

SOILS  
INVESTIGATION  
REPORT

FOR

**MOUNTAINSIDE WOODS**

HILLTOP LANE AND VISTA DRIVE

TOWN OF LLOYD  
ULSTER COUNTY, NEW YORK

PREPARED BY

**ENGINEERING  
PROPERTIES**

*Achieving Successful Results  
with Innovative Designs*

99 Clinton St. 2<sup>nd</sup> Floor  
Montgomery, NY 12549

MARCH 2011

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## **1.0 PURPOSE AND SCOPE**

The purpose of this report and soils investigation is to determine the depth to rock, the location of the water table and provide a general characterization of the soils for the project site.

## **2.0 SITE LOCATION**

The project site consists of five parcels identified as Town of Lloyd tax lots, Section 87.004 Block 3 Lot 14, Section 87.004 Block 5 Lot 1.2 and 2; containing 153.07± acres. East of the property is Vista Drive, from which one of the access roads will be located. To the northeast of the property is the Hudson Valley Rail Trail, which will be accessed via pedestrians only. Beyond the rail trail is Old New Paltz Road which will serve as a second connection point for water and sewer service to the site. To the south of the project site is Hilltop Lane, the Town of Lloyd water plant and Berean Park. At this location, a third connection to the water system and a second access road will be constructed connecting Hilltop Lane and the existing water mains within Hilltop Lane to the project. To the west lies Town of Lloyd property and one of the town's reservoirs. A location map for the project can be found in Appendix A.

## **3.0 PROPOSED CONSTRUCTION**

The project site consists of three parcels of land totaling 153.07± acres. The proposed project scope includes the construction of 175 single family homes in a neighborhood style development. The homes will be two story wood framed structures. All buildings will have full basements. Many of the buildings will be "walk-out" style construction with buildings built down the slope. There will be a total of approximately 9,275 linear feet of roads, 9,450 feet of water mains and 10,350 linear feet of sewer mains and associated manholes.

All buildings will be constructed on public roads and will be connected to new public water mains and sewer mains to be installed by the project sponsor. The project is within the Town of Lloyd and will receive water and sewer service via

connection to the existing Town of Lloyd Highland Water and Sewer District mains which are adjacent to the site.

#### **4.0 TESTING**

This study conducted a total of 36 test pit investigations across the portions of the site proposed for construction. Included in Appendix B of this report is a map entitled "Test Pit Locations", which identifies the locations of the test pit investigations. The deep test pit results, which provide specific information regarding each test pit site and its corresponding soil description, are included in Appendix C of this report. The purpose of this testing was to determine the location of rock and ground water in areas of deep cuts and use the information to determine the need for blasting, design changes and dewatering recommendations. The following is a discussion of our findings and recommendations which are subject to the limitations as detailed further in this report.

#### **5.0 SITE CONDITIONS**

SURFACE: The majority of the site is presently occupied by woods with an overgrown abandoned construction area which has been inactive for an extended period of time separating the wooded areas. The construction area that was abandoned now contains dense brush, saplings and low undergrowth.

The project has gentle slopes on the eastern portion of the site and steep to severe slopes on the western portion of the site. No significant development of the steep slopes to the west is proposed. Topography on the project site generally slopes gradually down from Vista Drive east to west to a stream and associated wetland area. Beyond the stream, the site slopes gradual up to the base of Illinois Mountain where it climbs sharply towards the west. The highest elevation of the developed portion of the site is 407 feet above mean sea level located in the area of the cul-de-sac near lots 46 thru 48. Lower elevations are found at the northeast & northwesterly portions of the property. The elevations in these areas are approximately 330 feet above mean sea level.

**SUBSURFACE:** The following is a summary of the subsurface strata that were encountered in the excavation of the 36 test pits.

**A HORIZON:** An organic topsoil layer was encountered in almost all test excavations with the exception of test pit #13 which was performed in a previously disturbed area. Typical topsoil depths range from 4 inches to 12 inches.

**B HORIZON:** Soils consisted most of sand and silt deposits. Most test pits encountered a stratified mixture of earth consisting of silt, sand, gravel, and cobbles. This soil composition ranged from in depths from 24 inches to 68 inches below the topsoil layer.

**C HORIZON:** Almost all test pits encountered a sandy loam mixture directly below the B Horizon. This sand mixture contained varying amounts of silt, gravel and cobbles. Depth of this soil horizon ranged from 24 inches to 209 inches below the surface.

**ROCK:** Twelve of the test pits encountered shale or bedrock. Where shale was present it was primarily “rip-pable” for the first several feet. While the location of rock is difficult to determine based on the testing program, rock will be encountered in several areas: along Road D including the area of lots 1 and 33-35, along Vista Drive in the area of Pond H and lots 11-15, along the steep cut slope to the rear of lots 85-96, along Road B in the area of lots 143-145 and at the intersection of Road B and Road C extending to the rear of lots 164-169.

**GROUND WATER:** Ground water seepage was also encountered in several of the test pits. Most of these areas were at stormwater pond locations and there is not expected to be an impact on the residences. One location where water was encountered near proposed residences, was at the rear of lot 29. This location should be further evaluated by a geotechnical engineer to ensure a proper foundation design in this area of the site.

## 6.0 SUMMARY AND RECOMMENDATIONS

### SUMMARY:

Topsoil and any deleterious fills are not suitable for bearing of pavement areas, curbing, sidewalks or foundations. All topsoil and deleterious fill must be removed prior to installation of pavement base or foundations.

Foundations and pavements sections should primarily bear on competent sandy loam, silt loam and bedrock. Some foundations and pavements will be placed on controlled fills. These fills should be properly installed and compacted on approved sub-grades to achieve the necessary bearing capacity without settlement.

Groundwater seepage was encountered during excavations in some areas, construction dewatering will likely be required. All structures shall have properly design and installed foundation moisture protection and drainage systems.

### RECOMMENDATIONS:

- 1- All topsoil and deleterious fill shall be stripped from beneath all foundations, slabs and pavement areas. Removal shall be to a point beyond the area of influence of the proposed loads.
- 2- Sub-grades shall be proof rolled by a compactor with a static drum weight of 12,000 lbs and observed by a qualified engineer. All areas that deflect should be removed until a stable sub-grade is achieved. Once a stable sub-grade is achieved the excavated area shall be filled and compacted in 8 inch lifts with controlled structural fill.
- 3- Some silt and clay sub-grades maybe highly sensitive to periods of rain and freeze/thaw cycles. These soils may need to be removed if earthwork is to be performed during wet or cold periods.
- 4- Fills of up to 14 feet are required to perform the intended construction. Any fills necessary for buildings and pavement areas shall be performed using controlled compacted fill. Most of the onsite sub-soils

maybe suitable for this work. All fills shall be monitored to ensure proper placement and compaction. Compaction shall be to at least 95% of the maximum dry density of the fill as determined in accordance with ASTM- D1557 test procedures.

- 5- Cuts of up to 20 feet are required to perform the intended construction. All excavations shall meet OSHA requirements and any other applicable Town, County or State guidelines. Any ground water seepage encountered in these excavations shall be controlled and removed in a manner approved by the engineer. Rock removal shall be performed using mechanical methods where possible. If blasting is necessary it shall be carried out in a method that conforms to all local, state and federal guidelines. The contractor must be the holder of a blaster's license issued by the State of New York. The contractor must also submit to the Town a certificate of general public liability insurance. The contractor must also assure the Building Inspector that any magazine used for the storage of explosives has been duly licensed by the Commissioner of Labor of the State of New York, as provided in Article 16, § 458, of the Labor Law.

## **7.0 LIMITATIONS**

1. The locations of the testing is approximate and was based on available site features and mapping.
2. The soil layers identified represent approximate boundaries between soil strata. The actual transitions may be more gradual.
3. Deep test pit result notations were performed by Engineering Properties, P.C. staff members and the soils information logged is unique to that test location. It is not implied by this report that the soils in the area of the test are uniform to those in the test area.
4. Groundwater levels indicated in the test pit results are an indicator of the ground water level at the time of the test and the specific hydrologic conditions at the time of the test. As these conditions vary

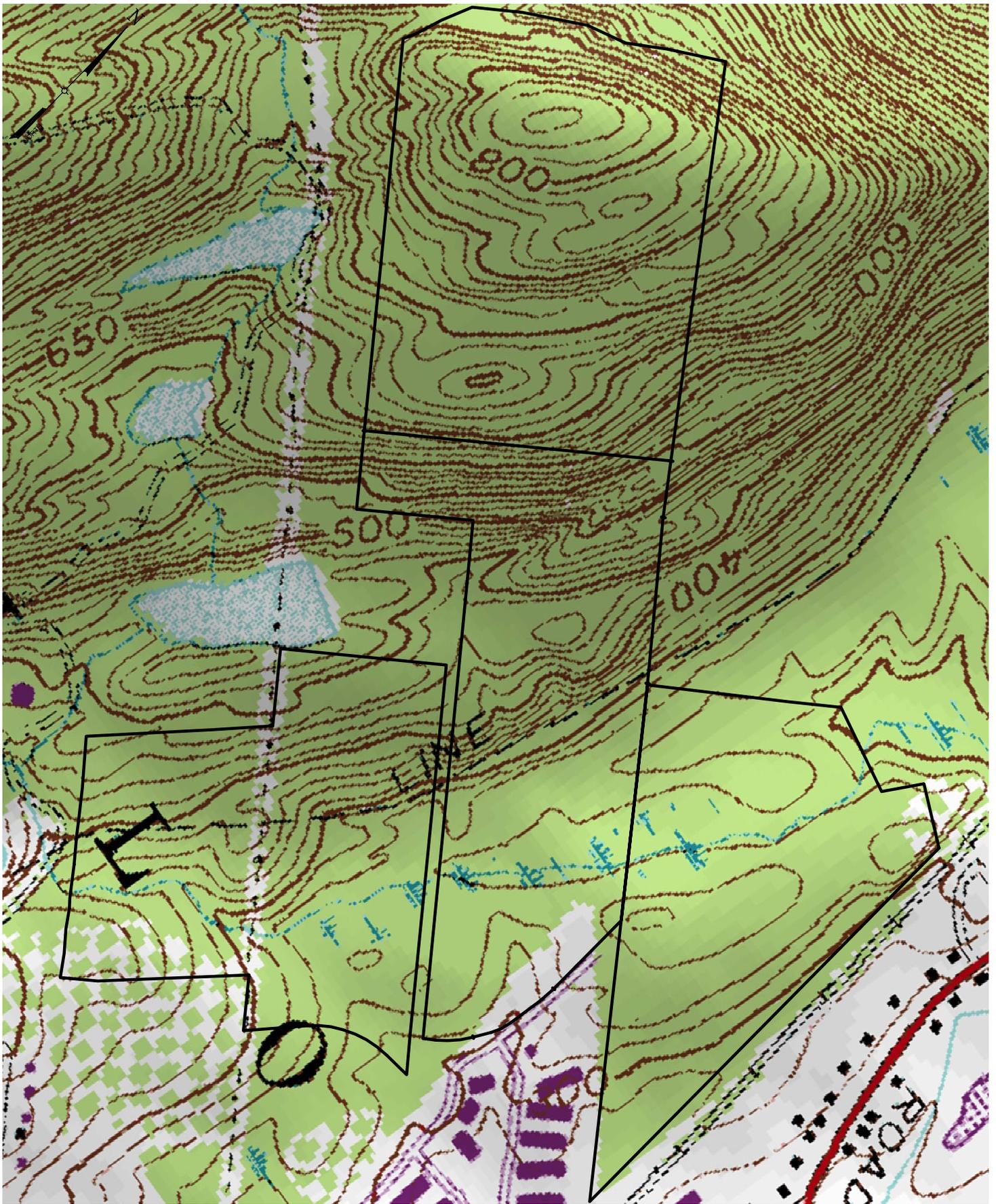
widely based on time of year and precipitation, fluctuations in groundwater conditions are expected.

5. Unless specifically discussed in this report the potential for soil pollution has not been evaluated and this report offers no opinions related to any possible pollution/contamination of soils at the site.

This report has been prepared for preliminary site design with the purpose of determining general soil composition, presence of ground water, and presence of rock. A more site specific report should be performed prior to proceeding with final design and/or construction. This report should be referred to for general information purposes only.

# APPENDIX A LOCATION MAP





USGS MAP

MOUNTAINSIDE WOODS  
TOC DRIVE  
TOWN OF LLOYD  
ULSTER COUNTY, NEW YORK

DATE:  
MAY '10

SCALE:  
1"=500'

JOB #  
944.01

SHEET #  
USGS

**ENGINEERING**  
**ROPERTIES, PC**

99 CLINTON ST. 2<sup>ND</sup> FLOOR  
MONTGOMERY, NY 12549

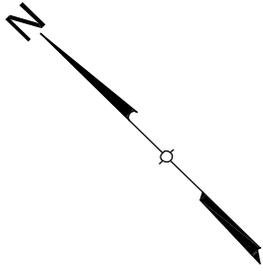
Ph: (845) 457-7727  
Fx: (845) 457-1899



APPENDIX B  
TEST PIT  
LOCATION PLAN



Drawing Name: Z:\944.01 - Mountainside\dwg\EIS Calculations.dwg Date Printed: Mar 02, 2011, 9:01am



<b>TEST PIT LOCATIONS</b>	<b>MOUNTAINSIDE WOODS VISTA DRIVE TOWN OF LLOYD ULSTER COUNTY, NEW YORK</b>	DATE: MAR 2011	JOB # 944.01	<b>ENGINEERING PROPERTIES</b> <i>Achieving Successful Results with Innovative Designs</i>	99 CLINTON ST. 2 <sup>ND</sup> FLOOR MONTGOMERY, NY 12549 Ph: (845) 457-7727 Fx: (845) 457-1899
		SCALE: 1"=400'	SHEET # F-3.2A		



APPENDIX C  
TEST PIT  
RESULTS



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## DEEP TEST PIT SOIL RESULTS

WO. NO. 944.01	DATE 11-9-10	REVISED	SHEET 2	OF 2
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PROJECT TITLE  
*Mountainside Woods*

LOCATION  
*Town of Lloyd*

CALCULATED BY  
*KW*

APPROVED BY

REF DRAWING(S)

Lot # Deep Test #	Depth	Soil Description
TP-01	0" - 4"	Topsoil
	4" - 31"	Silty loam with some gravel
	31" - 104"	Sandy loam with some cobs

Comments:

# ENGINEERING PROPERTIES

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## DEEP TEST PIT SOIL RESULTS

WO. NO. 944.01	DATE 11-9-10	REVISED	SHEET 1	OF 2
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PROJECT TITLE  
*Mountainside Woods*

LOCATION  
*Town of Lloyd*

CALCULATED BY  
*KW*

APPROVED BY

REF DRAWING(S)

Lot # Deep Test #	Depth	Soil Description
TP-08	0" - 6"	Topsoil
	6" - 24"	Silty Loam with some gravel + cobs
	24" - 82"	Sandy Loam with cobs + boulders
	82" - 111"	Shale
TP-06	0" - 9"	Topsoil
	9" - 40"	Silty Loam with cobs + boulders
	40" - 142"	Sandy Loam with gravel + cobs
TP-05	0" - 9"	Topsoil
	9" - 31"	Silty Loam with trace gravel
	31" - 108"	Sandy Loam some gravel + cobs
TP-04	0" - 7"	Topsoil
	7" - 45"	Silty Loam with trace gravel
	45" - 148"	Sandy Loam with some cobs + stones
TP-03	0" - 8"	Topsoil
	8" - 68"	Silty Loam with cobs + stones
	68" - 180"	Sand
		Seepage @ 166"
TP-02	0" - 10"	Topsoil
	10" - 45"	Silty Loam with some gravel
	45" - 107"	Sandy Loam with cobs + stones

Comments:

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## DEEP TEST PIT SOIL RESULTS

WO. NO.	DATE	REVISED	SHEET	OF
944.01	11-8-10		2	2

PROJECT TITLE  
*Mountainside Woods*

LOCATION  
*Town of Lloyd*

CALCULATED BY  
*KW*

APPROVED BY

REF DRAWING(S)

Lot # Deep Test #	Depth	Soil Description
TP-11	0" - 7" 7" - 54" 54" - 104"	Topsoil Silty Loam with trace gravel Sandy Loam with some gravel  Groundwater @ 102"
TP-09	0" - 6" 6" - 51" 51" - 113"	Topsoil Silty Loam with some gravel + cobs Sandy Loam with trace gravel + cobs with various pockets of Rippable Shale
TP-10	0" - 9" 9" - 39" 39" - 73" 73"	Topsoil Silty Loam with gravel Sandy Loam with some cobs Bedrock seepage @ 73"
TP-07	0" - 6" 6" - 51" 51" - 146" 146"	Topsoil Silty Loam with some gravel + cobs Sandy Loam with some cobs Bedrock with Rippable Shale

Comments:

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## DEEP TEST PIT SOIL RESULTS

WO. NO.	DATE	REVISED	SHEET	OF
944.01	11-8-10		1	2

PROJECT TITLE

Mountainside Woods

LOCATION

Town of Lloyd

CALCULATED BY

KW

APPROVED BY

REF DRAWING(S)

Lot # Deep Test #	Depth	Soil Description
TP-17	0" - 12" 12" - 45" 45" - 112" 112"	Topsoil Silty Loam with gravel + cobs Sandy Loam with gravel Bedrock
TP-16	0" - 12" 12" - 59" 59" - 138" 138" - 159"	Topsoil Silty Loam with gravel + cobs Sandy Loam with some gravel Rippable Shale      seepage @ 145"
TP-15	0" - 10" 10" - 47" 47" - 134" 134"	Topsoil Silty Loam with trace gravel Sandy Loam with some gravel Bedrock
TP-14	0" - 7" 7" - 60" 60" - 121"	Topsoil Silty Loam with trace gravel Sandy Loam with some gravel
TP-13	0" - 47" 47" - 145"	Light Brown Silty Loam with some gravel Dark Brown Silty Loam  Seepage @ 123"
TP-12	0" - 9" 9" - 42" 42" - 161"	Topsoil Silty Loam with gravel + cobs Sandy Loam  Seepage @ 160"

Comments:

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## DEEP TEST PIT SOIL RESULTS

WO. NO. 944.01	DATE 10-29-10	REVISED	SHEET 2	OF 2
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PROJECT TITLE  
*Mountainside Woods*

LOCATION  
*Town of Llyod*

CALCULATED BY  
*KW*

APPROVED BY

REF DRAWING(S)

Lot # Deep Test #	Depth	Soil Description
TP-22A	0" - 2" 2" - 23" 23" - 98"	Topsoil Silty Loam with gravel Sandy Loam Groundwater @ 90"
TP-20	0" - 6" 6" - 125"	Topsoil Sandy Loam Groundwater @ 100"
TP-21	0" - 12" 12" - 94"	Topsoil Sandy Loam with gravel + cobs Bedrock @ 94"
TP-19	0" - 6" 6" - 76"	Topsoil Sandy Loam with gravel + cobs Groundwater @ 52"

Comments:

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## DEEP TEST PIT SOIL RESULTS

WO. NO.	DATE	REVISED	SHEET	OF
944.01	10-27-10		1	2

PROJECT TITLE  
*Mountainside Woods*

LOCATION  
*Town of Lynd*

CALCULATED BY  
*KW*

APPROVED BY

REF DRAWING(S)

Lot # Deep Test #	Depth	Soil Description
TP-18	0" - 14"	Topsoil
	14" - 36"	Silty Loam with some gravel
	36" - 76"	Sandy Loam with gravel and some cobs
TP-24	0" - 12"	Topsoil
	12" - 35"	Silty Loam with gravel
	35" - 42"	Lite Brown Sandy Loam with gravel and cobs
	42" - 155"	Brown Sandy Loam some boulders
TP-25	0" - 13"	Topsoil
	13" - 33"	Silty Loam with some gravel and cobs
	33" - 158"	Sandy Loam with Rippable Shale pockets
TP-26	0" - 11"	Topsoil
	11" - 37"	Silty Loam with some gravel
	37" - 142"	Sandy Loam with cobs and trace boulders
	142"	Bedrock
TP-27	0" - 6"	Topsoil
	6" - 31"	Silty Loam with gravel
	31" - 102"	Sandy Loam with cobs and trace boulders
TP-28	0" - 10"	Topsoil
	10" - 50"	Silty Loam with some gravel
	50" - 132"	Sandy Loam with trace gravel and cobs Groundwater @ 112"

Comments:

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## DEEP TEST PIT SOIL RESULTS

WO. NO.	DATE	REVISED	SHEET	OF
944.01	10-27-10		2	2

PROJECT TITLE

*Mountainside Woods*

LOCATION

*Town of Lloyd*

CALCULATED BY

*KW*

APPROVED BY

REF DRAWING(S)

Lot # Deep Test #	Depth	Soil Description
TP-29	0" - 10"	Topsoil
	10" - 52"	Silty Loam with some gravel
	52" - 95"	Sandy Loam with some cobs Groundwater @ 95"
TP-30	0" - 10"	Topsoil
	10" - 54"	Silty Loam with gravel and cobs
	54" - 130"	Sandy loam with some cobs and boulders
	130"	Rippable Shale
TP-31	0" - 11"	Topsoil
	11" - 68"	Silty Loam with some gravel and cobs
	68" - 209"	Sandy Loam with cobs and some boulders

Comments:

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## DEEP TEST PIT SOIL RESULTS

WO. NO.	DATE	REVISED	SHEET	OF
944.01	10-29-10		1	2

PROJECT TITLE  
*Mountainside Woods*

LOCATION  
*Town of Lloyd*

CALCULATED BY  
*KW*

APPROVED BY

REF DRAWING(S)

Lot # Deep Test #	Depth	Soil Description
TP-32	0" - 4" 4" - 34" 34" - 90" 90" - 143"	Topsoil Silty loam with trace gravel Sandy loam with some gravel + cobs Mottled Sandy loam with pockets of Rippable Shale
TP-33	0" - 6" 6" - 40" 40" - 114" 114" - 138"	Topsoil Silty loam with gravel Sandy loam with gravel and cobs Rippable Shale
TP-34	0" - 7" 7" - 34" 34" - 95"	Topsoil Silty loam with gravel Sandy loam with stones
TP-35	0" - 4" 4" - 45" 45" - 96"	Topsoil Silty loam with gravel and cobs Sandy loam with stones
TP-23	0" - 2" 2" - 36"	Topsoil Rippable Shale
TP-22	0" - 2" 2" - 42"	Silty loam with gravel Rippable Shale

Comments: