**Brickyard Disposal & Recycling, Inc.**
**Danville, Vermilion County, Illinois**

**Site Number: 1838040029**

# EXHIBIT C
# Extraneous Materials Cover Plan

**May 2013**

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## 1. INTRODUCTION

The Extraneous Materials Cover Plan (Plan) has been devised to respond to Illinois Environmental Protection Agency (Illinois EPA) inquiries during raised discussions of the Adjusted Standard Petition for the extension of the groundwater compliance boundary for Brickyard Disposal and Recycling. This Plan includes the results of an additional investigation conducted to further evaluate the qualities of the existing cover overlying known areas containing extraneous materials. In addition, this Plan includes measures that shall be implemented where necessary to ensure adequate cover exists over areas containing extraneous materials that are referenced in the Adjusted Standard Petition. For purposes of completeness and ease of review, some of the information presented in the Technical Support Document to the Adjusted Standard Petition (Exhibit B) is also presented herein.

## 2. BACKGROUND

Historical information indicates the railroad ties were placed along the periphery of Unit 1 at some time prior to the RCRA Subtitle D landfill regulations in Illinois. The tie placement was not continuous but occurred in pockets or specific areas. Three field investigations were conducted over the years to better identify the locations of the extraneous materials, which also determined the thickness of cover overlying the materials. The field investigations accounted for 109 probe locations, including 36 cover probe borings (conducted with a drilling unit) and 73 test pits completed with the use of a tracked backhoe. Based on the 1992 cover probe investigation and the 2006 and 2008 trench investigations, the thickness of soils overlying the extraneous materials ranged from 0 to 15 feet, with an average thickness of 5.5 feet. The number of probes/test pits conducted to evaluate the cover occurred on the average of one per 0.17 acres, equivalent to less than a 100-foot grid spacing.

The cover composition ranges from clayey soil to a combination of clay, silt, and stone. In areas directly adjacent to the Unit 1 waste boundary, the cover appears to be consistent with that present on Unit 1 (i.e., vegetated clayey soil). It is expected this cover was placed simultaneously with the capping of areas of Unit 1 and in the same manner (compacted soil with a vegetated cover). With distance from the waste boundary, the percentage of aggregate increases within the soil matrix; the cover composition varies with location.

Visual observation from the trench excavations indicate the cover is highly compacted due to over 25 years of traffic during placement and site operation/development. Tests conducted as part of the October 2012 investigation confirmed those observations. Details of the October 2012 Investigation are discussed in Section 3 below. The cover is well vegetated in most areas except where heavy equipment traffic continues due to soil borrow activities adjacent to Unit 1 and facility maintenance. The cover overlying the extraneous materials is typically sloped to promote drainage such that no ponding water occurs, minimizing the potential of surface water infiltration. Existing cover overlying the extraneous material will not be disturbed except as to conduct maintenance and augment the vegetation.

## 3. ADDITIONAL COVER INVESTIGATION

Pursuant to comments provided by Illinois EPA personnel based on review of the draft Technical Support Document for the Adjusted Standard Petition, an additional investigation was conducted to further evaluate the qualities of the existing cover overlying known areas containing extraneous materials. The cover investigation included test pits at 24 locations (see Figure 1. The excavations advanced until extraneous materials were encountered at which time the excavation halted. Thickness of the extraneous materials was not evaluated during this investigation.

Soil samples were retained for analyses, including grain size/hydrometer, Atterberg limits, standard Proctor curves, and vertical hydraulic conductivity. Each test pit location included field density/moisture testing utilizing a nuclear density gauge at two- and four-foot depth intervals. The data obtained as a whole identify the characteristics of the cover with a focus on the capability of the cover to minimize surface water infiltration to the extraneous materials, thereby minimizing the potential for influence of the groundwater quality. Details of the investigation and results are discussed in the following sections.

## 3.1 Cover Thickness of Text Excavations

As stated above, test pits were conducted at 24 locations. Field logs were created for each of the excavations describing the material encountered; the subject logs are provided in Appendix A. The test excavations were located over known areas containing extraneous materials. The cover thickness ranged from 1.5 (Station 1005) to 11.0 feet (Stations 1011 and 1012), with an average thickness for the investigation of 6.9 feet. Of the 24 locations tested, only one contained less than 2.5 feet of cover; all other locations contained at least 3.0 feet of cover. The data obtained from the October 2012 investigation have been combined with the data derived during previous investigations to create a comprehensive cover thickness map (Figure 2). As shown, nearly all areas contain at least 3 feet of cover over the extraneous materials. Only very small areas contain less than 3 feet of cover. Table 1 summarizes the data from the test pit investigations from 1992, 2006, 2008, and 2012.

## 3.2 Soils Analyses

Three cover samples were analyzed for grain size/hydrometer, Atterberg limits (plasticity—plastic index, plastic limit, and liquid limit), and compaction via a standard Proctor test. The samples were deemed representative of the soil types encountered for the cover over the extraneous materials, with minor variability. Each parameter is interrelated with respect to the hydraulic conductivity properties. The results of the test are discussed further below.

### *3.2.1 Grain Size/Hydrometer Analyses*

The grain size analyses determined the percentages of different grain sizes within the soil samples, identifying the distribution of coarser particles (sand and gravel—retained by or exceeding the No. 200 sieve). The hydrometer method was used to identify the distribution of fine particles (silt and clay—passing the No. 200 sieve). The analyses were completed pursuant to ASTM D422. The samples were classified based on particle size and the Atterberg limit values via ASTM D2487. Each soil type was classified as “sandy lean clay (CL)” by the testing laboratory. Typically, samples with higher percentages of smaller particles (clay) exhibit lower hydraulic conductivities. The samples tested consist of greater than 50 percent fine-grained material (silt and clay). As discussed in Section 3.2.4, the hydraulic conductivity values for the cover are indicative of clayey soils (low).

The particle diameters of 0.075 mm (No. 200 sieve) and greater represent sand and gravel. Particle diameters less than 0.075 mm represent silt and clay. The following table lists the grain size distribution for the three referenced samples pursuant to the test method. Details of the grain size distributions are presented in Appendix B.

| Sample | ≥0.075 (Sand and Gravel) | 0. 074-0.001 (Silt and Clay) |
|---|---|---|
| 1003 | 36.1% | 63.9% |
| 1014 | 42.7% | 57.3% |
| 1015 | 44.9% | 55.1% |

Note: Grain sizes are in mm.

### *3.2.2 Atterberg Limits*

Atterberg limits of a soil (clay) are the liquid limit, plastic limit, and plastic index, as defined below:

1. The liquid limit is the moisture content, expressed as a percentage by weight of the oven-dry soil, at which the soil will begin to flow when disturbed slightly.
2. The plastic limit is the lowest moisture content, expressed as a percentage by weight of the oven-dry soil, at which the soil can be rolled into threads one-eighth of an inch in diameter without breaking into pieces.
3. The plastic index is the difference between the liquid limit and the plastic limit. It is the range of moisture content through which a soil is plastic.

The Atterberg limits are empirical values that identify a soil's cohesion with varying moisture contents. This is important when constructing liner systems or other structures where particle cohesion is necessary for geotechnical/structural purposes and/or fluid control structures. The Atterberg limits vary with the amount of clay present, the type of clay mineral, and the nature of the ions adsorbed on the clay surface.

A hydraulic conductivity of a soil typically decreases with an increasing liquid limit and plastic index. A smaller grain size is associated with a larger clay composition, which correlates with a lower hydraulic conductivity. Higher plastic limits also typically correlate with a lower hydraulic conductivity. The Atterberg limit values for the three samples analyzed indicate sufficient clay content to produce a low hydraulic conductivity cover. This correlates with the grain size analyses discussed in Section 3.2.1 above. The Atterberg limits for the three samples are:

| Sample | Liquid Limit | Plastic Limit | Plastic Index |
|---|---|---|---|
| 1003 | 28 | 15 | 13 |
| 1014 | 30 | 15 | 15 |
| 1015 | 29 | 15 | 14 |

There is no regulatory requirement for a range of Atterberg limits when constructing a liner system or final cover system for an Illinois-permitted solid waste disposal facility (35 Ill. Adm. Code Part 814, Subpart C). The limits are used to aid in the construction of such systems to meet foundation and mass stability, hydraulic conductivity, and contaminant transport requirements. However, for purposes of comparison, the State of Wisconsin regulations (NR

504.06 – Minimum Design and Construction Criteria for Landfill Liners and Leachate Collection Systems) require an average liquid limit of 25 with no values less than 20, and an average plastic limit of 12 with no values less than 10. Based on the above information, the soils overlying the extraneous materials are highly suitable for a low hydraulic conductivity cover.

### *3.2.3 Standard Proctor Test*

The standard Proctor test ties the soil characteristics together with a compaction standard to achieve desirable soil densities (geotechnical) and hydraulic conductivity values. Three standard Proctor tests were conducted on representative cover samples by Tri/Environmental, Inc. pursuant to ASTM D698 – Method A. Each test produces a Proctor curve, which is a graphical method illustrating the relationship between the soil dry unit weight and the moisture content of the soil. A soil type increases in density during compaction up to a certain point; beyond that point the density decreases with further increased moisture. The standard Proctor identifies the optimum moisture content to compact a specific soil type, directly relating to the minimum hydraulic conductivity for that soil.

Based upon the soils encountered during this and previous investigations, brown sandy lean clay (CL) from test pit 1014, brown sandy lean clay/grey shale mixture (CL) from test pit 1015, and weathered shale (CL) was the bulk of the material encountered over the extraneous material. Laboratory data classified the soil samples as sandy lean clay (CL). The relevance of the standard Proctor test with respect to this document is to accurately calculate the percent compaction of the cover as discussed in Section 3.3 (Field Moisture-Density Testing). As discussed in that section, the average percent compaction is above the current recommendation of 95 percent standard Proctor for clay liner systems. The Proctor, results along with the grain size/hydrometer and Atterberg limit values are contained in Appendix B.

### *3.2.4 Hydraulic Conductivity Tests*

Eight Shelby tube samples from the cover overlying the extraneous materials were tested for hydraulic conductivity. The results for all samples ranged from $9.5\text{x}10^{-9}$ cm/sec to $3.1\text{x}10^{-6}$ cm/sec. With the exception of sample 1020, ($3.1\text{x}10^{-6}$ cm/sec), all results were $6.9\text{x}10^{-7}$ cm/sec or less. From the photograph observed in Shelby tube sample 1020, it appears the soil was loose and composed of largely crushed bedrock, which resulted in a higher value. Excluding the 1020 result, the remaining seven Shelby tubes exhibited an average hydraulic conductivity of $2.59\text{x}10^{-7}$ cm/sec. Based upon the results of this investigation, the overlying soils are considered to be near or exceed final cover quality for modern day final cover, particularly after having been in place for greater than 20 years. The list of vertical hydraulic conductivity values is contained in Table 2.

The aforementioned average hydraulic conductivity for the cover is approximately two orders of magnitude lower than what the Illinois EPA Bureau of Land/Permit Section recommends for HELP (Hydrologic Evaluation of Landfill Performance) modeling cover for solid waste units in post-closure care. Permit Section personnel have stated that due to freeze-thaw cycles and settlement issues (at a typical municipal solid waste landfill), the vertical hydraulic conductivity of the clay cap is approximately $1\text{x}10^{-5}$ cm/sec within five years after placement. Testing conducted as part of this investigation indicates the cover on the extraneous materials has performed significantly better than typical cover constructed pursuant to 35 Ill. Adm. Code Part 811.314. As stated above, the maximum hydraulic conductivity recorded from the eight Shelby tube samples was $3.1\text{x}10^{-6}$ cm/sec, which is still less than the referenced value by the Illinois EPA Permit Section personnel. Therefore, the existing cover overlying the extraneous materials (where a minimum of two feet are present) is more than sufficient to provide long-term protection as to minimize surface water infiltration to the extraneous materials, thereby minimizing potential influences to the groundwater quality.

Standard Proctor curves, nuclear density tests and hydraulic conductivity test results were plotted together on the same graph to identify the range of values and illustrate the correlation. Figure 3 contains the moisture density and hydraulic conductivity information from this investigation of the cover soils. Detailed results from the hydraulic conductivity tests are provided in Appendix B.

### 3.3 Field Moisture-Density Testing

The geotechnical properties of the soil, which include hydraulic conductivity and compressibility, are dependent on the moisture and density at which the soil is compacted. Pursuant to requests from Illinois EPA personnel, the cover was tested for in-place moisture and density using a Troxler model 3440 nuclear moisture density gauge. The moisture/density tests were conducted at each test pit at depths of two and four feet except where less than two or four feet of cover was present. No field testing was conducted at locations 1009 and 1011 due to the blocky nature of the shale overlying the ties to a depth of over seven and eleven feet, respectively. The density and moisture readings are listed in Table 3.

As discussed above, the maximum dry density utilized in derivation of the in-place density (nuclear moisture density gauge) was obtained from the Proctor tests. The subject values used to determine the percent compaction were 122.1, 116.5, and 120.0 pounds per cubic foot for the varying soil types. The percent compaction is then determined by dividing the maximum dry density into the dry density given by the nuclear moisture-density gauge. An experienced construction quality assurance field technician from Andrews Engineering determined which maximum dry density value was appropriate for each field moisture density test. As shown in Table 3, the compaction of the cover ranged from 75.8- to 107-percent Standard Proctor. The average compaction was 97.4-percent Standard Proctor. The compaction/density requirement in a typical permitted construction quality assurance plan for the low permeable clay layer (final cover and liner) is 95-percent Standard Proctor. The average density of the cover over the extraneous materials exceeds this value. The high soil density does correlate with the low hydraulic conductivity for the extraneous materials cover.

### 3.4 Summary

Pursuant to comments provided by Illinois EPA personnel, an additional investigation was conducted to further evaluate the qualities of the cover overlying known areas containing extraneous materials. The cover investigation included test pits at 24 locations. Soil samples were retained for analyses, including grain size, standard proctor curves, and vertical hydraulic conductivity. Each test pit location included field density/moisture testing utilizing a nuclear density gauge. The investigation identified the following:

1. The grain size/hydrometer analyses determined the cover soils contained significant fine-grained particles and were classified as sandy lean clay (CL). The soils are conducive for and have created a low hydraulic conductivity cover.
2. The Atterberg limits of the samples are consistent with clayey soils conducive for creating a low hydraulic conductivity cover. The samples also meet liner criteria published for other regulatory programs for landfill liner systems.

3. Standard Proctor tests were conducted to aid in the evaluation of percent compaction of the existing cover. The field moisture-density test results were calibrated to the Proctor test values and determined the average percent compaction of the cover exceeded the typical permitted construction quality assurance requirement for the low permeable clay layer (final cover) 95-percent Standard Proctor after approximately 25 years in place.
4. Eight samples were tested for vertical hydraulic conductivity ranging from 9.5x10$^{-9}$ cm/sec to 3.1x10$^{-6}$ cm/sec. With the exception of sample 1020 (3.1x10$^{-6}$ cm/sec), all results were 6.9x10$^{-7}$ cm/sec or less with an average of 2.59x10$^{-7}$ cm/sec. Sample 1020 appears to be composed of largely crushed bedrock, which resulted in a higher value. As stated in Section 3.2.4, these values are lower than 1x10$^{-5}$ cm/sec, which is the current ideology of the Permit Section for final cover hydraulic conductivity five years after installation.

Based on the information acquired during the October 2012 investigation, the existing cover overlying the extraneous materials has performed beyond expectations and appears to perform better than typical clay cover for 35 Ill. Adm. Code Part 814, Subpart C facilities. Therefore, no augmentation is necessary for the existing cover except to small areas determined to require additional cover. Placement of any additional cover shall be conducted as discussed in the following sections.

# 4. COVER

The information presented above indicated existing cover overlying extraneous materials provides more than adequate physical protection of the materials and minimizes vertical migration of surface water to the subject materials. Augmentation of existing cover is not necessary except to small areas identified as having deficient cover thickness. Any additional cover placement shall be conducted pursuant to the following sections.

Areas identified as having less than two feet of protective soil cover over the entirety of the extraneous materials, Brickyard Disposal and Recycling will:

1. Place additional material on the areas creating a soil cover thickness of not less than two feet.
2. Establish vegetative cover on all applicable areas as necessary to prevent erosion. The vegetative layer will be a minimum of six inches thick in addition to a minimum of two feet of soil cover.
3. An Illinois Licensed Professional Engineer will provide a Construction Certification Report to the Illinois EPA documenting that the cover augmentation was conducted pursuant to this Plan.
4. Maintain the cover overlying the extraneous materials in a similar manner as the final cover present on Unit 1.

## 4.1 Low Hydraulic Conductivity Layer

Placement of the low hydraulic conductivity layer will occur on areas with less than two feet of existing cover. Areas determined to have two feet of soil cover or greater will not require additional cover. Any placement of additional cover shall consist of earthen material that under compaction achieves a hydraulic conductivity of approximately 1x10$^{-6}$ cm/sec.

Earthen material to be used for the low hydraulic conductivity layer will include Unified Soils Classification System types CH, CL, or ML, and may include other material to a lesser extent. Soils with the same or similar properties that currently overlie the extraneous materials should be used. The low hydraulic conductivity layer is to be placed in lifts not to exceed eight inches loose. This cover should be placed at a moisture content sufficient to enhance compaction as to achieve hydraulic conductivity's of approximately $1x10^{-6}$ cm/sec. This portion of the final cover system will be recompacted with a self-propelled soil compactor or other suitable equipment and each layer will be worked sufficiently to break down oversized clods and ensure uniform density. Roots, cobbles, debris, and other deleterious material will be removed from the earthen material prior to compaction. Consistent with current permitting requirements, a minimum of one laboratory hydraulic conductivity test shall be performed for every 10,000 cubic yards of soil placed as the low hydraulic conductivity layer. Alternative materials or procedures may be used, provided that the alternative materials or procedures achieve equivalent or superior performance to the soil cover as described herein.

As stated above, the extraneous materials occur typically in pockets and are not continuous. Areas that do not contain extraneous materials will not require cover.

### 4.2 Vegetative Layer

A minimum six-inch thick vegetative layer will be placed on any new cover and may include finished compost product or other augmentative materials generally allowed for use by Brickyard Disposal and Recycling to promote vegetation. The final grades should be capable of supporting vegetation and minimizes erosion. The slopes will promote runoff from the cover and prevent ponding.

Where applicable, seed will be incorporated into the upper surface vegetative layer using appropriate techniques. The mixture of grasses and legumes selected will be amenable to the soil quality, slopes, and moisture and climatological conditions that exist without the need for continued maintenance. It will also be a diverse mix of native and introduced species that is consistent with the open space land use. Such a mixture could include: Kentucky Bluegrass, Perennial Ryegrass, Crownvetch, and White Clover. Soil augmentation will be conducted as necessary to promote the vegetative growth. Mulch consisting of straw, jute, or wood excelsior, will be used as necessary to hold the seed in place and conserve moisture. Additional seeding may be done in the Spring and Fall to ensure proper establishment of the vegetative growth.

As necessary, erosion control techniques will be implemented to minimize the generation of sediment in the runoff from disturbed areas. These may include, but not be limited to, straw bale dikes, silt fences, and vegetative filters.

### 4.3 Documentation

As stated above, an Illinois Licensed Professional Engineer will provide a Construction Certification Report to the Illinois EPA documenting that the cover augmentation was conducted pursuant to this Plan.

Copies of documentation of all activities associated with the extraneous materials, including borings, test pits, cover placement, maintenance, etc. shall be maintained on site with the facility operating record.

### 4.4 Cover Maintenance

Maintenance of the cover overlying extraneous materials will be generally consistent with maintenance of the final cover for Unit 1. Any substantial maintenance activities shall be documented. Such documentation shall be placed with the facility operating record.

# TABLES

# TABLE 1
# BRICKYARD DISPOSAL AND RECYCLING
# UNIT 1 EXTRANEOUS MATERIAL INVESTIGATION

| Year | Test Pit/ Boring Number | Northing (ft) | Easting (ft) | Elevation (ft) | Total Depth of Test Pit/ Boring (ft) | Top of Material (ft)/Cover Thickness | Bottom of Material (ft) | Thickness of Material (ft) | Bottom Pit Elevation | Bottom of Material |
|---|---|---|---|---|---|---|---|---|---|---|
| 1992 | n/a | 49900 | 2900 | n/a | 4 | 4 | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49889 | 2900 | n/a | 16 | n/a | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49800 | 2900 | n/a | 1 | 1 | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49811 | 2879 | n/a | 7 | 7 | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49714 | 2853 | n/a | 1.5 | 1.5 | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49700 | 2900 | n/a | 3 | 3 | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49592 | 2800 | n/a | 7 | 7 | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49600 | 2900 | n/a | 15 | n/a | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49456 | 2898 | n/a | 12 | n/a | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49472 | 2892 | n/a | 12 | n/a | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49520 | 2971 | n/a | 9 | 9 | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49600 | 3000 | n/a | 15 | n/a | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49700 | 3000 | n/a | 6 | 6 | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49700 | 3100 | n/a | 8 | 8 | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49679 | 3184 | n/a | 9 | 9 | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49600 | 3100 | n/a | 15 | n/a | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49700 | 3300 | n/a | 12 | n/a | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49685 | 3415 | n/a | 9.5 | n/a | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49700 | 3475 | n/a | 11 | n/a | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49700 | 3600 | n/a | 25 | n/a | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49700 | 3700 | n/a | 1 | 1 | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49827 | 3711 | n/a | 10 | n/a | n/a | n/a | n/a | n/a |
| 1992 | n/a | 49917 | 3878 | n/a | 10.0 | n/a | n/a | n/a | n/a | n/a |
| 1992 | n/a | 50050 | 4005 | n/a | 10.0 | n/a | n/a | n/a | n/a | n/a |
| 1992 | n/a | 50138 | 4084 | n/a | 10.0 | n/a | n/a | n/a | n/a | n/a |
| 1992 | n/a | 50200 | 4000 | n/a | 4.0 | 4.0 | n/a | n/a | n/a | n/a |
| 1992 | n/a | 50300 | 4100 | n/a | 4.5 | 4.5 | n/a | n/a | n/a | n/a |
| 1992 | n/a | 50300 | 4200 | n/a | 4.0 | 4.0 | n/a | n/a | n/a | n/a |
| 1992 | n/a | 50400 | 4100 | n/a | 5.0 | 5.0 | n/a | n/a | n/a | n/a |
| 1992 | n/a | 50400 | 4200 | n/a | 7.0 | 7.0 | n/a | n/a | n/a | n/a |
| 1992 | n/a | 50500 | 4200 | n/a | 7.0 | 7.0 | n/a | n/a | n/a | n/a |
| 1992 | n/a | 50500 | 4300 | n/a | 7.5 | n/a | n/a | n/a | n/a | n/a |
| 1992 | n/a | 50600 | 4600 | n/a | 15.0 | n/a | n/a | n/a | n/a | n/a |
| 1992 | n/a | 50600 | 4500 | n/a | 20.0 | n/a | n/a | n/a | n/a | n/a |
| 1992 | n/a | 50600 | 4400 | n/a | 15.0 | n/a | n/a | n/a | n/a | n/a |
| 1992 | n/a | 50600 | 4300 | n/a | 5.0 | n/a | n/a | n/a | n/a | n/a |
| 2006 | 1 | 50059 | 4005 | 598.2 | 19.3 | n/a | n/a | n/a | 578.9 | n/a |
| 2006 | 2A | 50219 | 4155 | 580.2 | 10.5 | 1.5 | 10.1 | 8.6 | 569.7 | 570.1 |
| 2006 | 2B | 50186 | 4217 | 580.0 | 3.0 | 2.0 | 3.0 | 1.0 | 577.0 | 577.0 |
| 2006 | 2C | 50155 | 4275 | 577.3 | 18.0 | 7.0 | 18.0 | 11.0 | 559.3 | 559.3 |
| 2006 | 2D | 50136 | 4384 | 576.2 | 16.0 | n/a | n/a | n/a | 560.2 | n/a |
| 2006 | 3A | 50407 | 4301 | 576.5 | 17.0 | 3.0 | 17.0 | 14.0 | 559.5 | 559.5 |
| 2006 | 3B | 50356 | 4362 | 575.1 | 16.0 | 5.0 | 16.0 | 11.0 | 559.1 | 559.1 |
| 2006 | 3C | 50327 | 4430 | 574.0 | 19.0 | n/a | n/a | n/a | 555.0 | n/a |
| 2006 | 4A | 50681 | 4563 | 585.5 | 12.0 | 9.0 | 12.0 | 3.0 | 573.5 | 573.5 |
| 2006 | 4B | 50682 | 4667 | 579.8 | 12.0 | 7.0 | 12.0 | 5.0 | 567.8 | 567.8 |
| 2006 | 4C | 50669 | 4727 | 574.3 | 18.0 | 7.0 | 8.0 | 1.0 | 556.3 | 566.3 |
| 2006 | 5 | 50619 | 4485 | 587.5 | 14.0 | 13.0 | 14.0 | 1.0 | 573.5 | 573.5 |
| 2006 | 6 | 50483 | 4348 | 578.6 | 18.0 | 11.0 | 18.0 | 7.0 | 560.6 | 560.6 |
| 2008 | 2 | 50930.21 | 4847.26 | 564.99 | 16.0 | n/a | n/a | n/a | 549.0 | n/a |
| 2008 | 3 | 50794.63 | 4811.97 | 566.14 | 17.0 | n/a | n/a | n/a | 549.1 | n/a |
| 2008 | 4 | 49922.46 | 3977.33 | 581.22 | 21.0 | 4.0 | 21.0 | 17.0 | 560.2 | 560.2 |
| 2008 | 4A | 49892.32 | 4036.72 | 578.49 | 22.0 | 6.0 | 22.0 | 16.0 | 556.5 | 556.5 |
| 2008 | 5 | 49841.86 | 3862.76 | 592.41 | 14.0 | n/a | n/a | n/a | 578.4 | n/a |
| 2008 | 5A | 49811.06 | 3914.58 | 580.79 | 22.0 | 6.0 | 22.0 | 16.0 | 558.8 | 558.8 |
| 2008 | 5B | 49788.93 | 3966.82 | 580.54 | 24.0 | 10.0 | 24.0 | 14.0 | 556.5 | 556.5 |

# TABLE 1
# BRICKYARD DISPOSAL AND RECYCLING
# UNIT 1 EXTRANEOUS MATERIAL INVESTIGATION

| Year | Test Pit/ Boring Number | Northing (ft) | Easting (ft) | Elevation (ft) | Total Depth of Test Pit/ Boring (ft) | Top of Material (ft)/Cover Thickness | Bottom of Material (ft) | Thickness of Material (ft) | Bottom Pit Elevation | Bottom of Material |
|---|---|---|---|---|---|---|---|---|---|---|
| 2008 | 6 | 49725.86 | 3773.40 | 595.68 | 17.0 | n/a | n/a | n/a | 578.7 | n/a |
| 2008 | 6A | 49672.88 | 3841.17 | 583.62 | 22.0 | 11.0 | 22.0 | 11.0 | 561.6 | 561.6 |
| 2008 | 6B | 49626.65 | 3890.72 | 578.42 | 21.0 | 6.0 | 21.0 | 15.0 | 557.4 | 557.4 |
| 2008 | 7 | 49677.41 | 3728.55 | 593.02 | 21.0 | n/a | n/a | n/a | 572.0 | n/a |
| 2008 | 7A | 49624.66 | 3771.00 | 581.70 | 15.0 | n/a | n/a | n/a | 566.7 | n/a |
| 2008 | 8 | 49669.04 | 3501.81 | 600.74 | 14.0 | n/a | n/a | n/a | 586.7 | n/a |
| 2008 | 8A | 49616.85 | 3513.29 | 591.16 | 13.0 | n/a | n/a | n/a | 578.2 | n/a |
| 2008 | 9 | 49661.22 | 3310.08 | 581.07 | 18.0 | n/a | n/a | n/a | 563.1 | n/a |
| 2008 | 10 | 49612.38 | 3166.38 | 587.19 | 15.0 | 6.0 | 15.0 | 9.0 | 572.2 | 572.2 |
| 2008 | 11 | 49547.68 | 3089.57 | 600.35 | 11.0 | n/a | n/a | n/a | 589.4 | n/a |
| 2008 | 12 | 49506.09 | 2999.43 | 614.50 | 14.0 | 8.0 | 12.0 | 4.0 | 600.5 | 602.5 |
| 2008 | 13 | 49494.75 | 2900.10 | 615.27 | 12.0 | n/a | n/a | n/a | 603.3 | n/a |
| 2008 | 13A | 49452.64 | 2892.78 | 615.14 | 10.0 | n/a | n/a | n/a | 605.1 | n/a |
| 2008 | 14 | 49520.42 | 2821.62 | 610.83 | 12.0 | 2.0 | 10.0 | 8.0 | 598.8 | 600.8 |
| 2008 | 15 | 49625.89 | 2774.86 | 610.36 | 17.0 | 3.0 | 16.0 | 13.0 | 593.4 | 594.4 |
| 2008 | 16 | 49692.04 | 2781.26 | 612.14 | 18.0 | 6.0 | 16.0 | 10.0 | 594.1 | 596.1 |
| 2008 | 16A | 49706.96 | 2713.45 | 612.96 | 21.0 | 3.0 | 21.0 | 18.0 | 592.0 | 592.0 |
| 2008 | 16B | 49720.25 | 2657.00 | 613.38 | 19.0 | 2.0 | 19.0 | 17.0 | 594.4 | 594.4 |
| 2008 | 16C | 49733.29 | 2601.19 | 614.95 | 19.0 | 5.0 | 19.0 | 14.0 | 595.9 | 595.9 |
| 2008 | 17 | 49789.38 | 2806.95 | 615.54 | 19.0 | 4.0 | 15.0 | 11.0 | 596.5 | 600.5 |
| 2008 | 17A | 49791.10 | 2738.35 | 614.21 | 15.0 | 2.0 | 12.0 | 10.0 | 599.2 | 602.2 |
| 2008 | 17B | 49787.76 | 2679.77 | 614.27 | 12.0 | 2.0 | 12.0 | 10.0 | 602.3 | 602.3 |
| 2008 | 18 | 49887.71 | 2820.57 | 626.41 | 22.0 | 12.0 | 20.0 | 8.0 | 604.4 | 606.4 |
| 2008 | 18A | 49879.41 | 2767.64 | 623.65 | 18.0 | 12.0 | 15.0 | 3.0 | 605.6 | 608.6 |
| 2008 | 19 | 49968.90 | 2798.94 | 644.04 | 20.0 | n/a | n/a | n/a | 624.0 | n/a |
| 2008 | 20 | 49968.62 | 2637.16 | 647.26 | 18.0 | n/a | n/a | n/a | 629.3 | n/a |
| 2008 | 20A | 49902.98 | 2638.32 | 631.18 | 19.0 | 8.0 | 16.0 | 8.0 | 612.2 | 615.2 |
| 2008 | 20B | 49847.54 | 2641.56 | 618.68 | 13.0 | n/a | n/a | n/a | 605.7 | n/a |
| 2008 | 20C | 49794.76 | 2633.45 | 615.01 | 11.0 | n/a | n/a | n/a | 604.0 | n/a |
| 2008 | 21 | 49968.74 | 2431.71 | 643.12 | 17.0 | 10.0 | 14.0 | 4.0 | 626.1 | 629.1 |
| 2008 | 21A | 49910.03 | 2423.02 | 631.02 | 17.0 | 15.0 | 16.0 | 1.0 | 614.0 | 615.0 |
| 2008 | 21B | 49858.84 | 2418.31 | 622.77 | 12.0 | 4.0 | 10.0 | 6.0 | 610.8 | 612.8 |
| 2008 | 21C | 49810.96 | 2412.29 | 622.35 | 21.0 | 3.0 | 19.0 | 16.0 | 601.3 | 603.3 |
| 2008 | 22 | 49968.68 | 2245.84 | 633.39 | 11.0 | 0.0 | 6.0 | 6.0 | 622.4 | 627.4 |
| 2008 | 22A | 49953.16 | 2185.93 | 625.30 | 16.0 | 1.0 | 7.0 | 6.0 | 609.3 | 618.3 |
| 2008 | 22B | 49935.14 | 2129.22 | 628.72 | 23.5 | 4.0 | 22.0 | 18.0 | 605.2 | 606.7 |
| 2008 | 22C | 49921.28 | 2088.12 | 626.54 | 26.0 | 8.0 | 26.0 | 18.0 | 600.5 | 600.5 |
| 2008 | 22D | 49908.68 | 2041.86 | 624.98 | 25.0 | 8.0 | 25.0 | 17.0 | 600.0 | 600.0 |
| 2008 | 22E | 49936.94 | 1985.74 | 622.54 | 12.0 | 4.0 | 9.0 | 5.0 | 610.5 | 613.5 |
| 2008 | 23 | 50108.87 | 2247.25 | 642.88 | 11.0 | 0.0 | 5.0 | 5.0 | 631.9 | 637.9 |
| 2008 | 23C | 50088.58 | 2077.49 | 635.69 | 12.0 | n/a | n/a | n/a | 623.7 | n/a |
| 2008 | 23D | 50065.07 | 2003.46 | 632.35 | 13.0 | n/a | n/a | n/a | 619.3 | n/a |
| 2008 | 24 | 50275.50 | 2247.13 | 642.54 | 13.0 | 2.0 | 4.0 | 2.0 | 629.5 | 638.5 |
| 2008 | 24A | 50277.61 | 2214.63 | 639.85 | 7.5 | 2.0 | 3.0 | 1.0 | 632.3 | 636.8 |
| 2008 | 24B | 50258.14 | 2156.71 | 638.54 | 14.0 | 4.0 | 8.0 | 4.0 | 624.5 | 630.5 |
| 2008 | 24C | 50247.49 | 2093.19 | 639.14 | 15.0 | 3.0 | 5.0 | 2.0 | 624.1 | 634.1 |
| 2008 | 25 | 50546.80 | 2246.33 | 641.57 | 12.0 | n/a | n/a | n/a | 629.6 | n/a |
| 2008 | 26 | 50689.28 | 2246.39 | 645.75 | 14.0 | 6.0 | 8.0 | 2.0 | 631.7 | 637.7 |
| 2008 | 27 | 50856.19 | 2246.51 | 646.99 | 14.0 | 10.0 | 14.0 | 4.0 | 633.0 | 633.0 |
| 2008 | 27A | 50836.93 | 2182.91 | 630.29 | 12.0 | n/a | n/a | n/a | 618.3 | n/a |
| 2008 | 28 | 50192.43 | 4406.94 | 576.11 | 12.0 | n/a | n/a | n/a | 564.1 | n/a |
| 2008 | 28A | 50171.77 | 4242.80 | 578.33 | 18.0 | 2.0 | 18.0 | 16.0 | 560.3 | 560.3 |
| 2008 | 29 | 50392.47 | 4381.69 | 573.67 | 24.0 | 4.0 | 24.0 | 20.0 | 549.7 | 549.7 |
| 10/31/2012 | 1001 | 49586.79 | 2871.78 | 612.21 | 3.0 | 3.0 | N/A | N/A | 609.2 | N/A |

# TABLE 1
# BRICKYARD DISPOSAL AND RECYCLING
# UNIT 1 EXTRANEOUS MATERIAL INVESTIGATION

| Year | Test Pit/ Boring Number | Northing (ft) | Easting (ft) | Elevation (ft) | Total Depth of Test Pit/ Boring (ft) | Top of Material (ft)/Cover Thickness | Bottom of Material (ft) | Thickness of Material (ft) | Bottom Pit Elevation | Bottom of Material |
|---|---|---|---|---|---|---|---|---|---|---|
| 10/31/2012 | 1002 | 49586.79 | 3071.78 | 604.68 | 8.0 | 8.0 | N/A | N/A | 596.7 | N/A |
| 10/31/2012 | 1003 | 49686.79 | 3878.34 | 580.1 | 6.0 | 6.0 | N/A | N/A | 574.1 | N/A |
| 10/31/2012 | 1004 | 49786.79 | 2471.78 | 619 | 4.5 | 4.5 | N/A | N/A | 614.5 | N/A |
| 10/31/2012 | 1005 | 49786.79 | 2671.78 | 614.6 | 1.5 | 1.5 | N/A | N/A | 613.1 | N/A |
| 10/31/2012 | 1006 | 49786.79 | 2871.78 | 616.5 | 5.5 | 5.5 | N/A | N/A | 611.0 | N/A |
| 10/31/2012 | 1007 | 49886.79 | 2371.78 | 623.5 | 3.5 | 3.5 | N/A | N/A | 620.0 | N/A |
| 10/31/2012 | 1008 | 49886.79 | 2071.78 | 623.7 | 5.5 | 5.5 | N/A | N/A | 618.2 | N/A |
| 10/31/2012 | 1009 | 49886.79 | 2571.78 | 626.3 | 9.0 | 9.0 | N/A | N/A | 617.3 | N/A |
| 11/1/2012 | 1010 | 49886.79 | 3978.34 | 581.1 | 5.0 | 5.0 | N/A | N/A | 576.1 | N/A |
| 10/31/2012 | 1011 | 49886.79 | 2771.78 | 624 | 11.0 | 11.0 | N/A | N/A | 613.0 | N/A |
| 10/30/2012 | 1012 | 49986.79 | 2171.78 | 625.2 | 11.0 | 11.0 | N/A | N/A | 614.2 | N/A |
| 10/30/2012 | 1013 | 50086.79 | 2071.78 | 635 | 10.0 | 10.0 | N/A | N/A | 625.0 | N/A |
| 10/31/2012 | 1014 | 50086.79 | 4078.34 | 585.8 | 8.5 | 8.5 | N/A | N/A | 577.3 | N/A |
| 10/30/2012 | 1015 | 50186.79 | 2171.78 | 633.5 | 8.0 | 8.0 | N/A | N/A | 625.5 | N/A |
| 10/31/2012 | 1016 | 50186.79 | 4278.34 | 578.6 | 8.5 | 8.5 | N/A | N/A | 570.1 | N/A |
| 11/1/2012 | 1017 | 50286.79 | 4078.34 | 603.9 | 7.5 | 7.5 | N/A | N/A | 596.4 | N/A |
| 11/1/2012 | 1018 | 50386.79 | 4278.34 | 577.6 | 3.0 | 3.0 | N/A | N/A | 574.6 | N/A |
| 11/1/2012 | 1019 | 50386.79 | 4478.34 | 575.9 | 6.0 | 6.0 | N/A | N/A | 569.9 | N/A |
| 11/1/2012 | 1020 | 50486.79 | 4678.34 | 565.6 | 8.5 | 8.5 | N/A | N/A | 557.1 | N/A |
| 11/1/2012 | 1021 | 50586.79 | 4278.34 | 598.2 | 10.0 | 10.0 | N/A | N/A | 588.2 | N/A |
| 11/1/2012 | 1022 | 50586.79 | 4478.3 | 578 | 10.0 | 10.0 | N/A | N/A | 568.0 | N/A |
| 11/1/2012 | 1023 | 50586.79 | 4878.34 | 556.8 | 4.0 | 4.0 | N/A | N/A | 552.8 | N/A |
| 10/30/2012 | 1024 | 50786.79 | 2212.92 | 637.8 | 8.0 | 8.0 | N/A | N/A | 629.8 | N/A |

Shading indicates materials exceeded bottom of the trench.
NA Not applicable or information not available.
Test pits for 2012 investigation were to top of extraneous materials only.

# TABLE 2
## BRICKYARD DISPOSAL AND RECYCLING
## UNIT 1 EXTRANEOUS MATERIALS COVER HYDRAULIC CONDUCTIVITY

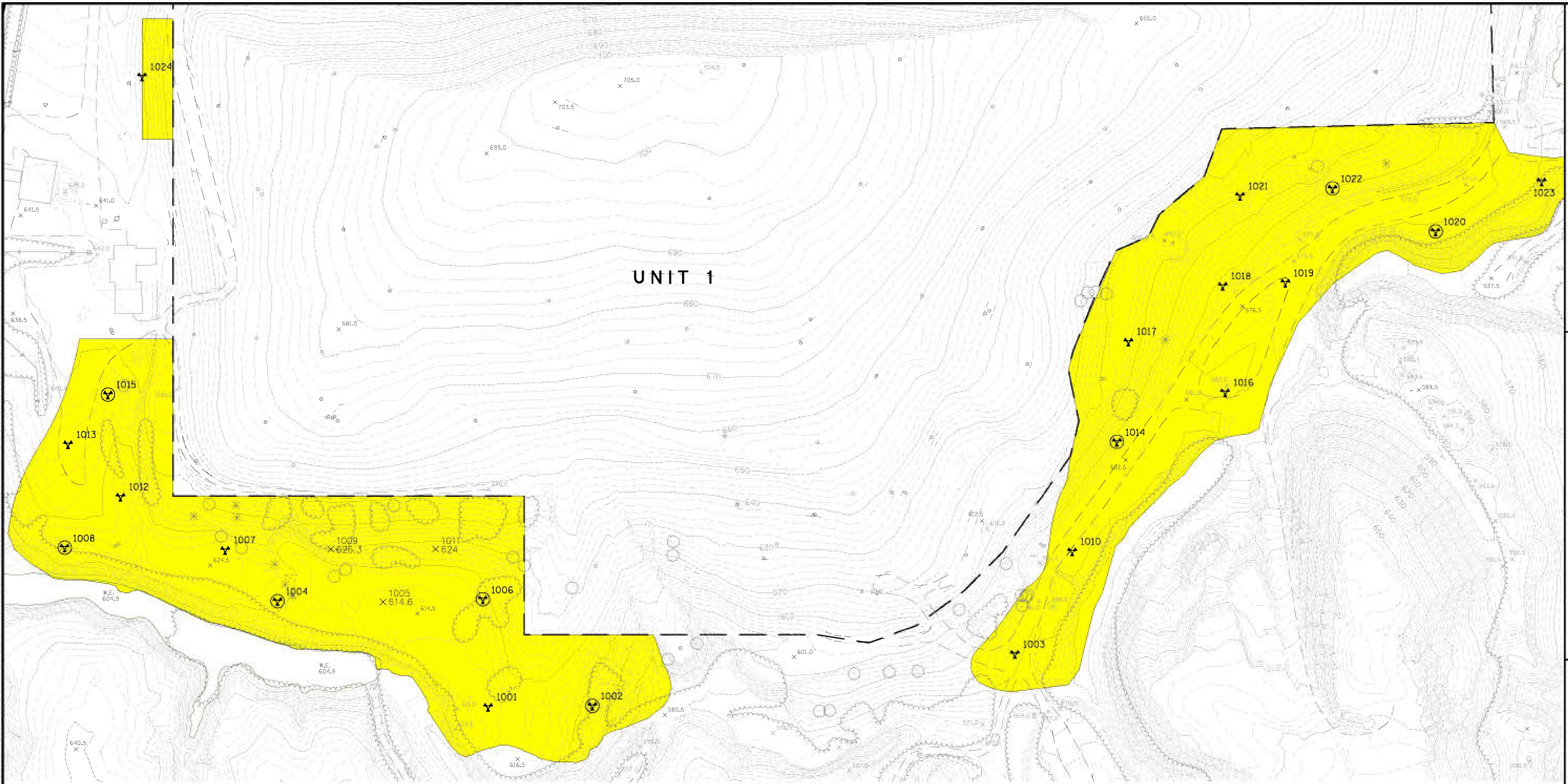
| Sample No. | Vertical Hydraulic Conductivity | Sample Interval |
|---|---|---|
| 1002 | 4.30E-08 | 2-4 ft. |
| 1004 | 9.50E-09 | 2-4 ft. |
| 1006 | 2.80E-07 | 2-4 ft. |
| 1008 | 6.90E-07 | 2-4 ft. |
| 1014 | 2.30E-08 | 2-4 ft. |
| 1015 | 2.00E-07 | 2-4 ft. |
| 1020 | 3.10E-06 | 2-4 ft. |
| 1022 | 5.70E-07 | 7-9 ft. |
| Maximum | 3.10E-06 | |
| Minimum | 9.50E-09 | |
| Average | 6.14E-07 | |

All values in cm/sec.

# TABLE 3
# BRICKYARD DISPOSAL AND RECYCLING
# FIELD MOISTURE DENSITY TEST RESULTS OF EXTRANEOUS MATERIALS COVER

| Test Point | Test Depth (ft) | Max. Dry Density (pcf) | Optimum Moisture (%) | Dry Density (pcf) | Wet Density (pcf) | Water Weight (%) | Moisture (%) | Compact. (%) |
|---|---|---|---|---|---|---|---|---|
| 1001 | 2 | 122.1 | 12.3 | 120.1 | 133.6 | 13.6 | 11.3 | 98.4 |
| 1002 | 2 | 116.5 | 13.9 | 116.3 | 130.7 | 14.4 | 12.2 | 99.8 |
| 1002 | 4 | 116.5 | 13.9 | 103.2 | 124.9 | 21.8 | 21.1 | 88.6 |
| 1003 | 2 | 122.1 | 12.3 | 129.3 | 138.2 | 8.9 | 6.9 | 105.9 |
| 1004 | 2 | 120.0 | 13.1 | 90.9 | 114.7 | 23.8 | 26.2 | 75.8 |
| 1004 | 4 | 120.0 | 13.1 | 119.0 | 134.9 | 15.9 | 13.3 | 99.2 |
| 1006 | 2 | 116.5 | 13.9 | 103.6 | 125.0 | 21.4 | 20.6 | 88.9 |
| 1006 | 4 | 116.5 | 13.9 | 110.5 | 128.0 | 17.4 | 15.8 | 94.8 |
| 1007 | 2 | 120.0 | 13.1 | 117.6 | 134.6 | 17.0 | 14.5 | 98.0 |
| 1008 | 2 | 120.0 | 13.1 | 120.3 | 131.2 | 10.9 | 9.1 | 100.3 |
| 1008 | 4 | 120.0 | 13.1 | 115.9 | 129.3 | 13.4 | 11.5 | 96.6 |
| 1010 | 2 | 122.1 | 12.3 | 125.1 | 137.5 | 12.4 | 9.9 | 102.5 |
| 1012 | 2 | 120.0 | 13.1 | 124.0 | 139.4 | 15.4 | 12.4 | 103.3 |
| 1012 | 4 | 116.5 | 13.9 | 110.1 | 127.7 | 17.6 | 16.0 | 94.5 |
| 1013 | 2 | 116.5 | 13.9 | 109.8 | 122.0 | 12.2 | 11.1 | 94.2 |
| 1013 | 4 | 116.5 | 13.9 | 110.3 | 124.2 | 13.9 | 12.6 | 94.7 |
| 1014 | 2 | 116.5 | 13.9 | 116.4 | 133.8 | 17.3 | 14.9 | 99.9 |
| 1014 | 4 | 116.5 | 13.9 | 116.5 | 134.3 | 17.7 | 15.2 | 100.0 |
| 1015 | 2 | 120.0 | 13.1 | 113.6 | 130.3 | 16.7 | 14.7 | 94.7 |
| 1015 | 4 | 120.0 | 13.1 | 125.8 | 137.4 | 11.6 | 9.2 | 104.8 |
| 1016 | 2 | 116.5 | 13.9 | 106.0 | 120.6 | 14.6 | 13.8 | 91.0 |
| 1016 | 4 | 116.5 | 13.9 | 124.6 | 137.1 | 12.5 | 10.0 | 107.0 |
| 1017 | 2 | 122.1 | 12.3 | 124.6 | 138.6 | 13.9 | 11.2 | 102.0 |
| 1017 | 4 | 122.1 | 12.3 | 123.1 | 136.0 | 13.0 | 10.5 | 100.8 |
| 1018 | 2 | 122.1 | 12.3 | 125.5 | 138.8 | 13.4 | 10.6 | 102.8 |
| 1019 | 2 | 122.1 | 12.3 | 123.4 | 135.7 | 12.3 | 10.0 | 101.1 |
| 1019 | 4 | 120.0 | 13.1 | 112.9 | 131.3 | 18.4 | 16.3 | 94.1 |
| 1020 | 2 | 116.5 | 13.9 | 109.9 | 120.0 | 10.1 | 9.2 | 94.3 |
| 1020 | 4 | 116.5 | 13.9 | 123.0 | 131.7 | 8.7 | 7.1 | 105.6 |
| 1021 | 2 | 122.1 | 12.3 | 124.0 | 139.0 | 15.0 | 12.1 | 101.6 |
| 1021 | 4 | 122.1 | 12.3 | 121.4 | 137.2 | 15.8 | 13.0 | 99.4 |
| 1022 | 2 | 122.1 | 12.3 | 114.7 | 125.2 | 10.6 | 9.2 | 93.9 |
| 1022 | 7 | 120.0 | 13.1 | 114.4 | 128.7 | 14.3 | 12.5 | 95.3 |
| 1023 | 2 | 120.0 | 13.1 | 113.9 | 129.0 | 15.1 | 13.3 | 94.9 |
| 1024 | 2 | 122.1 | 12.3 | 109.4 | 123.3 | 13.9 | 12.7 | 89.6 |
| 1024 | 4 | 122.1 | 12.3 | 120.9 | 132.4 | 11.6 | 9.6 | 99.0 |
| | | | | | | | | |
| Maximum | | 122.1 | 13.9 | 129.3 | 139.4 | 23.8 | 26.2 | 107.0 |
| Minimum | | 116.5 | 12.3 | 90.9 | 114.7 | 8.7 | 6.9 | 75.8 |
| Average | | 119.4 | 13.1 | 116.4 | 131.0 | 14.6 | 12.8 | 97.4 |

# FIGURES



**NOTE:**
AERIAL TOPOGRAPHY SURVEY CONDUCTED FEBRUARY 20, 2012 BY AEROCON PHOTOGRAMMETRIC SERVICES, INC.

EXPLANATION

| | |
|---|---|
| Ÿ | NUCLEAR DENSITY TEST LOCATION |
| ⓨ | SHELBY TUBE LOCATION IN ADDITION TO NUCLEAR DENSITY TEST |
| × | TEST PIT LOCATION - OBSERVATION ONLY |
| 🟨 | APPROXIMATE EXTENT OF EXTRANEOUS MATERIALS |

N

100 0 100 200 400
SCALE: IN FEET

REVISIONS

| NO. | DATE | DESCRIPTION | BY |
|---|---|---|---|
| | | | |

ANDREWS
ENGINEERING, INC.
3300 Ginger Creek Drive, Springfield, IL 62711-7233
Tel (217) 787-2334 Fax (217) 787-9495
Pontiac, IL • Naperville, IL • Indianapolis, IN • Warrenton, MO
Professional Design Engineering and Land Surveying Firm #184-001541

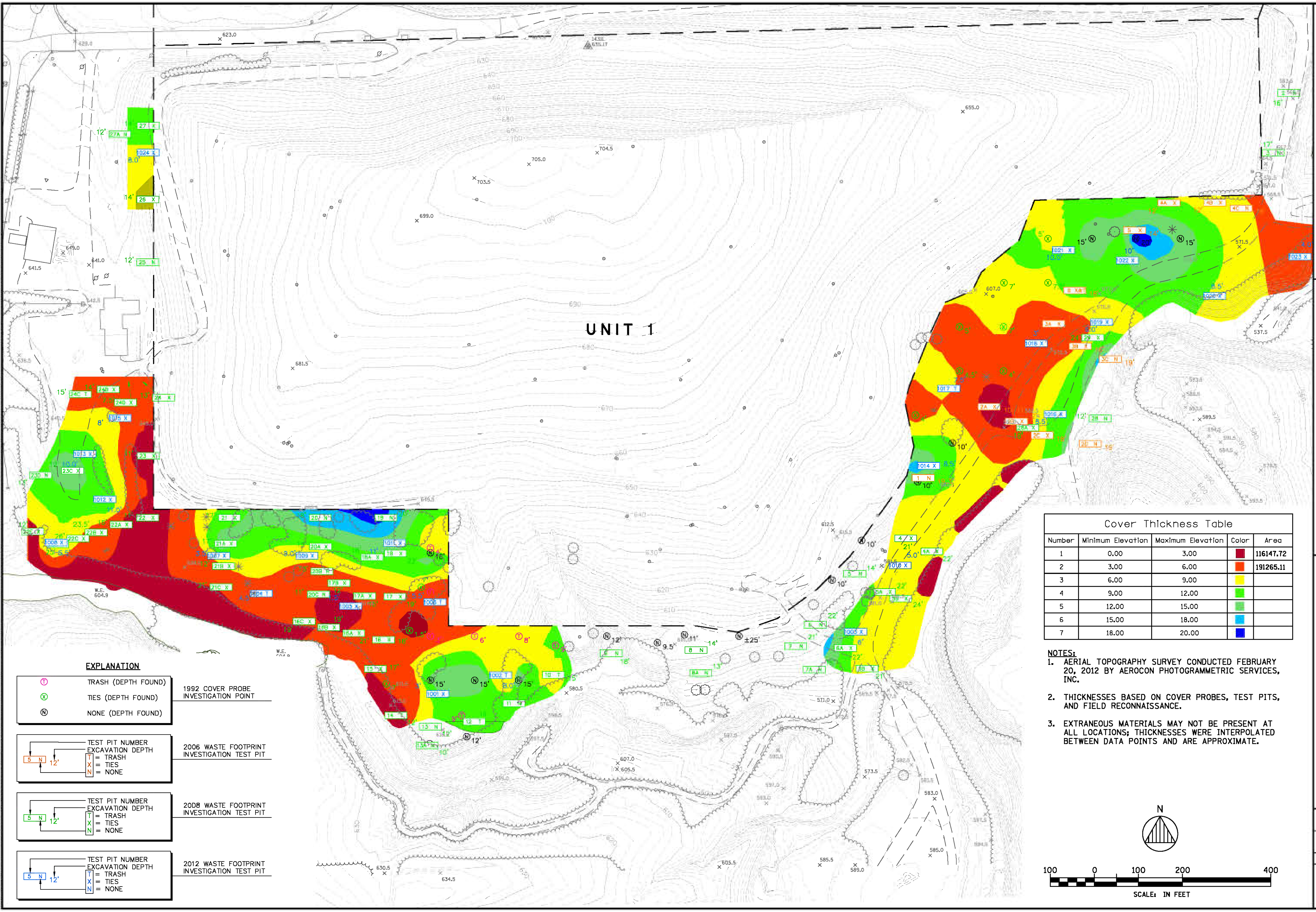
APPROVED BY: DWM DESIGNED BY: DWM DRAWN BY: MPN

2012 INVESTIGATION PITS

PLANS PREPARED FOR
BRICKYARD DISPOSAL & RECYCLING
DANVILLE, ILLINOIS

DATE: NOVEMBER 2012
PROJECT ID: 1989-115A
SHEET NUMBER:
FIG. 1

J:\1989\89-115A (Brickyard)\DWG\2012\RRTIE_Cover thickness REV 11-20-12.dwg Tab: Layout1 (2) Last Saved: January 31, 2013, by Mike Nguyen Plotted: Thursday, January 31, 2013 1:55:48 PM



**EXPLANATION**

| | | |
|---|---|---|
| Ⓣ | TRASH (DEPTH FOUND) | 1992 COVER PROBE INVESTIGATION POINT |
| Ⓧ | TIES (DEPTH FOUND) | |
| Ⓝ | NONE (DEPTH FOUND) | |

5 N 12' — TEST PIT NUMBER; EXCAVATION DEPTH; T = TRASH; X = TIES; N = NONE — 2006 WASTE FOOTPRINT INVESTIGATION TEST PIT

5 N 12' — TEST PIT NUMBER; EXCAVATION DEPTH; T = TRASH; X = TIES; N = NONE — 2008 WASTE FOOTPRINT INVESTIGATION TEST PIT

5 N 12' — TEST PIT NUMBER; EXCAVATION DEPTH; T = TRASH; X = TIES; N = NONE — 2012 WASTE FOOTPRINT INVESTIGATION TEST PIT

Cover Thickness Table

| Number | Minimum Elevation | Maximum Elevation | Color | Area |
|---|---|---|---|---|
| 1 | 0.00 | 3.00 | 🟥 | 116147.72 |
| 2 | 3.00 | 6.00 | 🟧 | 191265.11 |
| 3 | 6.00 | 9.00 | 🟨 | |
| 4 | 9.00 | 12.00 | 🟩 | |
| 5 | 12.00 | 15.00 | 🟩 | |
| 6 | 15.00 | 18.00 | 🟦 | |
| 7 | 18.00 | 20.00 | 🟦 | |

NOTES:

1. AERIAL TOPOGRAPHY SURVEY CONDUCTED FEBRUARY 20, 2012 BY AEROCON PHOTOGRAMMETRIC SERVICES, INC.
2. THICKNESSES BASED ON COVER PROBES, TEST PITS, AND FIELD RECONNAISSANCE.
3. EXTRANEOUS MATERIALS MAY NOT BE PRESENT AT ALL LOCATIONS; THICKNESSES WERE INTERPOLATED BETWEEN DATA POINTS AND ARE APPROXIMATE.

| REVISIONS | | | |
|---|---|---|---|
| NO. | DATE | DESCRIPTION | BY |

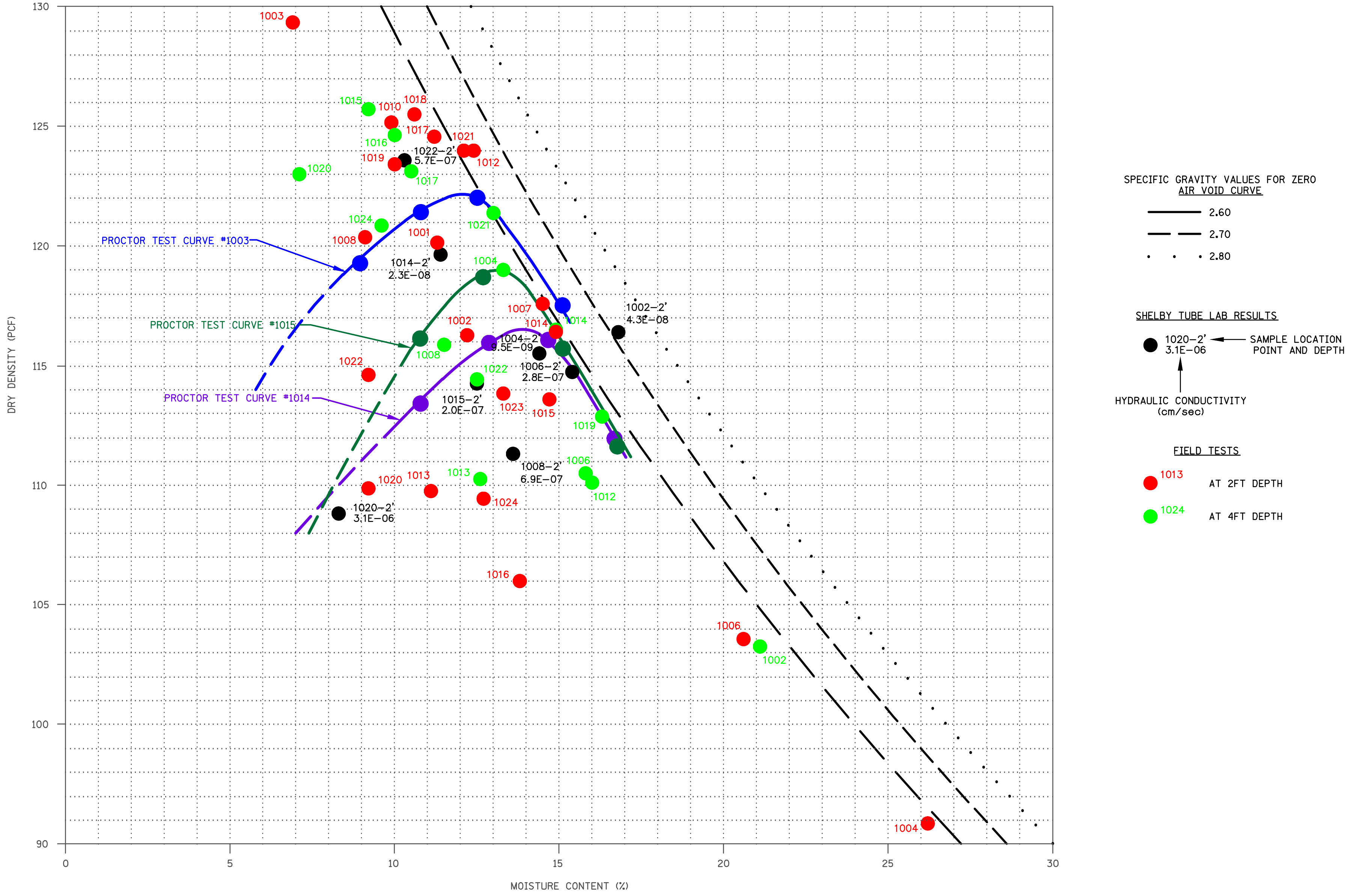
**ANDREWS ENGINEERING, INC.**
3300 Ginger Creek Drive, Springfield, IL 62711-7233
Tel (217) 787-2334 Fax (217) 787-9495
Pontiac, IL • Naperville, IL • Indianapolis, IN • Warrenton, MO
Professional Design Engineering and Land Surveying Firm #184-001541

APPROVED BY: DWM
DESIGNED BY: DWM
DRAWN BY: MPN

COVER THICKNESS MAP

PLANS PREPARED FOR
BRICKYARD DISPOSAL & RECYLING
DANVILLE, ILLINOIS

DATE: OCTOBER 2012
PROJECT ID: 1989-115A
SHEET NUMBER:
FIG. 2



| REVISIONS | | |
|---|---|---|
| NO. | DATE | DESCRIPTION | BY |

MOISTURE–DENSITY GRAPH

PLANS PREPARED FOR

BRICKYARD DISPOSAL & RECYLING

DANVILLE, ILLINOIS

**ANDREWS**
**ENGINEERING, INC.**
3300 Ginger Creek Drive, Springfield, IL 62711-7233
(217) 787-2334
Pontiac, IL • Naperville, IL • Indianapolis, IN • Warrenton, MO
Professional Design Engineering and Land Surveying Firm #184-001541

APPROVED BY: PMV
DESIGNED BY: PMV
DRAWN BY: WCU

DATE:
NOVEMBER 2012

PROJECT ID:
1989–115A

SHEET NUMBER:

FIG. 3

# APPENDIX A

# FIELD LOGS

AEEI Job Number: 1989-115A

Boring Number: 1001

Page

Site Name: Brickyard Disposal and Recycling

Address: Danville, IL

Boring Location:
N: 49586.8
E: 4871.78
Surf Elev: 612.21 ft

Dat Start: 10/31/2012

Finish: 10/31/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Vegetative layer | | | |
| | | | | 1 | | | | |
| | | | | | Shale fragments, dense, intermixed with clayey silt/silty clay | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | | Rail road ties encountered; EOB at 3.0 feet | | | |
| | | | | 4 | | | | |
| | | | | 5 | | | | |
| | | | | 6 | | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | 9 | | | | |
| | | | | 10 | | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling

▽ Depth After Drilling

Auger Depth

Rotary Depth

Driller/Co. KR&G - Backhoe

Rig

Geologist Tech: Jamie Stufflebeam

Andrews Engineering

AEEI Job Number: 1989-115A

Boring Number: 1002

Page:

Site Name: Brickyard Disposal and Recycling

Address: Danville, IL

Boring Location:
N: 49586.79
E: 3071.78
Surf Elev: 604.68 ft

Dat Start: 10/31/2012

Finish: 10/31/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Vegetative layer | | | |
| | | | | 1 | | | | |
| | | | | | Brown clayey silt/silty clay, with shale fragments | | | |
| | | | | 2 | | | | |
| | | | | 3 | Brown clayey silt/silty clay | | | |
| | | | | 4 | | | | |
| | | | | 5 | | | | |
| | | | | 6 | | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | | Refuse encountered; EOB at 8 feet | | | |
| | | | | 9 | | | | |
| | | | | 10 | | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling ____________

▽ Depth After Drilling ____________

Auger Depth ____________

Rotary Depth ____________

Driller/Co. KR&G Backhoe

Rig ____________

Geologist Tech: Jamie Stufflebeam

Andrews Engineering

Electronic Filing - Recived, Clerk's Office : 05/31/2013 * * * AS 2013-004 * * *

AEEI Job Number: 1989-115A

Boring Number: 1003

Page

Site Name: Brickyard Disposal and Recycling

Address: Danville, IL

Boring Location:
N: 49686.79
E: 3878.34
Surf Elev: 580.10 ft

Dat Start: 10/31/2012

Finish: 10/31/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | 1 | | | | |
| | | | | 2 | | | | |
| | | | | 3 | Gray shale fragments, dense, intermixed with varying amounts of silt and clay | | | |
| | | | | 4 | | | | |
| | | | | 5 | | | | |
| | | | | 6 | | | | |
| | | | | | Railrod ties encountered. EOB at 6.0 feet | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | 9 | | | | |
| | | | | 10 | | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling ______

▽ Depth After Drilling ______

Auger Depth ______

Rotary Depth ______

Driller/Co. KR&G Backhoe

Rig ______

Geologist Tech: Jamie Stufflebeam

Andrews
Engineering

AEEI Job Number: 1989-115A

Boring Number: 1004

Page

Site Name: Brickyard Disposal and Recycling

Address: Danville, IL

Boring Location:
N: 49786.79
E: 2471.78
Surf Elev: 619.00 ft

Dat Start: 10/31/2012

Finish: 10/31/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Vegetative layer | | | |
| | | | | 1 | | | | |
| | | | | | clayey silt/silty clay intermixed with slag from 0.5 to 3.5 feet | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | 4 | Brown clayey silt/silty clay | | | |
| | | | | 5 | Railroad ties encountered; EOB at 4.5 feet | | | |
| | | | | 6 | | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | 9 | | | | |
| | | | | 10 | | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling ____________

▽ Depth After Drilling ____________

Auger Depth ____________

Rotary Depth ____________

Driller/Co. KR&G Backhoe

Rig ____________

Geologist Tech: Jamie Stufflebeam

Andrews
Engineering

AEEI Job Number: 1989-115A

Boring Number: 1005

Page:

Site Name: Brickyard Disposal and Recycling

Address: Danville, IL

Boring Location:
N: 49786.79
E: 2671.78
Surf Elev: 614.60 ft

Dat Start: 10/31/2012

Finish: 10/31/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Vegetative layer | | | |
| | | | | 1 | Shale fragments intermixed with silty clay/clayey silt, dense | | | |
| | | | | 2 | Railroad ties encountered; EOB at 1.5 feet | | | |
| | | | | 3 | | | | |
| | | | | 4 | | | | |
| | | | | 5 | | | | |
| | | | | 6 | | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | 9 | | | | |
| | | | | 10 | | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling ____________

▽ Depth After Drilling ____________

Auger Depth ____________

Rotary Depth ____________

Driller/Co. KR&G Backhoe

Rig ____________

Geologist Tech: Jamie Stufflebeam

Andrews
Engineering

AEEI Job Number: 1989-115A

Boring Number: 1006

Page:

| | | | |
|---|---|---|---|
| Site Name: | Brickyard Disposal and Recycling | Dat Start: | 10/31/2012 |
| Address: | Danville, IL | Finish: | 10/31/2012 |

Boring Location:
N: 49786.79
E: 2871.78
Surf Elev: 616.50 ft

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Vegetative layer | | | |
| | | | | 1 | | | | |
| | | | | | brown sandy silt, some clay, with shale fragments, very wet | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | 4 | | | | |
| | | | | 5 | brown clayey silt/silty clay, very wet | | | |
| | | | | 6 | Refuse encountered; EOB at 5.5 feet | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | 9 | | | | |
| | | | | 10 | | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling ______

▽ Depth After Drilling ______

Auger Depth ______

Rotary Depth ______

Driller/Co. KR&G Backhoe

Rig ______

Geologist Tech: Jamie Stufflebeam

Andrews
Engineering

AEEI Job Number: 1989-115A
Boring Number: 1007
Page

Site Name: Brickyard Disposal and Recycling
Address: Danville, IL

Boring Location:
N: 49886.79
E: 2371.78
Surf Elev: 623.50 ft

Dat Start: 10/31/2012
Finish: 10/31/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Vegetative layer | | | |
| | | | | 1 | | | | |
| | | | | | Brown clayey silt/silty clay, very wet | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | 4 | Railroad ties encountered; EOB at 3.5 feet | | | |
| | | | | 5 | | | | |
| | | | | 6 | | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | 9 | | | | |
| | | | | 10 | | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data
▼ Depth While Drilling ______
▽ Depth After Drilling ______

Auger Depth ______
Rig ______
Rotary Depth ______
Geologist Tech: Jamie Stufflebeam
Driller/Co. KR&G Backhoe

Andrews
Engineering

AEEI Job Number: 1989-115A

Boring Number: 1008

Page:

Site Name: Brickyard Disposal and Recycling

Address: Danville, IL

Boring Location:
N: 49886.79
E: 2071.78
Surf Elev: 623.70 ft

Dat Start: 10/31/2012
Finish: 10/31/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Vegetative layer | | | |
| | | | | 1 | | | | |
| | | | | | Brown sandy silt, some clay, with shale fragments | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | | Brown clayey sand | | | |
| | | | | 4 | | | | |
| | | | | 5 | | | | |
| | | | | 6 | Railroad ties encountered; EOB at 5.5 feet | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | 9 | | | | |
| | | | | 10 | | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling ____________

▽ Depth After Drilling ____________

Auger Depth ____________

Rotary Depth ____________

Driller/Co. KR&G Backhoe

Rig ____________

Geologist Tech: Jamie Stufflebeam

Andrews Engineering

| | | | |
|---|---|---|---|
| AEEI Job Number: 1989-115A | Boring Number: 1009 | Page | |
| Site Name: Brickyard Disposal and Recycling | Boring Location: | Dat Start: | 10/31/2012 |
| Address: Danville, IL | N: 49886.79<br>E: 2571.78<br>Surf Elev: 626.30 ft | Finish: | 10/31/2012 |

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | 1 | Shale fragments, dense, intermixed with clayey silt/silty clay | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | 4 | | | | |
| | | | | 5 | | | | |
| | | | | 6 | | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | 9 | | | | |
| | | | | 10 | Railroad ties encountered; EOB at 9.0 feet | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling

▽ Depth After Drilling

Auger Depth

Rotary Depth

Driller/Co. KR&G Backhoe

Rig

Geologist Tech: Jamie Stufflebeam

Andrews Engineering

AEEI Job Number: 1989-115A

Boring Number: 1010

Page:

Site Name: Brickyard Disposal and Recycling

Address: Danville, IL

Boring Location:
N: 49886.79
E: 3978.34
Surf Elev: 581.10 ft

Dat Start: 11/1/2012

Finish: 11/1/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | 1 | Brown sandy silt, some clay, with shale fragments | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | 4 | Shale fragments, some brick, dense, intermixed with clayey silt/silty clay | | | |
| | | | | 5 | | | | |
| | | | | | Railroad ties encountered; EOB at 5.0 feet | | | |
| | | | | 6 | | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | 9 | | | | |
| | | | | 10 | | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling

▽ Depth After Drilling

Auger Depth

Rotary Depth

Driller/Co. KR&G Backhoe

Rig

Geologist Tech: Jamie Stufflebeam

Andrews
Engineering

AEEI Job Number: 1989-115A

Boring Number: 1011

Page:

Site Name: Brickyard Disposal and Recycling

Address: Danville, IL

Boring Location:
N: 49886.79
E: 2771.78
Surf Elev: 624.00 ft

Dat Start: 10/31/2012
Finish: 10/31/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | 1 | Shale fragments, some large, intermixed with clayey silt/silty clay, dense | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | 4 | | | | |
| | | | | 5 | | | | |
| | | | | 6 | | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | 9 | | | | |
| | | | | 10 | | | | |
| | | | | 11 | Railroad ties encountered; EOB at 11.0 feet | | | |
| | | | | 12 | | | | |

Groundwater Data
▼ Depth While Drilling ____
▽ Depth After Drilling ____

Auger Depth ____
Rotary Depth ____
Driller/Co. KR&G Backhoe

Rig ____
Geologist Tech: Jamie Stufflebeam

Andrews Engineering

AEEI Job Number: 1989-115A

Boring Number: 1012

Page:

Site Name: Brickyard Disposal and Recycling

Address: Danville, IL

Boring Location:
N: 49986.79
E: 2171.78
Surf Elev: 625.20 ft

Dat Start: 10/30/2012

Finish: 10/30/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Vegetative layer | | | |
| | | | | 1 | | | | |
| | | | | | Brown silty clay/clayey silt, with shale fragments | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | 4 | Brown clayey silt/silty clay | | | |
| | | | | 5 | | | | |
| | | | | 6 | | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | 9 | | | | |
| | | | | 10 | | | | |
| | | | | 11 | | | | |
| | | | | | Railroad ties encountered; EOB at 11.0 feet | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling ______

▽ Depth After Drilling ______

Auger Depth ______

Rig ______

Rotary Depth ______

Geologist Tech: Jamie Stufflebeam

Driller/Co. KR&G Backhoe

Andrews
Engineering

AEEI Job Number: 1989-115A

Boring Number: 1013

Page:

Site Name: Brickyard Disposal and Recycling

Address: Danville, IL

Boring Location:
N: 50086.79
E: 2071.78
Surf Elev: 635.00 ft

Dat Start: 10/30/2012

Finish: 10/30/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Vegetative layer | | | |
| | | | | 1 | | | | |
| | | | | | Brown clayey silt/silty clay, with shale fragments | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | 4 | | | | |
| | | | | 5 | Brown clayey silt/silty clay, with shale fragments, some brick and slag | | | |
| | | | | 6 | | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | 9 | Brown clayey silt/silty clay | | | |
| | | | | 10 | | | | |
| | | | | | Railroad ties encountered; EOB at 10.0 feet | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling

▽ Depth After Drilling

Auger Depth

Rotary Depth

Driller/Co. KR&G Backhoe

Rig

Geologist Tech: Jamie Stufflebeam

Andrews
Engineering

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| | | |
|---|---|---|
| AEEI Job Number: 1989-115A | Boring Number: 1014 | Page |
| Site Name: Brickyard Disposal and Recycling<br>Address: Danville, IL | Boring Location:<br>N: 50086.79<br>E: 4078.34<br>Surf Elev: 585.80 ft | Dat Start: 10/31/2012<br>Finish: 10/31/2012 |

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Vegetative layer | | | |
| | | | | 1 | | | | |
| | | | | | Brown clayey silt/silty clay, with shale fragments | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | | Brown sandy silt, some clay and brick, with shale fragments | | | |
| | | | | 4 | | | | |
| | | | | 5 | | | | |
| | | | | 6 | Brown clayey silt/silty clay, with shale fragments | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | 9 | Railroad ties encountered; EOB at 8.5 feet | | | |
| | | | | 10 | | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling ______________

▽ Depth After Drilling ______________

Auger Depth ______________ Rig ______________

Rotary Depth ______________ Geologist Tech: Jamie Stufflebeam

Driller/Co. KR&G Backhoe

Andrews
Engineering

AEEI Job Number: 1989-115A
Boring Number: 1015
Page:

Site Name: Brickyard Disposal and Recycling
Address: Danville, IL

Boring Location:
N: 50186.79
E: 4278.34
Surf Elev: 633.50 ft

Dat Start: 10/30/2012
Finish: 10/30/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Vegetative layer | | | |
| | | | | 1 | Brown clayey silt/silty clay, with shale fragments | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | 4 | | | | |
| | | | | 5 | | | | |
| | | | | 6 | | | | |
| | | | | 7 | | | | |
| | | | | 8 | Railroad ties encountered; EOB at 8.0 feet | | | |
| | | | | 9 | | | | |
| | | | | 10 | | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data
▼ Depth While Drilling ____________
▽ Depth After Drilling ____________

Auger Depth ____________
Rotary Depth ____________
Driller/Co. KR&G Backhoe
Rig ____________
Geologist Tech: Jamie Stufflebeam

Andrews Engineering

AEEI Job Number: 1989-115A
Boring Number: 1016
Page:

Site Name: Brickyard Disposal and Recycling
Address: Danville, IL

Boring Location:
N: 50186.79
E: 4278.34
Surf Elev: 578.60 ft

Dat Start: 10/31/2012
Finish: 10/31/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | 1 | Brown sandy silt/silty sand, some clay, with shale fragments | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | 4 | | | | |
| | | | | 5 | | | | |
| | | | | 6 | | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | 9 | Railroad ties encountered; EOB at 8.5 feet | | | |
| | | | | 10 | | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data
▼ Depth While Drilling ____________
▽ Depth After Drilling ____________

Auger Depth ____________
Rotary Depth ____________
Driller/Co. KR&G Backhoe
Rig ____________
Geologist Tech: Jamie Stufflebeam

Andrews
Engineering

AEEI Job Number: 1989-115A

Boring Number: 1017

Page:

Site Name: Brickyard Disposal and Recycling

Address: Danville, IL

Boring Location:
N: 50286.79
E: 4078.34
Surf Elev: 603.90 ft

Dat Start: 11/1/2012

Finish: 11/1/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Vegetative layer | | | |
| | | | | 1 | | | | |
| | | | | | Brown sandy silt/silty sand, some clay, with shale fragments | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | 4 | | | | |
| | | | | | Shale fragments, dense, intermixed with clayey silt/silty clay | | | |
| | | | | 5 | | | | |
| | | | | 6 | | | | |
| | | | | 7 | | | | |
| | | | | 8 | Refuse encountered; EOB at 7.5 feet | | | |
| | | | | 9 | | | | |
| | | | | 10 | | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling

▽ Depth After Drilling

Auger Depth

Rotary Depth

Driller/Co. KR&G Backhoe

Rig

Geologist Tech: Jamie Stufflebeam

Andrews
Engineering

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AEEI Job Number: 1989-115A

Boring Number: 1018

Page:

Site Name: Brickyard Disposal and Recycling

Address: Danville, IL

Boring Location:
N: 50386.79
E: 4278.34
Surf Elev: 577.60 ft

Dat Start: 11/1/2012

Finish: 11/1/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Vegetative layer | | | |
| | | | | 1 | Shale fragments, some brick and slag, intermixed with clayey silt/silty clay, trace sand | | | |
| | | | | 2 | | | | |
| | | | | 3 | Railroad ties encountered; EOB at 3.0 feet | | | |
| | | | | 4 | | | | |
| | | | | 5 | | | | |
| | | | | 6 | | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | 9 | | | | |
| | | | | 10 | | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling ____

▽ Depth After Drilling ____

Auger Depth ____

Rotary Depth ____

Driller/Co. KR&G Backhoe

Rig ____

Geologist Tech: Jamie Stufflebeam

Andrews Engineering

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AEEI Job Number: 1989-115A

Boring Number: 1019

Page:

Site Name: Brickyard Disposal and Recycling

Address: Danville, IL

Boring Location:
N: 50386.79
E: 4478.34
Surf Elev: 575.90 ft

Dat Start: 11/1/2012
Finish: 11/1/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | 1 | Clayey silt/silty clay, intermixed with shale fragments, dense | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | 4 | | | | |
| | | | | 5 | | | | |
| | | | | 6 | | | | |
| | | | | | Railroad ties encountered; EOB at 6.0 feet | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | 9 | | | | |
| | | | | 10 | | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling

▽ Depth After Drilling

Auger Depth

Rotary Depth

Driller/Co. KR&G Backhoe

Rig

Geologist Tech: Jamie Stufflebeam

Andrews Engineering

Electronic Filing - Recived, Clerk's Office : 05/31/2013 * * * AS 2013-004 * * *

AEEI Job Number: 1989-115A

Boring Number: 1020

Page:

Site Name: Brickyard Disposal and Recycling

Address: Danville, IL

Boring Location:
N: 50486.79
E: 4678.34
Surf Elev: 565.60 ft

Dat Start: 11/1/2012
Finish: 11/1/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Vegetative layer | | | |
| | | | | 1 | | | | |
| | | | | | Brown sandy silt/silty sand, some clay | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | 4 | | | | |
| | | | | 5 | | | | |
| | | | | 6 | | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | 9 | Railroad ties encountered; EOB 8.5 feet | | | |
| | | | | 10 | | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling ________

▽ Depth After Drilling ________

Auger Depth ________

Rotary Depth ________

Driller/Co. KR&G Backhoe

Rig ________

Geologist Tech: Jamie Stufflebeam

Andrews
Engineering

AEEI Job Number: 1989-115A

Boring Number: 1021

Page:

Site Name: Brickyard Disposal and Recycling

Address: Danville, IL

Boring Location:
N: 50586.79
E: 4278.34
Surf Elev: 598.20 ft

Dat Start: 11/1/2012
Finish: 11/1/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Vegetative layer | | | |
| | | | | 1 | | | | |
| | | | | | Brown clayey silt/silty clay, with shale fragments | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | 4 | | | | |
| | | | | 5 | | | | |
| | | | | 6 | | | | |
| | | | | | Shale fragments, intermixed with clayey silt/silty clay, dense | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | 9 | | | | |
| | | | | | Brown clayey silt/silty clay | | | |
| | | | | 10 | | | | |
| | | | | | Railroad ties encountered; EOB at 10.0 feet | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling ______________

▽ Depth After Drilling ______________

Auger Depth ____________

Rotary Depth ____________

Driller/Co. KR&G Backhoe

Rig ______________

Geologist Tech: Jamie Stufflebeam

Andrews Engineering

AEEI Job Number: 1989-115A

Boring Number: 1022

Page:

Site Name: Brickyard Disposal and Recycling

Address: Danville, IL

Boring Location:
N: 50586.79
E: 4478.3
Surf Elev: 578.00 ft

Dat Start: 11/1/2012

Finish: 11/1/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Vegetative layer | | | |
| | | | | 1 | | | | |
| | | | | | Shale fragments, large, intermixed with clayey silt/silty clay, dense | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | 4 | | | | |
| | | | | 5 | | | | |
| | | | | 6 | | | | |
| | | | | 7 | | | | |
| | | | | | Brown clayey silt/silty clay | | | |
| | | | | 8 | | | | |
| | | | | 9 | | | | |
| | | | | 10 | | | | |
| | | | | | Railroad ties encountered; EOB at 10.0 feet | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling

▽ Depth After Drilling

Auger Depth

Rotary Depth

Driller/Co. KR&G Backhoe

Rig

Geologist Tech: Jamie Stufflebeam

Andrews
Engineering

AEEI Job Number: 1989-115A

Boring Number: 1023

Page

Site Name: Brickyard Disposal and Recycling

Address: Danville, IL

Boring Location:
N: 50586.79
E: 4878.34
Surf Elev: 556.80 ft

Dat Start: 11/1/2012
Finish: 11/1/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Vegetative layer | | | |
| | | | | 1 | | | | |
| | | | | | Brown sandy silt, some clay and shale fragments | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | 4 | | | | |
| | | | | | Railroad ties encountered; EOB at 4.0 feet | | | |
| | | | | 5 | | | | |
| | | | | 6 | | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | 9 | | | | |
| | | | | 10 | | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling ____________

▽ Depth After Drilling ____________

Auger Depth ____________

Rotary Depth ____________

Driller/Co. KR&G Backhoe

Rig ____________

Geologist Tech: Jamie Stufflebeam

Andrews Engineering

AEEI Job Number: 1989-115A

Boring Number: 1024

Page:

Site Name: Brickyard Disposal and Recycling

Address: Danville, IL

Boring Location:
N: 50786.79
E: 2212.92
Surf Elev: 637.80 ft

Dat Start: 10/30/2012

Finish: 10/30/2012

| Sample Number | Sample Device | Recovery ( %) | Lith. Symbol | Depth (feet) | Detailed Soil and Rock Description | PPT (Qu) | PID | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | Vegetative layer | | | |
| | | | | 1 | | | | |
| | | | | | Shale fragments, dense, intermixed with clayey silt/silty clay | | | |
| | | | | 2 | | | | |
| | | | | 3 | | | | |
| | | | | 4 | | | | |
| | | | | 5 | | | | |
| | | | | 6 | | | | |
| | | | | 7 | | | | |
| | | | | 8 | | | | |
| | | | | | Railroad ties encountered; EOB at 8.0 feet | | | |
| | | | | 9 | | | | |
| | | | | 10 | | | | |
| | | | | 11 | | | | |
| | | | | 12 | | | | |

Groundwater Data

▼ Depth While Drilling ______

▽ Depth After Drilling ______

Auger Depth ______

Rig ______

Rotary Depth ______

Geologist Tech: Jamie Stufflebeam

Driller/Co. KR&G Backhoe

Andrews Engineering

# APPENDIX B

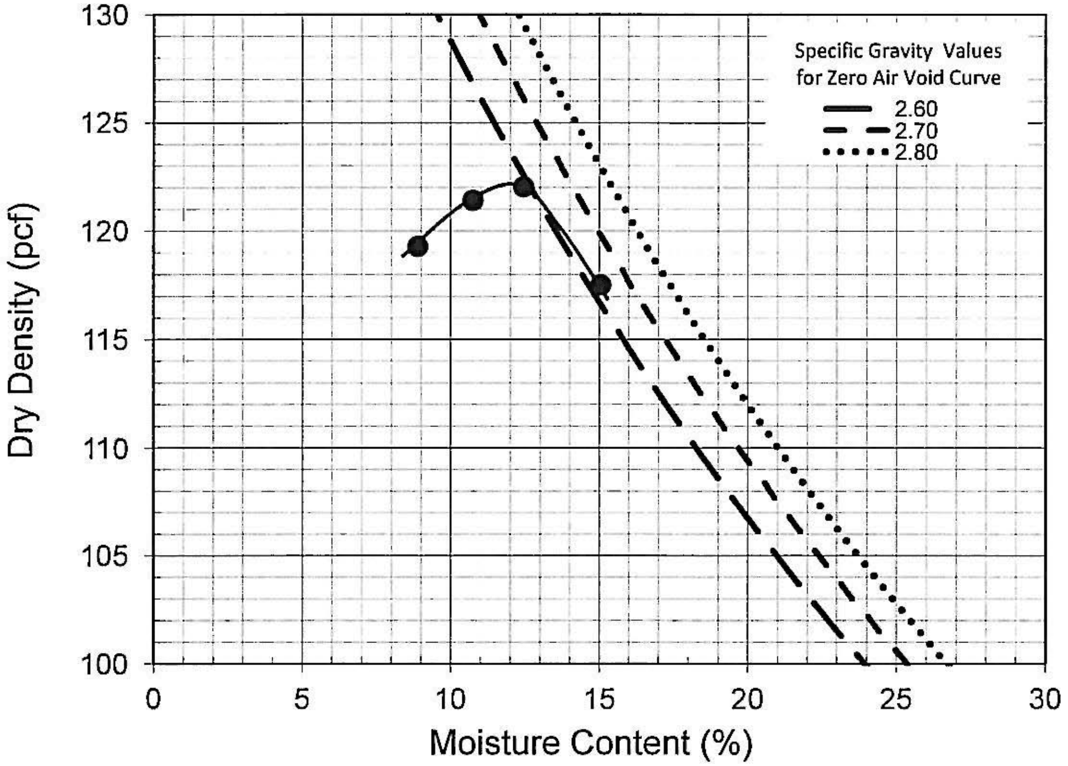
# LABORATORY SOILS ANALYSES

**TRI/ENVIRONMENTAL, INC.**
*A Texas Research International Company*

Client: Andrews Engineering, Inc.
Project: Brickyard
TRI Log No.: E2373-06-01
Sample Number: # 1003
Test Method: ASTM D698 - Method A
Rammer Type: Automatic

Maximum Dry Density (pcf): 122.1
Optimum Water Content (%): 12.3

## Proctor Compaction Test



John M. Allen, P.E., 11/13/2012

Quality Review/Date

Tested By:Kahlil Hart

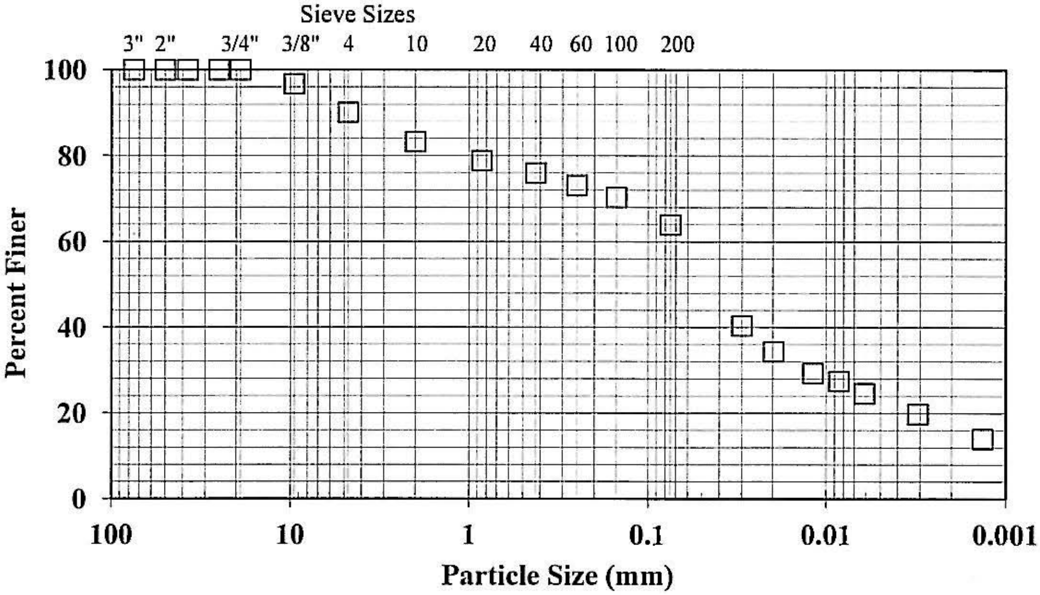
The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

TRI/ENVIRONMENTAL, INC.
*A Texas Research International Company*

# Particle Size Analysis for Soils

Client: Andrews Engineering, Inc.
Project: Brickyard
Sample: 1003

TRI Log#: E2373-06-01
Test Method: ASTM D 422
Test Date: 11/12/12



| Sieve Analysis | |
|---|---|
| Sieve Size | Percent Passing |
| 3 in. | 100.0 |
| 2 in. | 100.0 |
| 1.5 in. | 100.0 |
| 1 in. | 100.0 |
| 3/4 in. | 100.0 |
| 3/8 in. | 96.7 |
| No. 4 (4.75 mm) | 90.1 |
| No. 10 (2.00 mm) | 83.2 |
| No. 20 (850 μm) | 78.8 |
| No. 40 (425 μm) | 76.0 |
| No. 60 (250 μm) | 73.1 |
| No. 100 (150 μm) | 70.3 |
| No. 200 (75 μm) | 63.9 |
| **Hydrometer Analysis** | |
| Particle Size | Percent Passing |
| 0.074 mm | 63.4 |
| 0.005 mm | 22.8 |
| 0.001 mm | 12.9 |

Notes: Soil classifies as a sandy lean clay (CL) in accordance with ASTM D2487.

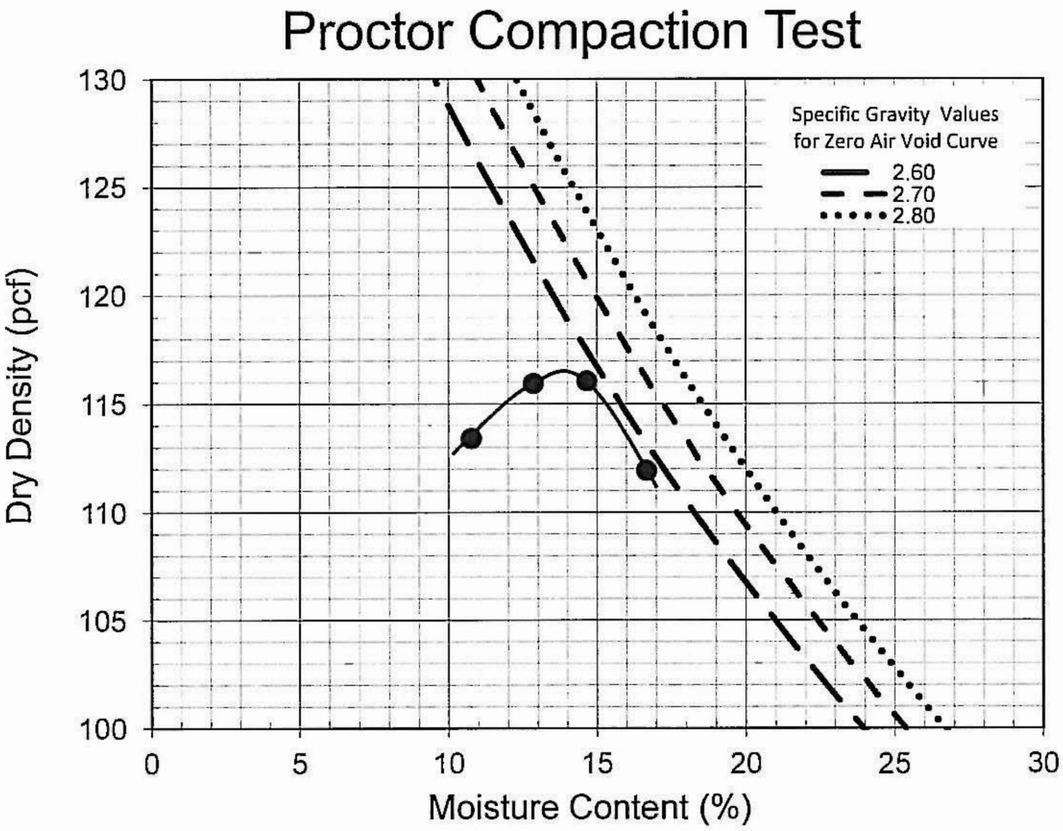
| Plastic Index (ASTM D 4318) Results | |
|---|---|
| Liquid Limit | 28 |
| Plastic Limit | 15 |
| Plastic Index | 13 |
| Notes: Specimen was air dried, 3 point Liquid Limit procedure was used. | |

John M. Allen, P.E., 11/14/2012
Quality Review/Date
Tested by: Kahlil Hart & Tierra Jackson

**TRI/ENVIRONMENTAL, INC.**
*A Texas Research International Company*

| | |
|---|---|
| Client: | Andrews Engineering, Inc. |
| Project: | Brickyard |
| TRI Log No.: | E2373-06-01 |
| Sample Number: | # 1014 |
| Test Method: | ASTM D698 - Method A |
| Rammer Type: | Automatic |

| | |
|---|---|
| Maximum Dry Density (pcf): | 116.5 |
| Optimum Water Content (%): | 13.9 |



John M. Allen, P.E., 11/13/2012

Quality Review/Date

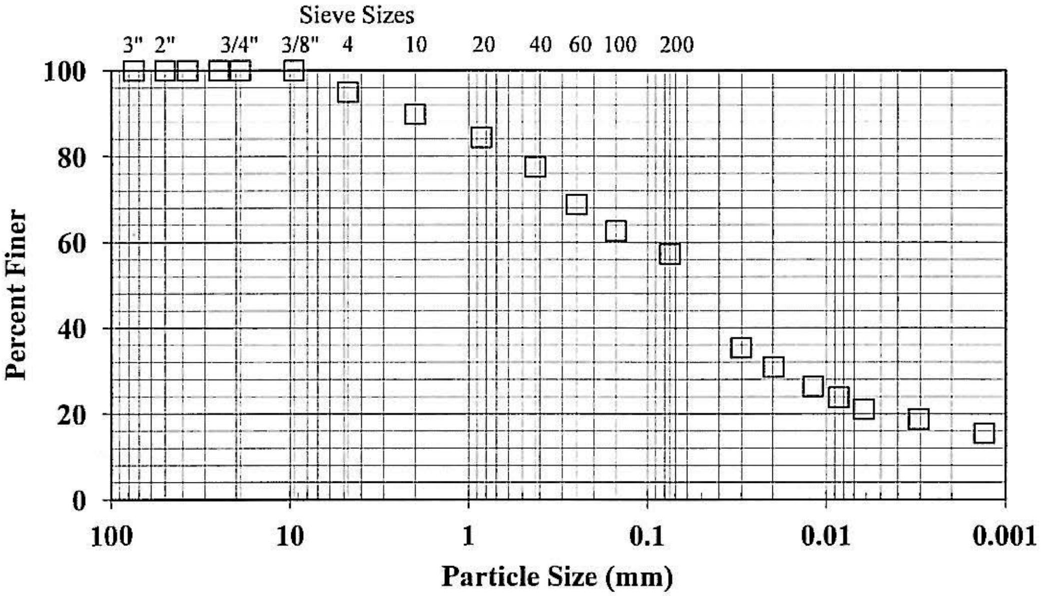
Tested By:Kahlil Hart

TRI/ENVIRONMENTAL, INC.
*A Texas Research International Company*

# Particle Size Analysis for Soils

Client: Andrews Engineering, Inc.
Project: Brickyard
Sample: 1014

TRI Log#: E2373-06-01
Test Method: ASTM D 422
Test Date: 11/12/12



| Sieve Analysis | |
|---|---|
| Sieve Size | Percent Passing |
| 3 in. | 100.0 |
| 2 in. | 100.0 |
| 1.5 in. | 100.0 |
| 1 in. | 100.0 |
| 3/4 in. | 100.0 |
| 3/8 in. | 100.0 |
| No. 4 (4.75 mm) | 94.9 |
| No. 10 (2.00 mm) | 89.8 |
| No. 20 (850 μm) | 84.4 |
| No. 40 (425 μm) | 77.5 |
| No. 60 (250 μm) | 68.8 |
| No. 100 (150 μm) | 62.7 |
| No. 200 (75 μm) | 57.3 |
| **Hydrometer Analysis** | |
| Particle Size | Percent Passing |
| 0.074 mm | 56.8 |
| 0.005 mm | 20.2 |
| 0.001 mm | 14.9 |

Notes: Soil classifies as a sandy lean clay (CL) in accordance with ASTM D2487.

| Plastic Index (ASTM D 4318) Results | |
|---|---|
| Liquid Limit | 30 |
| Plastic Limit | 15 |
| Plastic Index | 15 |
| Notes: Specimen was air dried, 3 point Liquid Limit procedure was used. | |

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Quality Review/Date
Tested by: Kahlil Hart & Tierra Jackson

**TRI/ENVIRONMENTAL, INC.**
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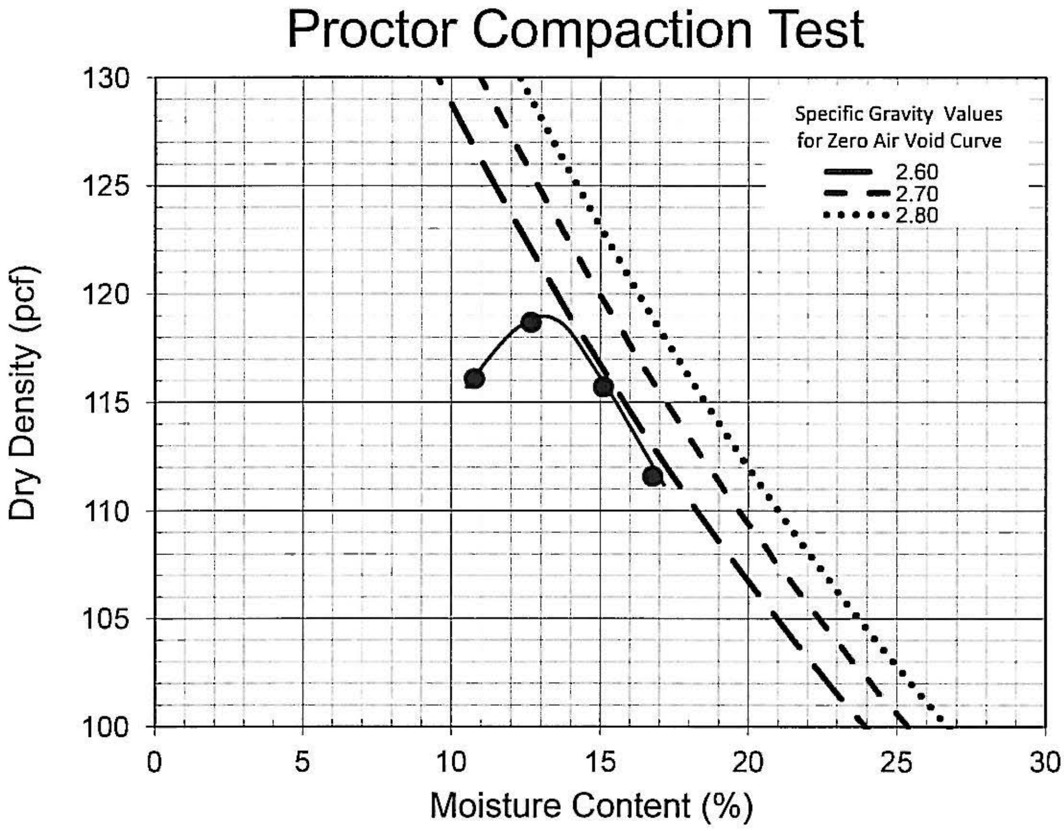
| | |
|---|---|
| Client: | Andrews Engineering, Inc. |
| Project: | Brickyard |
| TRI Log No.: | E2373-06-01 |
| Sample Number: | # 1015 |
| Test Method: | ASTM D698 - Method A |
| Rammer Type: | Automatic |

| | |
|---|---|
| Maximum Dry Density (pcf): | 120.0 |
| Optimum Water Content (%): | 13.1 |



John M. Allen, P.E, 11/13/2012

Quality Review/Date

Tested By:Kahlil Hart

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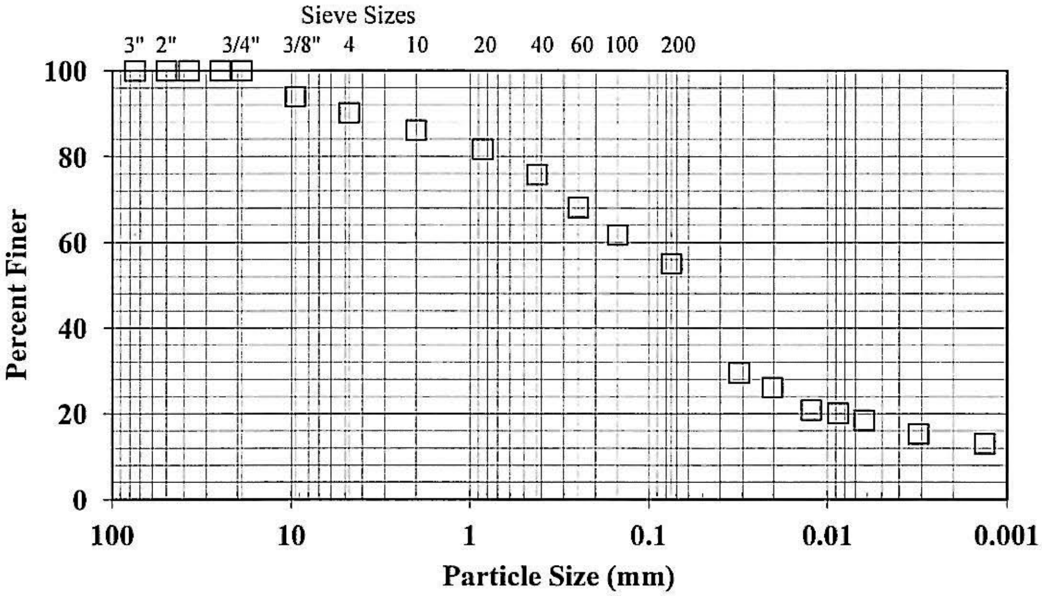
# Particle Size Analysis for Soils

Client: Andrews Engineering, Inc.
Project: Brickyard
Sample: 1015

TRI Log#: E2373-06-01
Test Method: ASTM D 422
Test Date: 11/12/12



**Sieve Analysis**

| Sieve Size | Percent Passing |
|---|---|
| 3 in. | 100.0 |
| 2 in. | 100.0 |
| 1.5 in. | 100.0 |
| 1 in. | 100.0 |
| 3/4 in. | 100.0 |
| 3/8 in. | 93.9 |
| No. 4 (4.75 mm) | 90.1 |
| No. 10 (2.00 mm) | 86.1 |
| No. 20 (850 µm) | 81.7 |
| No. 40 (425 µm) | 75.8 |
| No. 60 (250 µm) | 68.1 |
| No. 100 (150 µm) | 61.7 |
| No. 200 (75 µm) | 55.1 |

**Hydrometer Analysis**

| Particle Size | Percent Passing |
|---|---|
| 0.074 mm | 54.5 |
| 0.005 mm | 17.2 |
| 0.001 mm | 12.6 |

Notes: Soil classifies as a sandy lean clay (CL) in accordance with ASTM D2487.

| Plastic Index (ASTM D 4318) Results | |
|---|---|
| Liquid Limit | 29 |
| Plastic Limit | 15 |
| Plastic Index | 14 |
| Notes: Specimen was air dried, 3 point Liquid Limit procedure was used. | |

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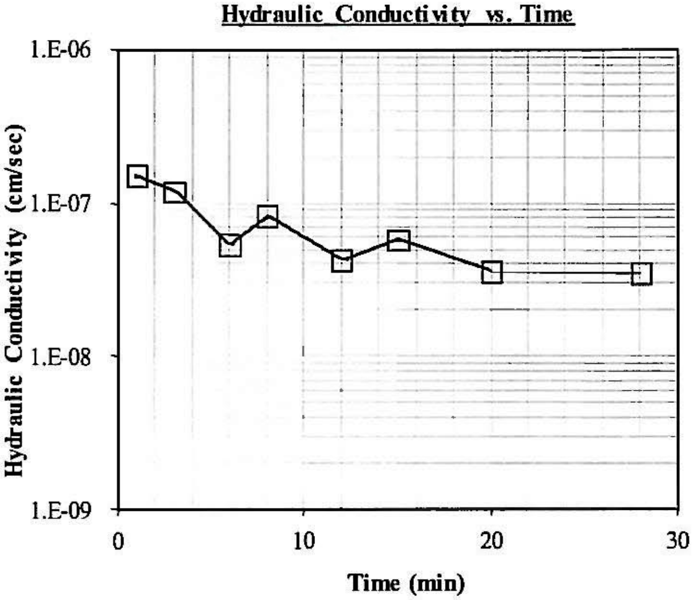
Quality Review/Date
Tested by: Kahlil Hart & Tierra Jackson

TRI/ENVIRONMENTAL, INC.
*A Texas Research International Company*

# Hydraulic Conductivity

Client: Andrews Engineering, Inc.
Project: Brickyard
Sample: 1002

TRI Log#: E2373-06-01
Test Method: ASTM D 5084, Method F
Test Date: 11/09/12

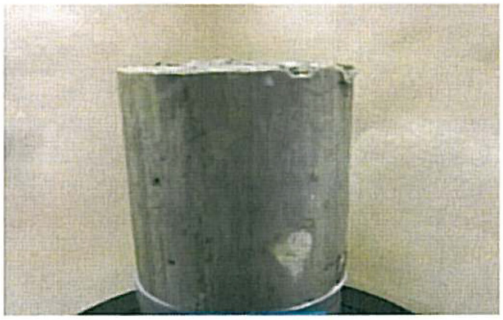


| INITIAL VALUES | |
|---|---|
| Avg. Sample Height (in) | 2.79 |
| Avg. Sample Diameter (in) | 2.84 |
| Wet Weight (g) | 630.1 |
| Area (in$^2$) | 6.32 |
| Volume (cc) | 289.3 |
| Initial Water Content (%) | 16.8 |
| Total Density (pcf) | 136.0 |
| Dry Density (pcf) | 116.4 |
| $G_s$ (assumed) | 2.65 |
| Degree of Saturation (%) | 100.0 |
| Void Ratio | 0.42 |
| Porosity | 0.30 |
| 1 Pore Volume (cc) | 85.6 |

### Hydraulic Conductivity

| Time (min) | k at 20 deg C (cm/sec) |
|---|---|
| 1 | 1.53E-07 |
| 3 | 1.20E-07 |
| 6 | 5.41E-08 |
| 8 | 8.31E-08 |
| 12 | 4.26E-08 |
| 15 | 5.82E-08 |
| 20 | 3.58E-08 |
| 28 | 3.51E-08 |

Average[1]: **4.3E-08**



Note: A B-value of 0.95 was achieved for the undisturbed specimen. Permeation measurements were made with a mercury U-tube. The effective confining pressure was 5 psi per test request.

[1]: Average corrected hydraulic conductivity ($k_{20}$) is obtained from the last 4 average readings.

John M. Allen, P.E., 11/12/2012
Analysis & Quality Review/Date
Tested by: Tierra Jackson

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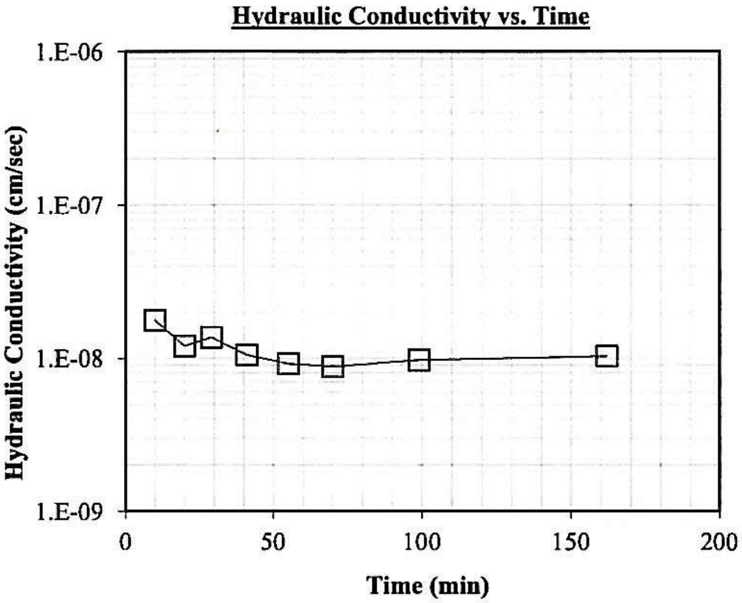
*A Texas Research International Company*

# Hydraulic Conductivity

| | | | |
|---|---|---|---|
| Client: | Andrews Engineering, Inc. | TRI Log#: | E2373-06-01 |
| Project: | Brickyard | Test Method: | ASTM D 5084, Method F |
| Sample: | 1004 | Test Date: | 11/09/12 |



| INITIAL VALUES | |
|---|---|
| Avg. Sample Height (in) | 2.14 |
| Avg. Sample Diameter (in) | 2.85 |
| Wet Weight (g) | 473.8 |
| Area (in$^2$) | 6.39 |
| Volume (cc) | 224.0 |
| Initial Water Content (%) | 14.4 |
| Total Density (pcf) | 132.1 |
| Dry Density (pcf) | 115.5 |
| $G_s$ (assumed) | 2.65 |
| Degree of Saturation (%) | 88.2 |
| Void Ratio | 0.43 |
| Porosity | 0.30 |
| 1 Pore Volume (cc) | 67.6 |

**Hydraulic Conductivity**

| Time (min) | k at 20 deg C (cm/sec) |
|---|---|
| 10 | 1.77E-08 |
| 20 | 1.20E-08 |
| 29 | 1.37E-08 |
| 41 | 1.05E-08 |
| 55 | 9.21E-09 |
| 70 | 8.81E-09 |
| 99 | 9.73E-09 |
| 162 | 1.03E-08 |
| Average[1]: | **9.5E-09** |

Note: A B-value of 0.97 was achieved for the undisturbed specimen. Permeation measurements were made with a mercury U-tube. The effective confining pressure was 5 psi per test request.

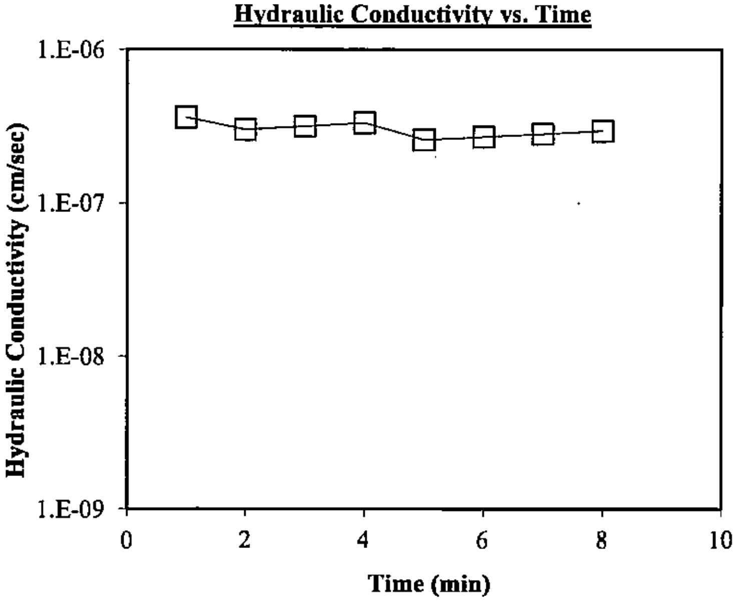
[1] Average corrected hydraulic conductivity ($k_{20}$) is obtained from the last 4 average readings.

John M. Allen, P.E., 11/12/2012
Analysis & Quality Review/Date
Tested by: Tierra Jackson

# Hydraulic Conductivity

Client: Andrews Engineering, Inc.
Project: Brickyard
Sample: 1006

TRI Log#: E2373-06-01
Test Method: ASTM D 5084, Method F
Test Date: 11/09/12



| INITIAL VALUES | |
|---|---|
| Avg. Sample Height (in) | 2.49 |
| Avg. Sample Diameter (in) | 2.84 |
| Wet Weight (g) | 547.3 |
| Area (in$^2$) | 6.32 |
| Volume (cc) | 257.8 |
| Initial Water Content (%) | 15.4 |
| Total Density (pcf) | 132.5 |
| Dry Density (pcf) | 114.8 |
| $G_s$ (assumed) | 2.65 |
| Degree of Saturation (%) | 92.9 |
| Void Ratio | 0.44 |
| Porosity | 0.31 |
| 1 Pore Volume (cc) | 78.8 |

**Hydraulic Conductivity**

| Time (min) | k at 20 deg C (cm/sec) |
|---|---|
| 1 | 3.60E-07 |
| 2 | 3.00E-07 |
| 3 | 3.15E-07 |
| 4 | 3.32E-07 |
| 5 | 2.58E-07 |
| 6 | 2.69E-07 |
| 7 | 2.81E-07 |
| 8 | 2.94E-07 |

Average[1]: **2.8E-07**

Note: A B-value of 0.97 was achieved for the undisturbed specimen. Permeation measurements were made with a mercury U-tube. The effective confining pressure was 5 psi per test request.

1: Average corrected hydraulic conductivity ($k_{20}$) is obtained from the last 4 average readings.

John M. Allen, P.E., 11/12/2012
Analysis & Quality Review/Date
Tested by: Tierra Jackson

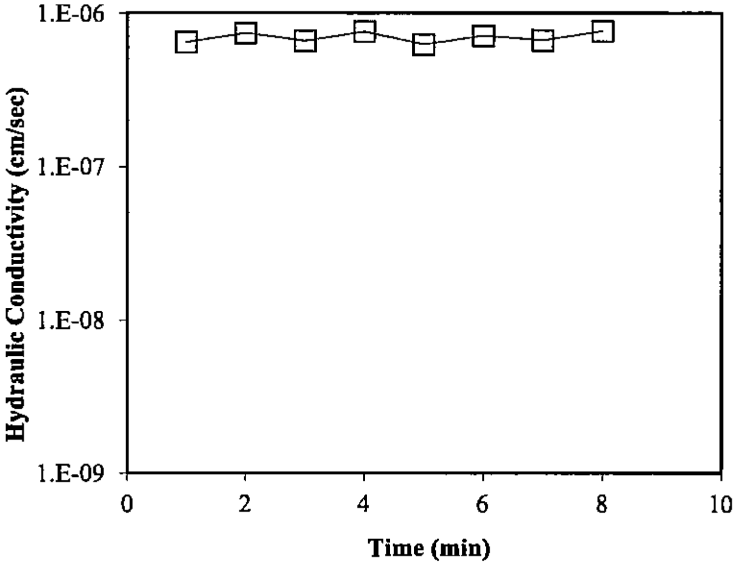
TRI/ENVIRONMENTAL, INC.
*A Texas Research International Company*

# Hydraulic Conductivity

Client: Andrews Engineering, Inc.
Project: Brickyard
Sample: 1008

TRI Log#: E2373-06-01
Test Method: ASTM D 5084, Method F
Test Date: 11/09/12

**Hydraulic Conductivity vs. Time**



| INITIAL VALUES | |
|---|---|
| Avg. Sample Height (in) | 2.06 |
| Avg. Sample Diameter (in) | 2.86 |
| Wet Weight (g) | 437.5 |
| Area (in$^2$) | 6.41 |
| Volume (cc) | 216.1 |
| Initial Water Content (%) | 13.6 |
| Total Density (pcf) | 126.4 |
| Dry Density (pcf) | 111.3 |
| $G_s$ (assumed) | 2.65 |
| Degree of Saturation (%) | 74.0 |
| Void Ratio | 0.49 |
| Porosity | 0.33 |
| 1 Pore Volume (cc) | 70.7 |

**Hydraulic Conductivity**

| Time (min) | k at 20 deg C (cm/sec) |
|---|---|
| 1 | 6.43E-07 |
| 2 | 7.36E-07 |
| 3 | 6.55E-07 |
| 4 | 7.52E-07 |
| 5 | 6.22E-07 |
| 6 | 7.08E-07 |
| 7 | 6.59E-07 |
| 8 | 7.58E-07 |
| Average[1]: | **6.9E-07** |

Note: A B-value of 0.95 was achieved for the undisturbed specimen. Permeation measurements were made with a mercury U-tube. The effective confining pressure was 5 psi per test request.

[1]: Average corrected hydraulic conductivity ($k_{20}$) is obtained from the last 4 average readings.

John M. Allen, P.E., 11/12/2012
Analysis & Quality Review/Date
Tested by: Tierra Jackson

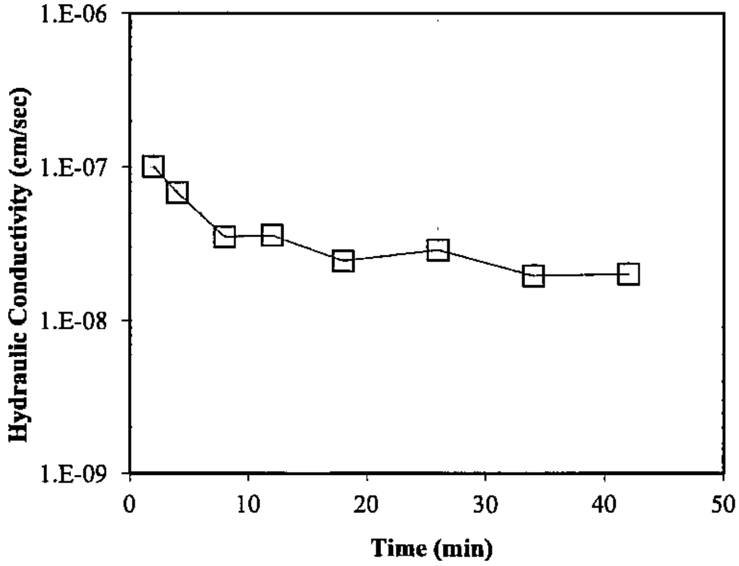
TRI/ENVIRONMENTAL, INC.
*A Texas Research International Company*

# Hydraulic Conductivity

Client: Andrews Engineering, Inc.
Project: Brickyard
Sample: 1014

TRI Log#: E2373-06-01
Test Method: ASTM D 5084, Method F
Test Date: 11/09/12

**Hydraulic Conductivity vs. Time**



| INITIAL VALUES | |
|---|---|
| Avg. Sample Height (in) | 2.44 |
| Avg. Sample Diameter (in) | 2.85 |
| Wet Weight (g) | 545.2 |
| Area (in$^2$) | 6.39 |
| Volume (cc) | 255.2 |
| Initial Water Content (%) | 11.4 |
| Total Density (pcf) | 133.3 |
| Dry Density (pcf) | 119.7 |
| $G_s$ (assumed) | 2.65 |
| Degree of Saturation (%) | 79.2 |
| Void Ratio | 0.38 |
| Porosity | 0.28 |
| 1 Pore Volume (cc) | 70.5 |

**Hydraulic Conductivity**

| Time (min) | k at 20 deg C (cm/sec) |
|---|---|
| 2 | 1.01E-07 |
| 4 | 6.84E-08 |
| 8 | 3.50E-08 |
| 12 | 3.59E-08 |
| 18 | 2.45E-08 |
| 26 | 2.88E-08 |
| 34 | 1.96E-08 |
| 42 | 2.01E-08 |
| Average[1]: | **2.3E-08** |

Note: A B-value of 0.95 was achieved for the undisturbed specimen. Permeation measurements were made with a mercury U-tube. The effective confining pressure was 5 psi per test request.

[1]: Average corrected hydraulic conductivity ($k_{20}$) is obtained from the last 4 average readings.

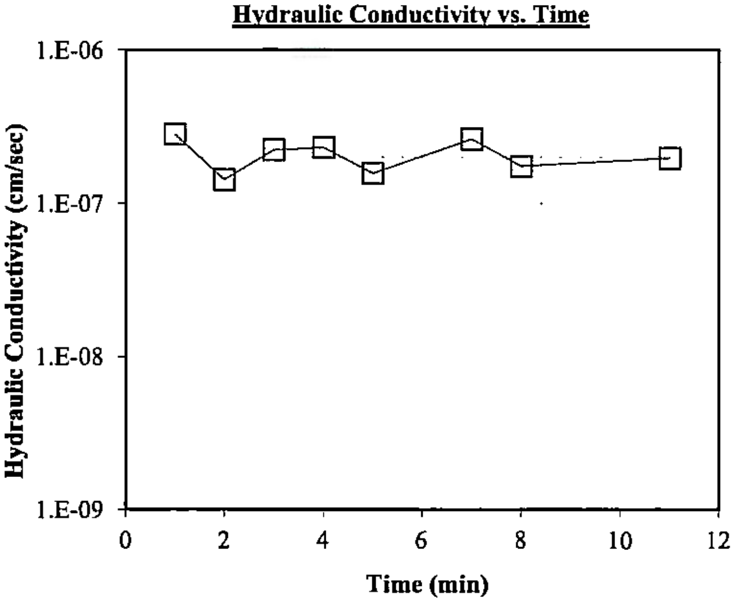
John M. Allen, P.E., 11/12/2012
Analysis & Quality Review/Date
Tested by: Tierra Jackson

TRI/ENVIRONMENTAL, INC.
*A Texas Research International Company*

# Hydraulic Conductivity

Client: Andrews Engineering, Inc.
Project: Brickyard
Sample: 1015

TRI Log#: E2373-06-01
Test Method: ASTM D 5084, Method F
Test Date: 11/09/12



| INITIAL VALUES | |
|---|---|
| Avg. Sample Height (in) | 2.50 |
| Avg. Sample Diameter (in) | 2.85 |
| Wet Weight (g) | 536.2 |
| Area (in$^2$) | 6.36 |
| Volume (cc) | 260.5 |
| Initial Water Content (%) | 12.5 |
| Total Density (pcf) | 128.5 |
| Dry Density (pcf) | 114.2 |
| $G_s$ (assumed) | 2.65 |
| Degree of Saturation (%) | 74.2 |
| Void Ratio | 0.45 |
| Porosity | 0.31 |
| 1 Pore Volume (cc) | 80.6 |

**Hydraulic Conductivity**

| Time (min) | k at 20 deg C (cm/sec) |
|---|---|
| 1 | 2.82E-07 |
| 2 | 1.42E-07 |
| 3 | 2.23E-07 |
| 4 | 2.31E-07 |
| 5 | 1.57E-07 |
| 7 | 2.62E-07 |
| 8 | 1.75E-07 |
| 11 | 1.97E-07 |

Average[1]: **2.0E-07**

Note: A B-value of 0.97 was achieved for the undisturbed specimen. Permeation measurements were made with a mercury U-tube. The effective confining pressure was 5 psi per test request.

[1]: Average corrected hydraulic conductivity ($k_{20}$) is obtained from the last 4 average readings.

John M. Allen, P.E., 11/12/2012
Analysis & Quality Review/Date
Tested by: Tierra Jackson

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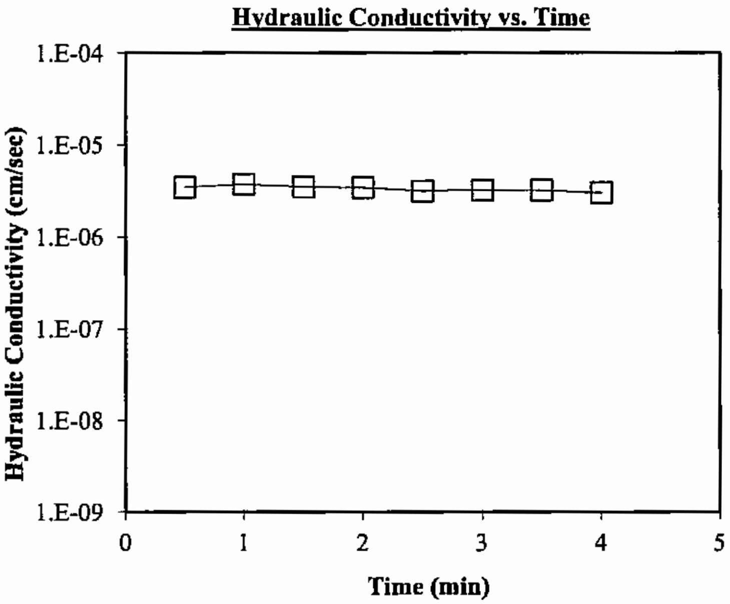
# Hydraulic Conductivity

Client: Andrews Engineering, Inc.
Project: Brickyard
Sample: 1020

TRI Log#: E2373-06-01
Test Method: ASTM D 5084, Method F
Test Date: 11/13/12



| INITIAL VALUES | |
|---|---|
| Avg. Sample Height (in) | 2.93 |
| Avg. Sample Diameter (in) | 2.80 |
| Wet Weight (g) | 559.2 |
| Area (in$^2$) | 6.16 |
| Volume (cc) | 296.0 |
| Initial Water Content (%) | 8.3 |
| Total Density (pcf) | 117.9 |
| Dry Density (pcf) | 108.9 |
| $G_s$ (assumed) | 2.65 |
| Degree of Saturation (%) | 42.4 |
| Void Ratio | 0.52 |
| Porosity | 0.34 |
| 1 Pore Volume (cc) | 101.2 |

Note: A B-value of 0.96 was achieved for the undisturbed specimen. Permeation measurements were made with a mercury U-tube. The effective confining pressure was 5 psi per test request.

**Hydraulic Conductivity**

| Time (min) | k at 20 deg C (cm/sec) |
|---|---|
| 1 | 3.44E-06 |
| 1 | 3.70E-06 |
| 2 | 3.49E-06 |
| 2 | 3.43E-06 |
| 3 | 3.15E-06 |
| 3 | 3.23E-06 |
| 4 | 3.20E-06 |
| 4 | 3.01E-06 |
| Average[1]: | **3.1E-06** |

1: Average corrected hydraulic conductivity ($k_{20}$) is obtained from the last 4 average readings.

John M. Allen, P.E., 11/14/2012
Analysis & Quality Review/Date
Tested by: Tierra Jackson

TRI/ENVIRONMENTAL, INC.
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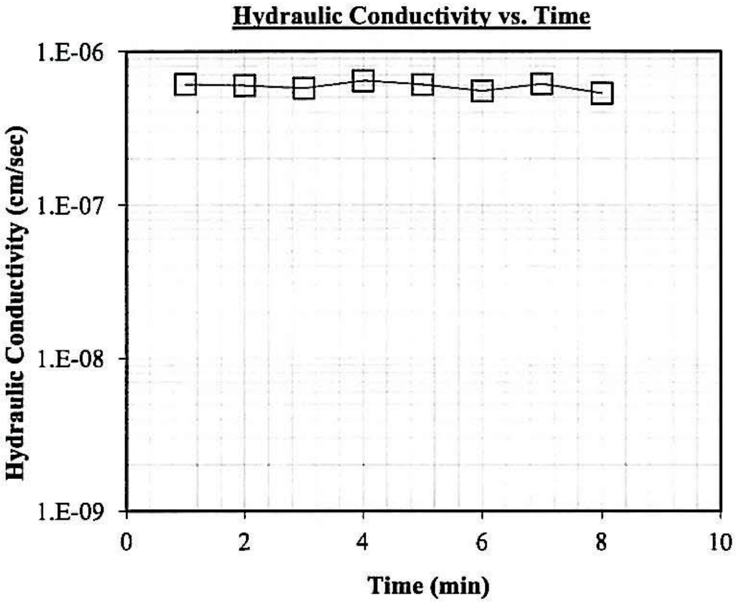
# Hydraulic Conductivity

Client: Andrews Engineering, Inc.
Project: Brickyard
Sample: 1022

TRI Log#: E2373-06-01
Test Method: ASTM D 5084, Method F
Test Date: 11/09/12



| INITIAL VALUES | |
|---|---|
| Avg. Sample Height (in) | 2.23 |
| Avg. Sample Diameter (in) | 2.87 |
| Wet Weight (g) | 515.6 |
| Area ($in^2$) | 6.47 |
| Volume (cc) | 236.1 |
| Initial Water Content (%) | 10.3 |
| Total Density (pcf) | 136.3 |
| Dry Density (pcf) | 123.6 |
| $G_s$ (assumed) | 2.65 |
| Degree of Saturation (%) | 80.8 |
| Void Ratio | 0.34 |
| Porosity | 0.25 |
| 1 Pore Volume (cc) | 59.6 |

Hydraulic Conductivity

| Time (min) | k at 20 deg C (cm/sec) |
|---|---|
| 1 | 6.09E-07 |
| 2 | 5.97E-07 |
| 3 | 5.73E-07 |
| 4 | 6.40E-07 |
| 5 | 6.05E-07 |
| 6 | 5.50E-07 |
| 7 | 6.12E-07 |
| 8 | 5.31E-07 |
| Average[1]: | **5.7E-07** |

Note: A B-value of 0.97 was achieved for the undisturbed specimen. Permeation measurements were made with a mercury U-tube. The effective confining pressure was 5 psi per test request.

1: Average corrected hydraulic conductivity ($k_{20}$) is obtained from the last 4 average readings.

John M. Allen, P.E., 11/12/2012
Analysis & Quality Review/Date
Tested by: Tierra Jackson