

SUPPLEMENTAL DATA REPORT

**Map 22, Parcel 3.3
Boston Road
Westford, MA**



January 2007

Prepared for: The Town of Westford

LANDTECH

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SECTION 1. EXISTING CONDITIONS

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1.1 Site Description

The subject site consists of approximately 17.74 acres of land, listed as Parcel 3.3, on Town of Westford Assessor's Map 22. The site is currently zoned Residential A (RA).

The site is bounded to the north by Blake's Hill Road, to the east by Boston Road, and to the south by Route 495. To the west the property is abutted by land owned by New England Power Company and Mass. Electric Company.

1.2 Topographic Features and Vegetative Cover

In general the sites topography is elevated above the adjacent Boston Road and slope's downward to the wetland areas located at the center and rear of the site. The site's high point has an elevation of approximately two hundred and ninety-eight (298) feet above sea level and is located in the northwest corner of the site adjacent to Blake's Hill Road. The site's ultimate low point, located along the southwest side of the property within the wetlands, has an elevation of less than two hundred and sixty-two (262) above sea level.

The site is divided by four hundred (400) feet of power company easements running east west through the site. The easements contain several sets of overhead and high tension power lines.

The area north of the power lines contains approximately five and one quarter (5.25) acres of land. Contained in this area are an access road to the abutting Mass. Electric Substation, a stormwater basin for Blake's Hill Road, and a small area of wetlands. The undeveloped areas are wooded. The majority of the trees are coniferous with light underbrush. A well maintained cart path leads from the access roadway to the power line easements.



Figure 1 Cart path heading to power lines from the access road.

The area under the power lines is free of trees with a ground cover of low brush or junipers. This area contains approximately six and one half (6.5) acres. A finger of the wetlands extends from the rear of the property under the power lines roughly half way to the front of the site. A cart path meanders under the power lines towards the wetlands at the rear of the site.



Figure 2 Power lines adjacent to Boston Road.

The area south of the power lines contains approximately six (6.0) acres of land. This area is fairly evenly split between wooded areas and wetlands. The existing cart path does not extend past the power lines and as such provides no direct access to this area.



Figure 3 Wooded area beyond the power lines looking south.

1.3 Resource Areas

A large wetland is located along the western boundary of the site. Two wetland fingers extend well into the site. The wetland has been flagged according to its vegetation, groundwater indicators and soil indicators in accordance with the Wetland Protection Act and the Town of Westford Non-Zoning Bylaw. The wetlands were flagged by Basbanes Wetland Consulting and field located by LANDTech Consultants, Inc. in November 2006. The wetlands flags and the associated buffer zones are shown on the attached plans. Due to the shape of the wetlands, large areas of the site are contained within the associated buffers zones and as such are subject to the Wetlands Protection Act and the Westford Wetland Non-Zoning Bylaw.

The site is not located within an Estimated Habitat of Rare Wetland Wildlife and a Priority Habitat of Rare Species as shown on Natural Heritage and Endangered Species Program 2006 Priority Habitat and Estimated Habitat Maps, maintained in the MassGIS system.

The wetland area along the westerly portion of the parcel is located in a Zone A, 100-year floodplain as shown on the Federal Emergency Management Agency FEMA Flood Insurance Rate Map for community panel number 250225 0009 B, effective June 15, 1983. The remainder of the site is within Zone C, areas of minimal flooding outside the 500-year flood plain.



Figure 4 Wetland area at western property line.

SECTION 2. SOILS ANALYSIS

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2.1 Subsurface Conditions

According to the Middlesex County Soil Survey Report Middlesex County the majority of the site contains soil group **7C** and **7D**, *Charlton-Hollis-Rock outcrop complex*. This agrees with the Natural Resource Conservation Service (N.R.C.S.) Soil Maps (see appendix C). The N.R.C.S. describes Charlton-Hollis-Rock outcrop complex as Charlton and Hollis soils with rock outcrops that occur in such intricate patterns on the landscape, that it is not practical to separate them. The N.C.R.S. lists the depth to bedrock and rockiness as major limitation for this soils group. The perimeter of the site is shown to contain or be adjacent to soil groups **122** *Paxton fine sandy loam*, and **81** *Woodbridge fine sandy loam*. The following soil descriptions were taken from the *Middlesex County Massachusetts Interim Soil Survey Report*, fourth edition, by the United States Department of Agriculture Natural Resource Conservation Service, published by the Middlesex Conservation Service, July 1995.

CHARLTON

Charlton series consists of gently sloping to steep, deep (5+ft.), well drained soils on uplands where the relief is affected by underlying bedrock. They formed in glacial till ground moraines. Charlton soils are 60 inches or more of friable fine sandy loam surface soils, subsoil, and substratum with moderate or moderately rapid permeability. Charlton soils have a very stony or extremely stony surface, except where the stones have been removed, and have stones below the surface. Major limitations are related to slope and stoniness.

HOLLIS

Hollis series consist of gently sloping to very steep, shallow (<20"), somewhat excessively drained soils on bedrock controlled uplands. They formed in a thin mantle of glacial till or residuum from local bedrock. Hollis soils have friable fine sandy loam surface soil and subsoil with moderate or moderately sandy loam surface soil and subsoil with moderate or moderately rapid permeability. Depth to bedrock is 10 to 20 inches. Rock outcrops are common, and many areas have stones and boulders on the surface. Major limitations are related to to depth to bedrock, rockiness, and slope.

PAXTON

Paxton Series consists of gently sloping to very steep, deep (5+ft.), well drained soils on drumlins. They formed in compact glacial till. Paxton soils have friable fine sandy loam surface soil and subsoil with moderate permeability over a firm or very firm fine sandy loam substratum (hardpan) at 15 to 38 inches which has slow or very slow permeability. Paxton soils have a very stone or extremely stony surface, except where stones have been removed, and have stones below the surface. Major limitations are related to slow permeability in the substratum, slope and stoniness.

WOODBIDGE

Woodbridge series consists of nearly level top steep, deep (5+ft.), moderately well drained soils on drumlins. They formed in compact glacial till. Woodbridge soils have friable fine sandy loam or sandy loam surface soil and subsoil with moderate permeability over a firm, fine sandy loam substratum at 15 to 38 inches which has slow or very slow permeability. Woodbridge soils have a very stony or extremely stony surface except where stones have been removed, and have stones below the surface. They have a perched, seasonal high water table at 18 to 24 inches. Major limitations are related to wetness, slow permeability in the substratum, stoniness, and slope.

Subsurface testing was performed on the site under the supervision of the Westford Board of Health. Test hole locations are shown on the attached site plans, and results of the testing are shown in Appendix B of this report. Test holes **1206-1** to **1206-5** were conducted in the area north of the power lines and found soils consistent with the description of *Charlton-Hollis-Rock outcrop complex*. These five holes varied in depth from just five (5) feet to nine (9) feet with refusal due to bedrock or possibly very large boulders in all holes. Test hole **1206-1** was the shallowest hole and did not demonstrate the four feet of naturally occurring material required to be a suitable for a septic system. All holes had a significant amount of stones or boulders and approximately 50% or more of the material removed during the excavation was rock. Estimated seasonal high groundwater was assumed to be at the bottom of the excavation (refusal) for all five holes. A percolation test was conducted adjacent to test hole **1206-5** to determine the permeability of the soils. The result was a percolation rate of ten (10) minutes per inch. Test hole **1206-6** was conducted south of the power lines near the front of the site and was consistent with the previous five holes except that almost no stones or boulders were present. No evidence of groundwater was observed. The last hole, **1206-7**, was south of the power lines towards the rear of the site. In this hole we encountered soils consistent with the description of *Woodbridge fine sandy loam*. The material appeared to have a slow to very slow permeability and a high (36") estimated seasonal high groundwater table.

2.2 SITE POTENTIAL AND CONSTRAINTS

In general *Charlton-Hollis-Rock outcrop complex* have a reasonable permeability, suitable for the installation of an on-site sewage disposal system, when sufficient soil is present above bedrock. In addition the permeability of the soils would allow for infiltration of storm water as part of storm water management system assuming sufficient soil was available above bedrock.

The main constraints are related to the depth to bedrock and the amount of stones present within the soil. It is anticipated that construction cost would be substantially increased for this site due to the need for blasting and rock removal for the installation of building foundations, drainage structures and pipes, and underground utilities. In addition the amount of rock and the depth to bedrock could become a major limitation in the placement of an on-site sewage disposal system, which is required by State regulations to be located in an area with a minimum of four (4) feet of naturally occurring pervious soil excluding the topsoil.

SECTION 3. DRAINAGE ANALYSIS

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3.1 EXISTING DRAINAGE PATTERNS

In general the site can be divided into two drainage subcatchments. The first encompasses an area 150'-200' deep, parallel to Boston Road and the Route 495 on-ramp. This area drains towards the front of the site and Boston Road. The second subcatchment encompasses the remainder of the site and drains towards the wetlands located at the rear of the site.

3.2 SITE POTENTIAL AND CONSTRAINTS

The development of any property creates increases in runoff through the addition of impervious surfaces including building, roads, and parking areas. This increase must be mitigated through the use of storm water management systems that detain and infiltrate runoff to maintain the amount of runoff leaving the site at predevelopment conditions. Common techniques include collecting runoff via catch basins and routing through detention basins or subsurface infiltration systems. Massachusetts Highway Department policy will not allow an increase in runoff to roadways under their control and prefers to see no runoff entering the roadway. In this case both Boston Road and Route 495 fall under their control. This will require that any storm water runoff directed towards the front of the site must be collected in stormwater management basin, piped to the rear of the property, or infiltrated into the ground.

Runoff from the rear of the property, and any runoff directed there, will likely be discharged within the buffer zone to the wetland. This triggers the requirements set forth in the Department of Environmental Protection *Stormwater Management Policy*. This policy has specific requirements that control the quantity and quality of any storm water discharge. Again there can be no increase runoff rates compared to the existing conditions. This will require that the increase due to impervious areas be detained in storm water basins and/or infiltrated into the ground. In addition a series of Best Management Practices will be needed to treat the storm water to ensure that a minimum of 80% of the total suspended solids has been removed. A typical treatment train might involve street sweeping, deep sump catch basins with gas traps, sediment forebays and extended detention basins. The requirements of the *Stormwater Management Policy* are administered by the Conservation Commission during the review of a Notice of Intent Filing.

SECTION 4. SITE UTILITIES

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4.1 EXISTING UTILITIES

The following utilities are available to the site:

Electric:	Overhead electric service currently exists along Boston Road and at the entrance to Blake's Hill Road. Underground electric is available along Blake's Hill Road.
Cable Television:	Overhead cable service currently exists along Boston Road and at the entrance to Blake's Hill Road. Underground cable is available along Blake's Hill Road.
Telephone:	Overhead telephone service currently exists along Boston Road and at the entrance to Blake's Hill Road. Underground telephone is available along Blake's Hill Road.
Natural Gas:	A 2" natural gas main is currently available within Blake's Hill Road. A 4" natural gas main is within Boston Road north of Blake's Hill Road. This main does not extend in front of the site.
Water:	Municipal water service is in both Boston Road (12") and Blake's Hill Road (8").
Sewer:	Municipal sanitary sewer service is not available.

4.2 SITE POTENTIAL AND CONSTRAINTS

The site has access to all utilities typical for a property in Westford. It is recommended that where feasible utilities be brought onto the site from Blake's Hill Road to minimize disturbance of Boston Road. The only utility not available to the site is municipal sewer. This will require an on-site sewage disposal system. Any system with a design capacity over 2,000 gallons per day, nineteen (19) bedrooms, is required by Title 5 to utilize a pressure distribution leaching facility and would require a hydrogeologic study to determine the effect of groundwater mounding. A septic system designed by the standards of 310 CMR 15.000 Title 5, is limited to a maximum of 10,000 gallons per day. Based on Title 5 loading rates of 110 gallons per bedroom, the site is limited to 90 bedrooms. If over 10,000 gallons per day were to be proposed a Waste Water Treatment Plant would be required.

SECTION 5. SITE ACCESS

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5.1 EXISTING ACCESS

The site has approximately six hundred and twenty-two (622) feet of frontage on Boston Road plus five hundred and ninety-one (591) feet of frontage on Blake's Hill Road. There is currently one curb cut from Boston Road provided for the site. The forty (40±) foot wide curb cut contains a gravel roadway that provides access, via an easement, to the electrical substation located on the adjacent property just west of the site.



Figure 5 Existing Access Road viewed from Boston Road looking west.

5.2 ROUE 495

The property abuts the southbound on-ramp for Route 495. Route 495 is a limited access highway and may not be used to access this site. The limit of the access restriction is shown on the attached plans roughly across from the northbound exit-ramp.

5.3 BOSTON ROAD

Boston Road provides the existing access for the site and potential for an additional access or expansion of the existing access. The location of the existing access is roughly 130' south of the Blake's Hill Road access. The proximity of these two access points on a busy street provides a high potential for traffic conflicts. In addition the curvature of Boston Road provides limited site distance to the north, making it difficult for a vehicle leaving the site to safely enter traffic on Boston Road. Vegetation removal along Boston Road may increase the site distance to 350 feet, the distance recommended for a secondary street, but not the 500 feet recommended for an intersection with a major street such as Boston Road. The entrance could be relocated to the south, however this will quickly put vehicles leaving the site in conflict with vehicles at the newly constructed traffic light at the exit-ramp of Route 495 and the turning lane for the on-ramp to Route 495. While access directly onto Boston Road may be feasible depending on the scope of the project it would likely be costly and time consuming to design and permit with the Massachusetts Highway Department.



Figure 6. Looking north from the existing access road with limited sight distance.



Figure 7. Looking south from the existing access road.



Figure 8. Access road viewed from across Boston Road.

5.4 BLAKE’S HILL ROAD

Blake’s Hill Road is a standard paved residential roadway servicing approximately thirty-five (35) residential houses. The roadway begins at Boston Road and slopes upward towards the west. Drainage from the roadway collects and is discharged to a detention basin on the Town’s property approximately 150’ back from Boston Road. Blake’s Hill Road would provide convenient access to a residential development and help to reduce the number of access points on Boston Road. Access would likely need to be within the first 500’ of Blake’s Hill Road due to the increasing difference in elevation between Blake’s Hill Road and the existing site. Near Boston Road the two sites are level, however at the rear of the site Blake’s Hill Road is roughly twenty-five higher in elevation, making a transition between the two difficult. A likely location for an access road would be just west of the detention basin shown on the plans. This area has an existing forty (40) foot wide access easement shown on the plans.



Figure 8. Vehicle(background) on Blake’s Hill Road viewed from the access road

5.5 EASEMENT LIMITATIONS

The record deed and documents do not list any specific use restrictions for the easements located onsite; however it is recommended that Town Council review any activity that is proposed within an easement.

Appendix A U.S.G.S. LOCUS MAP

Appendix B TESTHOLE LOGS

Appendix C N.R.C.S. Soils Reports

**Appendix D SITE PLANS
(reduced to 11”X17” not to Scale)**

Appendix E Site Plans