3.1 Soils and Topography

Introduction

The Union Place project is proposed to be developed on an approximately 287± acre site located in the Town of Carmel, New York. The site is characterized by generally level to moderately sloping topography and the nine (9) soil map units further described below. This section presents information on the suitability of the site for the proposed development and how such use would impact the on-site soils, topography and geology.

3.1.1 Existing Conditions

Topography

The topography on the property, consistent with the surrounding land, is primarily rolling. The topography north of the site is characterized by moderate sized hill tops and valleys while the topography to the south of the site is characterized by moderately rolling hills. The local topography is shown in Figure 3.1-1.

There are two north/south trending hills on the property. Agor Ridge is located in the northeastern portion of the property. A second, smaller hill is located within the southwestern portion of the property. Elevations on the site range from approximately 560 feet above sea level along Baldwin Place Road, on the western property boundary of the site, to approximately 878 feet above sea level on Agor Ridge, within the eastern portion of the property. On-site topography and slopes are shown in Figure 3.1-2, Existing Slopes Map. It appears that on-site slope conditions have not been altered substantially. Currently, there are existing residential and barn structures located in the southern portion of the property and the fields associated with the property have been used for agriculture in the past, but these structures and activities did not change the historic slope conditions of the property. Existing slope categories are defined on the figure and shown in Table 3.1-1, below.

Table 3.1-1
Existing Slopes

Slope Category	Acres	Percentage
0% to 15%	199.4 acres	69%
15% to 25%	64.5 acres	23%
>25%	23.3 acres	8%
Total Site Acreage	287.2 acres	100%

Source: Insite Engineering Surveying & Landscape Architecture, PC, 2009

Soils

The soils on the site were initially identified using the soil classifications of the United States Department of Agriculture (USDA) Soil Conservation Service (SCS), as described in the Soil Survey of Westchester and Putnam Counties, 1994. The Soil Survey provides generic information related to soils mapped by the federal government on the project site. As actual on-site conditions can differ, this Soil Survey information was supplemented by two (2) site specific soil investigations. These included the completion of sixty-three (63) deep holes by the

Applicant's Engineer, Insite Engineering, Surveying & Landscape Architecture, P.C. (Insite Engineering) for the purpose of investigating soil for stormwater basins and the completion of twenty-nine (29) borings and nineteen (19) test pits by the Applicant's Subsurface Hydrogeologic Consultant, GeoDesign Incorporated (GeoDesign) for the purpose of evaluating soils for the waste water treatment plant absorption fields and or a subsurface sewage treatment system. Therefore not all soil types were specifically tested because the investigations were conducted for engineering purposes. Refer to the Soil Testing section that follows pages 3.1-7 to 3.1-8 for details on these investigations.

According to the Soil Survey of Westchester and Putnam Counties, the Property contains nine (9) soil map units: Paxton fine sandy loam (PnB, PnC and PnD), Woodbridge loam (WdB and WdC), Ridgebury loam (RdA and RdB), Sun loam (Sh), Charlton loam (ChC, ChE, and CID), Leicester loam (LcA), Udorthents (Uc), Charlton-Chatfield complex (CrC) and Urban land (Uf). The distribution of the soil map units on the property is shown on Figure 3.1-3, Soils Map.

The characteristics of each of the soil map unit identified on this property are described below generally in the order of their prevalence on the Property.

Paxton fine sandy loam (PnB, PnC and PnD)

This soil map unit is defined by USDA SCS Soil Survey of Westchester and Putnam Counties as very deep and well drained. It can be found on sides and tops of broad ridges and small hills with the slopes between 2 to 8 percent (PnB), 8 and 15 percent (PnC) and 15 to 25 percent (PnD). The water table is perched above the dense substratum at an approximate depth of 1.5 to 2.5 feet below the ground surface from February through April. Permeability is moderate within the surface layer and subsoils and is slow or very slow within the substratum. The available water capacity is moderate. The erosion hazard of the soil is slight to severe depending on the slope category of the soil, slight for the gentle slopes leading to severe for the steeper slopes. The surface runoff is considered medium to rapid, also depending on the steepness of the slopes. The depth of bedrock can be found at more than 60 inches below the ground surface. This soil unit is not characterized as a hydric soil by the USDA Natural Resources Conservation Service (NRCS).

Paxton fine sandy loam soils are mapped throughout the northern and central areas of the site, as shown in Figure 3.1-3, Soils Map.

During the first of the two site specific soil investigations completed on the project site, Insite Engineering advanced deep test holes that included the completion of fifty-three (53) borings within the Paxton fine sandy loam soil map unit to depths between 5.5 and 9.0 feet below the ground surface. The location of the borings are depicted on Drawing P-1 within Appendix C. Within these borings, bedrock was not encountered confirming that bedrock is more than 60 inches below the ground surface as documented in the Soil Survey. Shallow surficial groundwater was observed at depths between 1.5 and 8.0 feet below the ground surface in these borings. Of the fifty-one (51) borings completed in this soil map unit forty-nine (49) of the borings were observed to have shallow groundwater deeper than the 2.5 feet below the ground surface. These groundwater observations generally confirm the generic description of this soil in the Soil Survey but also show that groundwater is found at depths greater than those noted in the Soil Survey.

Within areas of Paxton fine sandy loam soils, the second on-site soil investigation, performed by GeoDesign, included the completion of fifteen (15) borings to depths between 26.2 to 71.5 feet

below the ground surface and eight (8) test pits to depth between 12.0 to 12.5 feet below the ground surface. As with the soil investigation completed by Insite Engineering, bedrock was not encountered thereby confirming that bedrock is significantly deeper than the 60 inches noted in the Soil Survey and below any improvements proposed with the exception of potential water supply wells. Groundwater was encountered during this investigation between 4.7 and 43.5 feet below the ground surface in the borings and no water was observed in any of the eight test pits.

Woodbridge loam (WdB and WdC)

This soil map unit is defined by USDA SCS Soil Survey of Westchester and Putnam Counties as very deep and moderately well drained. It can be found on hillsides and uplands with slopes ranging from 3 to 8 percent (WdB) and 8 to 15 percent (WdC). The water table can be found approximately 1.5 to 2.5 feet below the ground surface from November through May. Permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. The surface runoff ranges from medium to rapid depending on the steepness of the slope category. The erosion hazard is defined as moderate in both slope ranges. Depth to bedrock can be found more than 60 inches below the ground surface. This soil unit is not characterized as a hydric soil by the USDA NRCS.

Woodbridge loam soils are mapped on the northern, central and western corner sections of the property, as shown in Figure 3.1-3, Soils Map.

During the first of the two site specific soil investigations completed on the project site, Insite Engineering advanced deep test holes that included the completion of eight (8) borings (B2, B3, B25, B26, B28, B29, B32 and B33) within the Woodbridge loam soil map unit to depths between 6.5 and 9.0 feet below the ground surface. The location of the borings are depicted on Drawing P-1 within Appendix C. Within these borings, bedrock was not encountered confirming that bedrock is more than 60 inches below the ground surface as documented in the Soil Survey. Shallow surficial groundwater was observed at depths between 2.0 and 5.0 feet below the ground surface in these borings. These groundwater observations generally confirm the generic description of this soil in the Soil Survey but also show that groundwater is found at depths greater than those noted in the Soil Survey. Of the seven (7) borings completed in this soil map unit six (6) of the borings were observed to have shallow groundwater deeper than the 2.5 feet below the ground surface.

Within areas of Woodbridge loam soils, the second of the on-site soil investigations, performed by GeoDesign, included the completion of fourteen (14) borings to depths between 13.0 to 44.0 feet below the ground surface and eleven (11) test pits to depths between 12.0 to 16.5 feet below the ground surface. As with the soil investigation completed by Insite Engineering, bedrock was not encountered thereby confirming that bedrock is significantly deeper than the 60 inches noted in the Soil Survey and below any improvements proposed with the exception of potential water supply wells. Groundwater was encountered during this investigation between 5.0 and 23.0 feet below the ground surface in the borings and 3.6 to 16.5 feet below the ground surface in the test pits.

Ridgebury loam (RdA and RdB)

This soil map unit is defined by USDA SCS Soil Survey of Westchester and Putnam Counties as very deep and poorly drained or somewhat poorly drained. It can be found in uplands and along drainage ways with slope ranging from 0 to 3 percent (RdA) and 3 to 8 percent (RdB). The water table can be found approximately 1.5 feet below the ground surface from November

to May. Permeability is moderate or moderately rapid in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. The surface runoff is slow to medium depending on the slope category. The erosion hazard is defined as slight. Depth to bedrock can be found more than 60 inches below the ground surface. Ridgebury loam (RdA) with a slope category of 0 to 3 percent is characterized as a hydric soil by the USDA NRCA but Ridgebury loam (RdB) soils with a slope category of 3 to 8 percent is not characterized as a hydric soil.

Ridgebury loam soils are mapped on the northern and eastern sections of the property, as shown in Figure 3.1-3, Soils Map.

One site specific soil investigation was completed within the Ridgebury loam soil map unit on the property. The investigation, completed by Insite Engineering, advanced deep test holes and included the completion of one (1) boring (B39) to depth 7.0 feet below the ground surface. The location of this boring are depicted on Drawing P-1 within Appendix C. Bedrock was not encountered, within this boring, confirming that bedrock is more than 60 inches below the ground surface as documented in the Soil Survey. Shallow surficial groundwater was observed at a depth of 1.0 feet below the ground surface in these borings. This groundwater observation confirms that groundwater is found at depth noted in the Soil Survey.

Sun loam (Sh)

This soil map unit is defined by USDA SCS Soil Survey of Westchester and Putnam Counties as very deep and poorly drained or very poorly drained. It can be found in small depressions and in drainage ways with slopes that range from 0 to 3 percent. The water table can be found 1.0 foot above to 0.5 feet below the ground surface from November through April. Permeability is moderate in the surface layer and slow or very slow in the subsoil and substratum. The surface runoff is very slow making the erosion hazard none or slight. Depth to bedrock can be found more than 60 inches below the ground surface. This soil unit is characterized as a hydric soil by the USDA NRCA.

Sun loam soils are mapped on the northern, central and western portions of the property, as shown in Figure 3.1-3, Soils Map.

Charlton loam (ChC, ChE, and CID)

This soil map unit is defined by USDA SCS Soil Survey of Westchester and Putnam Counties as very deep and well drained. It can be found on hillsides with slopes that range from 8 to 15 percent (ChC), 15 to 25 percent (ChD and CID). The water table can be found at a depth of approximately 6 feet below the ground surface throughout most of the year. Permeability is moderate or moderately rapid throughout most of the profile. The available water capacity is moderate. The surface runoff is medium to rapid making the erosion hazard moderate to severe, both depending on the specific slope range of the soil. Depth to bedrock can be found more than 60 inches below the ground surface. This soil unit is not characterized as a hydric soil by the USDA NRCA.

Charlton loam soils are mapped on the northern and western portions of the property, as shown in Figure 3.1-3, Soils Map.

Liecester loam (LcA)

This soil map unit is defined by USDA SCS Soil Survey of Westchester and Putnam Counties as very deep and somewhat poorly drained to poorly drained. It can be found on the lower parts of hillsides and along small drainage ways in bedrock-controled areas. The slopes range from 0 to 3 percent. The water table can be found within a depth of 1.5 feet below the ground surface from November to May. Permeability is moderate or moderately rapid within the surface and subsoil layers and is moderate to rapid within the substratum. Available water capacity is moderate. The surface runoff is slow and the erosion hazard for the soil is characterized as slight. Depth to bedrock can be found more than 60 inches below the ground surface. This soil unit is characterized as a hydric soil by the USDA NRCS.

Liecester loam soils are mapped in a small area of the northeastern portion of the site along Baldwin Place Road, as shown in Figure 3.1-3, Soils Map.

Udorthent, wet substratum (Uc)

This soil map unit is defined by USDA SCS Soil Survey of Westchester and Putnam Counties as somewhat poorly drained and very poorly drained. It typically has been altered mainly by filling. The slopes range from 0 to 15 percent. The properties and characteristics of this soil map unit are variable due to the disturbance to the original soil. Typically, fill material is more than 20 inches deep over the original soil map unit.

Udorthent soils are mapped in small areas in the northwestern and northeastern portions of the property along Baldwin Place Road and US Route 6, as shown in Figure 3.1-3, Soils Map.

Charlton-Chatfield complex (CrC)

This soil map unit is defined by USDA SCS Soil Survey of Westchester and Putnam Counties as very to moderately deep and well to somewhat well drained. It can be found on hilltops and hillsides with slopes that range from 2 to 15 percent. This soil map unit is typically made up of 50 percent Charlton soil, 30 percent Chatfield soil, and 20 percent other soil map units and rock outcrops. The water table can be found more then 6 feet below the ground surface throughout most of the year in both Charlton and Chatfield soils. Permeability is moderate or moderately rapid throughout the profile. Available water capacity is moderate in Charlton soils and low in Chatfield soils. Surface runoff is medium in both soil map units making the erosion hazard moderate in each. Depth to bedrock can be found more than 60 inches below the ground surface in both soil map units. Both of the soil map units associated with the soil complex are not characterized as hyrdric soils by the USDA NRCS.

Charlton-Chatfield soils are mapped on the western portion of the property, as shown in Figure 3.1-3, Soils Map.

Urban land (Uf)

This soil map unit is defined by USDA SCS Soil Survey of Westchester and Putnam Counties as soils that are at least 60 percent covered with buildings or other structures. Slopes in this soil map unit range from 0 to 8 percent. Small areas of soils that have not been disturbed can include soils such as Riverhead, Chatfield, Sutton and Unadilla soils, which can be found in between buildings. On this site it can be assumed that the undisturbed portions of Urban Land are comprised of Chatfield soils since this is the most predominant soil map unit of those listed

as possible undisturbed soil types. The characteristics of this soil map unit is summarized above.

Urban land soils are mapped on the southeastern corner of the property, as shown in Figure 3.1-3, Soils Map.

Soil characteristics for individual soils mapped on the site are provided in Table 3.1-2, below. Also tabulated are the soil limitations that may affect typical site development activities. This information has been compiled from data in the SCS Soil Survey of Putnam and Westchester Counties. Development limitations are considered *slight* where soil properties are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties are less favorable for the indicated use and special planning, design or maintenance may be needed to overcome or minimize the limitations; and *severe* if soil properties require special design and would necessitate increased costs to construct and maintain.

Table 3.1-2
Soil Characteristics

Soil Series	Acres/ Percent	Hydrologic Group[1]	Permeability (in./hr.)	Erosion Factor K[2]
Paxton fine sandy loam (PnB, PnC, & PnD)	175.1/ 61.0%	C	0.6-2.0 (0-20" deep) <2.0 (20-60" deep)	0.24 (0-10" deep) 0.32 (10-20" deep) 0.24 (20-60" deep)
Woodbridge loam (WdB & WdC)	46.3/ 16.1%	C	0.6-2.0 (0-29" deep) <0.2 (29-60" deep)	0.24 (0-12" deep) 0.32 (12-29" deep) 0.24 (29-60" deep)
Ridgebury loam (RdA & RdB)	35.8/ 12.5%	C	0.6-6.0 (0-26" deep) <0.2 (26-60" deep)	0.24 (0-8" deep) 0.32 (8-26" deep) 0.24 (26-60" deep)
Sun loam (Sh)	13.2/ 4.6%	D	0.6-2.0 (0-9" deep) <0.2 (9-60" deep)	0.28 (0-9" deep) 0.20 (9-60" deep
Charlton loam (ChC, ChE, & CID)	7.4/ 2.6%	B	0.6-6.0 (0-60" deep)	0.24 (0-60"deep)
Leicester loam (LcA)	4.2/ 1.5%	C	0.6-6.0 (0-26" deep) 0.6-20.0 (26-60" deep)	0.24 (0-8" deep) 0.28 (8-26" deep) 0.24 (26-60" deep)
Udortents, wet substratum (Uc)	1.6/ 0.5%	Description of map unit is subjective and variable.		
Charlton-Chatfield complex (CrC)	1.2/ 0.4%	B	---Charlton--- 0.6-6.0 (0-60" deep) ---Chatfield--- 0.6-6.0 (0-24" deep)	---Charlton--- 0.24 (0-60" deep) ---Chatfield--- 0.24 (0-7" deep) 0.20 (7-24" deep)
Urban Land (Uf)	1.0/ 0.3%	Variable		
Water	1.4/ 0.5%	--------		
Total Acreage/ Percentage	287.2/ 100%	--------		

[1] Hydrologic groups are used to estimate runoff from precipitation; they range from high infiltration (A) to low infiltration (D).
[2] Erosion Factor K indicates susceptibility to sheet and rill erosion (expressed in tons/acre/year). K values range from 0.05 to 0.69 (0.05 being least susceptible).
Source: Soil Survey of Putnam and Westchester Counties, New York, USDA SCS

Table 3.1-3
Soil Limitations

Soil Series	Potential Limitations for:					
	Local Roads and Streets	**Dwellings without Basements**	**Shallow Excavations**	**Lawns and Landscaping**	**Small Commercial Buildings**	**Septic Tank and Absorption Fields**
Paxton fine sandy loam, (PnB, PnC, & PnD)	--PnB/PnC-- Moderate: wetness, slope, frost action. ----PnD---- Severe: slope.	--PnB/PnC-- Moderate: wetness, slope. ----PnD---- Severe: slope.	--PnB/PnC-- Moderate: dense layer, wetness, slope. ----PnD---- Severe: slope.	----PnB---- Slight ----PnC---- Moderate: slope. ----PnD---- Severe: slope.	----PnB---- Moderate: wetness, slope. --PnC/PnD-- Severe: slope.	Severe: percs slowly, slope.
Woodbridge loam, (WdB & WdC)	Severe: frost action.	Moderate: wetness, slope.	Severe: wetness.	Moderate: wetness, slope.	----WdB---- Moderate: wetness, slope. ----WdC---- Severe: slope.	Severe: wetness, percs slowly.
Ridgebury loam (RdA & RdB)	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: slope.	Severe: wetness, percs slowly.
Sun loam (Sh)	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, percs slowly.
Charlton loam (ChC, ChE, & CID)	Severe: slope.	-----ChC----- Moderate; slope. --ChE/CID-- Severe: slope.	-----ChC----- Moderate: slope. --ChE/CID-- Severe: slope.	-----ChC----- Moderate: slope. --ChE/CID-- Severe: slope.	Severe: slope.	-----ChC----- Moderate: slope. ---ChE/CID--- Severe: slope.
Leicester loam (LcA)	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Udortents, wet substratum (Uc)	Description of map unit is subjective and variable.					
Urban Land (Uf)	Variable					
Charlton-Chatfield complex (CrC)	---Charlton--- Moderate: slope. ---Chatfield--- Moderate: slope, depth to rock, frost action.	---Charlton--- Moderate: slope. ---Chatfield--- Moderate: slope, depth to rock, frost action.	---Charlton--- Moderate: slope. ---Chatfield--- Severe: depth to rock.	---Charlton--- Moderate: slope. ---Chatfield--- Moderate: drought, slope, thin layer.	Severe: slope.	---Charlton--- Moderate: slope. ---Chatfield--- Severe: depth to rock.

Source: Soil Survey of Putnam and Westchester Counties, New York, USDA SCS.

As noted in Table 3.1-3, the SCS identifies on-site soils as possessing potential limitations for development of roads, dwellings, small commercial buildings, shallow excavations, lawns and landscaping and septic areas due to their characteristics. Such limitations require planning consideration prior to development. The presence of these constraints does not mean the land

cannot be developed, nor are they a rating of construction potential. The ratings reflect the difficulty and relative costs of corrective measures that may be necessary (e.g. erosion controls, footing drains or other drainage improvements) for development. The limiting characteristics of these soils may be overcome through careful project planning, design and management. It is noted that the soils on the subject site are common in Putnam County and support many types of suburban land uses at the present time.

Soil Testing

Sixty-two (62) deep test holes were completed on the property in February and March of 2003 by Insite Engineering. As shown in Drawing P-1 contained, in Appendix C of this DEIS. Groundwater was observed as shallow as one foot below the ground surface (1.0 ft bgs) in D 39 located in the northern central portion of the property and as deep as eight feet below the ground surface (8 ft bgs) in D 4 in the northwestern portion of the property and in D 56 and D 59 located in the southwestern portion of the site. No groundwater, and only mottling, was observed within deep test holes D 42A to D 50 all located either along the western boundary of the property or the southeastern portion of the property. Depth to bedrock was not noted or encountered in the above mentioned soil testing due to the depth of completion of each boring, not deeper than nine feet below the ground surface (9.0 ft bgs).

Twenty-nine borings and nineteen test pits were completed by GeoDesign, Inc. during May and October 2009 for the purpose of investigating a subsurface treatment and disposal system. These borings were completed in the eastern portion of the property, extending west from US Route 6 into the central portion of the property outside the wetland buffer. The borings were completed to depths between 13.0 to 71.5 feet below the ground surface and the test pits were completed to depths between 12.0 to 16.5 feet below the ground surface; no bedrock was encountered in any of the borings or test pits.

Each of these boring was finished as a two-inch diameter observation well, except for B-30, to determine static water levels in the area. As documented in the GeoDesign report, Appendix C, the wells were installed to between 15.0 to 60.0 feet below the ground surface. Groundwater levels were then monitored during four (4) different monitoring events on June 2, 2009, June 30, 2009, July 20, 2009, and October 22, 2009. Groundwater levels were found between 1.6 and 48.9 feet below the ground surface in the borings and between 3.6 to 16.5 feet below the ground surface within the open test pits.

Geology/Bedrock/Subsurface Condition

The property lies within the Hudson highlands, which are part of the New England uplands physiographic province. In southern New York, this province is defined by a series of ridges and valleys with a large variety of rock types. It is underlain by complexly folded and faulted sequences of metamorphosed rock. The area of southern Putnam County in which the Property is located is comprised of middle Proterozoic (precambrian) bedrock. Specifically, the project site is underlain by biotite-quartz-plagioclase gneiss with subordinate biotic granitic gneiss, amphibolite, and calcsilicate rock. This rock is relatively hard but the surface of the bedrock, under the overburden soil, can be weathered. There are not many fractures or faults close to the surface of the bedrock and is of homogenous (uniform) material. If the rock were to be disturbed on one side of the Property the rock is hard enough to not cause an impact on the other side of the Property, vibrations will not travel a great distance.

Leggette, Brashears & Graham, Inc. (LBG) installed eleven (11) drinking water wells for the purpose of supplying potable drinking water at the site. During the drilling of these wells bedrock was encountered on the property from 30 feet below the ground surface to as deep as 230 feet below the ground surface.

3.1.2 Potential Impacts

Topography/Slopes Impacts

Impacts to slopes are directly related to the potential for soil erosion during construction. A Slopes Disturbance Map is shown in Figure 3.1-4. The site disturbance and grading is proposed in the northeastern portion of the property, throughout the central, western and eastern portions of the property and extends to the southern boundary.

Soil erosion during construction is related in part to the amount of disturbance to steep slopes. As described previously, approximately 8 percent of the entire site consists of slopes greater than 25 percent and the disturbance to these slopes impacts approximately 4 percent of the entire site. Impacts to slopes on the property are presented in Figure 3.1-4, Slope Disturbance Map.

A comparison of slopes disturbance is provided in Table 3.1-4 below.

Table 3.1-4
Slopes Disturbance Summary

Slope Category	Approximate Acres Disturbed	Percentage
0% to 15%	108.4 acres	66%
15% to 25%	43.4 acres	27%
>25%	12.2 acres	7%
Total Disturbance	164.0 acres	100%

Notes: Total Site Acreage: 287.2 acres
Source: Insite Engineering Surveying & Landscape Architecture, PC, 2009

Exposing soils on steep slopes during construction increases the potential for erosion in the short term. Steep slopes are located along the southwestern boundary of the site where areas of parking are proposed for the commercial development. Part of the road structure does traverse areas of steep slope located in the northeastern portion of the site and the eastern boundary of the site. Areas of the residential development, in the northeastern portion of the site, also proposed to disturb existing steep slopes These areas are where erosion is most likely to occur. Grading would be conducted in accordance with Chapter 142 and Chapter 156 of the Town of Carmel Code, which states "Roads and skid trails shall be located, designed and built on dry, well-drained spots and off of steep slopes. Running water shall be diverted off roads and primary skid trails when slopes exceed 10%. All roads shall be set back at least 100 feet from streams, ponds, lakes, swampy areas, marshes and other wetlands where slopes are less than 30% and 150 feet where slopes are steeper than 30%." This potential impact would be offset by adherence to soil erosion and sedimentation control practices described in Erosion and Sediment Control Plan Drawings SP-4.1 through SP-4.6 attached to this document and section 3.1.4 below. Following construction, soil erosion and slope failure on the property is expected to be minimal since developed areas would be stabilized with lawn and landscaping, and

stormwater management features would be fully functional. Soil erosion and slope failure would also be minimized by adhering to the Sediment and Erosion Control Plan and the permanent devices constructed to help maintain the property.

Soils Impacts

Site development is proposed mainly within three (3) soils groups on the Union Place Property. The majority of the site development is proposed in Paxton fine sandy loam soils (PnB and PnC), which are rated with moderate limitations for the construction of local roads, dwellings without basements, shallow excavations for utilities, lawns and landscaping, and small commercial buildings due to wetness, frost action and slopes. The remainder of the development would fall within Woodbridge loam soils (WdC and WdB), which are rated with moderate limitations for the construction of dwellings without basements, small commercial buildings, and lawns and landscaping due to slopes and wetness and with severe limitations for the construction of local roads and shallow excavations for utilities due to frost action and wetness; and Ridgebury loam soils (RdA), which are rated with severe limitations for the construction of buildings without basements, local roads, shallow excavations for utilities, lawns and landscaping, and small commercial buildings due to wetness, frost action for roads, and slope. Construction in these soils may require cutting, filling and possible rock removal by mechanical means such as ripping and hammering, as well as provisions to remove subsurface water within soils that have wetness and frost action limitations. This would require an increase in construction costs.

The proposed waste water treatment facility is located within Ridgebury Loam (RdB), Woodbridge loam (WdB & WdC), and Paxton fine sandy loam (PnD). According to the Soil Survey of Putnam and Westchester Counties, these soils have sever limitations due to slope, wetness, and that the soil percs slowly, for the construction of septic tank and absorption fields. The proposed action is not proposing to use absorption fields, rather there will be an effluent to a stream outside of the New York City watershed. However, on going testing by GeoDesign is occurring in the areas of proposed absorption fields in case in the future an alternative proposes to use an absorption field. The approval for the waste water treatment plant will need to be approved by the Westchester County Department of Health and the New York State Department of Environmental Conservation (NYSDEC).

As described above the site is 100% covered with soils with moderate and severe limitations. The site is approximately 88% covered with soils that carry a severe limitation, whether it be due to slopes, wetness, frost action, percs slowly or depth to rock. Disturbing these areas is proposed to be limited, where it is essential to develop in soils with severe limitations proper engineering methods will be maintained to construct in these areas.

Grading and recontouring of soils is required for the construction of roads, parking lots, building sites and a series of stormwater detention basins. Areas of proposed grade changes for the project development are shown in the grading plans attached to this document as Drawings SP-3.1 through SP-3.6. The total area of grading is estimated to be 163.8 acres. Approximately 123.4 acres of the project site would remain undisturbed.

The impacts to soils associated with site development work are temporary in nature, relating to erosion hazards. Virtually all of the disturbed area that does not become impervious would be graded, permanently stabilized, seeded and landscaped, including the stormwater management basins. The area to be revegetated and retained as open space equals approximately 201.3

acres, or 70.1 percent of the property, while the area of impervious surface proposed would be roughly 85.9 acres, or 29.9 percent of the property.

The majority of road construction and building construction would occur within soils mapped as Paxton fine sandy loam (PnC). Only limited grading would occur in the remaining soils on the property. As noted above Paxton soils have moderate limitation for the construction.

An estimate of the project earthwork has been completed by the project engineer. The areas anticipated to be disturbed are shown on Drawings SP-3.1 through SP-3.6 included within the plan set attached to this document. The grading would involve approximately 986,000 cubic yards (cy) of earth cut and approximately 909,000 cy of fill resulting in approximately 77,000 cy of excess material. The volume of excess material is primarily the result of cuts required for the construction building pads and the commercial development. The Applicant will continue to work to reduce the volume of excess material as the project plans are refined during the environmental and site plan review processes.

Geology/Bedrock/Physiography Impacts

While there are limited areas of surficial rock in the eastern portion of the project site (Figure 3.1-5, Locations of Limited Surficial Rock), the site specific soils investigations indicate that neither surficial nor near surface bedrock is present on the property. As indicated in the on-site soil borings associated with the well drilling, bedrock is located at depths between 30 feet and 230 feet below the ground surface. The surficial rock observed is primarily glacial erratics or large boulders and covers approximately 0.1 acres of land. This suggests that blasting will not be needed and that if rock is encountered it can be removed by mechanical means (i.e. ripping, chipping and hammering). Since blasting is not proposed a site specific blasting plan was not created.

3.1.3 Mitigation Measures

Soil Erosion and Sediment Control Plan

Erosion and sedimentation would be controlled during the construction period by temporary devices in accordance with a Sediment and Erosion Control Plan developed specifically for this site and this project (see Drawings SP-4.1 through SP-4.6 at the rear of this document) as well as the Preliminary Stormwater Pollution Prevention Plan (SWPPP) located in Appendix E. The plan has been developed by the project engineer, Insite Engineering, Surveying & Landscape Architecture, P.C., to address erosion control and slope stabilization in accordance with the Erosion and Sediment Control Guidelines in the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activities (Permit No. GP-0-10-001). The SWPPP, and the Sediment and Erosion Control Plan included in it, would be implemented during construction to prevent erosion and sedimentation of on- and off-site surface waters.

The Sediment and Erosion Control and Construction Sequencing Plans include the area of disturbance limitations, criteria and specifications for placement and installation of erosion control devices, and a maintenance schedule. As part of the NYSDEC SPDES permit no more than five acres of the site would be disturbed at one time without a variance from the NYSDEC and the Town of Carmel. Temporary erosion control devices include stabilized construction entrances, silt fencing, storm drain inlet protection, as well as, temporary sediment traps with optional dewatering devices. This stabilized construction entrance would minimize the tracking of soil from the project site onto local roads. Dust control would also occur by spraying water

onto dry exposed areas of the site. This would minimize the potential transportation of dust onto adjoining properties.

Silt fence barriers, constructed of geosynthetic filter cloth would be installed at the base of all disturbed slopes. These barriers are used to contain silt and sediment at its source and to inhibit its migration to other areas on-site and off-site by stormwater runoff. They would also be installed around the catch basins and drain inlets, to prevent silt from entering the stormwater collection system. The sediment traps would also act as a temporary erosion control measure with optional dewatering devices during construction of the proposed road and utilities. These sediment traps will be sized in accordance with the August 2005 publication, *New York State Standards and Specifications for Erosion and Sediment Control (Blue Book)*.

Permanent stormwater measures would divert stormwater runoff from steep slopes, control/reduce stormwater runoff velocities and volumes, and produce vegetative and structural stabilization. This would be accomplished by converting the temporary sediment traps to permanent stormwater management ponds, bringing them to their final grade and dimensions, installing the outlet control structures, and stabilizing the basins with vegetation. All pipe drainage systems would have rip rap aprons at the discharge points to prevent erosion. The runoff velocities would be reduced so that they do not cause erosion to the receiving water bodies. The primary method of permanent erosion and sediment control, other than the impervious surfaces proposed, would be the proposed vegetation to be planted on-site. Vegetation would control stormwater runoff by preventing soil erosion, reducing runoff volume and velocities, and providing a natural filter medium.

Construction Sequencing Plan

As part of the Sediment and Erosion Control plan an overall construction sequence was created, Figure 3.1-6 (Drawing SP-4.0 of the attached plan set). The plan is divided into 24 phases (1 to 24) for the Union Place portion of the proposed development and additional 19 phases (A through S) for Union Heights. These sequences are repeated below for ease of review.

Union Place Overall Construction Sequence:

1. Phase 1 involves the construction of the proposed access road platform utilizing the existing site access and establish Western Staging Area where indicated on the plan. This phase will disturb approximately 0.2 acres.
2. Phase 2 will involve the construction and stabilization of the temporary sediment trap (TST) 2.1P, including outlet structure, drainage piping, and temporary outlets. Underground utilities, drainage structures and subbase will be installed as part of this phase. In addition, installation of the North Entrance Road will be initiated and all stormwater runoff will be directed to TST 2.1P. This phase will disturb approximately 4.8 acres.
3. Phase 3 will involve construction and stabilization of TSTs 1.1P and 1.2P, including outlet structures, drainage piping, and temporary outlets. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TSTs 1.1P and 1.2P. This phase will disturb approximately 3.6 acres.
4. Phase 4 will involve construction and stabilization of TSTs 1.3P and 1.4P, including outlet structures, drainage piping, and temporary outlets. Underground utilities, drainage

structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TSTs 1.3P and 1.4P. This phase will disturb approximately 4.7 acres.

5. Phase 5 will involve construction and stabilization of TSTs 5.1P and 5.2P, including outlet structures, drainage piping, and temporary outlets. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TSTs 1.3P and 1.4P. This phase will disturb approximately 4.6 acres.
6. Phase 6 will involve construction and stabilization of TST 5.7P, including outlet structures, drainage piping, and temporary outlets. The remaining portion of East Entrance Road will be completed. Excavated material from borrow area 6b will be used for construction and stabilization of the Building A building pad in fill area to subgrade. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff from borrow area 6b will be directed to TST 5.7P. This phase will disturb approximately 4.9 acres.
7. Phase 7 involves continued excavation and the use excavated material for construction and stabilization of the Building A building pad in fill area to subgrade with material from borrow area 7b. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff from borrow area 7b will be directed to TST 2.1P, and remaining runoff from Phase 7 to TST 1.1P. This phase will disturb approximately 4.0.
8. Phase 8 involves continued excavation and use of excavated material for construction and stabilization of the Building A building pad in fill area to subgrade. Material from both borrow areas indicated as 8b will be used. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff from borrow areas will be directed to TSTs 1.4P and 5.1P, with the remainder of Phase 8 being directed to TST 1.1P. This phase will disturb approximately 4.7 acres.
9. Phase 9 involves the continued excavation and use of excavated material for construction and stabilization of the parking areas and building pads in fill area to subgrade Underground utilities, drainage structures and subbase will be installed as part of this phase. all stormwater runoff will be directed to TST 2.1P. This phase will disturb approximately 4.3 acres.
10. Phase 10 involves the continued excavation and use of excavated material for the construction and stabilization of the Building A building pad in fill area to subgrade with material from borrow area 10b. All underground utilities, drainage structures and subbase will be installed. All stormwater runoff from borrow area 10b is directed to TST 2.1P. This phase will disturb approximately 5.0 acres.
11. Phase 11 involves the construction and stabilization of TST 1.5P, including outlet structures, drainage piping, and temporary outlets. Underground utilities, drainage structures and subbase will be installed as part of this phase. This phase will disturb approximately 2.5 acres.
12. Phase 12 involves the construction of the Union Heights West road utilizing material from borrow area 12b. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff from Union Heights West road to TST 1.5P. Underground utilities, drainage structures and subbase will be installed as part of this phase. This phase will disturb approximately 5.0 acres.
13. Phase 13 involves the construction and stabilization of TST 1.6P, including outlet structures, drainage piping, and temporary outlets. Underground utilities, drainage

structures and subbase will be installed as part of this phase. In addition, the Wastewater Treatment Plant and access road will be constructed. All stormwater runoff will be directed to TST 1.6P. This phase will disturb approximately 3.6 acres .

14. Phase 14 involves continued excavation using excavated material from borrow area 14b for construction and stabilization of the Building A building pad in fill area to subgrade. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff from borrow areas will be directed to TSTs 2.1P and 5.7P and remainder of Phase 14 runoff will go to TST 1.1P. This phase will disturb approximately 4.3 acres.
15. Phase 15 involves the construction and stabilization of TSTs 5.3P and 5.6P, including outlet structures, drainage piping, and temporary outlets. Underground utilities, drainage structures and subbase will be installed as part of this phase. Excess material from construction of 5.3P and borrow area 15b will be used in the construction of 5.6P and entrance of Main Entrance Rd. This phase will disturb approximately 5.0 acres.
16. Phase 16 involves the construction and stabilization of TST 5.5P, including outlet structures, drainage piping, and temporary outlets. Underground utilities, drainage structures and subbase will be installed as part of this phase. Excess material from construction of 5.5P and borrow area 16b will be used in the construction Building A building pad. All stormwater runoff from Building A building pad portion of Phase 16 will be directed to TST 1.1P. This phase will disturb approximately 4.6 acres.
17. Phase 17 involves the construction and stabilization of TST 5.4P, including outlet structures, drainage piping, and temporary outlets. Underground utilities, drainage structures and subbase will be installed as part of this phase. This phase will disturb approximately 4.8 acres.
18. Phase 18 involves continued excavation using excavated material for construction and stabilization of the Building A building pad in fill area to subgrade with material from borrow area 18b. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff from borrow area 18b will be directed to TST 5.3P with the remaining runoff from Phase 18 going to TST 1.1P. This phase will disturb approximately 3.1 acres.
19. Phase 19 involves continued excavation of building pad and parking areas. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TST 5.4P. This phase will disturb approximately 3.7 acres.
20. Phase 20 involves continued excavation of Building L building pad and parking area. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TSTs 5.4P and 5.6P. This phase will disturb approximately 2.7 acres.
21. Phase 21 involves continued excavation of building pad and parking areas. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TST 5.4P. This phase will disturb approximately 4.2 acres.
22. Phase 22 involves excavation of Building I building pad and 3rd street using excess material for Phase F (Disturbance = 3.3 Ac.) of Union Heights. Total Disturbance associated with Phase 22 of Union Place (1.4 acres) and Phase F of Union Heights is approximately 4.7 acres.

23. Phase 23 involves excavation of Building G building pad using excess material for Phase H (Disturbance = 3.0 Ac.) of Union Heights. Total Disturbance associated with Phase 23 of Union Place (0.9 acres) and Phase H of Union Heights is approximately 3.9 acres.
24. Phase 24 involves excavation of Building K building pad and final portion of Main Street using excess material for Phase I (Disturbance = 2.6 Ac.) of Union Heights. Total Disturbance associated with Phase 24 of Union Place (2.2 acres) and Phase I of Union Heights is approximately 4.8 acres.

Union Place Overall Construction Sequence:

A. Phase A involves construction and stabilization of TSTs 6.4P and 6.6P, including outlet structures, drainage piping, and temporary outlets. Underground utilities, drainage structures and subbase will be installed as part of this phase. Also included in this phase is the initiation of Union Heights East entrance road construction, Road D, associated building pad and the establishment of the Eastern Staging Area. All stormwater runoff will be directed to TST 6.4P and 6.6P. This phase will disturb approximately 4.7 acres.
B. Phase B involves construction and stabilization of TSTs 6.3P and 6.5P, including outlet structures, drainage piping, and temporary outlets. Underground utilities, drainage structures and subbase will be installed as part of this phase. This phase will disturb approximately 4.1 acres.
C. Phase C involves continued construction of the Union Heights East road. Also included in this phase is the initiation of the constriction of the Union Heights West road, Road D, and associated building pad. All stormwater runoff will be directed to TSTs 6.4P and 6.3P. This phase will disturb approximately 4.2 acres.
D. Phase D involves construction and stabilization of TSTs 1.7P and 1.8P, including outlet structures, drainage piping, and temporary outlets and the remaining portion of East Entrance Road will be completed. Excavated material from the temporary sediment traps will be used to establish the northern end of Road J and associated building pad to subgrade. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TSTs 1.7P and 1.8P. This phase will disturb approximately 4.6 acres.
E. Phase E involves continued construction of the Union Heights West road and establishment of the building pad for the clubhouse. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TSTs 1.7P and 6.3P. This phase will disturb approximately 4.8 acres.
F. Phase F involves continued construction of the Union Heights West road, completion of Road J and the associated building pad. Underground utilities, drainage structures and subbase will be installed as part of this phase. Excess material from Phase 22 (Disturbance = 1.4 Ac.) of Union Place will be used for establishment of fill areas. All strormwater runoff will be directed to TST 1.5P. The total disturbance associated with Phase F of Union Heights (3.3 acres) and Phase 22 of Union Place is 4.7 acres.
G. Phase G involves completion of Union Heights West road. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TST 1.5P. This phase will disturb approximately 2.9 acres.
H. Phase H involves initiation of construction of Road I and the associated building pad with excess material from Phase 23 of Union Place (Disturbance = 0.9 Ac.). Underground

utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TST 1.7P. The total disturbance associated with Phase H of Union Heights (3.0 acres) and Phase 23 of Union Place is 3.9 acres.

I. Phase I involves completion of the construction of Road I and the associated building pad with excess material from Phase 24 of Union Place (Disturbance = 2.2 Ac.). Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TST 1.7P. The total disturbance associated with Phase I of Union Heights (2.6 acres) and Phase 24 of Union Place is 4.8 acres.

J. Phase J involves the initiation of Road K construction and associated building pad. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TST 1.5P. This phase will disturb approximately 3.6 acres.

K. Phase K involves the completion of Road K and associated building pad. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TST 1.5P. This phase will disturb approximately 3.4 acres.

L. Phase L involves construction of Road C and the associated building pad. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TST 6.4P. This phase will disturb approximately 3.1 acres.

M. Phase M involves construction of Road F and associated building pad. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TST 6.4P. This phase will disturb approximately 3.2 acres.

N. Phase N involves construction of Roads G and H and associated building pads. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TST 1.7P. This phase will disturb approximately 4.9 acres.

O. Phase O involves construction and stabilization of TSTs 6.1P and 6.2P including outlet structures, drainage piping, and temporary outlets and completion of the remaining portion of the East Entrance Road. Excavated material from the temporary sediment traps to be used to initiate construction of Road D and the associated building pad to subgrade. Underground utilities, drainage structures and subbase will be installed as part of this phase. Direct all stormwater runoff will be directed to TST 6.1P. This phase will disturb approximately 5.0 acres.

P. Phase P involves construction of Road A and the associated building pad. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TST 6.3P. This phase will disturb approximately 4.8 acres.

Q. Phase Q involves continuation of the construction of Road D, the associated building pad and the completion of the construction of Union Heights East road. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TST 1.5P. This phase will disturb approximately 4.1 acres.

R. Phase R involves completion of the construction of Road D and the associated building pad. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TST 1.5P. This phase will disturb approximately 4.4 acres.

S. Phase S involves construction of Road E and the associated building pad. Underground utilities, drainage structures and subbase will be installed as part of this phase. All stormwater runoff will be directed to TSTs 1.5P and 6.1P. This phase will disturb approximately 4.2 acres.

Other Mitigation Measures

Best Management Practices (BMPs)

The principle objectives of the Erosion and Sediment Control Plan are the following:

- divert clean surface water before it reaches the construction area;
- control erosion at its source with temporary and permanent soil protection measures;
- capture sediment-laden runoff from areas of disturbance and filter the runoff prior to discharge; and
- decelerate and distribute stormwater runoff through natural vegetative buffers or structural means before discharging to off-site areas.

These objectives would be achieved by utilizing a collective approach to managing runoff, i.e. Best Management Practices (BMPs).

Divert clean runoff - Diversion of runoff from off-site or stabilized areas would be accomplished through surface swales and erosion control barriers in order to keep clean water clean.

Coordinate grading and construction to minimize soil exposure - To the extent practical, the development would be phased to limit the area of disturbed soil at any particular time. One phase of construction, for example, would remain undisturbed or temporarily stabilized until the preceding phase is substantially complete.

Retain existing vegetation wherever feasible - Silt fencing/barriers would be used to physically define the limits of work. Wooded areas not to be developed (regraded), would be retained in the existing condition. Buffers of existing vegetation would be provided along the perimeter of the site and near existing wetland areas wherever possible.

Stabilize disturbed areas as soon as possible - Stabilization measures shall be implemented as soon as practicable, but in no case, more than 14 days after construction activity has ceased. In areas where work would not occur for periods longer than two weeks, soil stabilization by hydroseeding or mulching would be completed. Following completion of grading operations, level areas would be immediately seeded and mulched. Sloped areas, such as fill slopes may be seeded or stabilized depending upon weather conditions at the time of carrying out the work.

Maintain low runoff velocities - To protect disturbed areas from stormwater runoff, haybale diversion berms and/or soil diversion berms and channels would be installed wherever

runoff is likely to traverse newly exposed soil. Immediately following the clearing and stripping of topsoil, rough grading for the temporary and permanent swales and ponds would take place. The swales would direct runoff so that it can be checked or impounded.

Trap sediment on-site and prior to reaching critical areas such as wetlands - Silt fences, stone check dams, filter strips, temporary sediment ponds, sediment traps, and catch basin filters would be used to either impound sediment-carrying runoff and/or to filter the runoff as it flows through an area. A stabilized construction entrance would be installed at the single construction entrance to prevent construction vehicles from tracking soil onto public roadways. All temporary erosion control devices would be installed prior to the commencement of construction.

Establish a thorough inspection, maintenance and repair program - During active soil disturbance activities, erosion control measures would be inspected by a qualified inspector, as defined in GP-0-10-001, once every seven days, and repaired as needed to ensure that they function properly. In addition to inspections by Town of Carmel representatives, the qualified inspector engaged by the Applicant would be responsible for monitoring and maintaining the soil erosion and sedimentation controls.

Where greater than five acres of soil are disturbed, a qualified inspector, as defined in GP-0-10-001, will conduct at least two site inspections in accordance with Part IV. B. of GP-0-10-001, every seven calendar days for as long as the disturbance remains.

Assign responsibility for the maintenance program - The responsibility for implementing, monitoring, and maintaining the Sediment and Erosion Control Plan would be detailed in the project specifications or construction drawings.

With the incorporation of the proposed procedures, protocols and practices, the Proposed Action would not result in significant adverse impacts to geology, soils or topography.

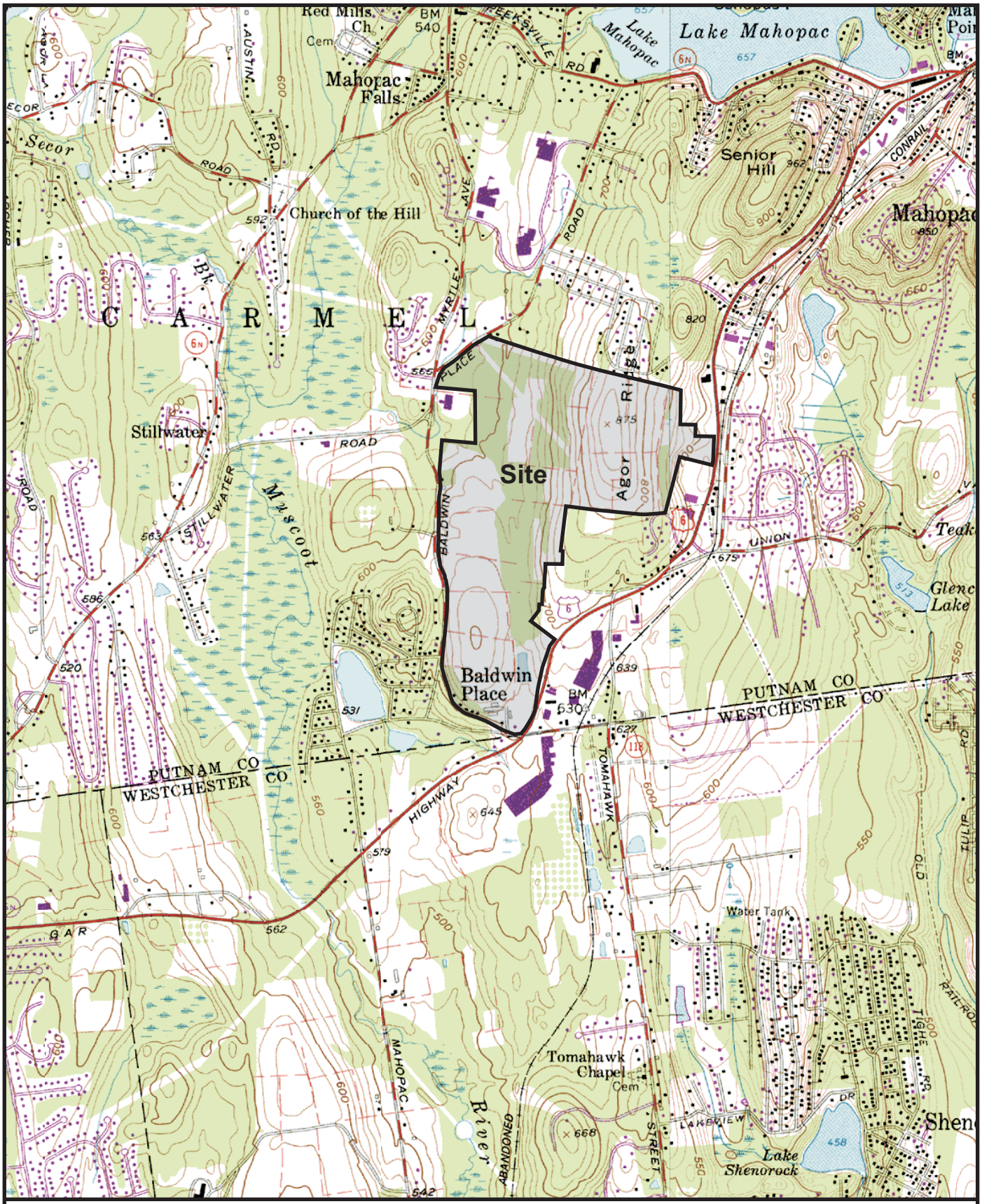
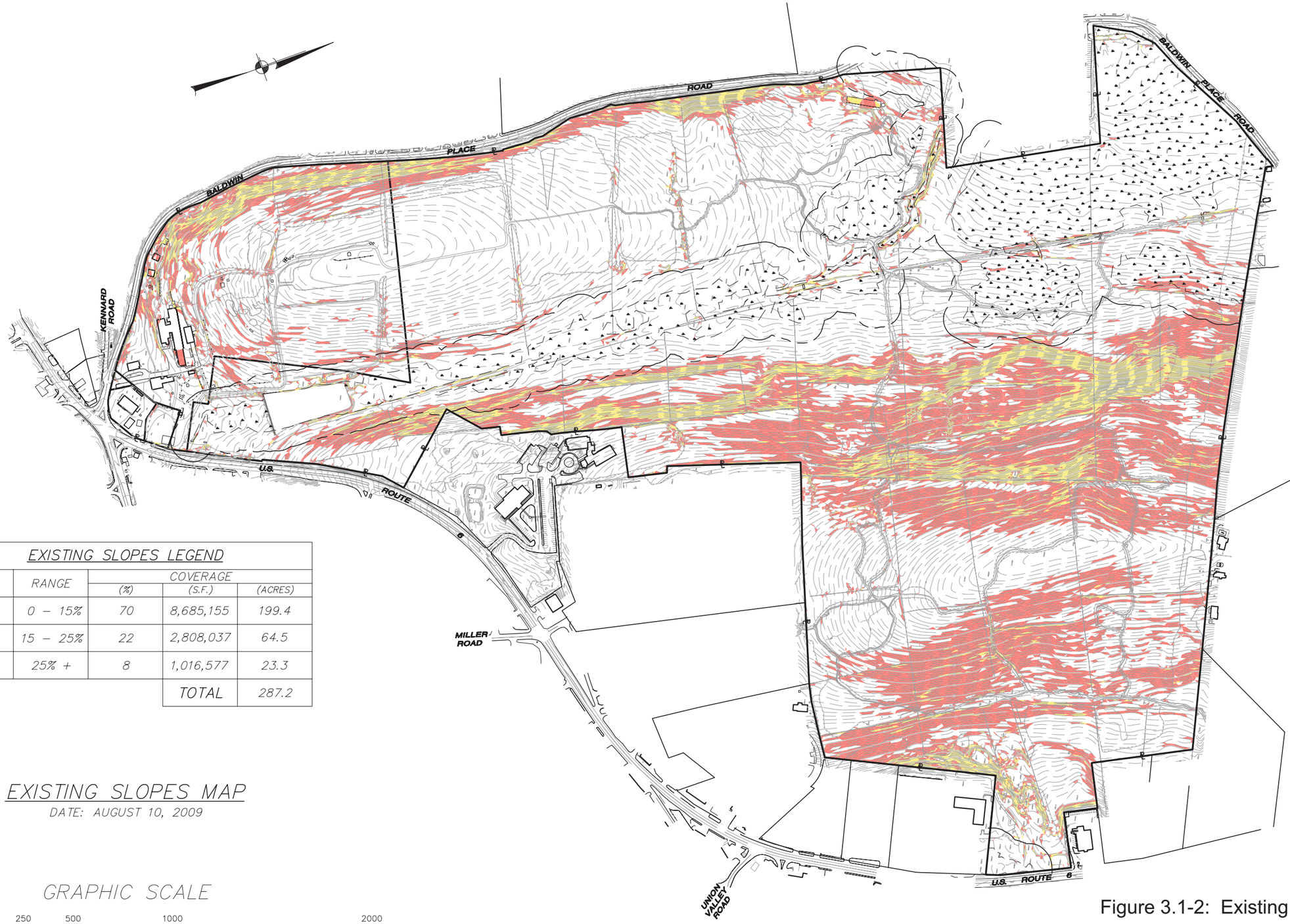


Figure 3.1-1: Local Topography Map
Union Place
Town of Carmel, Putnam County, New York
Base Map: USGS 7.5-minute Topographic Map, Mohegan Lake Quad
Scale: 1" = 2,000'

File 07049 8/25/07
JS:\07049

Tim Miller Associates, Inc.,10 North Street, Cold Spring, New York 10516 (845) 265-4400 Fax (845) 265-4418



EXISTING SLOPES LEGEND				
KEY	RANGE	COVERAGE (%)	(S.F.)	(ACRES)
	0 – 15%	70	8,685,155	199.4
	15 – 25%	22	2,808,037	64.5
	25% +	8	1,016,577	23.3
			TOTAL	287.2

EXISTING SLOPES MAP

DATE: AUGUST 10, 2009

GRAPHIC SCALE

500 0 250 500 1000 2000

(IN FEET)

1 inch = 500 ft.

File 07049 09/03/09
JS/07049

Figure 3.1-2: Existing Slopes Map
Union Place
Town of Carmel, Putnam County, New York
Source: Insite Engineering, Surveying & Landscape Architecture, P.C., 8/11/09
Scale: As shown

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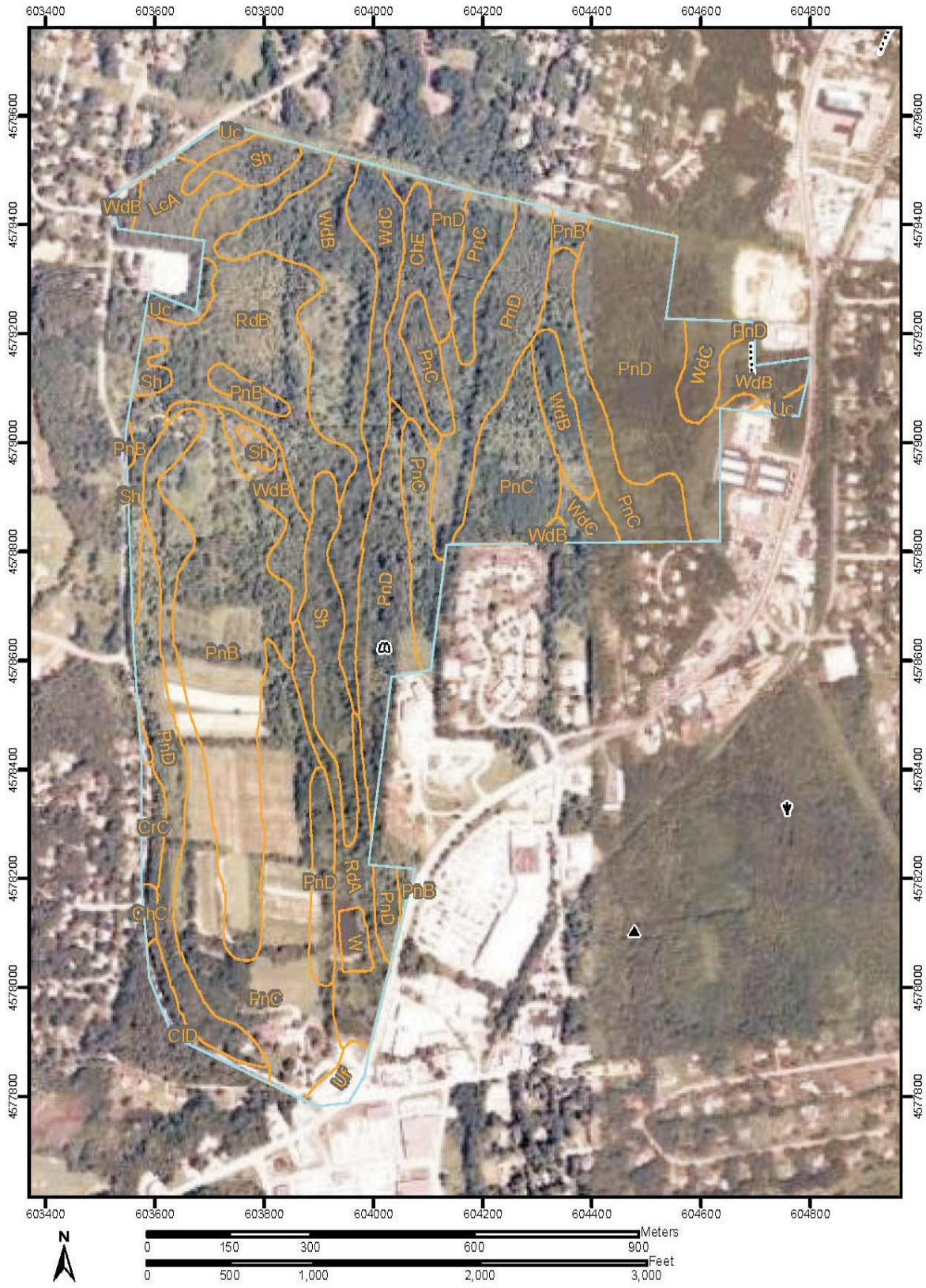

Figure 3.1-3: Soils Map
Union Place
Town of Patterson, Putnam County, New York
Source: CITY/SCAPE Cultural Resource Consultants
Scale: As shown

File 07049 9/24/08
JS:\07049

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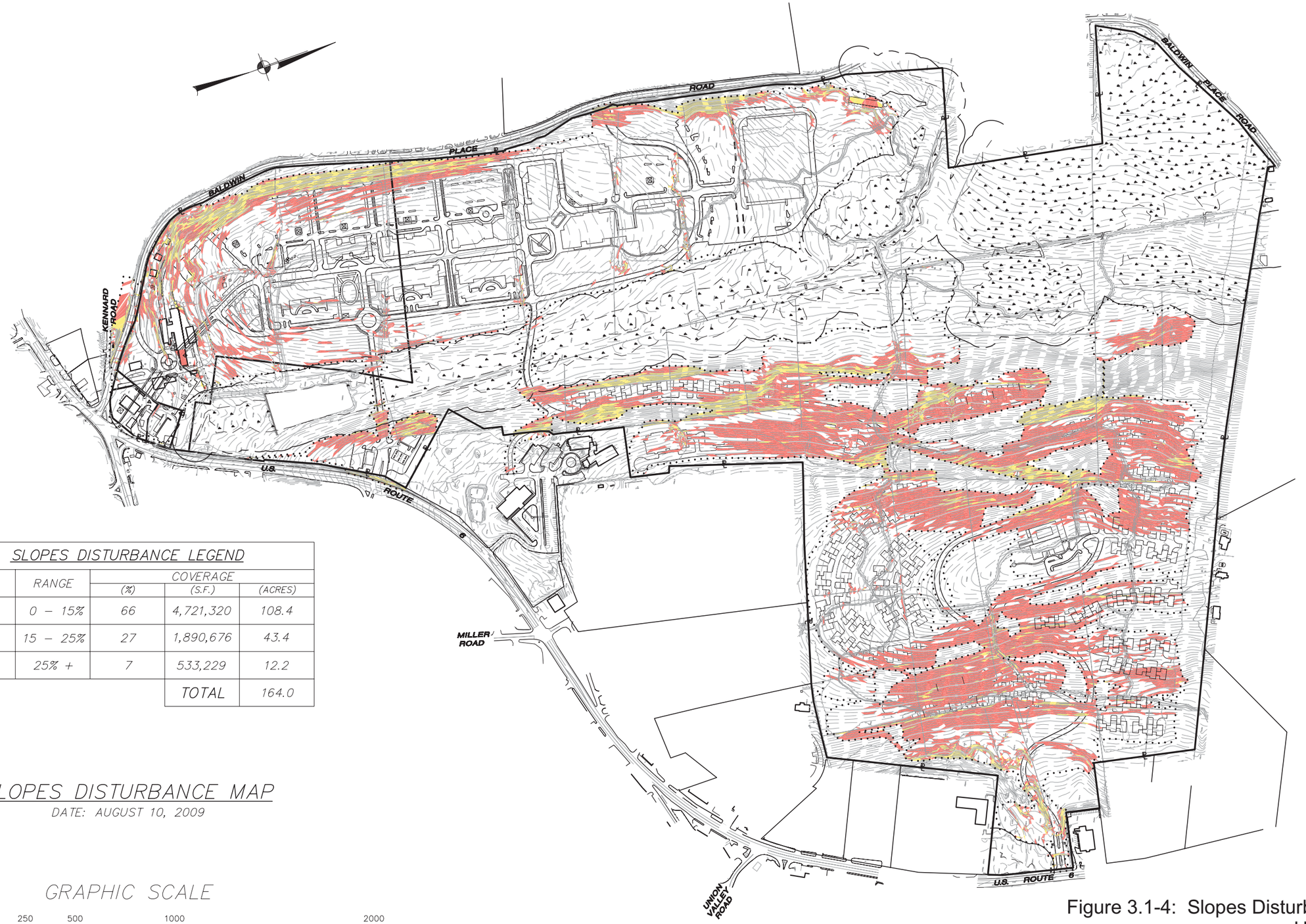

SLOPES DISTURBANCE LEGEND				
KEY	RANGE	COVERAGE		
		(%)	(S.F.)	(ACRES)
	0 – 15%	66	4,721,320	108.4
	15 – 25%	27	1,890,676	43.4
	25% +	7	533,229	12.2
			TOTAL	164.0

SLOPES DISTURBANCE MAP

DATE: AUGUST 10, 2009

GRAPHIC SCALE

500 0 250 500 1000 2000

(IN FEET)

1 inch = 500 ft.

File 07049 09/03/09
JS/07049

Figure 3.1-4: Slopes Disturbance Map
Union Place
Town of Carmel, Putnam County, New York
Source: Insite Engineering, Surveying & Landscape Architecture, P.C., 8/11/09
Scale: As shown

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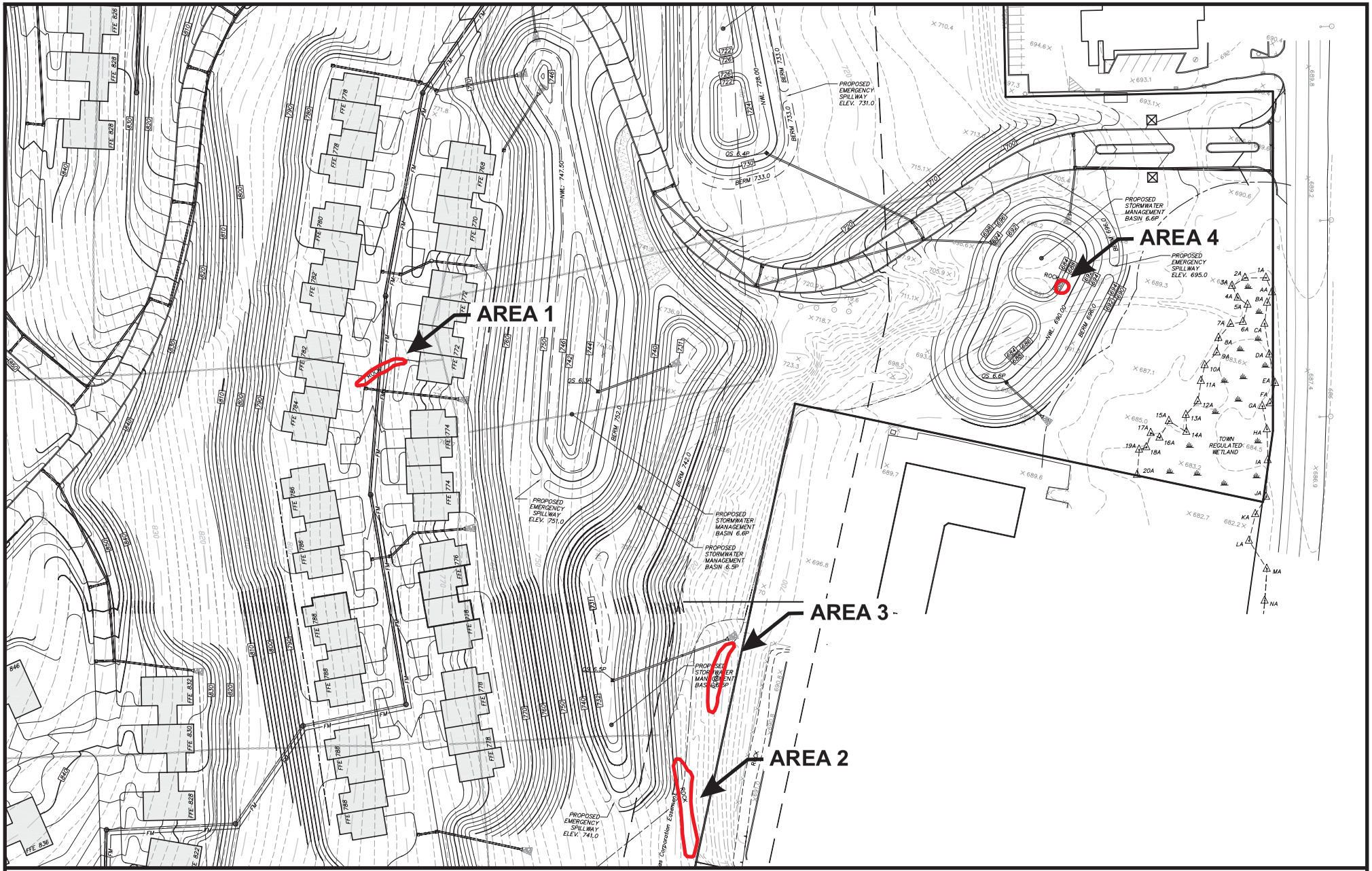

Figure 3.1-5: Locations of Limited Rock Outcrops
Union Place
Town of Carmel, Putnam County, New York
Source: Insite Engineering, Surveying & Landscape Architecture, P.C., 2/20/09
Scale: As shown

File 07049 9/03/09
JS/07049

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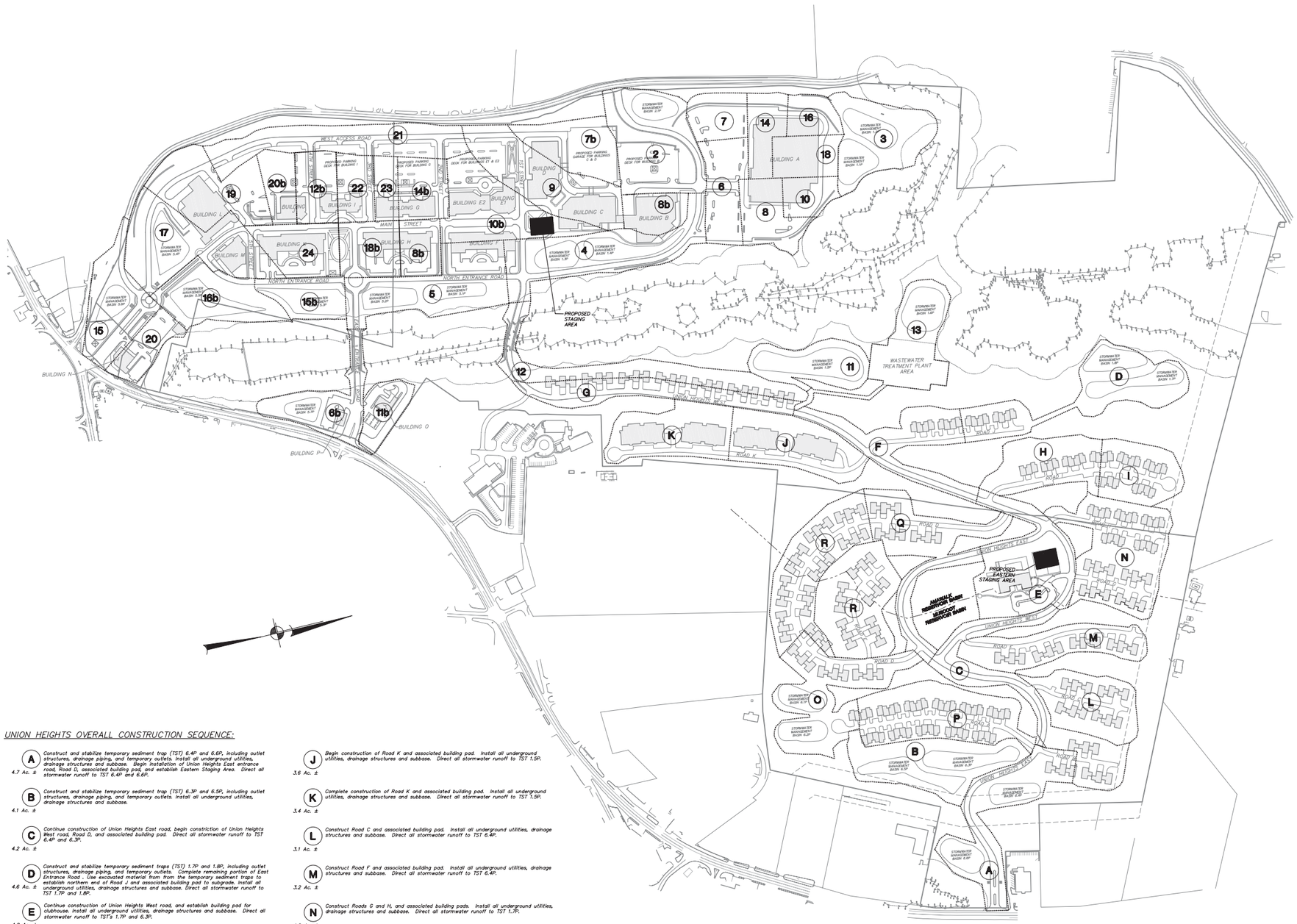

UNION PLACE OVERALL CONSTRUCTION SEQUENCE:

1 — 0.2 Ac. ±
Utilize existing site access and establish Western Staging Area where indicated on the plan.

2 — 4.8 Ac. ±
Construct and stabilize temporary sediment trap (TST) 2.1P, including outlet structure, drainage piping, and temporary outlets. Install all underground utilities, drainage structures and subbase. Begin installing North Entrance Road. Direct all stormwater runoff to TST 2.1P.

3 — 3.6 Ac. ±
Construct and stabilize temporary sediment trap (TST) 1.1P and 1.2P, including outlet structures, drainage piping, and temporary outlets. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 1.1P and 1.2P.

4 — 4.7 Ac. ±
Construct and stabilize temporary sediment trap (TST) 1.3P and 1.4P, including outlet structures, drainage piping, and temporary outlets. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 1.3P and 1.4P.

5 — 4.6 Ac. ±
Construct and stabilize temporary sediment trap (TST) 5.1P and 5.2P, including outlet structures, drainage piping, and temporary outlets. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 1.3P and 1.4P.

6 — 4.9 Ac. ±
Construct and stabilize temporary sediment trap (TST) 5.7P, including outlet structures, drainage piping, and temporary outlets. Complete remaining portion of East Entrance Road . Use excavated material from borrow area 6b for construction and stabilization of the Building A building pad in fill area to subgrade. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff from borrow area 6b to TST 5.7P.

7 — 4.0 Ac. ±
Continue excavation using excavated material for construction and stabilization of the Building A building pad in fill area to subgrade with material from borrow area 7b. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff from borrow area 7b to TST 2.1P, and remaining runoff from Phase 7 to 1.1P.

8 — 4.7 Ac. ±
Continue excavation using excavated material for construction and stabilization of the Building A building pad in fill area to subgrade. Use material from both borrow areas indicated as 8b. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to from borrow areas to 1.4P and 5.1P, and remainder of Phase 8 to 1.1P.

9 — 4.3 Ac. ±
Continue excavation using excavated material for construction and stabilization of the parking areas and building pads in fill area to subgrade. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 2.1P.

10 — 5.0 Ac. ±
Continue excavation using excavated material for construction and stabilization of the Building A building pad in fill area to subgrade with material from borrow area 10b. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff from borrow area 10b to TST 2.1P, and remaining runoff from Phase 10 to 1.1P.

11 — 2.5 Ac. ±
Construct and stabilize temporary sediment trap (TST) 1.5P, including outlet structures, drainage piping, and temporary outlets. Install all underground utilities, drainage structures and subbase.

12 — 5.0 Ac. ±
Construct Union Heights West road utilizing material from borrow area 12b. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff from Union Heights West road to TST 1.5P.

13 — 3.6 Ac. ±
Construct and stabilize temporary sediment trap (TST) 1.6P, including outlet structures, drainage piping, and temporary outlets. Install all underground utilities, drainage structures and subbase. Construct Wastewater Treatment Plant and access road. Direct all stormwater runoff to 1.6P.

14 — 4.3 Ac. ±
Continue excavation using excavated material from borrow area 14b for construction and stabilization of the Building A building pad in fill area to subgrade. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff from borrow areas to 2.1P and 5.7P, and remainder of Phase 14 to 1.1P.

15 — 5.0 Ac. ±
Construct and stabilize temporary sediment trap (TST) 5.3P and 5.6P, including outlet structures, drainage piping, and temporary outlets. Install all underground utilities, drainage structures and subbase. Use excess material during construction of 5.3P, borrow area 15b, in the construction of 5.6P and entrance of Main Entrance Rd.

16 — 4.6 Ac. ±
Construct and stabilize temporary sediment trap (TST) 5.5P, including outlet structures, drainage piping, and temporary outlets. Install all underground utilities, drainage structures and subbase. Use excess material during construction of 5.5P, borrow area 16b, in the construction Building A building pad. Direct all stormwater runoff from Building A building pad portion of Phase 16 to 1.1P.

17 — 4.8 Ac. ±
Construct and stabilize temporary sediment trap (TST) 5.4P, including outlet structures, drainage piping, and temporary outlets. Install all underground utilities, drainage structures and subbase.

18 — 3.1 Ac. ±
Continue excavation using excavated material for construction and stabilization of the Building A building pad in fill area to subgrade with material from borrow area 18b. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff from borrow area 18b to TST 5.3P, and remaining runoff from Phase 18 to 1.1P.

19 — 3.7 Ac. ±
Continue excavation of building pad and parking areas. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 5.4P.

20 — 2.7 Ac. ±
Continue excavation of Building L building pad and parking area. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 5.4P and 5.6P.

21 — 4.2 Ac. ±
Continue excavation of building pad and parking areas. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 5.4P.

22 — 1.4 Ac. ±
Excavate Building I building pad and 3rd street using excess material for Phase F (Disturbance = 3.3 Ac.) of Union Heights. Total Disturbance associated with Phase 22 of Union Place and Phase F of Union Heights = 4.7 Ac.

23 — 0.9 Ac. ±
Excavate Building G building pad using excess material for Phase H (Disturbance = 3.0 Ac.) of Union Heights. Total Disturbance associated with Phase 23 of Union Place and Phase H of Union Heights = 3.9 Ac.

24 — 2.2 Ac. ±
Excavate Building K building pad and final portion of Main Street using excess material for Phase I (Disturbance = 2.6 Ac.) of Union Heights. Total Disturbance associated with Phase 24 of Union Place and Phase I of Union Heights = 4.8 Ac.

UNION HEIGHTS OVERALL CONSTRUCTION SEQUENCE:

A — 4.7 Ac. ±
Construct and stabilize temporary sediment trap (TST) 6.4P and 6.6P, including outlet structures, drainage piping, and temporary outlets. Install all underground utilities, drainage structures and subbase. Begin installation of Union Heights East entrance road, Road D, associated building pad, and establish Eastern Staging Area. Direct all stormwater runoff to TST 6.4P and 6.6P.

B — 4.1 Ac. ±
Construct and stabilize temporary sediment trap (TST) 6.3P and 6.5P, including outlet structures, drainage piping, and temporary outlets. Install all underground utilities, drainage structures and subbase.

C — 4.2 Ac. ±
Continue construction of Union Heights East road, begin constriction of Union Heights West road, Road D, and associated building pad. Direct all stormwater runoff to TST 6.4P and 6.3P.

D — 4.6 Ac. ±
Construct and stabilize temporary sediment traps (TST) 1.7P and 1.8P, including outlet structures, drainage piping, and temporary outlets. Complete remaining portion of East Entrance Road . Use excavated material from from the temporary sediment traps to establish northern end of Road J and associated building pad to subgrade. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 1.7P and 1.8P.

E — 4.8 Ac. ±
Continue construction of Union Heights West road, and establish building pad for clubhouse. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST's 1.7P and 6.3P.

F — 3.3 Ac. ±
Continue construction of Union Heights West road, complete Road J, and associated building pad. Install all underground utilities, drainage structures and subbase. Use excess material from Phase 22 (Disturbance = 1.4 Ac.) of Union Place for establishment of fill areas. Direct all stormwater runoff to TST 1.5P. Total Disturbance associated with Phase F of Union Heights and Phase 22 of Union Place is 4.7 Ac.

G — 2.9 Ac. ±
Complete construction of Union Heights West road. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 1.5P.

H — 3.0 Ac. ±
Begin construction of Road I and associated Building pad with excess material from Phase 23 of Union Place (Disturbance = 0.9 Ac.). Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 1.7P. Total Disturbance associated with Phase H of Union Heights and Phase 23 of Union Place is 3.9 Ac.

I — 2.6 Ac. ±
Complete construction of Road I and associated Building pad with excess material from Phase 24 of Union Place (Disturbance = 2.2 Ac.). Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 1.7P. Total Disturbance associated with Phase I of Union Heights and Phase 24 of Union Place is 4.8 Ac.

J — 3.6 Ac. ±
Begin construction of Road K and associated building pad. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 1.5P.

K — 3.4 Ac. ±
Complete construction of Road K and associated building pad. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 1.5P.

L — 3.1 Ac. ±
Construct Road C and associated building pad. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 6.4P.

M — 3.2 Ac. ±
Construct Road F and associated building pad. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 6.4P.

N — 4.9 Ac. ±
Construct Roads G and H, and associated building pads. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 1.7P.

O — 5.0 Ac. ±
Construct and stabilize temporary sediment traps (TST) 6.1P and 6.2P including outlet structures, drainage piping, and temporary outlets. Complete remaining portion of East Entrance Road . Use excavated material from from the temporary sediment traps to begin construction of Road D and associated building pad to subgrade. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 6.1P.

P — 4.8 Ac. ±
Construct Road A, and associated building pad. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 6.3P.

Q — 4.1 Ac. ±
Continue construction of Road D, associated building pad, and complete construction of Union Heights East road. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 1.5P.

R — 4.4 Ac. ±
Complete construction of Road D, and associated building pad. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 1.5P.

S — 4.2 Ac. ±
Construct Road E and associated building pad. Install all underground utilities, drainage structures and subbase. Direct all stormwater runoff to TST 1.5P and 6.1P.

CONSTRUCTION SEQUENCE NOTES:

1. For Erosion and Sediment Control Notes, see Drawing D-5.
2. Each phase of work implies that all sediment and erosion control measures will be installed in accordance with best management practices and prior to any clearing and grubbing operations.
3. Each phase of work implies the removal of existing trees and grubbing of all tree root systems.
4. All topsoil is to be stripped and stockpiled in appropriate locations for future use on the site. All stockpiled soil areas are to be appropriately stabilized and protected.
5. All finished slopes greater than 3:1 are to be immediately stabilized.
6. No more than 5 acres of disturbance shall be permitted at any one time without prior written approval from the New York State Department of Environmental Conservation.
7. Should groundwater be encountered during excavation the contractor shall contact the project's certified erosion control specialist immediately to assess the situation. Dewatering, should groundwater be encountered, shall be discharged from the sump to a splash pad or energy dissipator with silt fence down gradient.

GRAPHIC SCALE
200 0 100 200 400 800
(IN FEET)

Figure 3.1-6: Construction Sequencing Plan

Union Place
Town of Carmel, Putnam County, New York
Source: Insite Engineering, Surveying & Landscape Architecture, P.C.. 2/20/09
Scale: 1" = 550'

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JS/07049

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