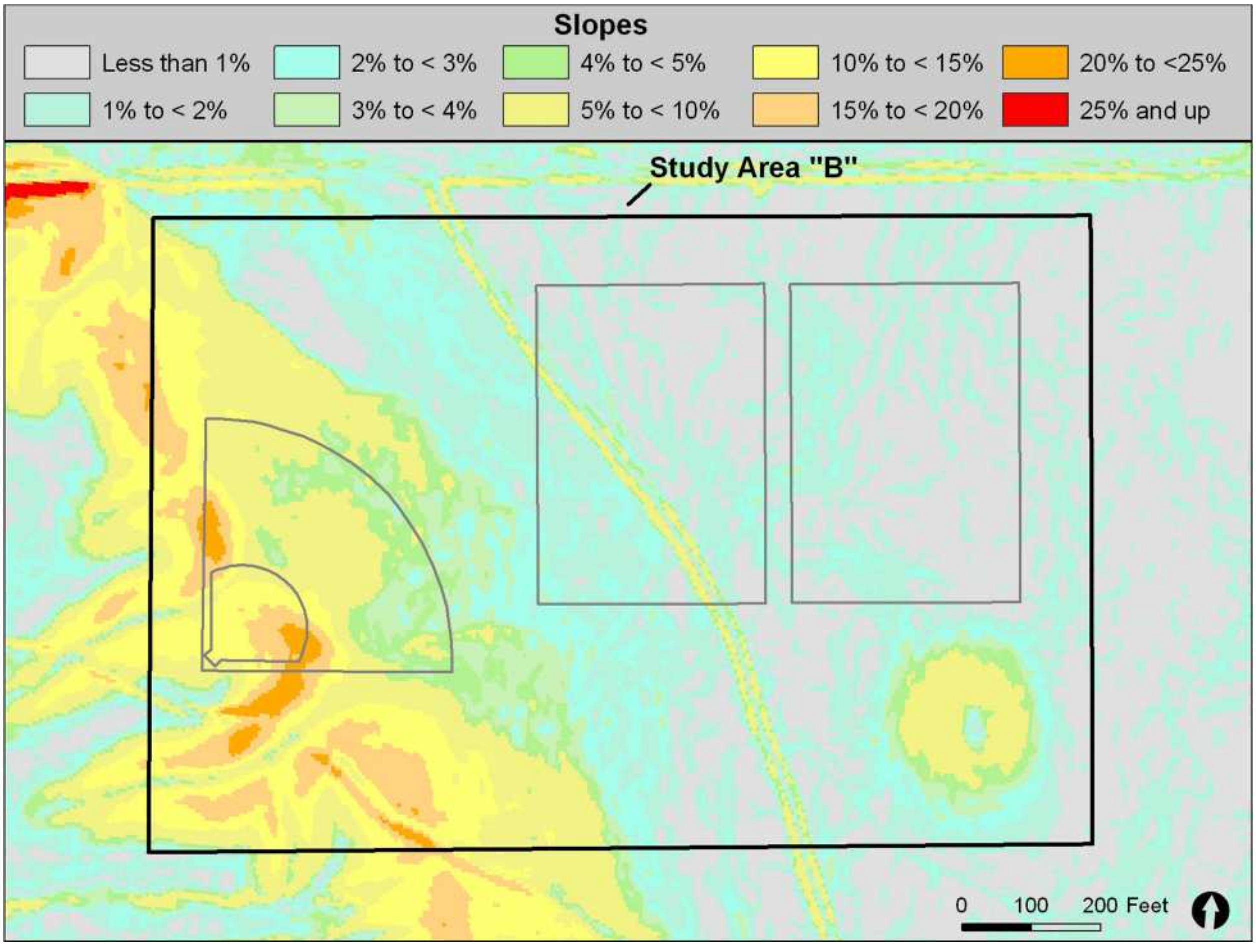
The topography and slope of the developed areas will be altered. Overall drainage patterns will remain the same and the potential loss of soil material will be mitigated by implementation of an approved Soil Erosion and Sediment Control Plan.

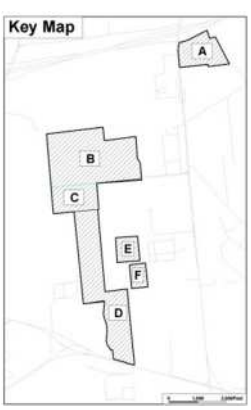

A
B
C
D
E
F
Long Island Ave
I 495
Gerard Rd
Yaphank Ave
A Rd
Park St
Crescent St
State St
Glover Dr
Sterling Path
Suffolk Ave
Pine St
Gerard Rd
Sommerset Dr
Kara Ct
Quaker Path
Grucci Ln
Woodside Ave
Horseblock Rd
0 1,000 2,000 Feet



Topographic Relief and Elevations (in feet) for the Areas and Vicinity
Figure 3-3


Slopes (percent of slope)
Less than 10%
10% to < 25%
25% and higher
Long Island Ave
I 495
A
A Rd
Montauk Branch
Park St
Study Areas
State St
Long Island Rail Road
Crescent St
B
Sterling Path
Glover Dr
C
Suffolk Ave
Yaphank Ave
Gerard Rd
Sommerset Dr
E
Pine St
F
Grucci Ln
Kara Ct
Quaker Path
D
Alexan Blvd
Woodside Ave
Horseblock Rd
0
0.25
0.5 Miles





Cameron Engineering
& Associates, LLP

Slopes of Area C with an Overlay of Proposed Ball Fields
Figure 3-5