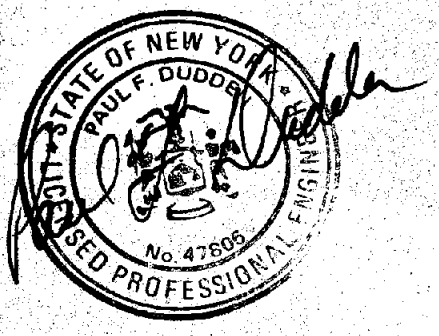
*CORTLAND COUNTY LANDFILL*
*REMEDIAL ACTION LANDFILL CLOSURE*

*TOWNLINE ROAD*
*CORTLAND COUNTY, NEW YORK*

# CONSTRUCTION CERTIFICATION REPORT

## VOLUME I OF III

**JUNE, 2002**




Barton & Loguidice, P.C.
*Consulting Engineers*

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Box 3107
Syracuse, New York 13220

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## APPENDICES

## CERTIFICATION STATEMENT

Barton & Loguidice, P.C. herein provides the Construction Certification Report for the Cortland County Landfill Remedial Action Landfill Closure, located at the Cortland County Landfill, Town Line Road, McGraw, New York.

Barton & Loguidice, P.C., certifies that the Cortland County Landfill Remedial Action Landfill Closure Project has been constructed in substantial compliance with the Construction Plans and Specifications prepared by Barton & Loguidice, P.C., dated September 2000 and approved by the New York State Department of Environmental Conservation during September, 2000.

Paul F. Dudden, P.E.
Principal

Date: June 11, 2002

## 1.0 INTRODUCTION

This Construction Certification Report for the Cortland County Landfill Remedial Action Landfill Closure is written in compliance with the New York State Department of Environmental Conservation (NYSDEC) 6NYCRR Part 360 regulations. This construction phase was completed in substantial compliance to the Construction Plans and Specifications prepared by Barton & Loguidice, P.C., dated September 2000

The 40-acre capping system is comprised of two distinct capping sections. These two sections are the County Landfill Capping system, which covers approximately 38 acres, and the City Landfill Capping system that covers the remaining 2 acres. The City Landfill capping system also incorporated the connection of the capping system to the existing maintenance building that remained in place.

The County Landfill Capping System has been designed with a modified 6NYCRR Part 360 final cover system comprised of a gas venting system, geomembrane barrier layer, a composite geonet lateral drainage layer, a barrier protection layer, and a topsoil layer. Details on the construction of each layer of the capping system are included herein.

Adjacent to the County Landfill portion of the closure, the City Landfill Capping system was designed with a slightly different section from the County Landfill Capping system. The City Landfill Capping system is comprised of a gas venting system adjacent to the maintenance building, geomembrane barrier layer, protective geotextile, granular fill, and a shale wearing surface. Details on the construction of each layer of the capping system are included herein.

Construction Plans and Specifications were prepared by Barton & Loguidice, P.C. and approved by the NYSDEC during September, 2000. Construction commenced in April 2001 and was substantially completed on December 18, 2001. The construction was performed by Marcy Excavation Company Incorporated and construction administration and inspection of the landfill closure was performed by Barton & Loguidice, P.C.

Completed Construction Drawings have been prepared by Barton & Loguidice, P.C. and have been included as Appendix F of this report.

## 2.0 PROJECT PARTICIPANTS

### 2.1 Organizations

#### 2.1.1 Owner

Cortland County
County Office Building
60 Central Avenue
Box 5590
Cortland, New York 13045

W. Stephen Harrington – Legislature Chairman
Ralph K. Pitman - Director of Solid Waste
Roger Stanton - Landfill Operations Supervisor

#### 2.1.2 Regulator

New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Construction Services
625 Broadway
Albany, New York 12233-7013
(518) 402-9814

Joseph Yavonditte, PE – Environmental Engineer 2

### 2.2 Consultants

#### 2.2.1 Design and Contract Administration

Barton & Loguidice, P.C.
290 Elwood Davis Road
Box 3107
Syracuse, New York 13220
(315) 457-5200

Paul F. Dudden, P.E. – Principal
Paul R. Czerwinski, P.E. – Vice President
Doug A. Miller, P.E. – Managing Engineer
Rodd C. Brinkmann - Engineer
Chad W. Hutton, I.E. – Assistant Engineer

## 2.3 Contractors

### 2.3.1 General Construction – Contract No. 1A

Marcy Excavation Company, Inc.
2256 Broad Street
Frankfort, New York 13390
(315) 724-4062

Phil Hale, Owner
Chris Hale, Superintendent
Kathy Delaney, Project Coordinator

### 2.3.2 Subcontractors

#### 2.3.2.1 Geosynthetic Installation

Antana Linings Inc.
1 School Street
Latham, New York 12110
(518) 785-0652

#### 2.3.2.2 LFG Well & Vent Drilling

Moretrench Environmental Services, Inc.
100 Stickle Avenue
Rockway, New Jersey 07866
(973) 627-2100

2.3.2.3 Geosynthetic Testing

Geotesting Express of Texas, Inc
2004 East Randol Mill
Suite 512
Arlington, Texas 76011
(800) 247-6030

AGP Laboratories, Inc.
2004 East Randol Mill
Suite 512
Arlington, Texas 76011
(800) 247-6030

2.3.2.4 Soil Testing

SJB Services, Inc.
Central New York Office
2415 North Triphammer Road
Ithaca, New York 14850
(607) 226-0147

2.3.2.5 Electrical

Bagnell Electric, Inc.
PO Box 577
45 Classic Street
Sherburne, New York 13460-9783
(607) 674-9460

2.3.2.6 Survey

S.J. Harris Land Surveying
PO Box 319
Bridgewater, New York 13313
(315) 822-6637

2.3.2.7 Health and Safety

Woodward Miller & Associates
5806 Innsbruck Road
East Syracuse, New York 13057
(315) 656-8247

2.3.2.8 Concrete

Keystone Construction
125 Clark Street
Illion, New York, 13357

## 2.4 Materials, Manufacturers, and Suppliers

| Material | Manufacturer | Supplier |
|---|---|---|
| Geomembrane | Polyflex, Inc.<br>2000 W. Marshall Drive<br>Grand Prairie, Texas 75051 | Pavilion Drainage Supply<br>Box 219<br>Pavilion, New York 14525 |
| Composite Geonet | ESP Inc.<br>405 Hood Road<br>Lilburn, Georgia 30047 | Babcock Highway Supply<br>565 County Route 51A<br>Oswego, New York 13126 |
| Geotextile | ESP Inc.<br>405 Hood Road<br>Lilburn, Georgia 30047 | ESP Inc.<br>405 Hood Road<br>Lilburn, Georgia 30047 |
| Type B & D Select Fill | Suit-Kote Asphalt<br>PO Box 5160<br>Cortland, New York 13045 | Suit-Kote Asphalt<br>PO Box 5160<br>Cortland, New York 13045 |
| Granular Fill | Suit-Kote Asphalt<br>PO Box 5160<br>Cortland, New York 13045 | Suit-Kote Asphalt<br>PO Box 5160<br>Cortland, New York 13045 |
| Riprap | Marcy Excavation Company, Inc.<br>2256 Broad Street<br>Frankfort, New York 13390 | Marcy Excavation Company, Inc.<br>Heath Road Pit<br>Cortlandville, New York 13101 |

| | | |
|---|---|---|
| Common Fill | Marcy Excavation Company, Inc.<br>2256 Broad Street<br>Frankfort, New York 13390 | Marcy Excavation Company, Inc.<br>Heath Road Pit<br>Cortlandville, New York 13101 |
| Topsoil | Marcy Excavation Company, Inc.<br>2256 Broad Street<br>Frankfort, New York 13390 | Marcy Excavation Company, Inc.<br>Heath Road Pit<br>Cortlandville, New York 13101 |
| PVC Pipe | National Pipe & Plastics<br>PO Box 174<br>Binghamton, New York 13920 | American Indian Builders and Suppliers Inc.<br>1162 Ridge Road<br>Lewiston, New York 14092 |
| PVC Fittings | Multi Fittings<br>4607 LeSaint Court<br>Fairfield, Ohio 45014 | American Indian Builders and Suppliers Inc.<br>1162 Ridge Road<br>Lewiston, New York 14092 |
| Culvert Pipe | Lane-Bath<br>May Street<br>Bath, New York 14810 | MS Unlimited, Inc.<br>PO Box 577<br>Syracuse, New York 13206 |
| Corrugated PE Pipe | Advanced Drainage Systems<br>3300 Riverside Drive<br>Columbus, Ohio 43221 | Martisco Corporation<br>PO Box 2067<br>Syracuse, New York 13220 |
| Grass Seed | Merritt Seed Company<br>7880 Gates Road<br>Baldwinsville, New York 13027 | Merritt Seed Company<br>7880 Gates Road<br>Baldwinsville, New York 13027 |
| Turf Reinforcement Matting (TRM) | North American Green<br>14649 Highway 41 North<br>Evansville, Indiana 47725 | Everett J. Prescott, Inc.<br>198 Ushers Road<br>Round Lake, New York 12151 |
| Precast Concrete Tanks | Binghamton Precast<br>Phelps Street<br>Binghamton, New York 13901 | MS Unlimited, Inc.<br>PO Box 577<br>Syracuse, New York 13206 |
| Concrete | Cortland Ready-Mix<br>6 Locust Avenue<br>Cortland, New York 13045 | Cortland Ready-Mix<br>6 Locust Avenue<br>Cortland, New York 13045 |

# 3.0 CONSTRUCTION SUMMARY

## 3.1 Final Cover System

### 3.1.1 Subgrade Preparation

The Remedial Action Landfill Closure encompasses approximately 40 acres of landfill capping system. In preparation of the final cover system construction, all vegetation from the landfill slopes was removed by stripping the upper sod layer of the existing intermediate cover layer. This material was stockpiled for later use as on- site topsoil. The landfill side slopes were graded to a minimum slope of 5 percent to a maximum slope of 25 percent. In general, the existing grades established at the site during waste placement were sufficient and met the grading requirements. Minor flat and low areas within the intermediate cover were filled using common fill material and abrupt grade changes were removed. Once stripped of vegetation and graded the intermediate cover layer outside of the waste relocation area was compacted with a vibratory smooth drum roller to provide a smooth surface for geosynthetic installation, and oversized stones were removed.

### 3.1.2 Waste Relocation

To minimize the footprint of the capping system, waste was relocated from the areas south and west of the existing maintenance building along with an isolated area near the sediment ponds to the disposal area located on the southern slope of the existing landfill.

Following the removal of the topsoil from the waste disposal area, shown on Sheet G-3 of the Completed Construction Drawings, the remaining intermediate cover was progressively removed to provide an area for the relocation. The waste was excavated and hauled from the removal areas, shown on Sheet G-3 of the Completed Construction Drawings, and placed in lifts perpendicular to the landfill slope. Each lift was graded and tracked with a bulldozer, then compacted with a vibratory roller. Upon completion of the waste relocation to the final grade, the intermediate cover was re-established.

Excavation continued on the waste removal areas until acceptable soil was encountered and visually verified by Barton and Loguidice, P.C.. Typically a waste depth of 8 to 12 feet was encountered south and west of the maintenance building, and 4 to 6 feet near the sediment ponds. Within this excavation, the existing sanitary sewer system and floor drainage system was removed and replaced with two 1,000 gallon concrete underground storage tanks. No intact drums were encountered in the waste removal areas and continuous air monitoring did not yield any hazardous conditions.

Common fill was placed in the areas to the west of the maintenance building and near the sediment ponds following the excavation until the original grade was reestablished. In the area to the south of the maintenance building, the excavation was graded to promote positive drainage.

### 3.1.3 Gas Venting System

A series of deep gas wells and shallow vents were installed to passively vent the landfill gas contained within the closure area. The installation frequency typically consisted of 1 deep well and three shallow vents per acre. A summary of the well and vent drilling data can be found in Appendix C.

The deeper gas wells were constructed by rotary excavating a 36-inch diameter hole approximately ¾ of the total depth of the waste mass utilizing a drill rig with a bucket auger bit attached. Once the final depth was reached, a 12-inch diameter schedule 80 PVC perforated casing and Type D Select Fill was placed into the excavation. Coupled to the casing, a solid 12-inch schedule 80 PVC riser was installed along with a flanged tee at each location. Following this, perforated PVC plates were attached to the open ends at the tees.

Each shallow gas vent consisted of a 6-inch diameter PVC schedule 40 perforated casing extending five feet into the waste mass, surrounded by Type D Select Fill. Following the subsurface installation a solid 6-inch PVC riser pipe and gooseneck was attached. All vents were then fitted with bird screens.

### 3.1.4 LLDPE Geomembrane Barrier

A 40 mil Linear Low Density Polyethylene (LLDPE) textured geomembrane was used as the capping system hydraulic barrier. The LLDPE geomembrane was textured on both sides for all applications. The geomembrane was deployed directly over the prepared subgrade. In general, geomembrane panels were oriented parallel to the landfill side slopes in accordance to the approved panel layout drawing and as shown on the geomembrane as-built drawing (Appendix B). Typically, the geomembrane panels were deployed from the top portion of the landfill and pulled down slope.

The geomembrane was anchored at the toe of the slopes within an anchor trench excavated into the existing soil four feet outward from the limits of waste. In areas where additional waste was encountered during the

excavation of the anchor trench, the anchor trench was realigned to contain the waste within the capping system.

Most final cover system geomembrane seams were fusion welded using a double wedge welder. This method provides an air channel that can easily be tested using the air pressure test method. The remaining seams were welded using an extrusion welder that requires testing using a vacuum box. Extrusion welding was performed at repairs, destructive tests, cap strips or tie-in seams where a wedge welder could not be used. Patches were installed by cleaning the area to be seamed, tacking down the patch with a Leister, grinding the seam edge and finally extrusion welding the patch to the geomembrane panel.

Placement of the LLDPE geomembrane required the construction of a LLDPE pipe boot at each LFG well and vent location. To construct the penetration boots, a hole slightly larger than the pipe was cut in the geomembrane. Scrap LLDPE geomembrane material was then wrapped around the pipe allowing excess material at the base to form the boot tail. The scrap geomembrane material was then welded together to form the boot. The boot tails were extrusion welded to the LLDPE geomembrane panels a minimum of one foot away from the pipe and the top of the boot was clamped to the pipe itself. A detail of the penetration boot can be found on the Completed Construction Drawings (Appendix F).

### 3.1.5 Lateral Drainage Layer

A composite geonet was installed as the lateral drainage layer of the final cover system. The composite geonet was installed directly over the textured LLDPE geomembrane barrier.

The composite geonet was deployed parallel to the landfill side slopes. The composite geonet was fastened using ties for the geonet every 5-feet on the landfill side slopes, every two feet on butt seams and every 6-inches on repairs. The lower geotextile was overlapped while the upper geotextile was secured by heat laminating the geotextiles together. At the butt seams, an additional piece of geotextile, typically 2-feet wide by the width of the roll, was installed over the seam and heat laminated into place.

To remove the water collected by the lateral drainage layer of the final cover system, an underdrain system was installed just above the side slope diversion berm. The composite geonet was cut and a five-foot wide section was removed. The composite geonet was then brought directly to a 4-inch diameter perforated corrugated polyethylene drainpipe covered by Type B Select Fill. The Type B Select Fill was covered with a Type 1 Geotextile. The underdrain outlets to the side slope diversion berm every 100-feet through the use of 4-inch diameter solid corrugated polyethylene pipe. The end of the side slope diversion berms outlet to the riprap down chute located on the southern slope. Refer to Sheet No. G-5 for lateral drainage layer termination details.

In addition to the mid-slope underdrain, a toe of slope drain consisting of Type B Select Fill was constructed to relieve water collected at the toe of the landfill slopes. An 8 oz/yd$^2$ geotextile was placed between the Select Fill and the barrier protection soils to minimize any migration of fines. Refer to Sheet No. G-4 for lateral drainage layer termination details.

### 3.1.6 Barrier Protection and Topsoil Layers

Local glacial tills were used as common fill for the barrier protection layer. The barrier protection layer was installed directly over the lateral drainage layer composite geonet. The material was mined and processed through a 6-inch screen to meet the 6-inch maximum stone size required by the project specifications. After processing, the material was loaded into articulated haulers and transported to the closure area. The material was dumped at the toe of the slope and pushed up-slope by low ground pressure bulldozers. To improve access to the capping area 3-foot thick haul roads were constructed over the lateral drainage layer. Following the completion of the barrier protection installation these haul roads were removed. The barrier protection layer was placed in one 12-inch lift. The lift was compacted with a smooth drum roller after placement. Cardboard tubes placed at the specified 100-foot by 100-foot grid along with the use of modified wooden grade stakes controlled lift thickness. The grade tubes and stakes were marked with the appropriate lift thickness and removed upon completion of soil placement and visual verification by Barton and Loguidice, P.C. The remaining holes from the tubes were filled with compacted common fill. Approximately 65,100 in-place cubic yards of common fill were installed as the barrier protection layer.

Following the completion of the barrier protection layer, a six-inch layer of topsoil was installed to promote an adequate seedbed. Topsoil removed during the grubbing stage of the landfill was screened to meet the specified maximum size requirements and reinstalled. Due to the insufficient quantity of the on-site material, topsoil was required from off-site sources. The amount of area that was covered by topsoil that was taken from on-site and processed was approximately 13.5 acres. Over the remaining area of 31.5 acres, off-site topsoil was utilized. These areas included the forty (40) acres of capping system and five (5) acres of disturbance from consolidating the footprint.

Adjacent to the county landfill portion of the closure, within the Old City Landfill area, the closure system above the hydraulic barrier was designed to accommodate heavy vehicle traffic. This design includes the use of a Type II Geotextile (16 oz/yd$^2$) installed directly above the geomembrane, two feet of granular fill and a shale wearing surface. Refer to Sheet G-4 of the Completed Construction Drawings for the City Landfill Details.

### 3.1.7 Seeding & Mulch

Prior to seeding of the final cover system, the topsoil layer was fine graded, scarified using bulldozer tracks and back bladed to eliminate ridges or other depressions that may have held water. Seeding of the final cover system was performed through the use of a Brillion Seeder by Marcy Excavation Company, Inc. Following the seeding, mulch was installed in an effort to retain moisture for germination and also control erosion and sediment loss until the vegetation becomes established.

## 3.2 Surface Water Management

As discussed in Section 3.1.5 of this report, an underdrain system and toe of slope drains were constructed as part of the lateral drainage layer to prevent excessive head buildup on the LLDPE geomembrane. These drains outlet to the surface water collection system on the site.

As part of the closure, a series of drainage swales and a down chute was constructed to aid in the removal of storm water runoff from the final cover system. Six side slope diversion berms were constructed on the southern landfill slope to decrease the storm water runoff length and divert stormwater to the downchute. The diversion berms were lined with Turf Reinforcement Mat (TRM), a permanent synthetic erosion control product.

The down chute at the site was constructed using Type II geotextile and Type III riprap, and outlets to the existing storm water management system at the site. Existing perimeter swales were cleaned and re-graded to the dimensions shown on the Completed Construction Drawings. Perimeter swales were either grass or riprap lined after re-grading. The riprap lining material was produced from the processing of the common fill material. All storm water collected at the site is routed through the existing series of sediment ponds before being released from the site.

Refer to Sheet Nos. G-4 and G-8 of the Completed Construction Drawings for storm water management details.

## 3.3 Site Access Roads

After further review during closure construction, the access road that was scheduled to be replaced over the southern slope was not installed. Instead, a road crossing was installed south of the Area 1 waste removal area, which included two 36" diameter culverts. With this road in place the perimeter of the landfill along with all of the monitoring wells can be accessed.

## 4.0 QUALITY ASSURANCE / QUALITY CONTROL

The following is a summary of the QA/QC testing program provided for the Remedial Action Landfill Closure construction. A summary of all testing data may be reviewed in Appendices A and B. The QA/QC data is grouped according to the specific construction element, i.e. common fill, select fills, geosynthetics, etc.

### 4.1 Soils

#### 4.1.1 Select Fills

##### 4.1.1.1 Type B Select Fill

Pre-qualification quality assurance testing of Type B select fill included a grain size analysis. Grain size specifications for Type B select fill material are summarized below:

| Type B Select Fill | % Passing by Weight | Sieve |
|---|---|---|
| | 100 | 2" |
| | 90-100 | 1-1/2" |
| | 0-15 | 1" |
| | 0-3 | No. 200 |

The pre-qualification sample obtained from the Type B select fill source was tested for gradation and found to be acceptable.

Approximately 974 cubic yards of Type B select fill was installed during the project. Quality control testing for Type B select fill included one grain size analysis for every 1,000 cubic yards of in-place material. The test results demonstrate that the materials met the project requirements. Type B select fill test results have been included in Appendix A.

In addition to the quality control testing above, visual inspections were made to ensure the material was free from excessive moisture, roots and other unsuitable materials. The in-place density of the select fills was also visually inspected.

4.1.1.2 Type D Select Fill

Pre-qualification quality assurance testing of Type D select fill included grain size analyses, permeability testing and relative density testing. A calcium carbonate content test was also performed to ensure that the material contained less that 30% calcium carbonate. Grain size specifications for Type D select fill material are summarized below:

| Type D Select Fill | % Passing by Weight | Sieve |
|---|---|---|
| | 100 | 1-1/2" |
| | 90-100 | 1" |
| | 0-15 | 1/2" |
| | 0-3 | No. 200 |

The pre-qualification test results met the project specifications.

Approximately 350 cubic yards of Type D select fill were installed during the project. Quality control testing for Type D select fill included one grain size analysis for every 1,000 cubic yards of in-place material and one min/max relative density test for each stockpile of Type D select fill to be pre-qualified. The test results demonstrate that the materials met the project requirements. Type D select fill test results have been included in Appendix A.

In addition to the quality control testing above, visual inspections were made to ensure the material was free from excessive moisture, roots and other unsuitable materials. The in-place density of the select fills was also visually inspected.

4.1.2 Common Fill

Quality control testing for common fill included performing Atterberg Limits, grain size analyses and Modified Proctor compaction tests for every 5,000 cubic yards of in-place material. The test results demonstrate that the common fill met the grain size requirements for a maximum of 50 percent passing the No. 200 sieve and stones not exceeding 6-inches in the greatest dimension.

Quality assurance testing consisted of testing the in-place density of the common fill material at a minimum frequency of one test for every 10,000 square feet per lift. Tests were performed on a 100' grid. All test results met the minimum 90% Modified Proctor dry density compaction requirement.

The results of the QA/QC testing for the common fill are presented in Appendix A.

### 4.1.3 Topsoil

As discussed in Section 3.1.6 of this report, screened on-site and off-site topsoil was used for the final cover system. The material was placed following the barrier protection layer. The intent of the topsoil layer is to permit development of substantial and sustainable vegetative cover over the final cover system and the topsoil at the site has proven to support vegetative growth on other projects.

Prequalification tests on the topsoil were taken to determine the ph and organic content. The material was found to be acceptable and the results are shown in Appendix A.

### 4.1.4 Granular Fill

Granular fill used on the city landfill capping system met the requirements for the specified NYSDOT Type 2 Subbase Coarse. A certified grain size analysis was submitted by the material supplier to verify the material met NYSDOT specifications. The grain size analysis report was found to be acceptable and is included in Appendix A.

### 4.1.5 Riprap

Gradation of the riprap utilized at the project for lining of the storm water management swales was controlled by visual inspection. Prior to installation of the riprap, the material was stockpiled on-site and mechanically sorted to produce the acceptable gradation.

## 4.2 Geosynthetics

### 4.2.1 Geotextiles

In accordance with the project specifications, the geotextile manufacturer provided QA/QC roll certificates for each roll of material delivered to the project. All manufacturers' QA/QC roll certificates met the project specification requirements. The manufacturer's data is included in Appendix B.

Conformance testing was performed on the Type 1 (6 oz/sy) and Type 2 (16 oz/sy) geotextile for the project. Geotextile samples were taken for every 100,000 square feet of material that arrived at the site and tested for the following:

- Mass Per Unit Area
- Burst Strength
- Grab Strength
- Puncture Strength
- Trapezoidal Tear Strength

The results of conformance testing for the composite geonet indicated that the initial sample of the Type II geotextile did not meet the specified mass per unit area. Therefore, the material was not used in Type II applications and additional material was brought to the site. Conformance test results for the additional 16 oz/yd$^2$ material brought to the site and the Type I geotextile were found acceptable. All conformance test results can be found in Appendix B.

No quality assurance testing was performed on the geotextiles for the project other than a visual inspection of the condition of the material, material placement and material seaming.

### 4.2.2 Composite Geonet

The composite geonet manufacturer provided QA/QC roll certifications of the material properties for each roll of material delivered to the project. All manufacturers' QA/QC roll certificates met the project specification requirements. The manufacturer's data is included in Appendix B.

Conformance testing was performed on the composite geonet for the project. Composite geonet samples were taken for every 100,000 square feet of material that arrived at the site and tested for the following:

| | |
|---|---|
| HDPE Geonet Core: | Mass per Unit Area (ASTM D5261) |
| | Specific Gravity (ASTM D1505) |
| | Thickness (ASTM D5199) |
| | Melt Flow Index (ASTM D1238) |
| Geotextile: | Apparent Opening Size (ASTM D4751) |
| | Mass per Unit Area (ASTM D5261) |
| | Grab Strength (ASTM D4632) |
| Composite Geonet: | Ply Adhesion (ASTM D413) |
| | Index Transmissivity (ASTM D4716) |

The results of conformance testing for the composite geonet indicated that all composite geonet samples met the specification requirements. Conformance test results for the composite geonet are included in Appendix B.

No quality assurance testing was performed on the composite geonet for the project other than a visual inspection of the condition of the material, material placement and material seaming.

Following the placement of the overlying barrier protection and topsoil layers, an additional visual inspection was performed on the composite geonet seams. This inspection included excavating through the soil layers in two locations on the southern slope and exposing approximately 200 linear feet of the seams. In all of the excavated areas the seams were found to be acceptable and no damage was caused to the composite geonet or geomembrane during the investigations activities. Following the acceptance of the seams, the barrier protection and topsoil layers were re-constructed, and the areas were seeded.

### 4.2.3 LLDPE Geomembrane

In accordance with the project specifications, the LLDPE geomembrane manufacturer provided QA/QC roll certificates for each roll of material delivered to the project. All manufacturers' QA/QC roll certificates met the project specification requirements. The manufacturer's data is included in Appendix B.

In addition to the manufacturer's data, conformance testing was performed on the LLDPE geomembrane for the project. Geomembrane samples were taken for every 100,000 square feet of material that arrived at the site and tested for:

- Thickness (ASTM D1593)
- Specific gravity (ASTM D1505)
- Carbon black content (ASTM D1603)
- Carbon black dispersion (ASTM D3015)
- Tensile properties (ASTM D638).

The results of this testing indicated that LLDPE geomembrane met the specification requirements. All conformance test results for the LLDPE geomembrane are included in Appendix B.

Geomembrane quality assurance testing included performing trial seams and non-destructive seam testing. In addition, destructive testing was performed for each 500 lineal feet of seam constructed.

At the start of each seaming session (in both the morning and the afternoon) a trial seam was constructed and tested for peel adhesion as well as shear strength to ensure that the equipment was operating at the correct temperature and rate to produce acceptable seam results. Trial seams were performed for each seaming machine and each operator. If trial seam results were found to be unacceptable, the operator adjusted the machine's rate and temperature until acceptable seam results were obtained. Trial seam test results have been included in Appendix B.

Non-destructive testing of the seams was performed by either an air pressure test on the double wedge welded seams or a vacuum box test on all other seams and repairs. Air pressure testing consisted of pressurizing the air channel of each seam to a minimum of 25 psi and monitoring the pressure over 3 minutes. The test was considered passing if the pressure drop over three minutes was less than 3 psi. If tests did not initially pass, the seam was visually

inspected for leaks using a soapy water solution when necessary. Typically leaks were found around the gauge needle at the ends of seams. Repairs were made and the seam was re-tested until acceptable results were achieved. Where the air pressure test could not be conducted, vacuum box testing was performed. Vacuum box testing consisted of wetting the seam with soapy water, placing a vacuum box over the seam, creating a vacuum to a minimum 5 psi, and monitoring the seam for air bubbles. If an air bubble was detected, the area was marked and later repaired and re-tested until acceptable results were achieved. Non-destructive testing logs have been included in Appendix B.

Destructive testing of the seams was performed by cutting out a 3-foot long section of the seam for every 500 lineal feet of seam constructed. These samples were cut into thirds with one sample sent to an independent laboratory, one given to the Contractor and one given to the Owner. The samples that were sent to the laboratory were tested for shear strength and peel adhesion. Samples DS-39, DS-71, DS-79, DS-88, DS-122, DS-122A, DS-130, DS-130, DS-130B, DS-131, DS-132, DS-134, DS-135, DS-135A, DS-142, DS-151, and DS-156 did not meet the project requirements for peel adhesion. In all of the failure cases during the peel tests the film tear bond was not established. Additional samples were taken from the seams at the specified ten-foot separation on both sides of the failure and sent to an independent laboratory. Ultimately, acceptable test results were obtained from each seam that contained a destructive sample failure, and the area between the additional samples was repaired using an extrusion welder to weld a "cap strip" and non-destructively tested with a vacuum box apparatus. Destructive sample testing logs have been included in Appendix B.

The LLDPE geomembrane panel layout, location of repairs and destructive samples are shown on the geomembrane as-built drawing (Appendix B).

*CORTLAND COUNTY LANDFILL*
*REMEDIAL ACTION LANDFILL CLOSURE*

*TOWNLINE ROAD*
*CORTLAND COUNTY, NEW YORK*

# APPENDIX A
# SOIL TEST RESULTS

**JUNE, 2002**

Barton & Loguidice, P.C.
*Consulting Engineers*

**290 Elwood Davis Road**
**Box 3107**
**Syracuse, New York 13220**

# Appendix A

# Soil Test Results

## Table of Contents

# Appendix A

## Section: 1.0

## Common Fill Material Test Results

# Appendix A

## Section: 1.A

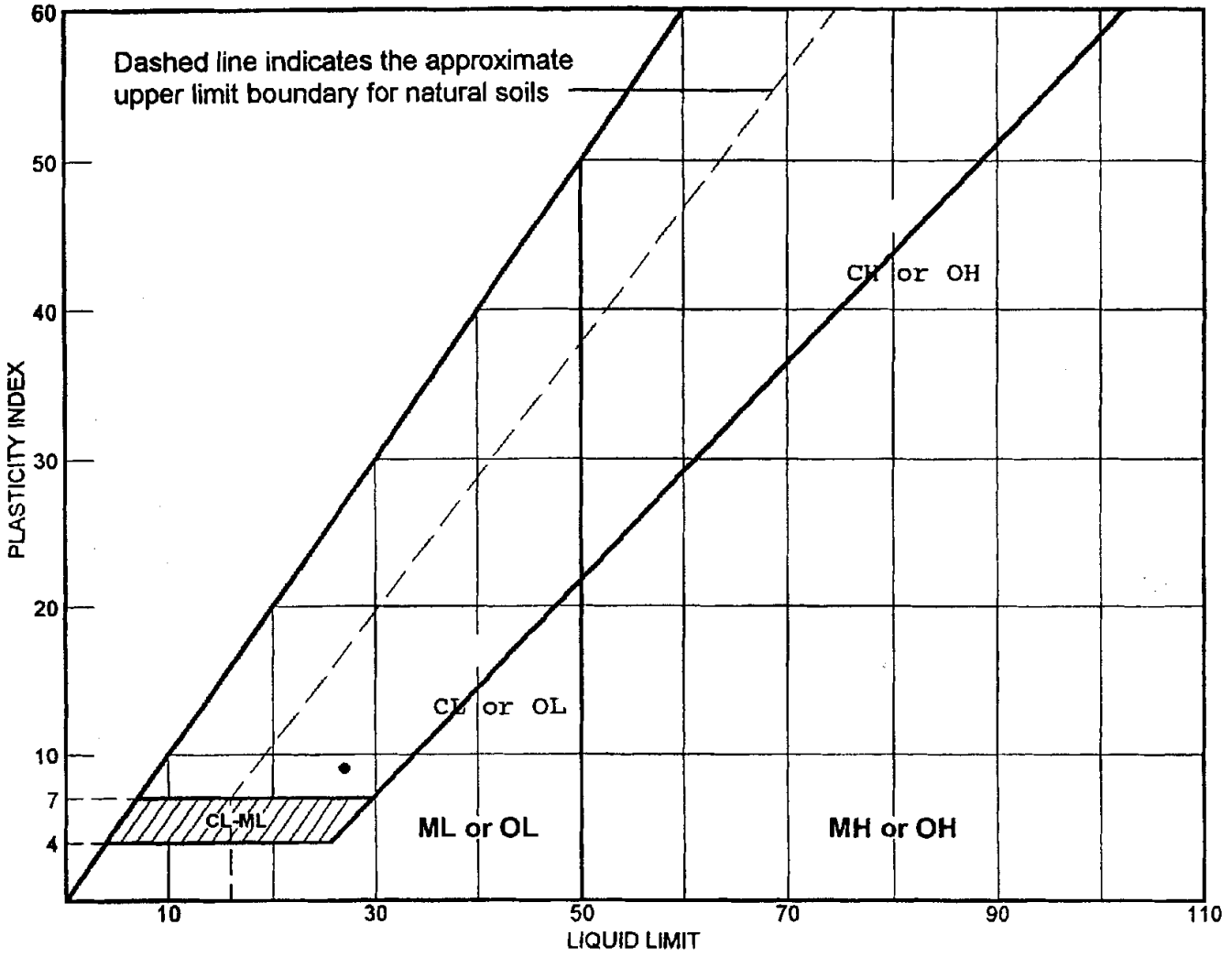
## Common Fill Material

## Quality Control Testing

# COMMON FILL (SECTION 02255)
# TEST RESULTS SUMMARY
## Cortland County Landfill Remedial Action Lanfill Closure 331.035

| SAMPLE NO. | DATE SAMPLED | CUMULATIVE VOLUME (cy) | ATTERBERG LIMITS | | | GRAIN SIZE ANALYSIS | | MODIFIED PROCTOR | OPTIMUM MOISTURE |
|---|---|---|---|---|---|---|---|---|---|
| | | | LL | PL | PI | %PSG 6" | %PSG 200 | (pcf) | (%) |
| TEST METHOD → | | | D4318 | D4318 | D4318 | D422 | D422 | D1557 | |
| SAMPLE FREQUENCY → | | | 5,000 cy | 5,000 cy | 5,000 cy | 5,000 cy | 5,000 cy | 5,000 cy | 5,000 cy |
| SPECIFICATIONS (8" lifts) → | | | NA | NA | NA | 100 | 25 (min) | NA | NA |
| 209,CF-2 | 5/3/01 | Prequalification / 5000 | 27 | 18 | 9 | 100 | 39 | 139.3 | 7.5 |
| 217, CF-3 | 5/11/01 | 10,000 | 28 | 16 | 12 | 100 | 43.6 | 136.3 | 8.1 |
| 225, CF-4 | 5/14/01 | 15,000 | 27 | 16 | 11 | 100 | 40.2 | 134.3 | 7.7 |
| 242,CF-5 | 5/17/01 | 20,000 | 28 | 16 | 12 | 100 | 42.7 | 138.5 | 7.0 |
| 252,CF-6 | 5/25/01 | 25,000 | 24 | 17 | 7 | 100 | 55.9 | 140.2 | 8.5 |
| 256,CF-7 | 6/5/01 | 30,000 | 25 | 17 | 8 | 100 | 40.4 | 140 | 6.9 |
| 266,CF-8 | 6/7/01 | 35,000 | 25 | 18 | 7 | 100 | 48.2 | 136.4 | 7.0 |
| 267,CF-9 | 6/7/01 | 40,000 | 24 | 17 | 7 | 100 | 44.3 | 135.7 | 7.4 |
| 285,CF-10 | 6/18/01 | 45,000 | 28 | 16 | 12 | 100 | 43.6 | 136.3 | 8.1 |
| 298,CF-11 | 6/30/01 | 50,000 | 12 | NP | NP | 100 | 51 | 136.8 | 8.4 |
| 325,CF-12 | 7/5/01 | 55,000 | 29 | 21 | 8 | 100 | 45.2 | 132.4 | 9.2 |
| 326,CF-13 | 7/5/01 | 60,000 | 30 | 22 | 8 | 100 | 49.5 | 128.9 | 8.5 |
| 373,CF | 7/27/01 | 65,000 | 28 | 20 | 8 | 100 | 45.2 | 134.2 | 8.1 |
| 352,CF | 7/18/01 | 70,000 | 24 | 17 | 7 | 100 | 43.7 | 137.4 | 7.0 |
| 374,CF | 7/27/01 | 75,000 | 27 | 20 | 7 | 100 | 47.4 | 133.3 | 8.0 |
| 378,CF | 8/1/01 | 80,000 | 23 | 16 | 7 | 100 | 46.5 | 138.4 | 7.6 |
| 415 | 8/15/01 | 85,000 | 25 | 17 | 8 | 100 | 43.2 | 133.5 | 7.2 |
| 438 | 8/28/01 | 90,000 | 24 | 18 | 6 | 100 | 45 | 130.1 | 8.9 |
| 439 | 8/29/01 | 95,000 | 23 | 18 | 5 | 100 | 47.2 | 131.2 | 8.3 |
| 452 | 9/7/01 | 100,000 | 24 | 17 | 7 | 100 | 46 | 132.4 | 8.8 |
| 453 | 9/7/01 | 105,000 | 25 | 18 | 7 | 100 | 42.9 | 135.7 | 8.1 |
| 454 | 9/7/01 | 110,000 | 23 | 17 | 6 | 100 | 43.9 | 136 | 7.9 |

# LIQUID AND PLASTIC LIMITS TEST REPORT




## SOIL DATA

| SYMBOL | SOURCE | SAMPLE NO. | DEPTH (ft.) | NATURAL WATER CONTENT (%) | PLASTIC LIMIT (%) | LIQUID LIMIT (%) | PLASTICITY INDEX (%) | USCS |
|---|---|---|---|---|---|---|---|---|
| ● | Common Fill | 209, CF-2 | | | 18 | 27 | 9 | GC |

LIQUID AND PLASTIC LIMITS TEST REPORT

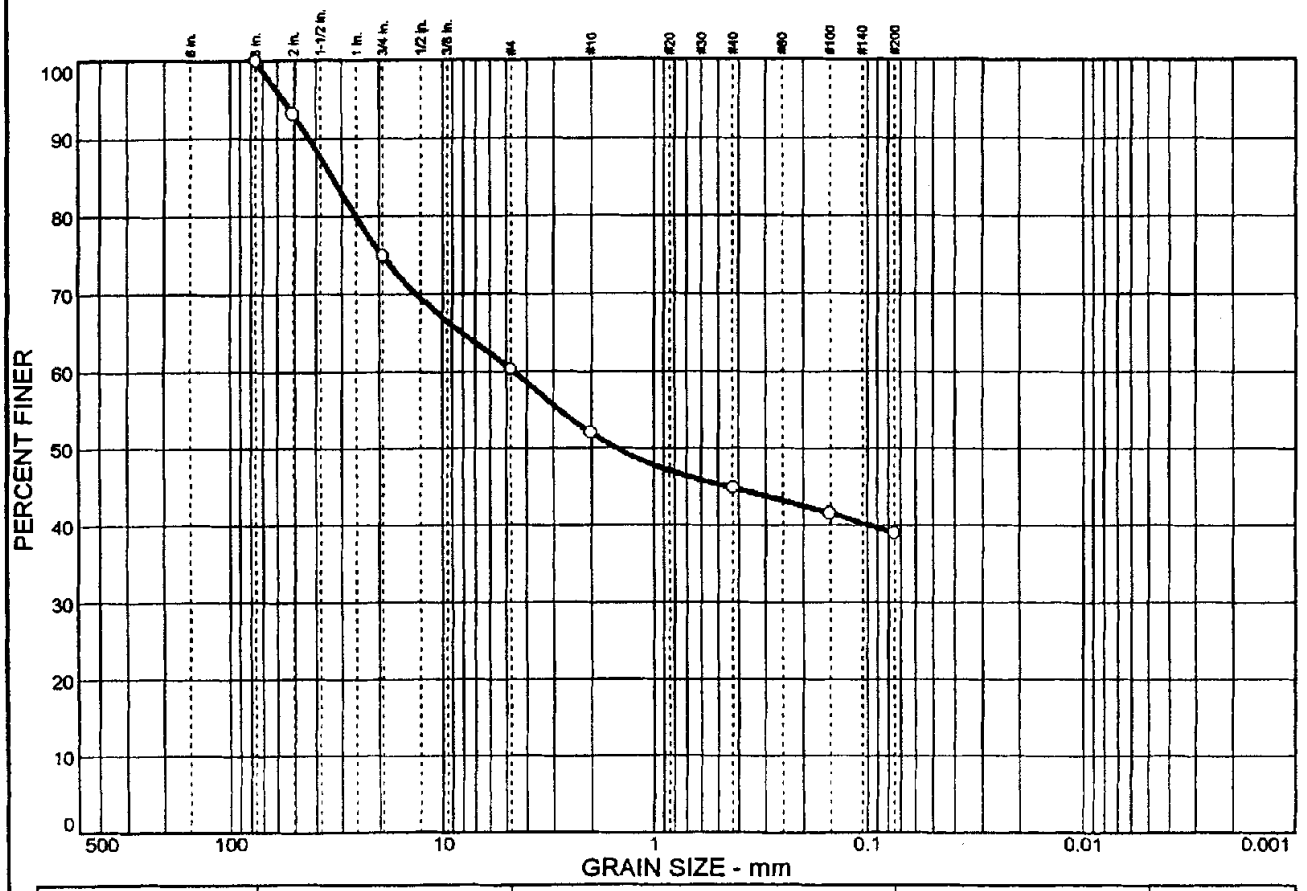
**SJB SERVICES, INC.**

**Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

**Project No.:** 2009053 **Plate**

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 0.0 | 39.7 | 21.3 | 39.0 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3 in. | 100.0 | | |
| 2 in. | 93.2 | | |
| .75 in. | 74.9 | | |
| #4 | 60.3 | | |
| #10 | 52.0 | | |
| #40 | 44.8 | | |
| #100 | 41.5 | | |
| #200 | 39.0 | | |

* (no specification provided)

**Soil Description**

Clayey gravel with sand

**Atterberg Limits**

PL= 18 LL= 27 PI= 9

**Coefficients**

$D_{85}$= 33.1 $D_{60}$= 4.60 $D_{50}$= 1.52
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= GC AASHTO=

**Remarks**

CF-2

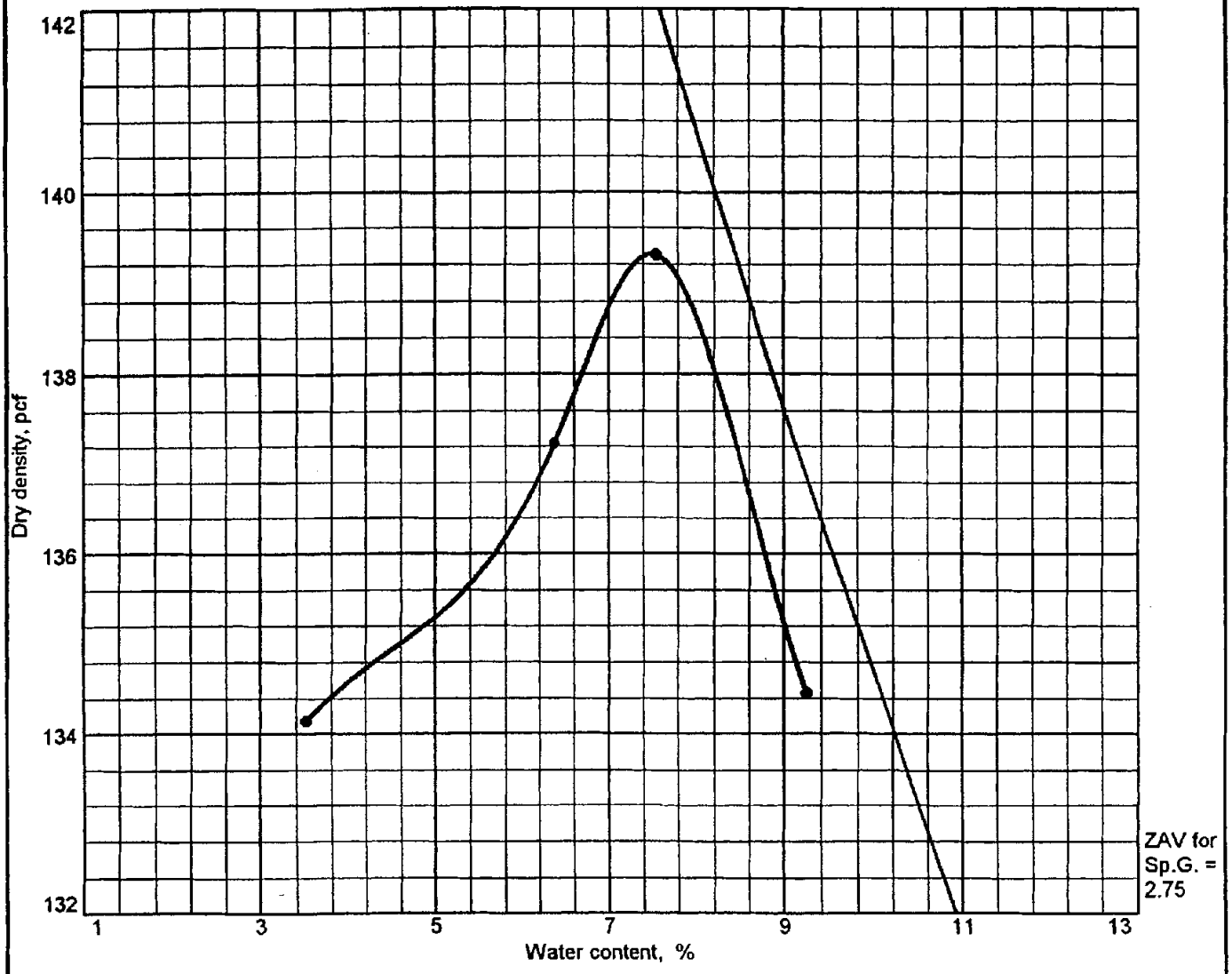
**Sample No.:** 209, CF-2 **Source of Sample:** Common Fill **Date:** 5/4/01
**Location:** Pile #5 **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover

**Project No:** 2009053 **Plate**

# COMPACTION TEST REPORT




Test specification: ASTM D 1557-78 Method D Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | GC | | | | 27 | 9 | 25.1 | 39.0 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 139.3 pcf<br>Optimum moisture = 7.5 % | Clayey gravel with sand |

**Project No.** 2009053 **Client:** Marcy Excavation
**Project:** Cortland Landfill Cover

• **Location:** Pile #5

**Remarks:**

COMPACTION TEST REPORT

**SJB SERVICES, INC.**

**Plate**

# PERMEABILITY TEST REPORT

**TEST DATA:**

Specimen Height (cm): 11.81
Specimen Diameter (cm): 10.16
Dry Unit Weight (pcf): 124.0
Moisture Before Test (%): 8.4
Moisture After Test (%): 11.6
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 90.0

Sat. Pressure (psi): 80.0
Diff. Head (psi): 4.8

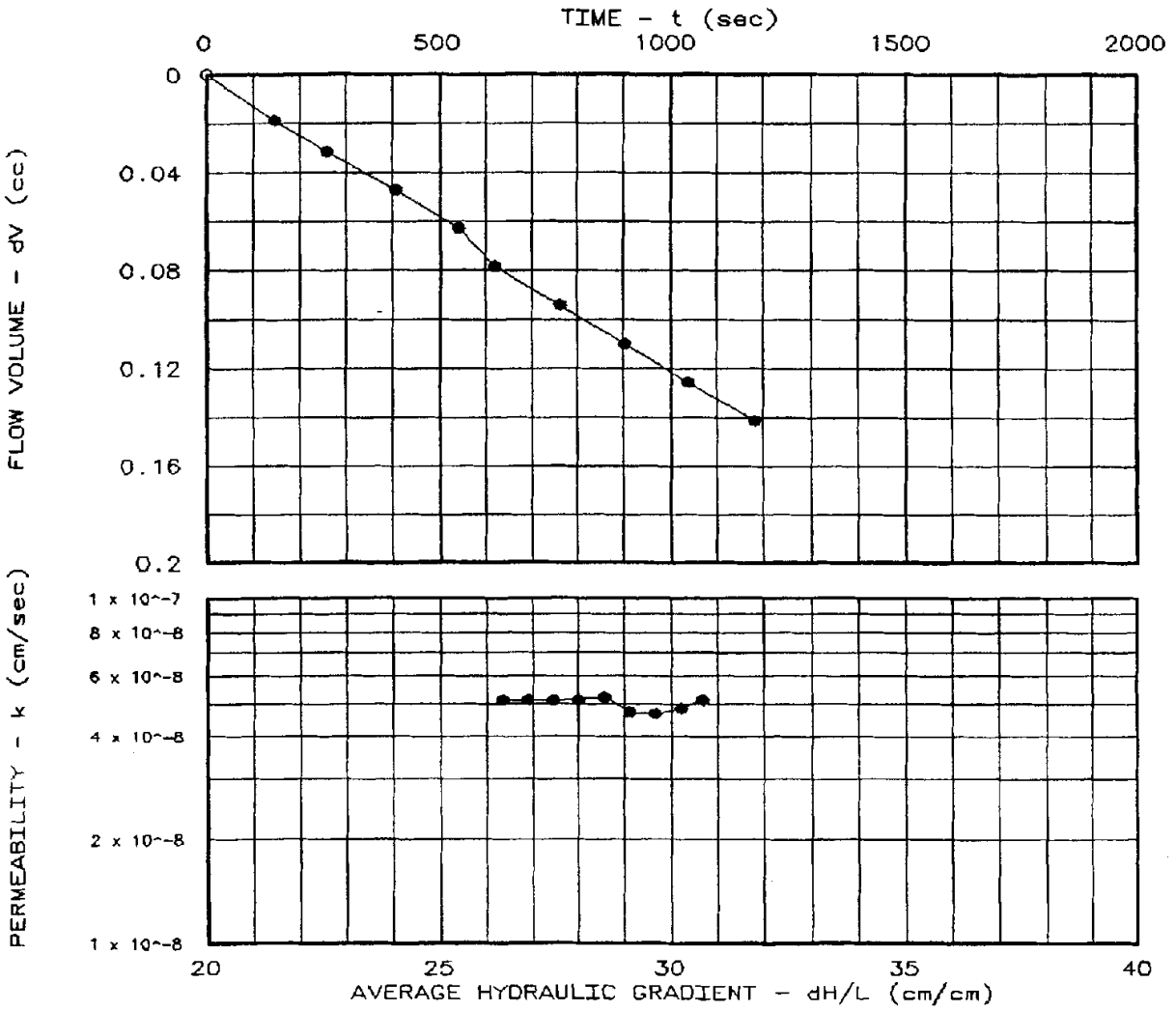
Perm. (cm/sec): 4.89 x 10^-8

**SAMPLE DATA:**

Sample Identification: Common Fill, On site, Pile # 5.
Visual Description: Clayey gravel with sand

Remarks:

Maximum Dry Density (pcf): 139.3
Optimum Moisture Content (%): 7.5
ASTM(1557)
Percent Compaction: 89.0%
Permeameter type: Flexible Wall
Sample type: Remolded



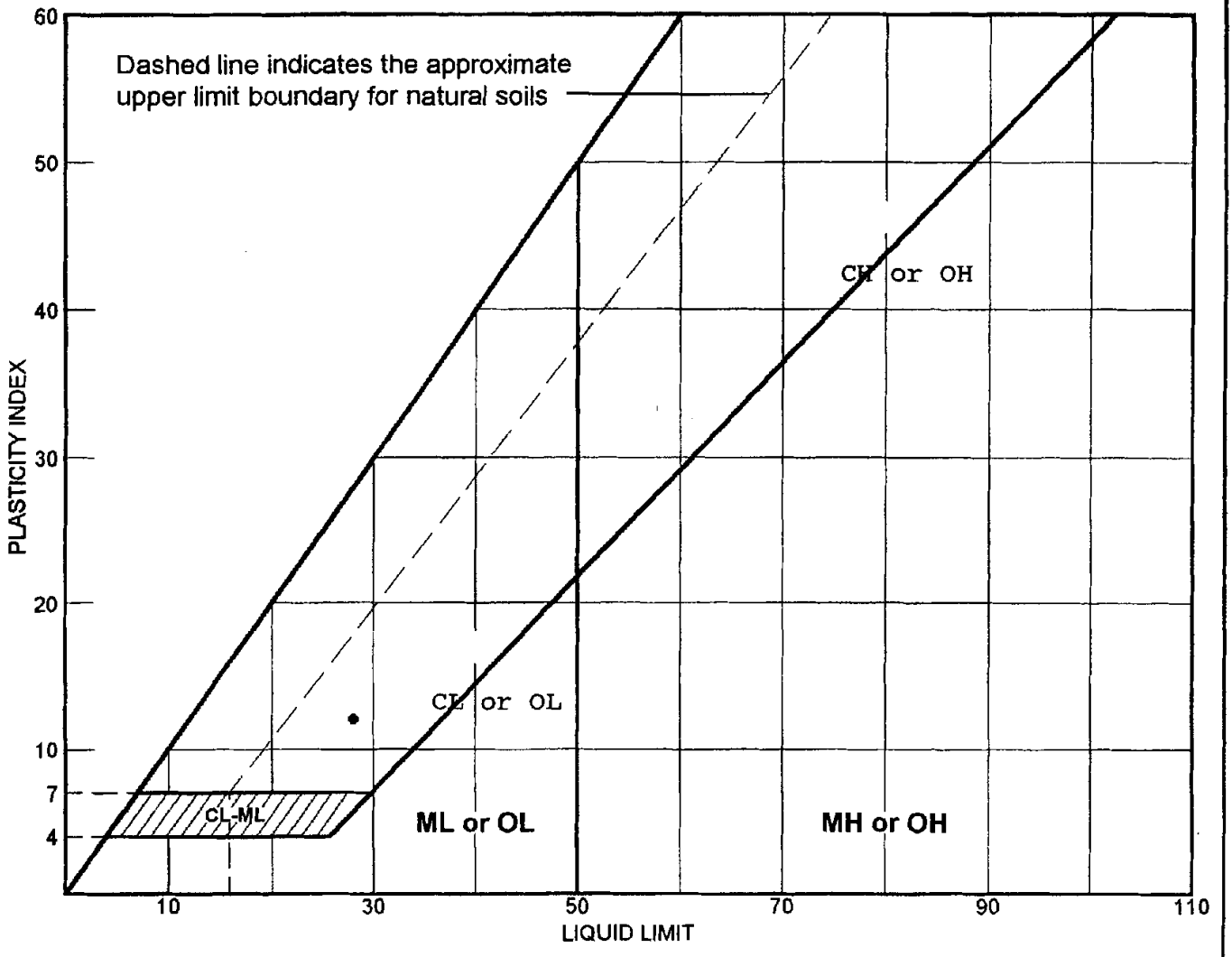

Project: Cortland Landfill Cover
Location: Cortlandville, NY
Date: 5/9/01

PERMEABILITY TEST REPORT

**SJB SERVICES, INC.**

Project No.: 2009053
File No.: 209
Lab No.: 209
Tested by: AM
Checked by: TH
Test: CV - Constant volume

# LIQUID AND PLASTIC LIMITS TEST REPORT




| SOIL DATA | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SYMBOL | SOURCE | SAMPLE NO. | DEPTH (ft.) | NATURAL WATER CONTENT (%) | PLASTIC LIMIT (%) | LIQUID LIMIT (%) | PLASTICITY INDEX (%) | USCS |
| ● | Common Fill | 217, CF-3 | | | 16 | 28 | 12 | SC |

LIQUID AND PLASTIC LIMITS TEST REPORT

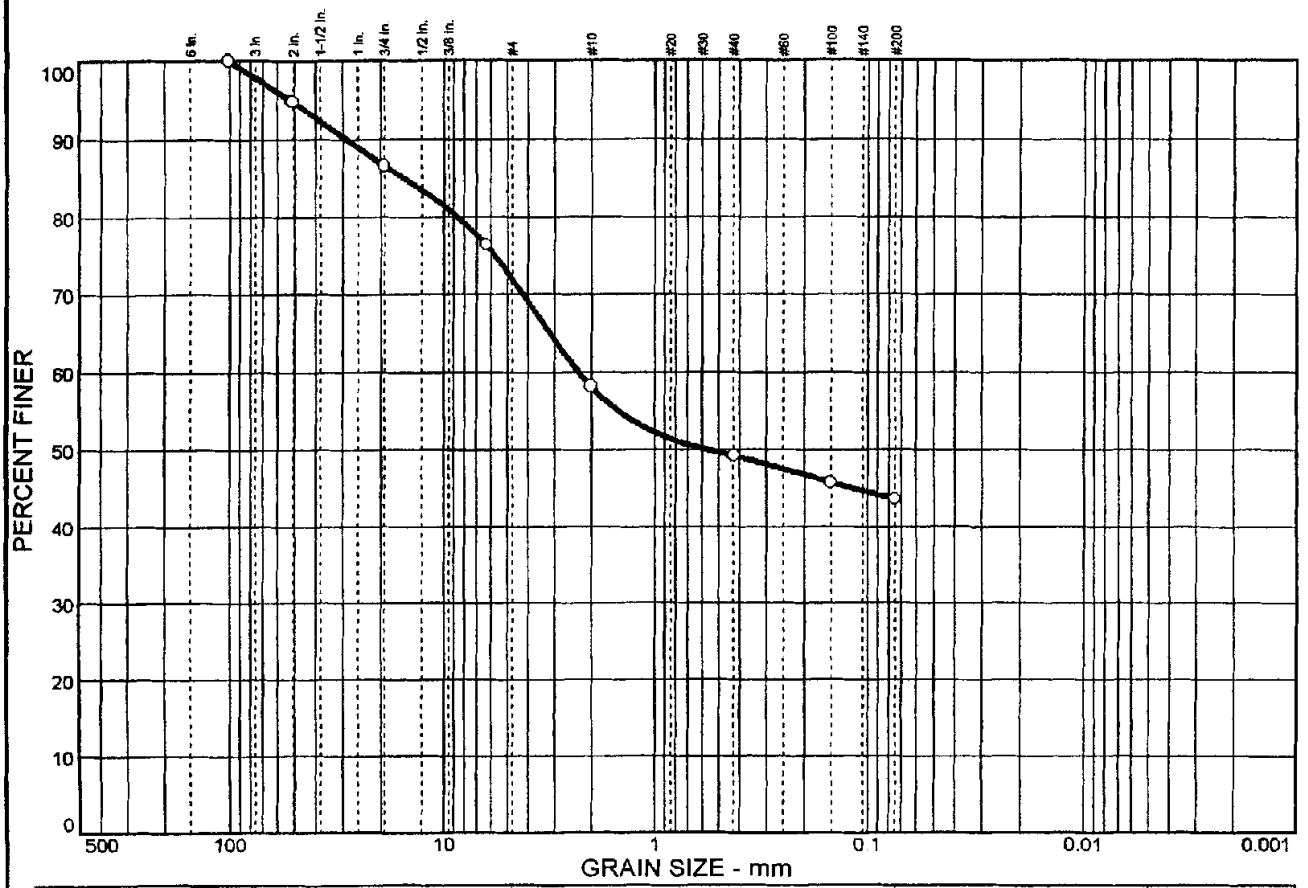
**SJB SERVICES, INC.**

**Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

**Project No.:** 2009053 **Plate**

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 2.1 | 25.9 | 28.4 | 43.6 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 4 in. | 100.0 | | |
| 2 in. | 94.8 | | |
| .75 in. | 86.6 | | |
| .25 in. | 76.4 | | |
| #10 | 58.2 | | |
| #40 | 49.2 | | |
| #100 | 45.8 | | |
| #200 | 43.6 | | |

* (no specification provided)

**Soil Description**

Clayey sand with gravel Retest of CF #1

**Atterberg Limits**

PL= 16 LL= 28 PI= 12

**Coefficients**

$D_{85}$= 15.5 $D_{60}$= 2.28 $D_{50}$= 0.565
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= SC AASHTO=

**Remarks**

**Sample No.:** 217, CF-3 **Source of Sample:** Common Fill **Date:** 5/11/01
**Location:** Pile #3 **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover

**Project No:** 2009053 **Plate**

# COMPACTION TEST REPORT


**Test specification:** ASTM D 1557-78 Method D Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | | | | | 28 | 12 | 13.4 | 43.6 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 136.3 pcf<br>Optimum moisture = 8.1 % | Clayey sand with gravel Retest of CF #1 |

**Project No.** 2009053 **Client:** Marcy Excavation
**Project:** Cortland Landfill Cover

• **Location:** Pile #3

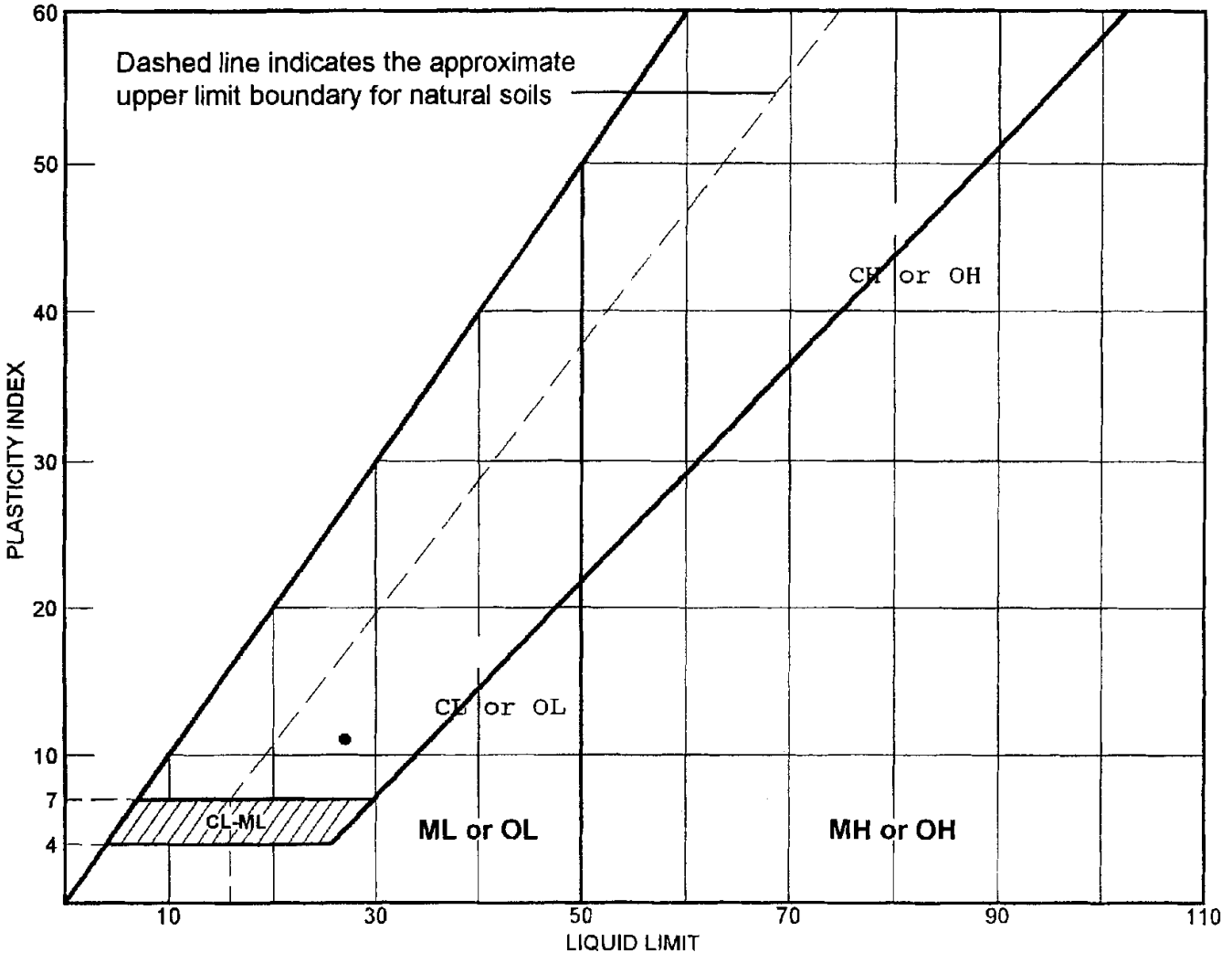
**Remarks:**

COMPACTION TEST REPORT

**SJB SERVICES, INC.**

**Plate**

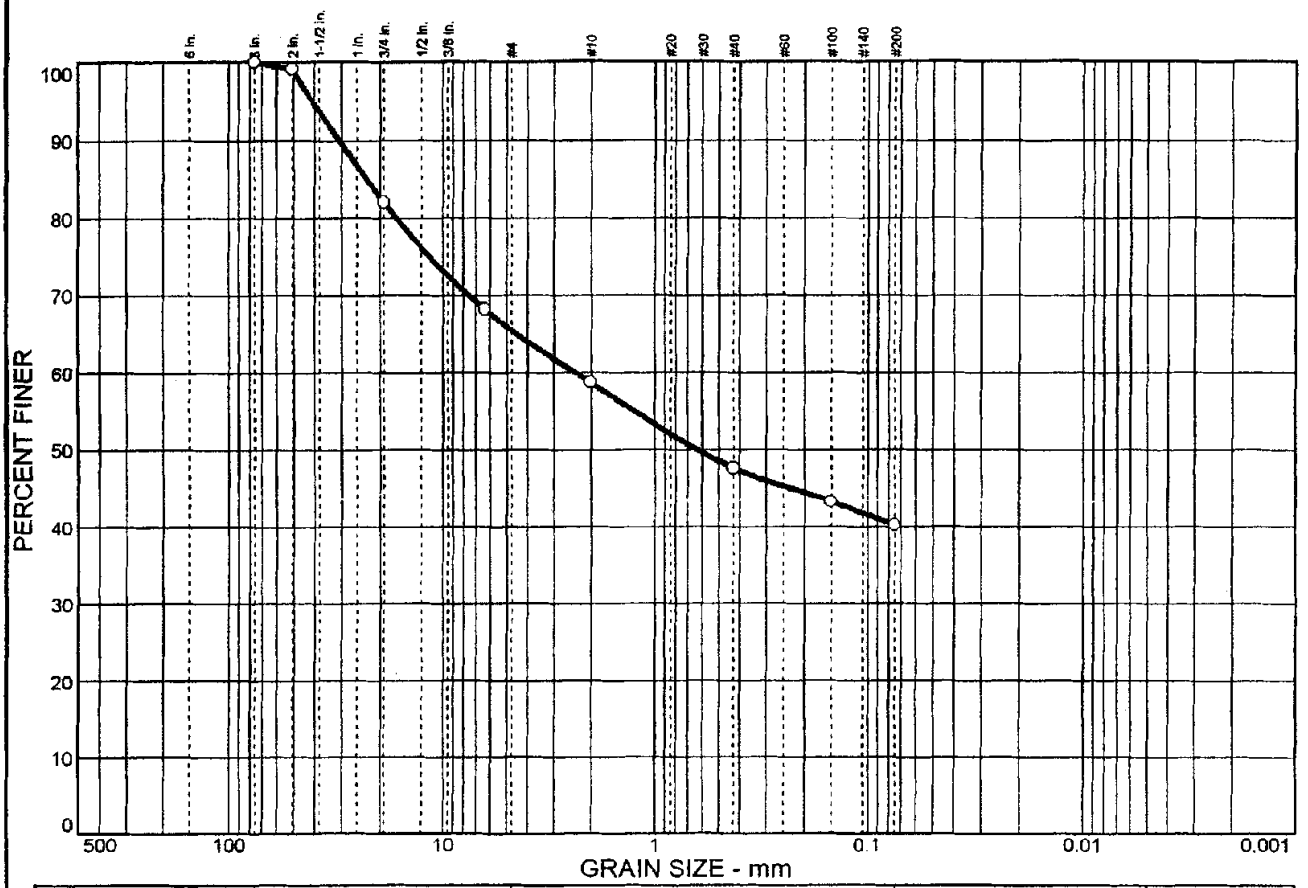
# LIQUID AND PLASTIC LIMITS TEST REPORT




| SOIL DATA | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SYMBOL | SOURCE | SAMPLE NO. | DEPTH (ft.) | NATURAL WATER CONTENT (%) | PLASTIC LIMIT (%) | LIQUID LIMIT (%) | PLASTICITY INDEX (%) | USCS |
| ● | Common Fill | 225, CF-4 | | | 16 | 27 | 11 | GC |

| | |
|---|---|
| LIQUID AND PLASTIC LIMITS TEST REPORT<br>**SJB SERVICES, INC.** | **Client:** Marcy Excavation<br>**Project:** Cortland Landfill Cover<br>**Project No.:** 2009053 **Plate** |

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 0.0 | 34.5 | 25.3 | 40.2 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3 in. | 100.0 | | |
| 2 in. | 99.2 | | |
| .75 in. | 82.1 | | |
| .25 in. | 68.2 | | |
| #10 | 58.7 | | |
| #40 | 47.6 | | |
| #100 | 43.3 | | |
| #200 | 40.2 | | |

* (no specification provided)

**Soil Description**

Clayey gravel with sand
Common Fill

**Atterberg Limits**

PL= 16 LL= 27 PI= 11

**Coefficients**

$D_{85}$= 22.8 $D_{60}$= 2.37 $D_{50}$= 0.633
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= GC AASHTO=

**Remarks**

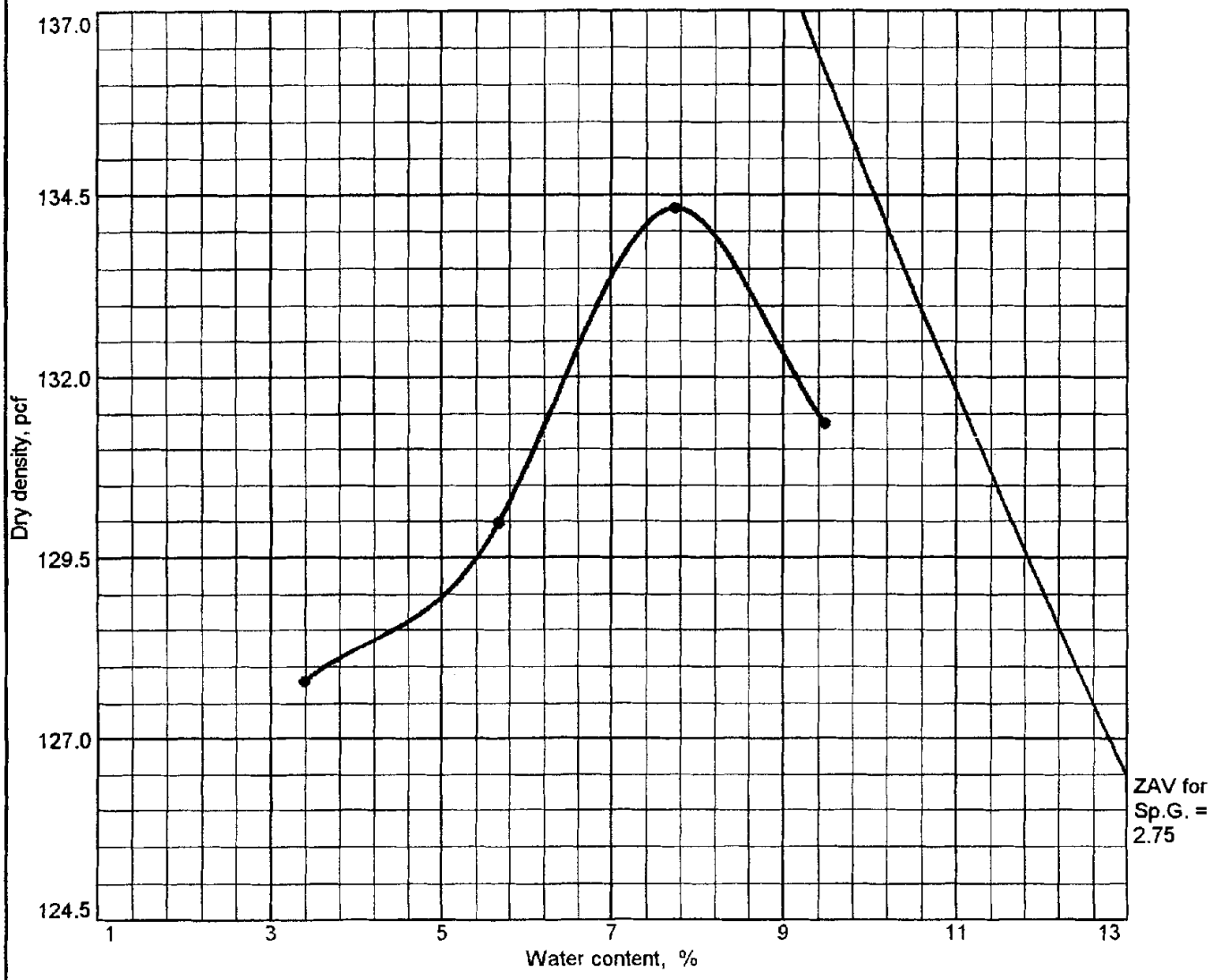
**Sample No.:** 225, CF-4 **Source of Sample:** Common Fill **Date:** 5/14/01
**Location:** 5/10/01, S-1 **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover

**Project No:** 2009053 **Plate**

# COMPACTION TEST REPORT




Test specification: ASTM D 1557-78 Method D Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | GC | | | | 27 | 11 | 17.9 | 40.2 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 134.3 pcf<br>Optimum moisture = 7.7 % | Clayey gravel with sand<br>Common Fill |

**Project No.** 2009053 **Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

● **Location:** 5/10/01, S-1

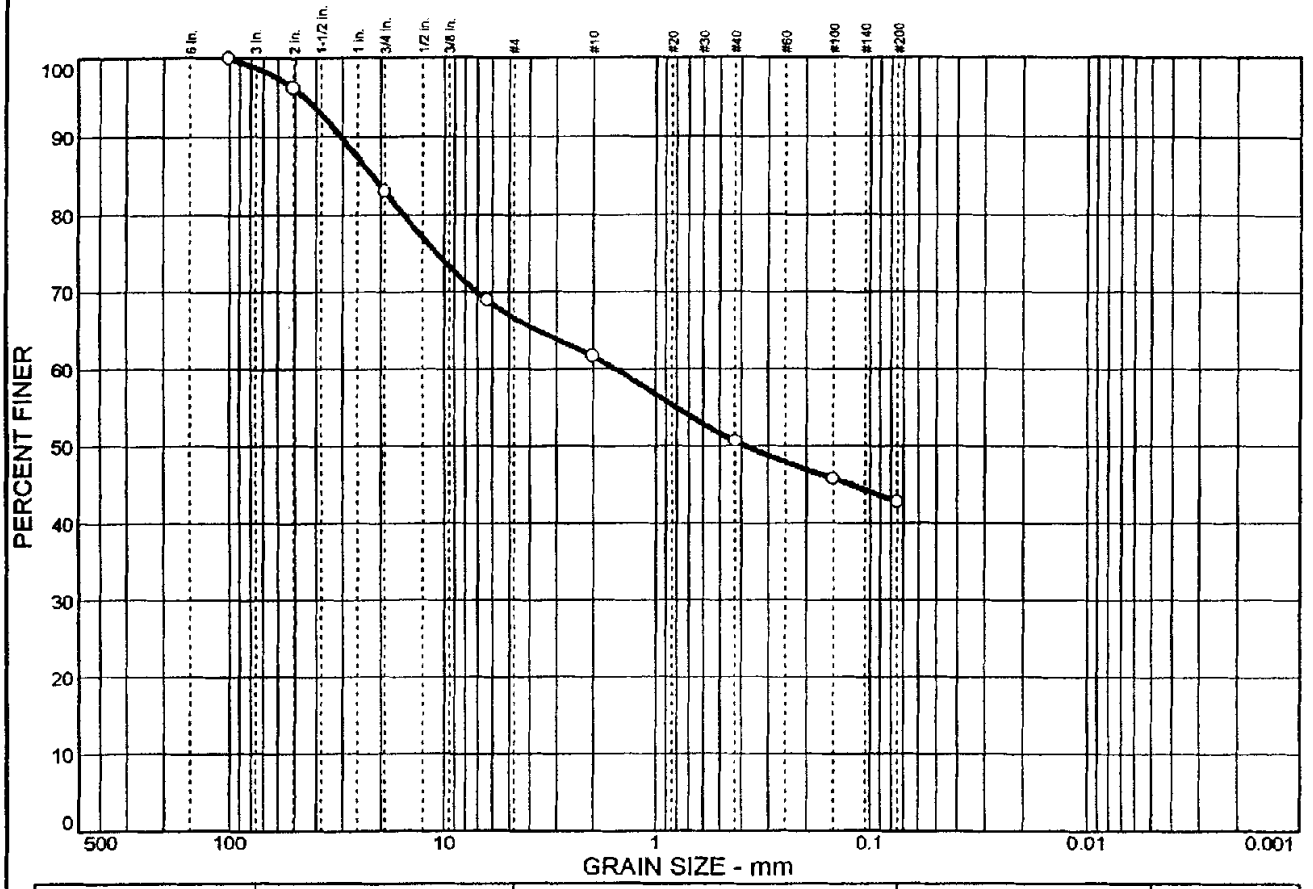
**Remarks:**

COMPACTION TEST REPORT

**SJB SERVICES, INC.**

**Plate**

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 1.2 | 32.1 | 24.0 | 42.7 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 4 in. | 100.0 | | |
| 2 in. | 96.1 | | |
| .75 in. | 83.0 | | |
| .25 in. | 69.0 | | |
| #10 | 61.6 | | |
| #40 | 50.6 | | |
| #100 | 45.8 | | |
| #200 | 42.7 | | |

* (no specification provided)

**Soil Description**

Common Fill, 5K
Clayey gravel with sand

**Atterberg Limits**

PL= 16 LL= 28 PI= 12

**Coefficients**

$D_{85}$= 21.7 $D_{60}$= 1.57 $D_{50}$= 0.382
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= GC AASHTO=

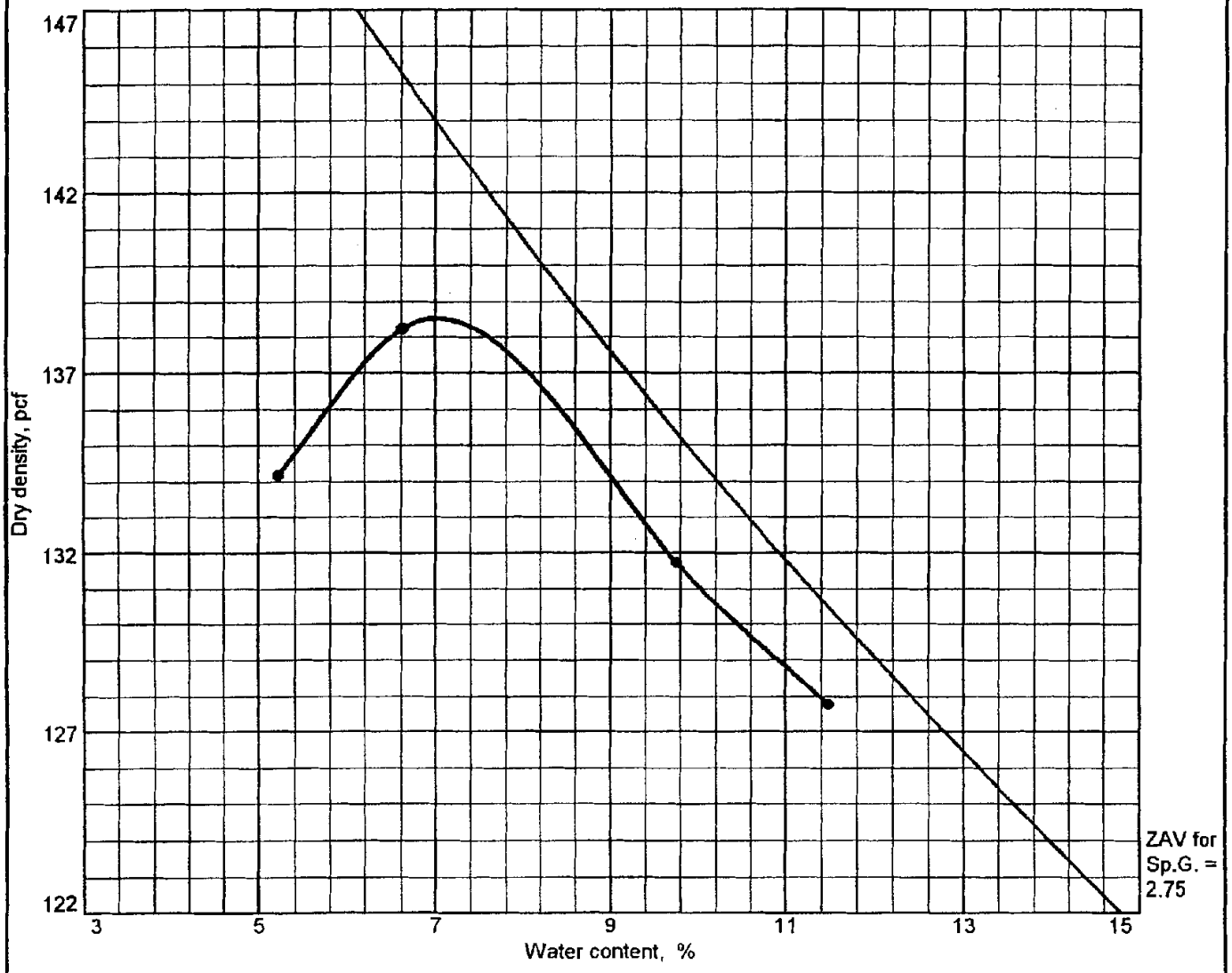
**Remarks**

**Sample No.:** 242, CF-5 **Source of Sample:** Common Fill **Date:** 5/18/01
**Location:** Pile 5, Sampled on 5/17/01 **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover
**Project No:** 2009053 **Plate**

# COMPACTION TEST REPORT




Test specification: ASTM D 1557-78 Method D Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | GC | | | | 28 | 12 | 33.3 | 42.7 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 138.5 pcf<br>Optimum moisture = 7.0 % | Common Fill, 5K<br>Clayey gravel with sand |

**Project No.** 2009053 **Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

● **Location:** Pile 5, Sampled on 5/17/01

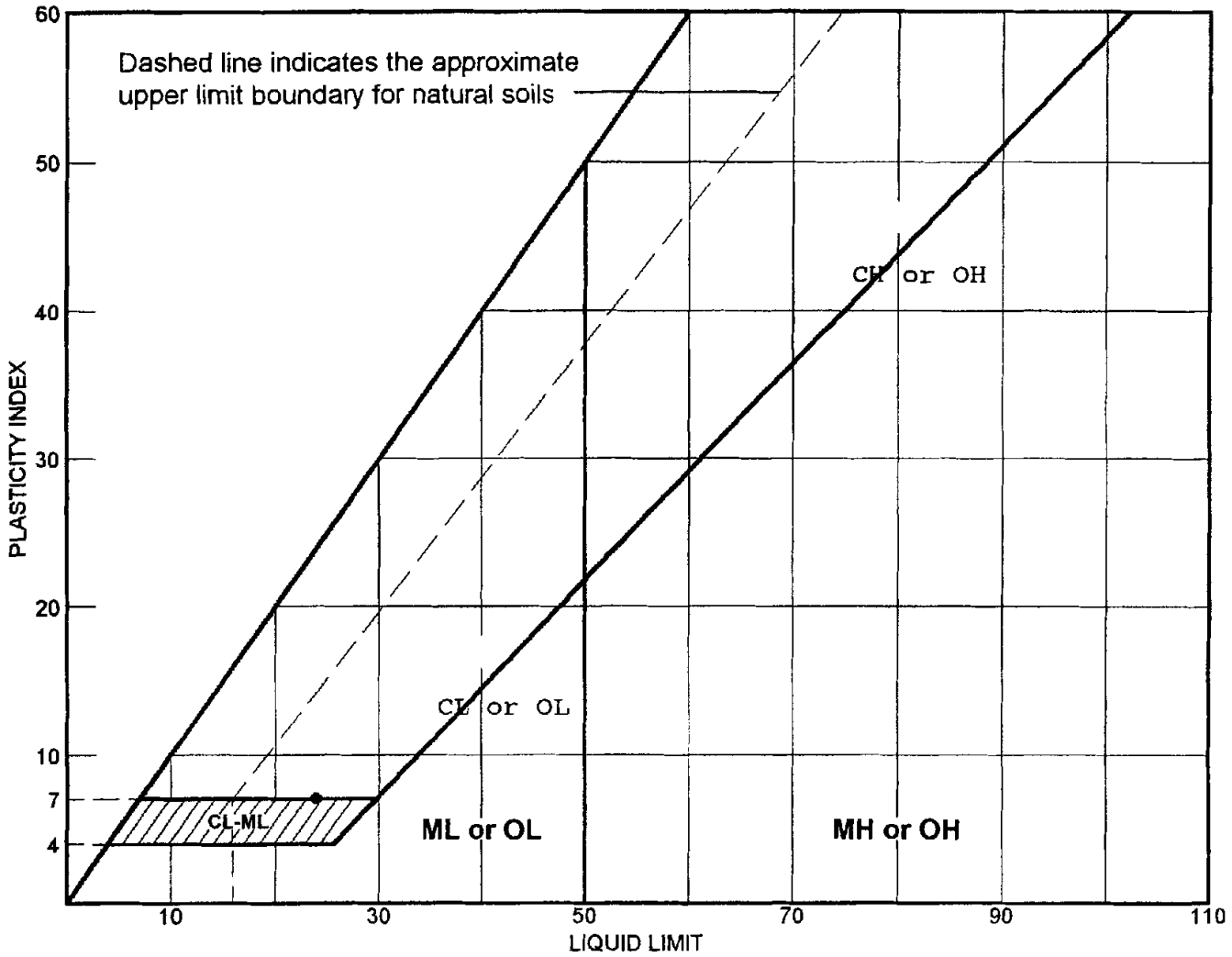
**Remarks:**

COMPACTION TEST REPORT

**SJB SERVICES, INC.**

**Plate**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| SOIL DATA | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SYMBOL | SOURCE | SAMPLE NO. | DEPTH (ft.) | NATURAL WATER CONTENT (%) | PLASTIC LIMIT (%) | LIQUID LIMIT (%) | PLASTICITY INDEX (%) | USCS |
| ● | Common Fill | 252, CF #6 | Loc. B-74 | | 17 | 24 | 7 | CL-ML |

LIQUID AND PLASTIC LIMITS TEST REPORT

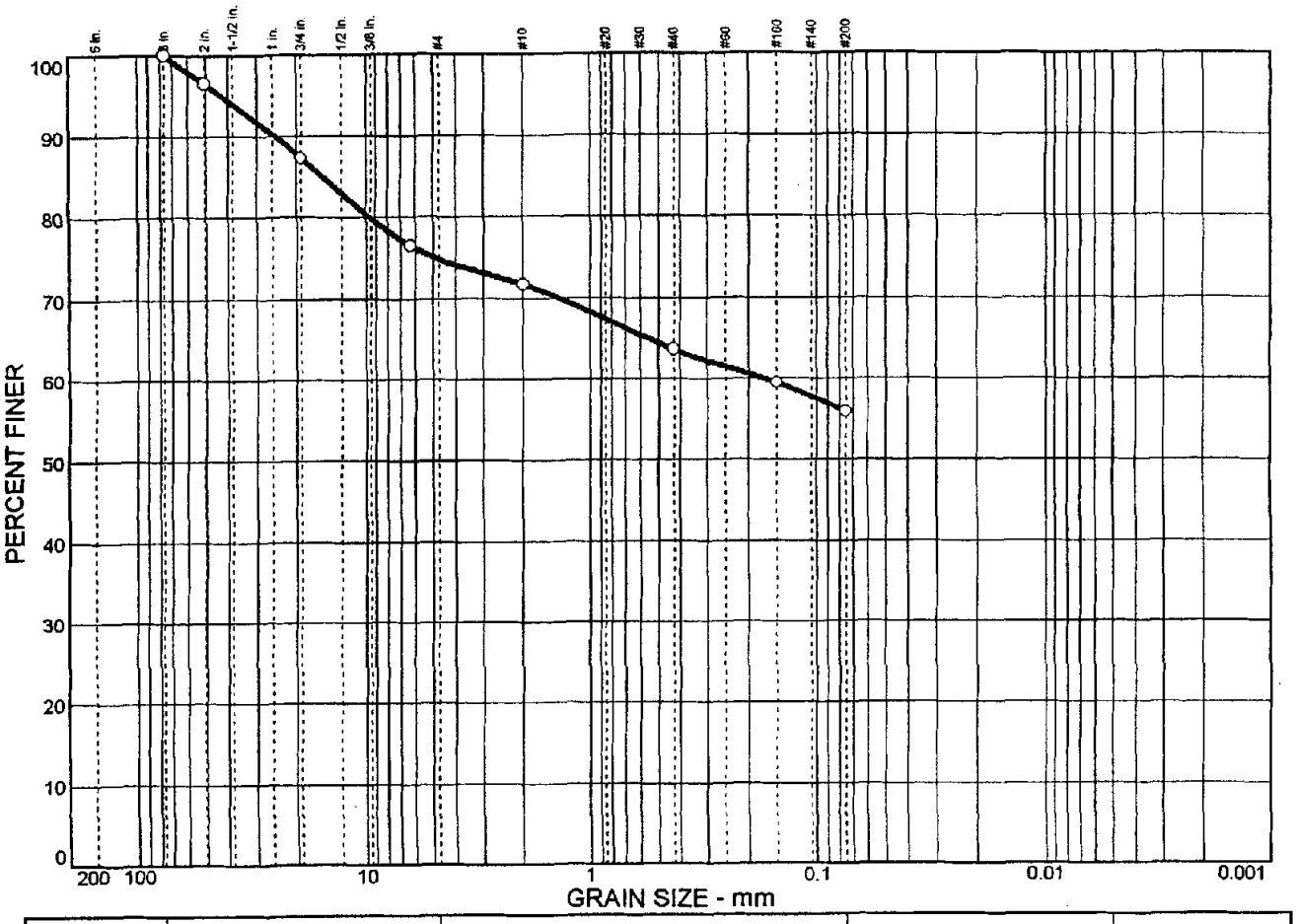
**SJB SERVICES, INC.**

**Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

**Project No.:** 2009053 **Plate**

# Particle Size Distribution Report




| | % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|---|
| ○ | 0.0 | 25.2 | 18.9 | 55.9 | |

## SOIL DATA

| SYMBOL | SOURCE | SAMPLE NO. | DEPTH (ft.) | DESCRIPTION | USCS |
|---|---|---|---|---|---|
| ○ | Common Fill | 252, CF #6 | Loc. B-74 | Common Fill, Gravelly silty clay with sand | CL-ML |
| | | | | B-74, Sampled on 5/25/01 | |

Particle Size Distribution Report

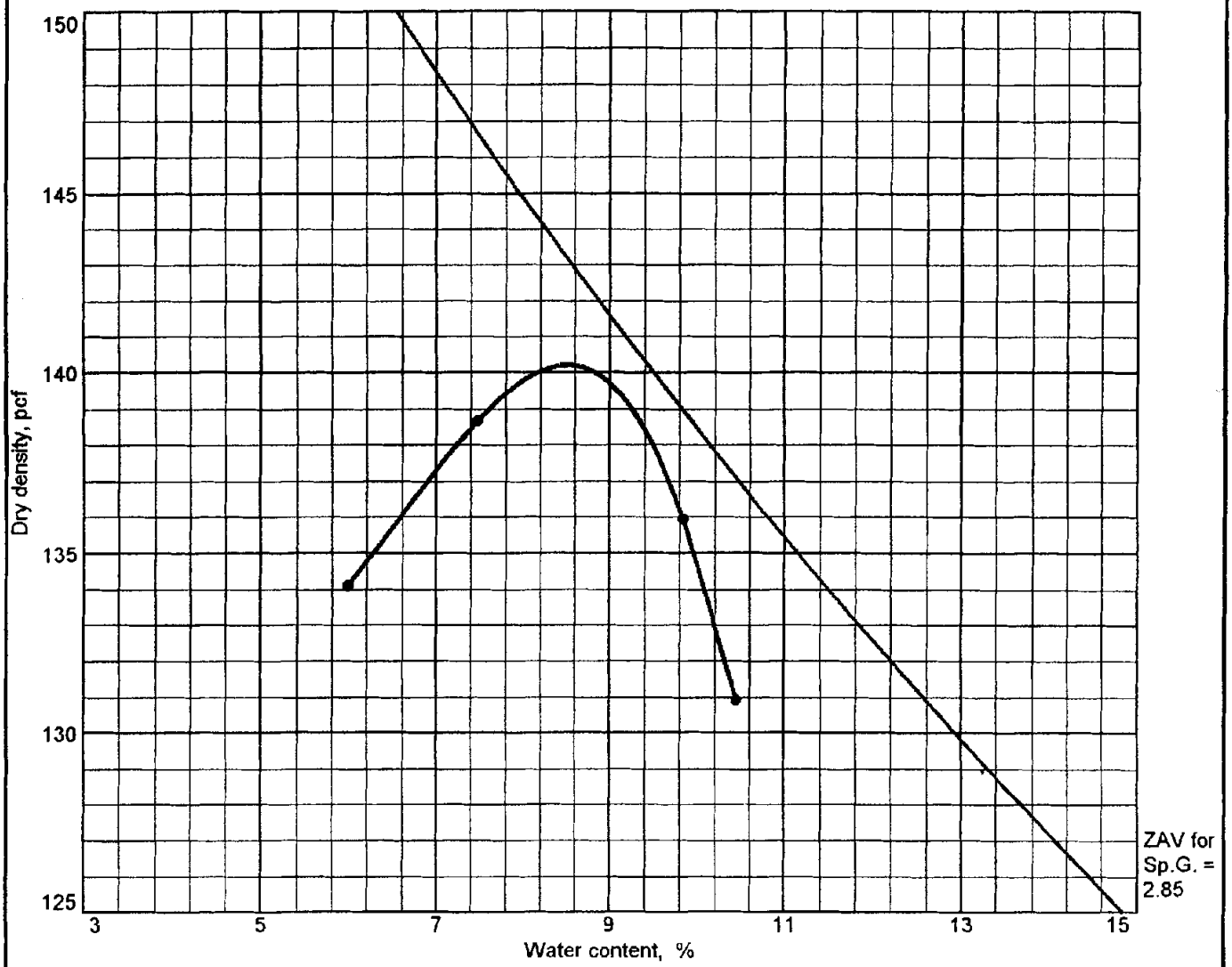
**SJB SERVICES, INC.**

**Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

**Project No.:** 2009053 **Plate**

# COMPACTION TEST REPORT




Test specification: ASTM D 1557-78 Method D Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | CL-ML | | | | 24 | 7 | 25.2 | 55.9 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 140.2 pcf<br>Optimum moisture = 8.5 % | Common Fill, Gravelly silty clay with sand<br>B-74, Sampled on 5/25/01 |

**Project No.** 2009053 **Client:** Marcy Excavation
**Project:** Cortland Landfill Cover

• **Location:** 5-10K cy, B-74

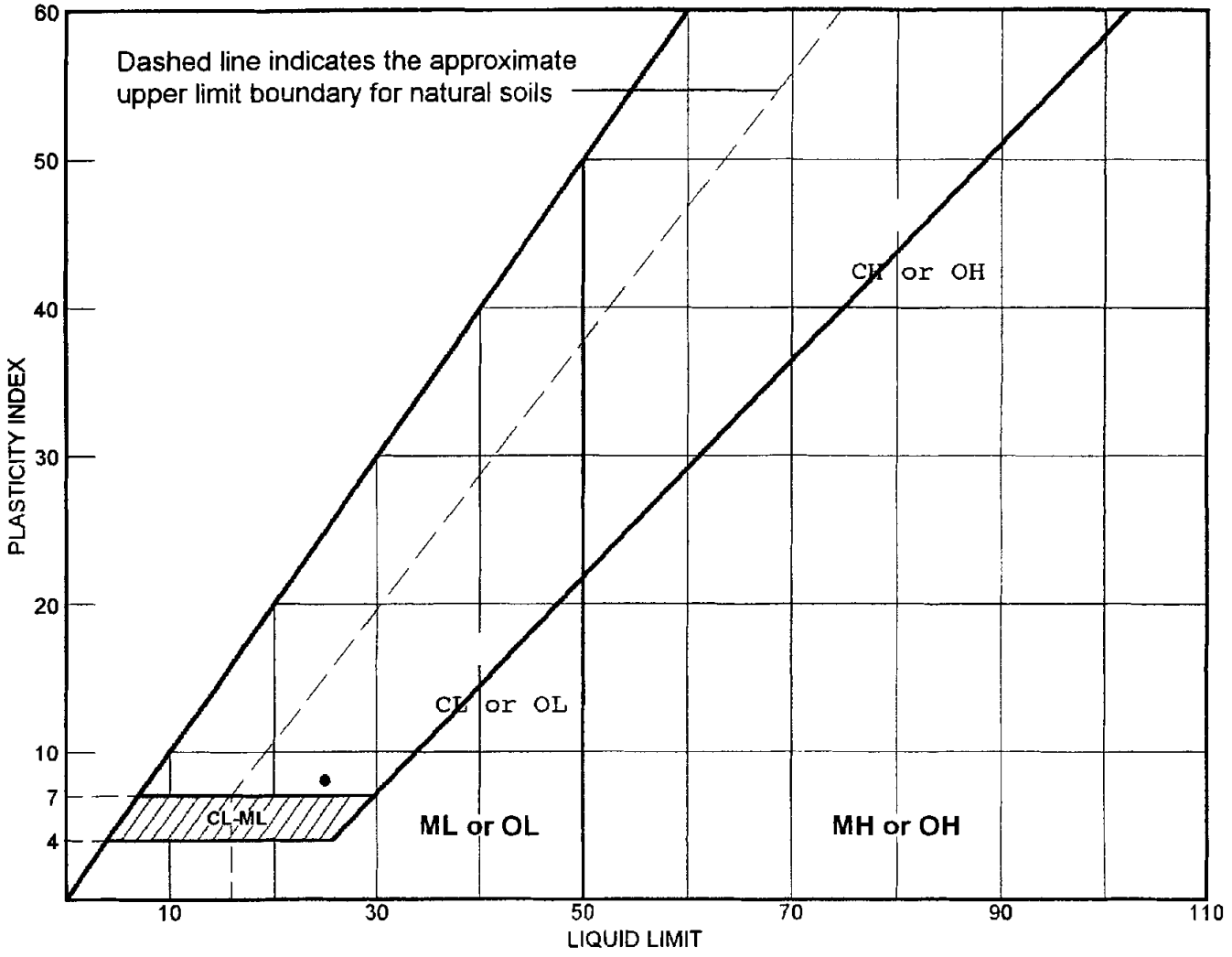
**Remarks:**

COMPACTION TEST REPORT

**SJB SERVICES, INC.**

**Plate**

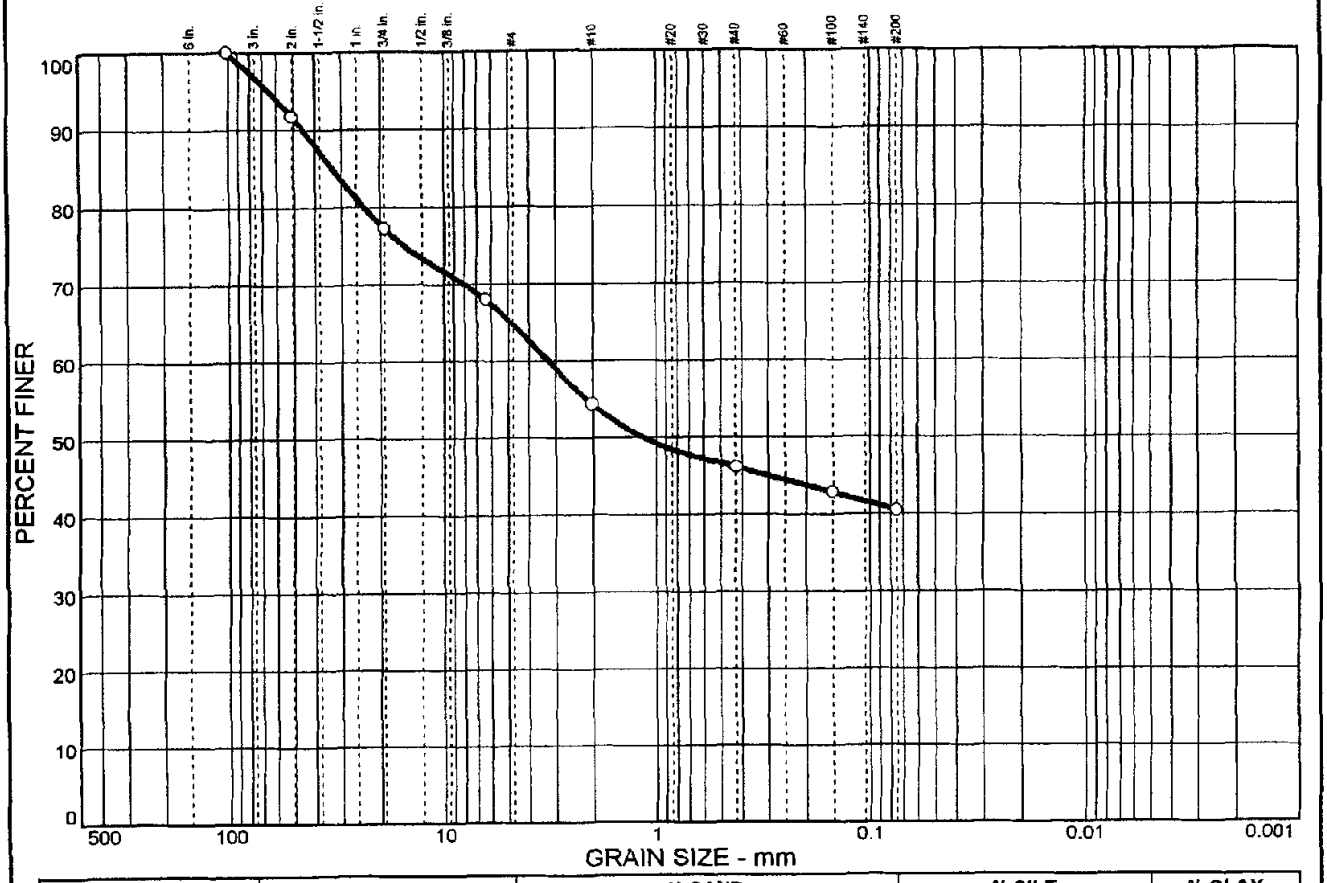
# LIQUID AND PLASTIC LIMITS TEST REPORT




| SOIL DATA | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SYMBOL | SOURCE | SAMPLE NO. | DEPTH (ft.) | NATURAL WATER CONTENT (%) | PLASTIC LIMIT (%) | LIQUID LIMIT (%) | PLASTICITY INDEX (%) | USCS |
| ● | Common Fill | 256 | | | 17 | 25 | 8 | GC |

| | |
|---|---|
| LIQUID AND PLASTIC LIMITS TEST REPORT<br>**SJB SERVICES, INC.** | **Client:** Marcy Excavation<br>**Project:** Cortland Landfill Cover<br>**Project No.:** 2009053 **Plate** |

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 3.2 | 32.0 | 24.4 | 40.4 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 4 in. | 100.0 | | |
| 2 in. | 91.7 | | |
| .75 in. | 77.2 | | |
| .25 in. | 68.0 | | |
| #10 | 54.3 | | |
| #40 | 46.1 | | |
| #100 | 42.8 | | |
| #200 | 40.4 | | |

* (no specification provided)

**Soil Description**

Common Fill, Sampled 6/1/01
Clayey gravel with sand

**Atterberg Limits**

PL= 17 LL= 25 PI= 8

**Coefficients**

$D_{85}$= 32.8 $D_{60}$= 3.24 $D_{50}$= 1.16
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= GC AASHTO=

**Remarks**

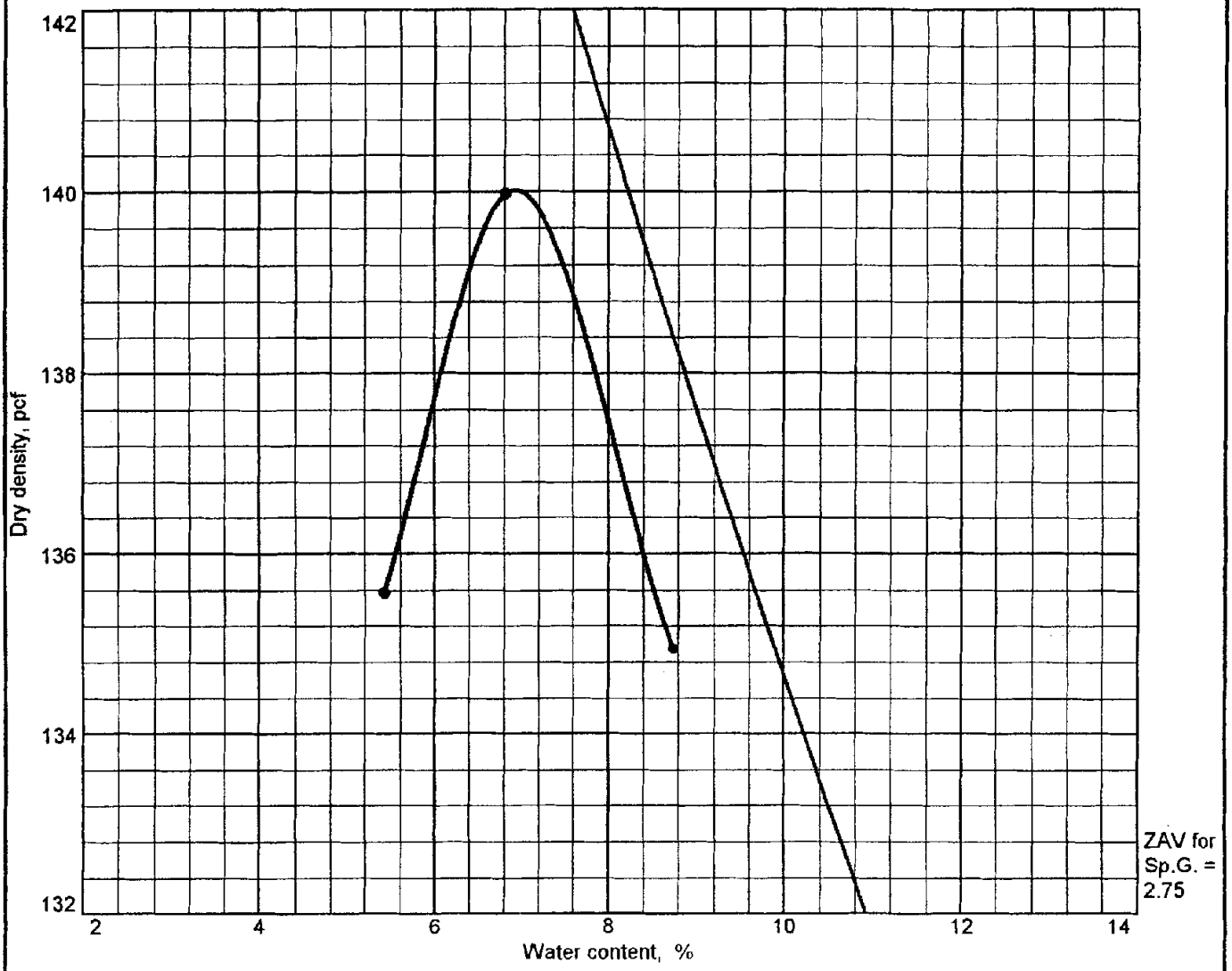
F.M.=0.80

**Sample No.:** 256 **Source of Sample:** Common Fill **Date:** 6/5/01
**Location:** CF-7, BGV 97, 15K **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover
**Project No:** 2009053 **Plate**

# COMPACTION TEST REPORT




Test specification: ASTM D 1557-78 Method D Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | GC | | | | 25 | 8 | 22.8 | 40.4 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 140.0 pcf<br>Optimum moisture = 6.9 % | Common Fill, Sampled 6/1/01<br>Clayey gravel with sand |

**Project No.** 2009053 **Client:** Marcy Excavation
**Project:** Cortland Landfill Cover

• **Location:** CF-7, BGV 97, 10-15K

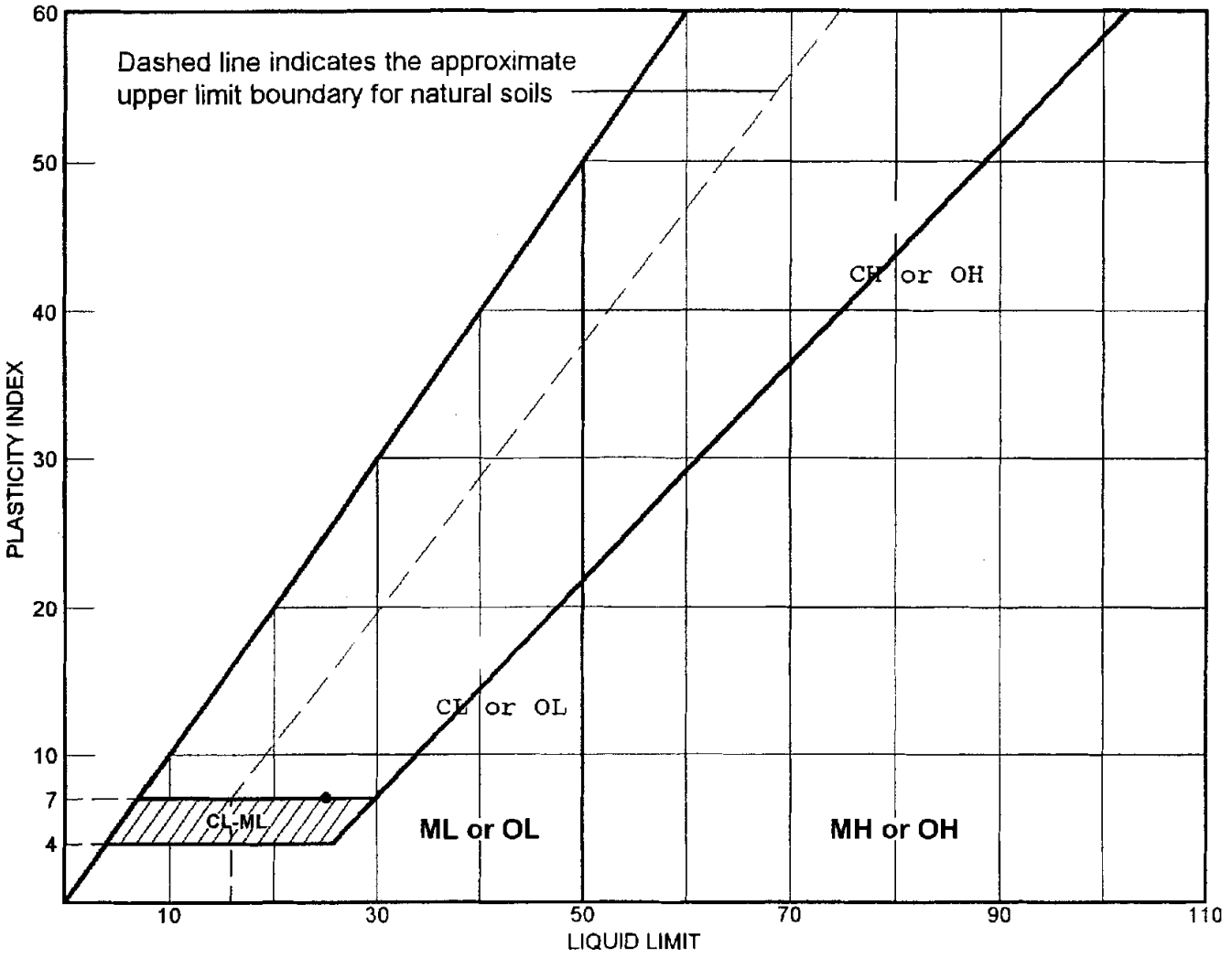
**Remarks:**

COMPACTION TEST REPORT

**SJB SERVICES, INC.**

Plate

# LIQUID AND PLASTIC LIMITS TEST REPORT




| SOIL DATA | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SYMBOL | SOURCE | SAMPLE NO. | DEPTH (ft.) | NATURAL WATER CONTENT (%) | PLASTIC LIMIT (%) | LIQUID LIMIT (%) | PLASTICITY INDEX (%) | USCS |
| ● | Common Fill | 266, CF-8 | | | 18 | 25 | 7 | GC-GM |

LIQUID AND PLASTIC LIMITS TEST REPORT

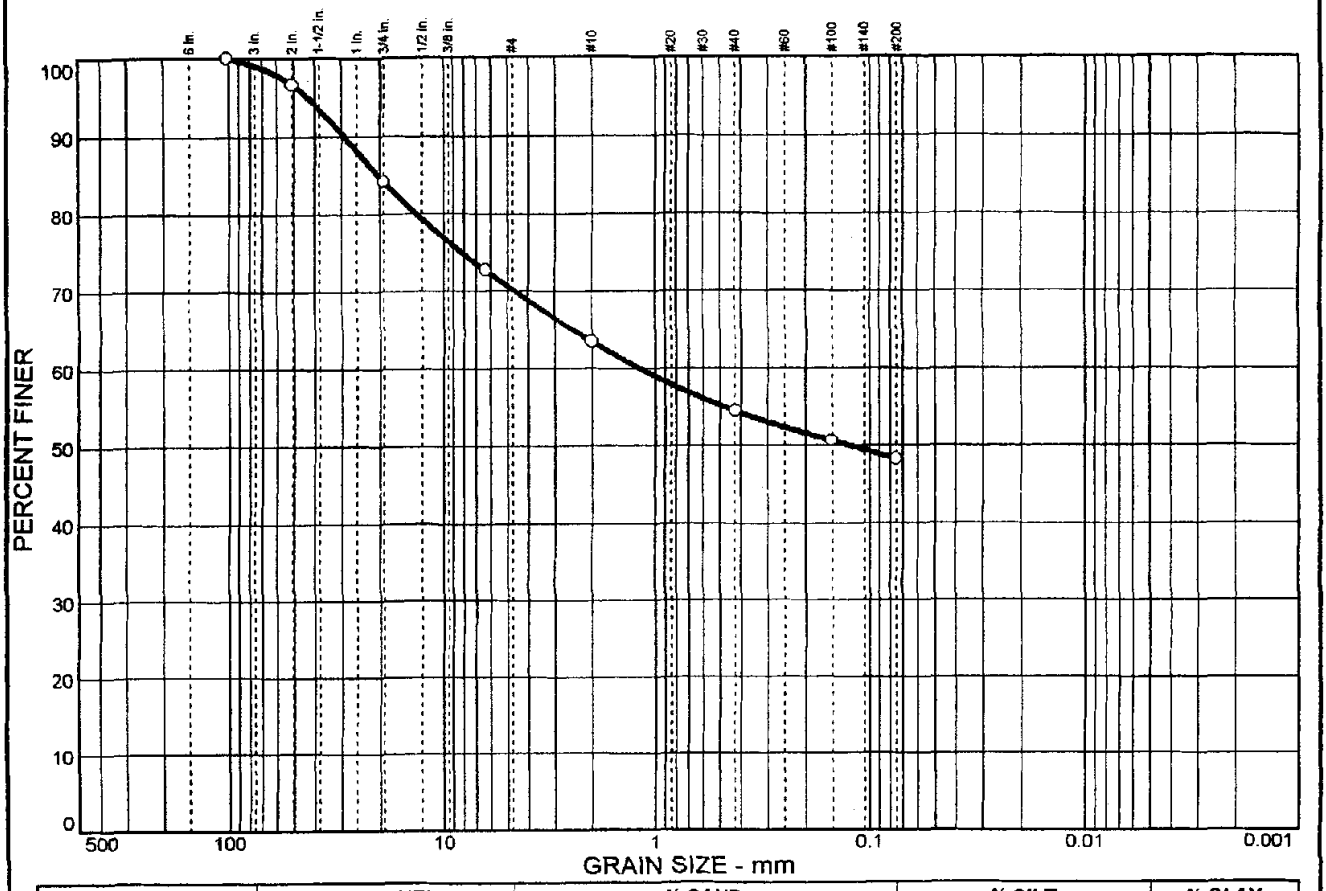
**SJB SERVICES, INC.**

**Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

**Project No.:** 2009053 **Plate**

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 0.9 | 28.9 | 22.0 | 48.2 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 4 in. | 100.0 | | |
| 2 in. | 96.7 | | |
| .75 in. | 84.2 | | |
| .25 in. | 72.7 | | |
| #10 | 63.5 | | |
| #40 | 54.5 | | |
| #100 | 50.6 | | |
| #200 | 48.2 | | |

* (no specification provided)

**Soil Description**

Common Fill CF-8, @ AV-10, Sampled 6-6-01
Silty clayey gravel with sand.

**Atterberg Limits**

PL= 18 LL= 25 PI= 7

**Coefficients**

$D_{85}$= 20.2 $D_{60}$= 1.19 $D_{50}$= 0.126
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= GC-GM AASHTO=

**Remarks**

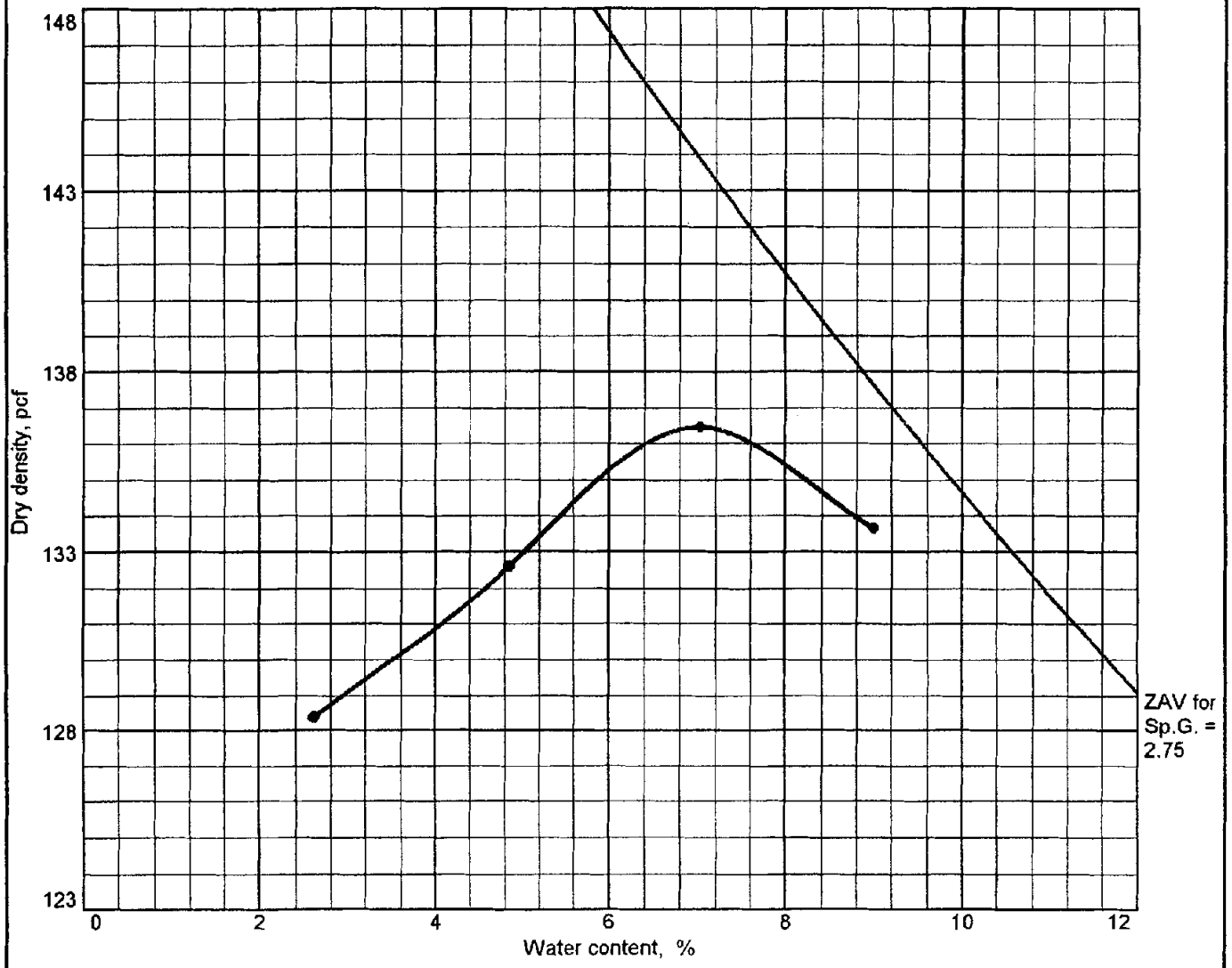
F.M.=0.65

**Sample No.:** 266, CF-8 **Source of Sample:** Common Fill **Date:** 6/7/01
**Location:** AV-10, 20K **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover
**Project No:** 2009053 **Plate**

# COMPACTION TEST REPORT

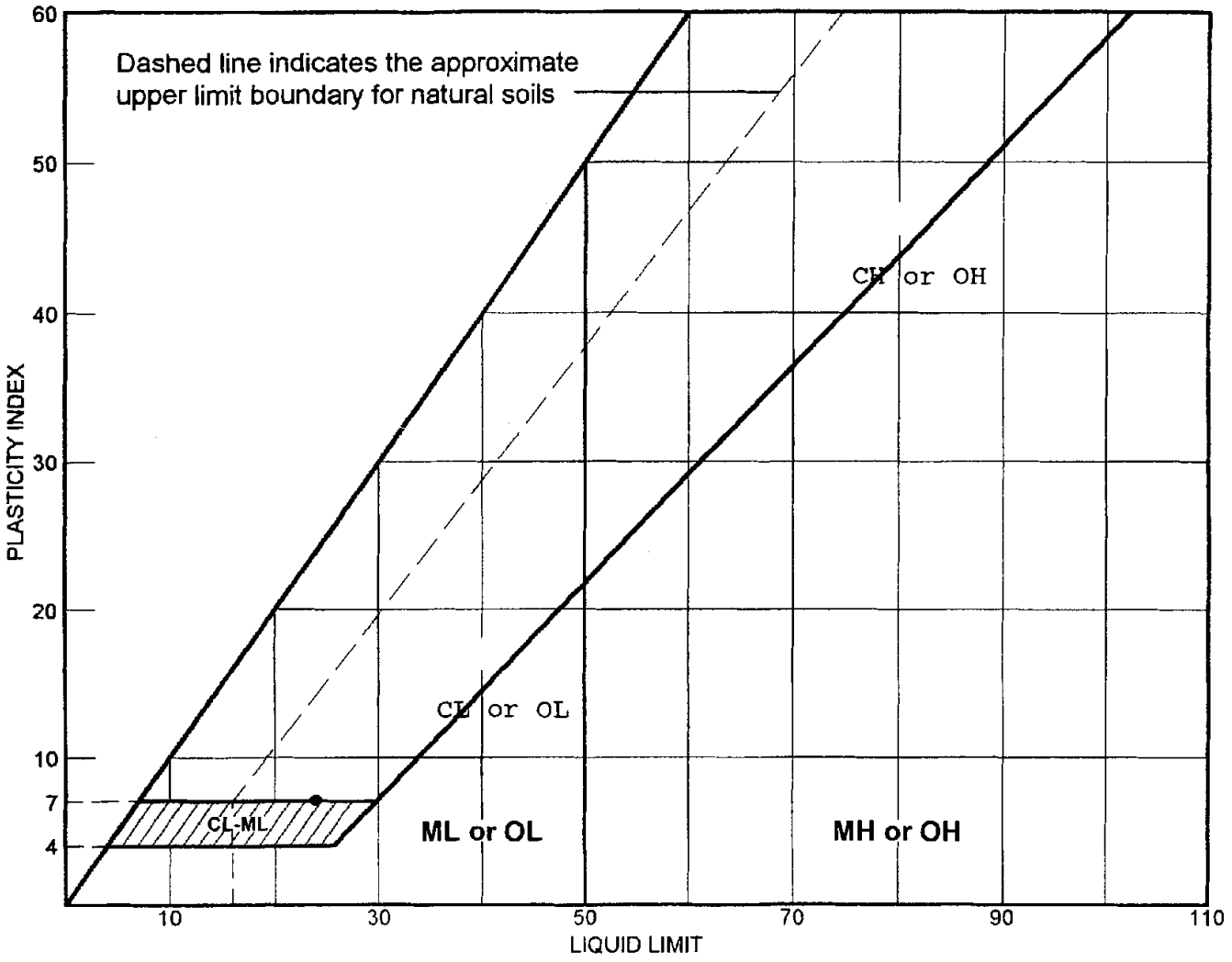



Test specification: ASTM D 1557-78 Method C Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | GC-GM | | | | 25 | 7 | 15.8 | 48.2 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 136.4 pcf<br>Optimum moisture = 7.0 % | Common Fill CF-8, @ AV-10, Sampled 6-6-01<br>Silty clayey gravel with sand. |
| **Project No.** 2009053 **Client:** Marcy Excavation<br>**Project:** Cortland Landfill Cover<br>● **Location:** AV-10, 20K | **Remarks:**<br>Common Fill CF-8, @ AV-10, Sampled 6-6-01. |
| COMPACTION TEST REPORT<br>**SJB SERVICES, INC.** | **Plate** |

# LIQUID AND PLASTIC LIMITS TEST REPORT




| SOIL DATA | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SYMBOL | SOURCE | SAMPLE NO. | DEPTH (ft.) | NATURAL WATER CONTENT (%) | PLASTIC LIMIT (%) | LIQUID LIMIT (%) | PLASTICITY INDEX (%) | USCS |
| ● | Common Fill | 267, CF-9 | | | 17 | 24 | 7 | GC-GM |

LIQUID AND PLASTIC LIMITS TEST REPORT

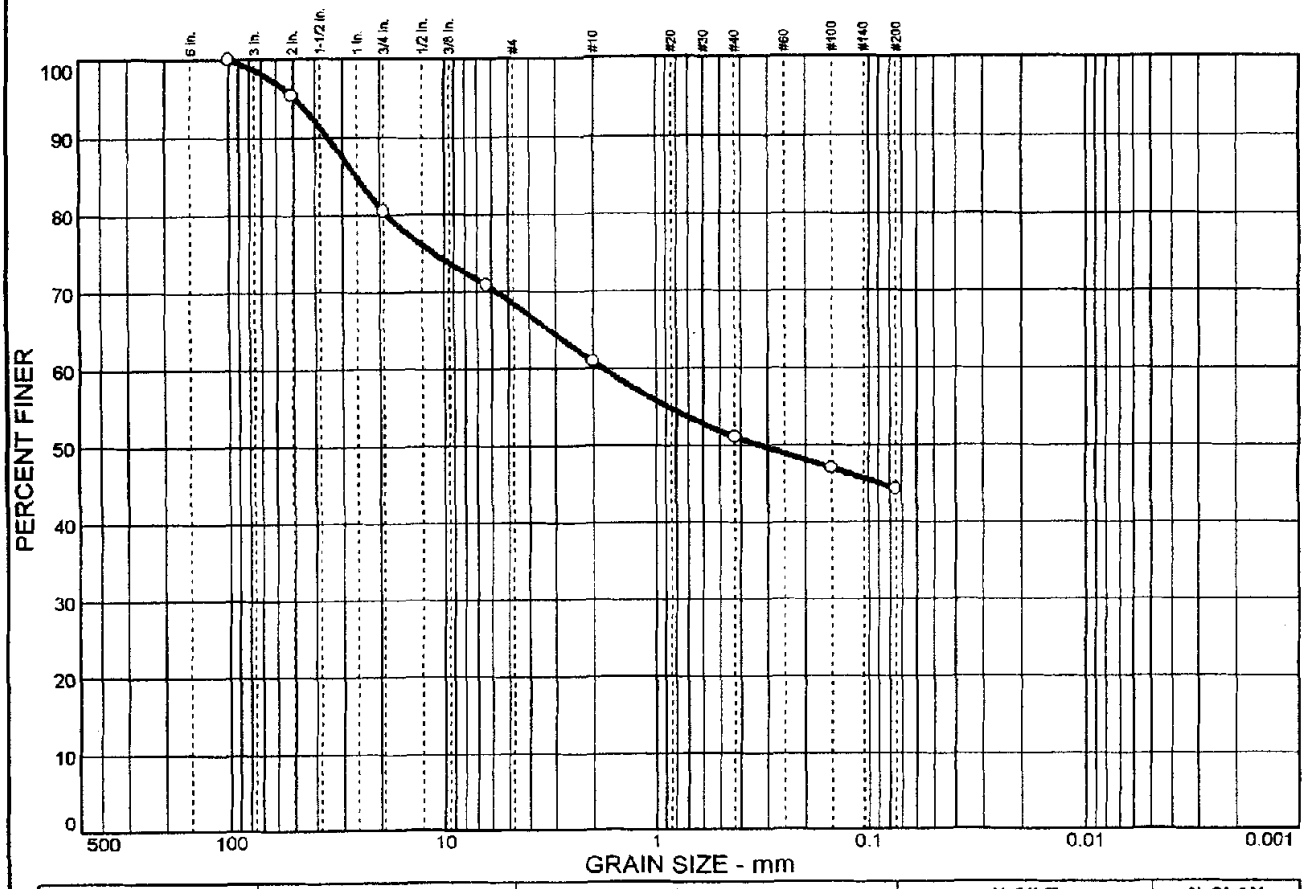
**SJB SERVICES, INC.**

**Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

**Project No.:** 2009053 **Plate**

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 1.4 | 30.2 | 24.2 | 44.2 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 4 in. | 100.0 | | |
| 2 in. | 95.4 | | |
| .75 in. | 80.5 | | |
| .25 in. | 70.8 | | |
| #10 | 60.9 | | |
| #40 | 51.1 | | |
| #100 | 47.0 | | |
| #200 | 44.3 | | |

* (no specification provided)

**Soil Description**

Common Fill, CF-9, 25K, Sampled 6/7/01
Silty clayey gravel with sand

**Atterberg Limits**

PL= 17 LL= 24 PI= 7

**Coefficients**

$D_{85}$= 25.6 $D_{60}$= 1.79 $D_{50}$= 0.329
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= GC-GM AASHTO=

**Remarks**

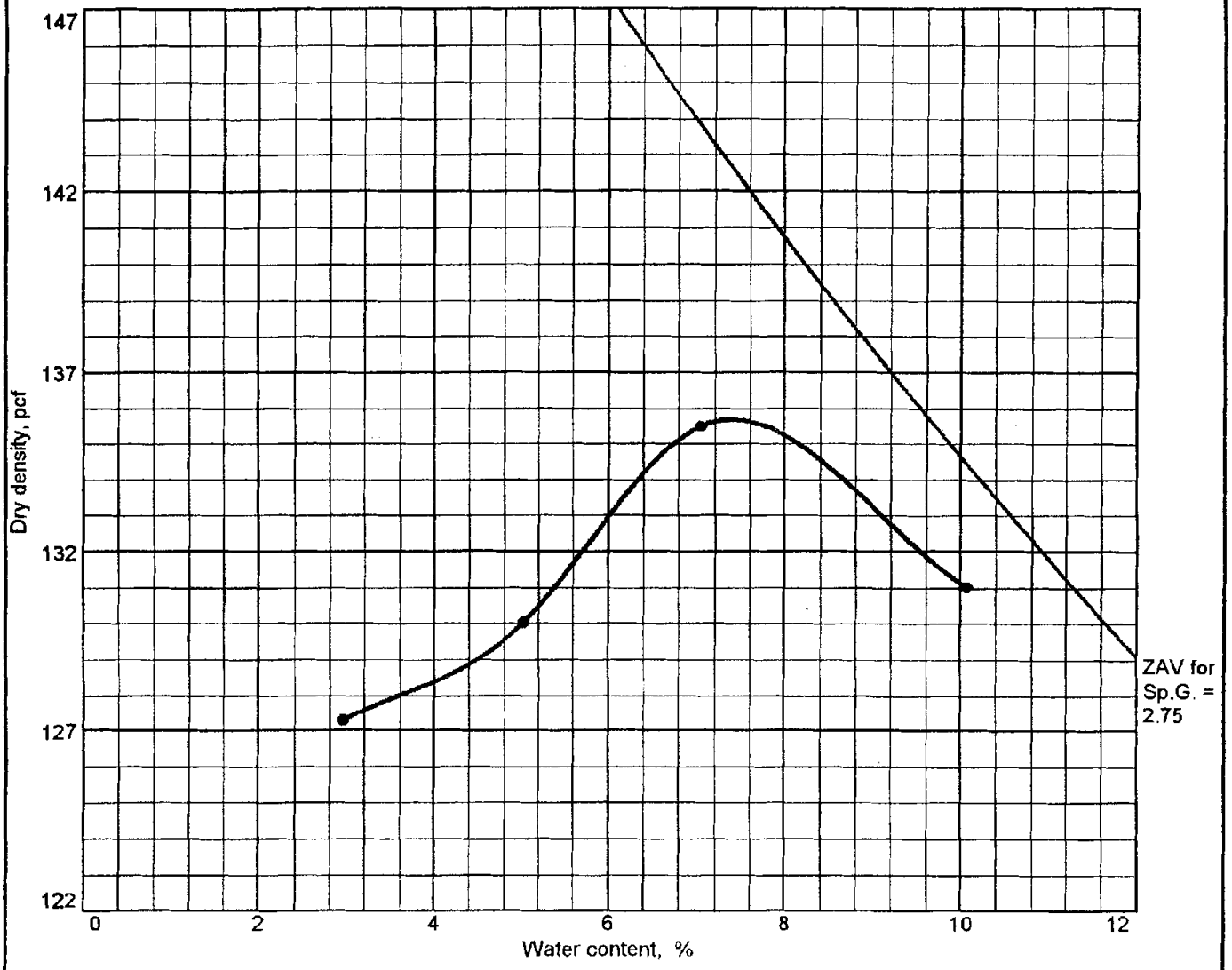
F.M.=0.73

**Sample No.:** 267, CF-9 **Source of Sample:** Common Fill **Date:** 6/11/01
**Location:** 25K **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover
**Project No:** 2009053 **Plate**

# COMPACTION TEST REPORT




**Test specification:** ASTM D 1557-78 Method D Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | GC-GM | | | | 24 | 7 | 19.5 | 44.3 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 135.7 pcf<br>Optimum moisture = 7.4 % | Common Fill, CF-9, 25K, Sampled 6/7/01<br>Silty clayey gravel with sand |

**Project No.** 2009053 **Client:** Marcy Excavation
**Project:** Cortland Landfill Cover

• **Location:** 25K

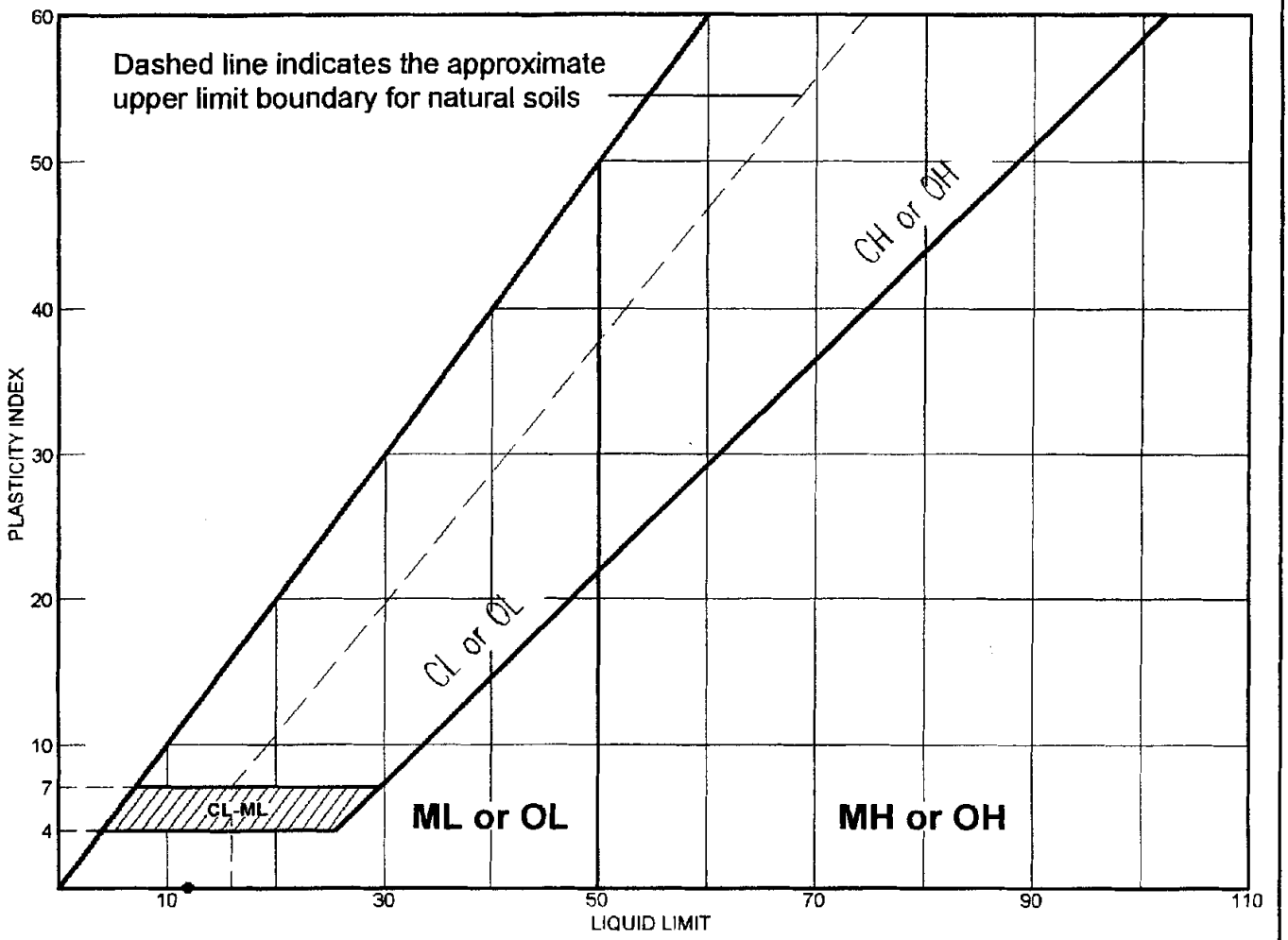
**Remarks:**

COMPACTION TEST REPORT

**SJB SERVICES, INC.**

**Plate**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | Common Fill, CF-11<br>Gravelly silt with sand | 12 | NP | NP | 55.9 | 51.0 | ML |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Project No.** 2009053 **Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

● **Location:** LF Road, 30 K Sample

**Remarks:**

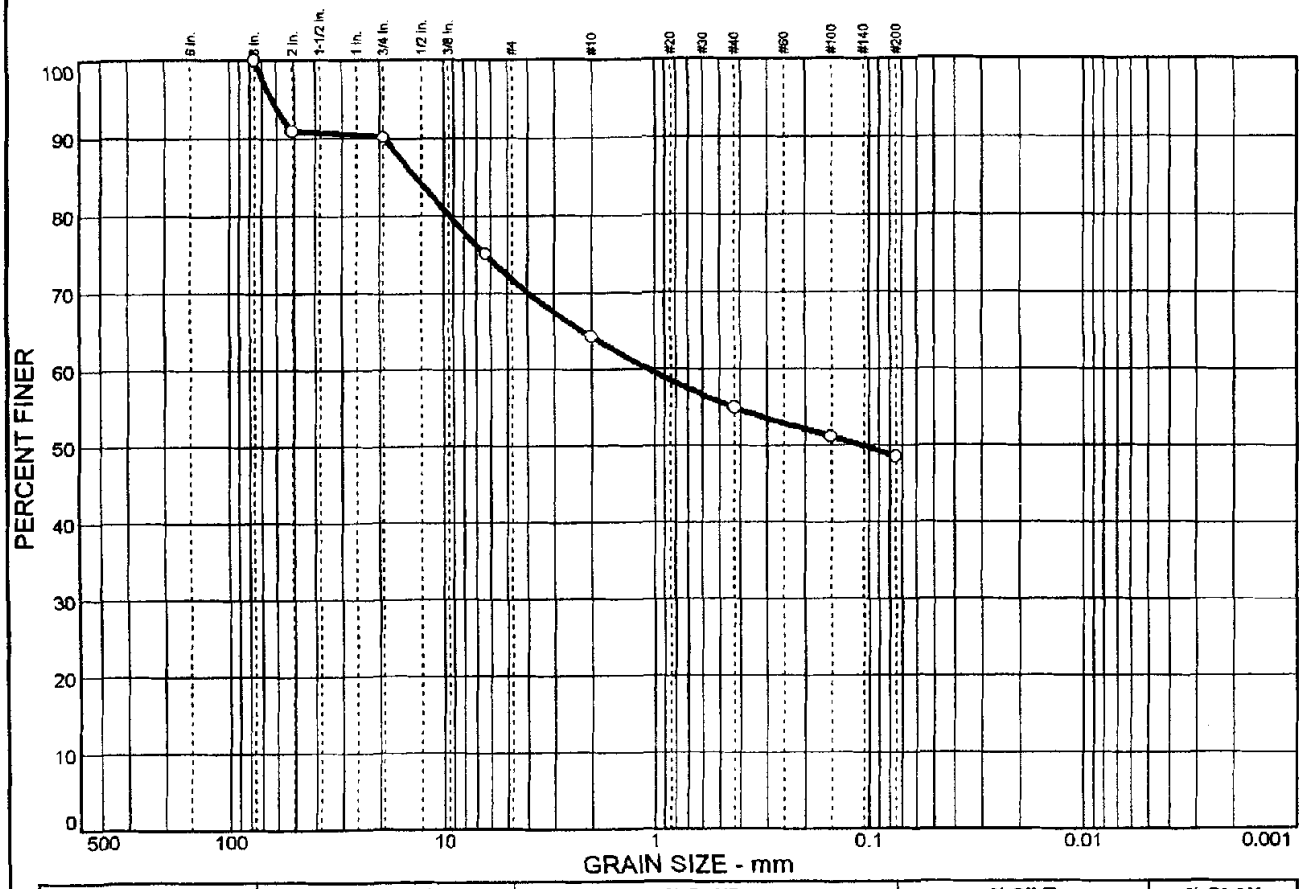
●

LIQUID AND PLASTIC LIMITS TEST REPORT

**SJB SERVICES, INC.**

**Plate**

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 0.0 | 28.1 | 23.4 | 48.5 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3 in. | 100.0 | | |
| 2 in. | 90.9 | | |
| .75 in. | 90.1 | | |
| .25 in. | 75.1 | | |
| #10 | 64.3 | | |
| #40 | 54.9 | | |
| #100 | 51.1 | | |
| #200 | 48.5 | | |

* (no specification provided)

**Soil Description**

Common Fill, N. Garage #3 P

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{85}$= 13.4 $D_{60}$= 1.09 $D_{50}$= 0.111
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= GC-GM AASHTO=

**Remarks**

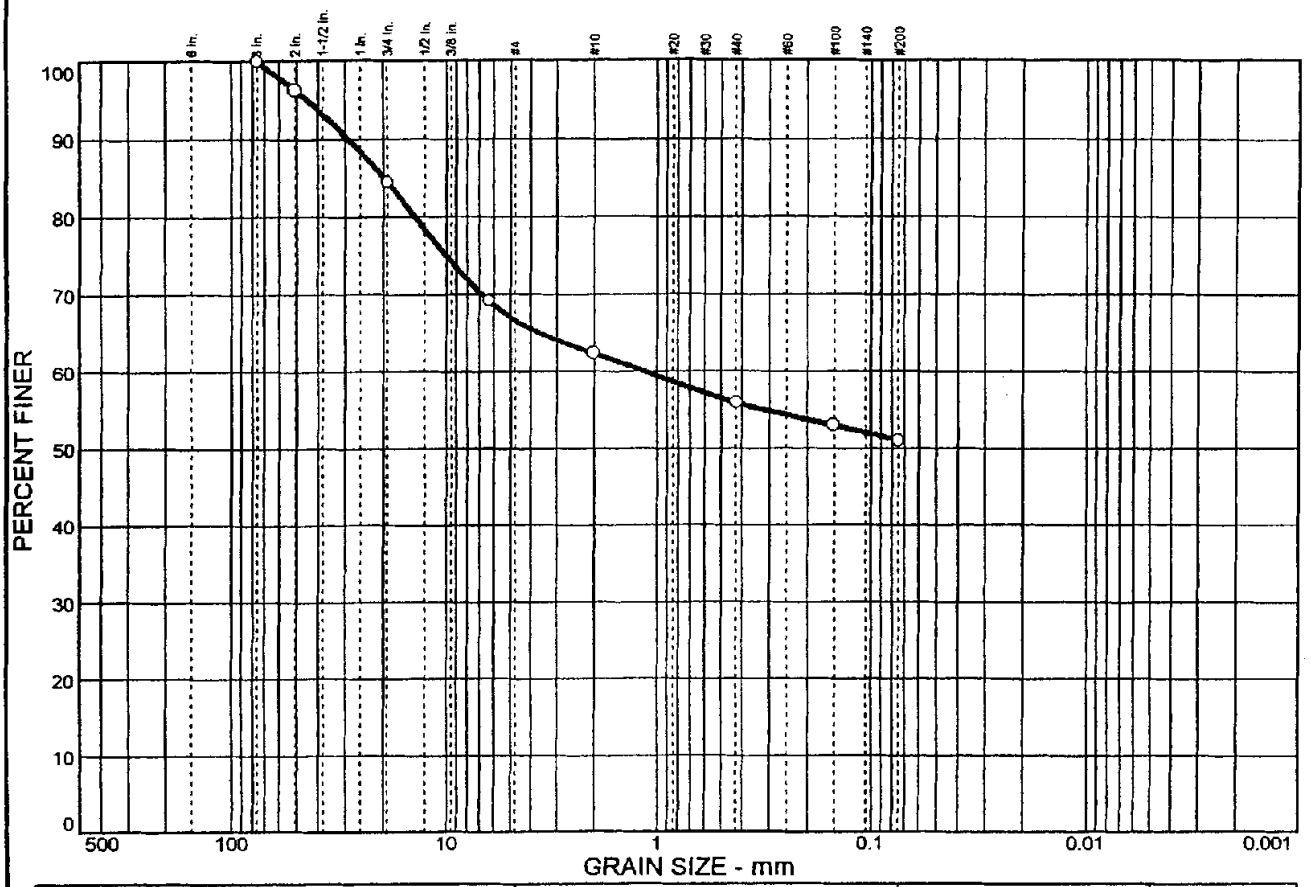
Performed Grain Size only.
F.M.=0.59

**Sample No.:** 285 **Source of Sample:** Common Fill **Date:** 6/18/01
**Location:** CF-10, #3P **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover
**Project No:** 2009053 **Plate**

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 0.0 | 33.3 | 15.7 | 51.0 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3 in. | 100.0 | | |
| 2 in. | 96.3 | | |
| .75 in. | 84.5 | | |
| .25 in. | 69.2 | | |
| #10 | 62.4 | | |
| #40 | 55.9 | | |
| #100 | 53.0 | | |
| #200 | 51.0 | | |

* (no specification provided)

**Soil Description**

Common Fill, CF-11
Gravelly silt with sand

**Atterberg Limits**

PL= NP LL= 12 PI= NP

**Coefficients**

$D_{85}$= 19.7 $D_{60}$= 1.15 $D_{50}$=
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= ML AASHTO=

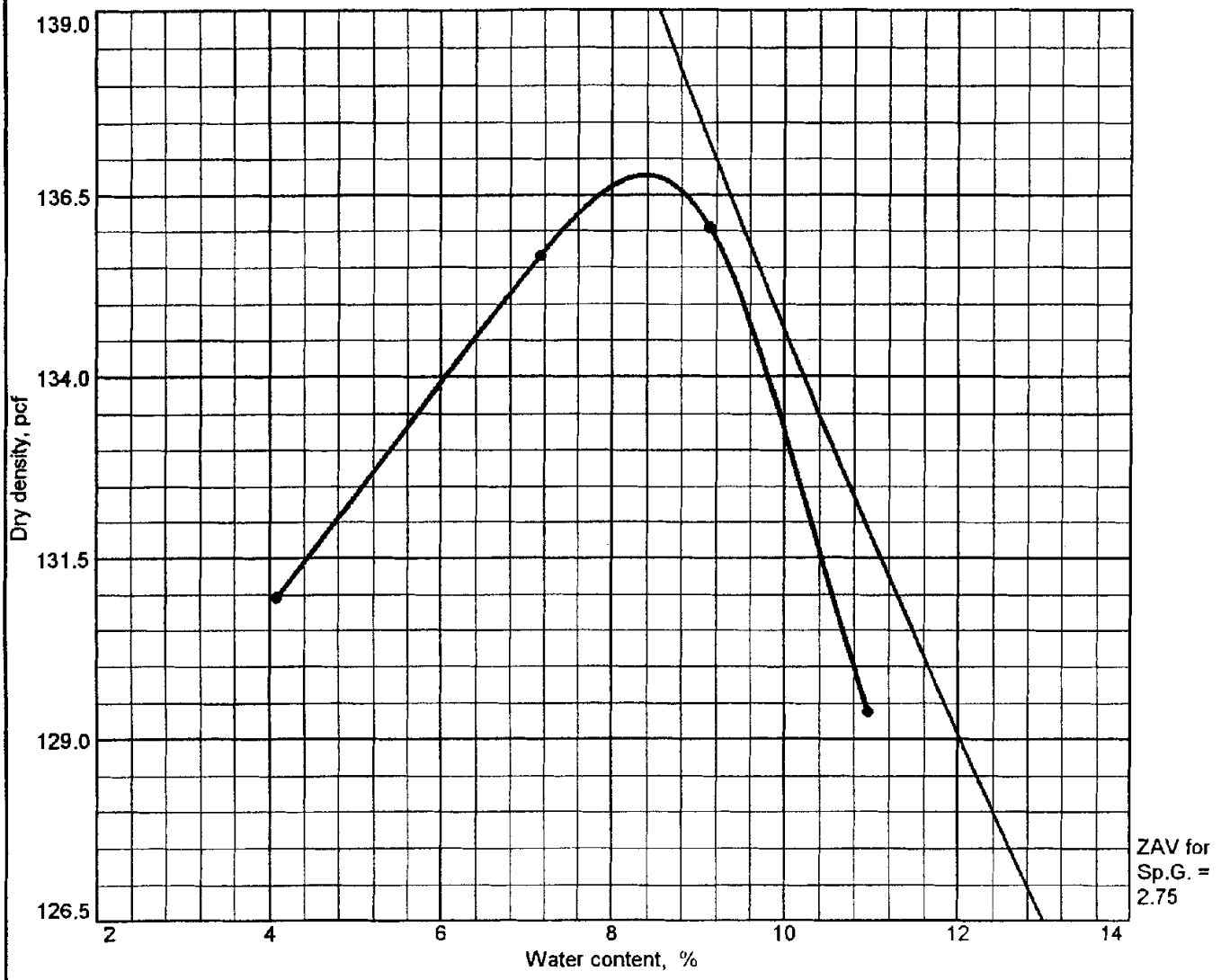
**Remarks**

**Sample No.:** 298 **Source of Sample:** Common Fill **Date:** 6/30/01
**Location:** LF Road, 30 K Sample **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover
**Project No:** 2009053 **Plate**

# COMPACTION TEST REPORT

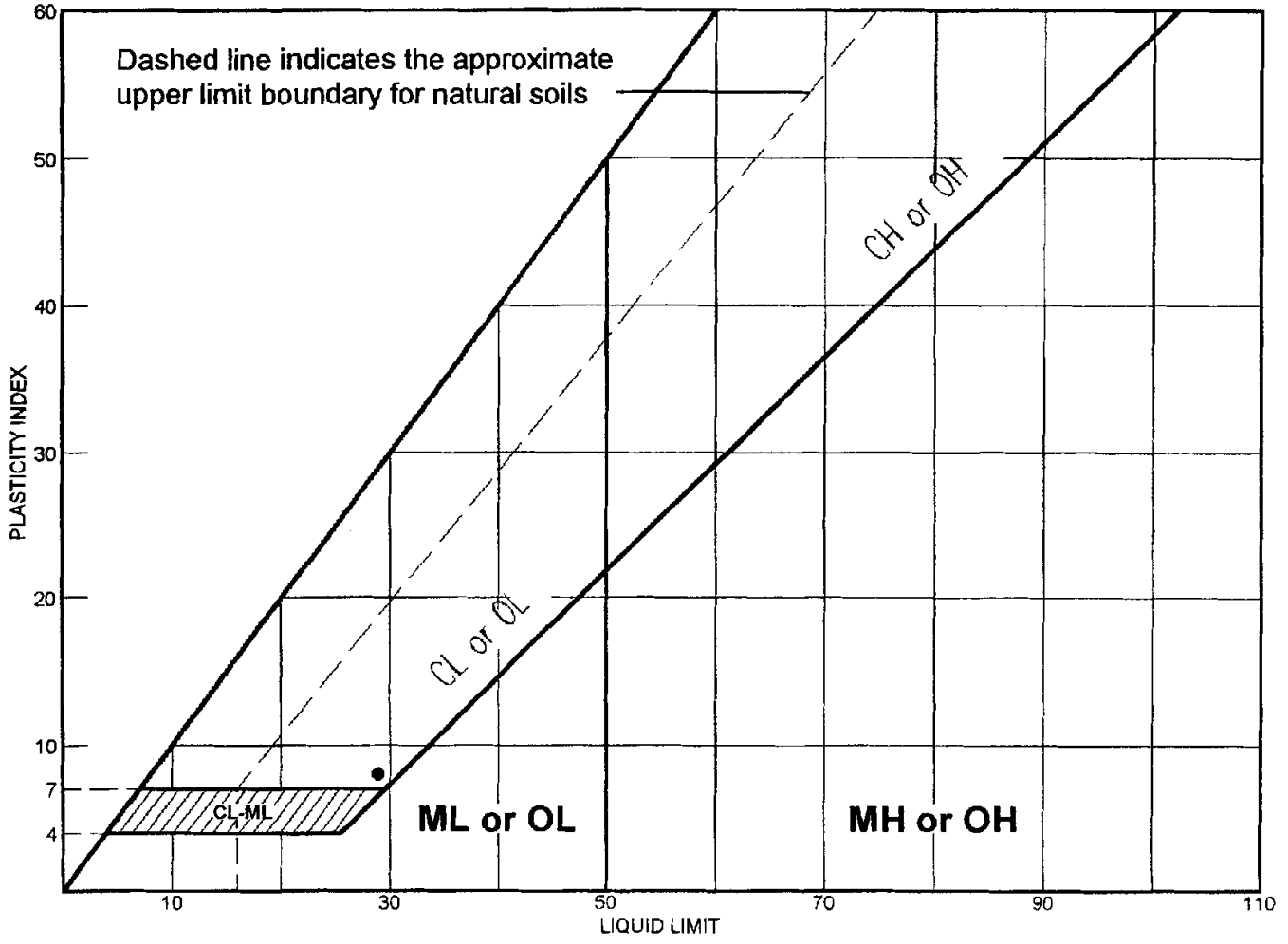



**Test specification:** ASTM D 1557-78 Method D Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | ML | | | | 12 | NP | 33.3 | 51.0 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 136.8 pcf<br>Optimum moisture = 8.4 % | Common Fill, CF-11<br>Gravelly silt with sand |
| **Project No.** 2009053 **Client:** Marcy Excavation<br>**Project:** Cortland Landfill Cover<br>● **Location:** LF Road, 30 K Sample | **Remarks:** |
| COMPACTION TEST REPORT<br>**SJB SERVICES, INC.** | **Plate** |

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | Common Fill, CF-12<br>Clayey gravel with sand | 29 | 21 | 8 | 51.7 | 45.2 | GC |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Project No.** 2009053 **Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

● **Location:** B55, 35K Sample

**Remarks:**

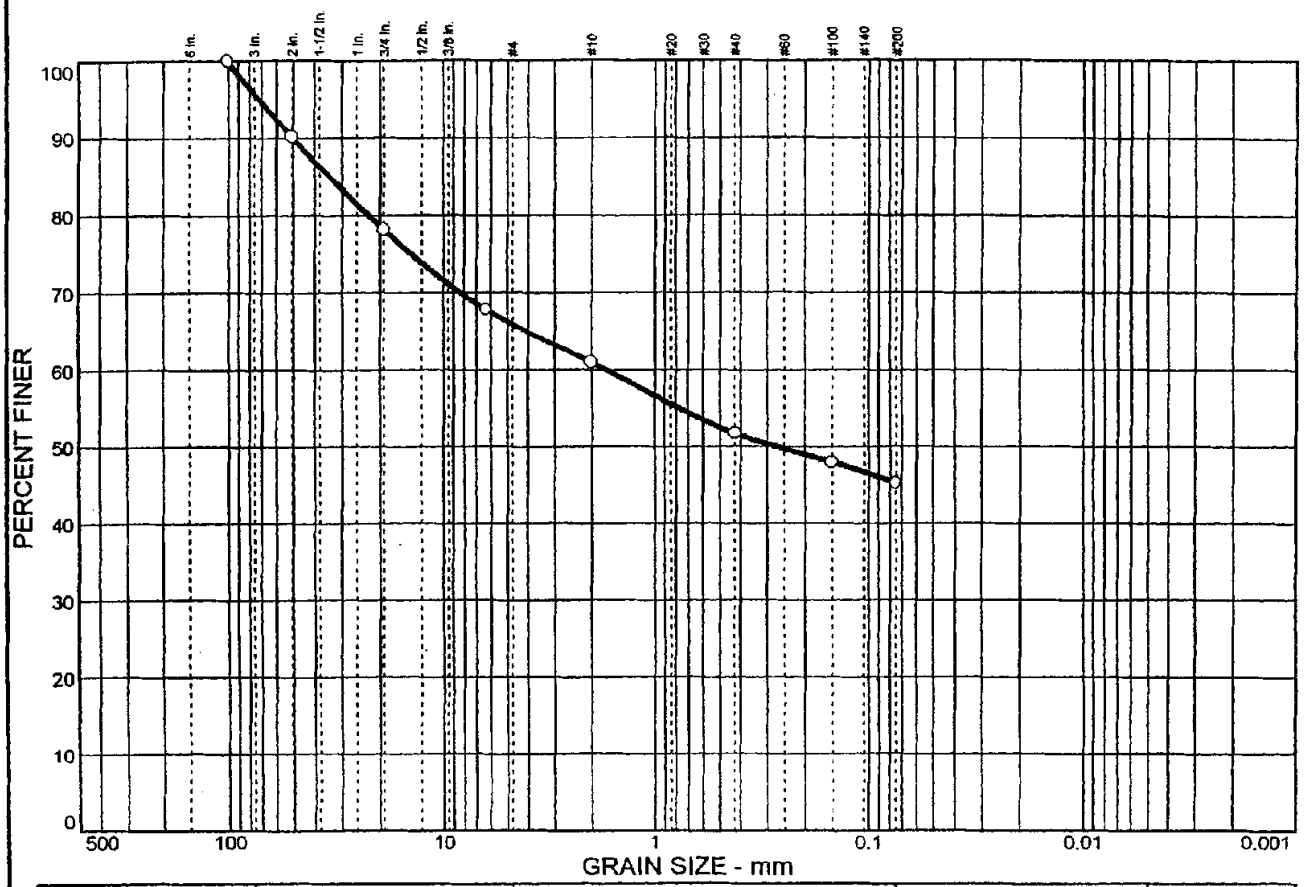
●

LIQUID AND PLASTIC LIMITS TEST REPORT

**SJB SERVICES, INC.**

**Plate**

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 4.1 | 30.0 | 20.7 | 45.2 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 4 in. | 100.0 | | |
| 2 in. | 90.2 | | |
| .75 in. | 78.2 | | |
| .25 in. | 67.8 | | |
| #10 | 61.0 | | |
| #40 | 51.7 | | |
| #100 | 48.0 | | |
| #200 | 45.2 | | |

* (no specification provided)

**Soil Description**

Common Fill, CF-12
Clayey gravel with sand

**Atterberg Limits**

PL= 21 LL= 29 PI= 8

**Coefficients**

$D_{85}$= 34.0 $D_{60}$= 1.69 $D_{50}$= 0.275
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= GC AASHTO=

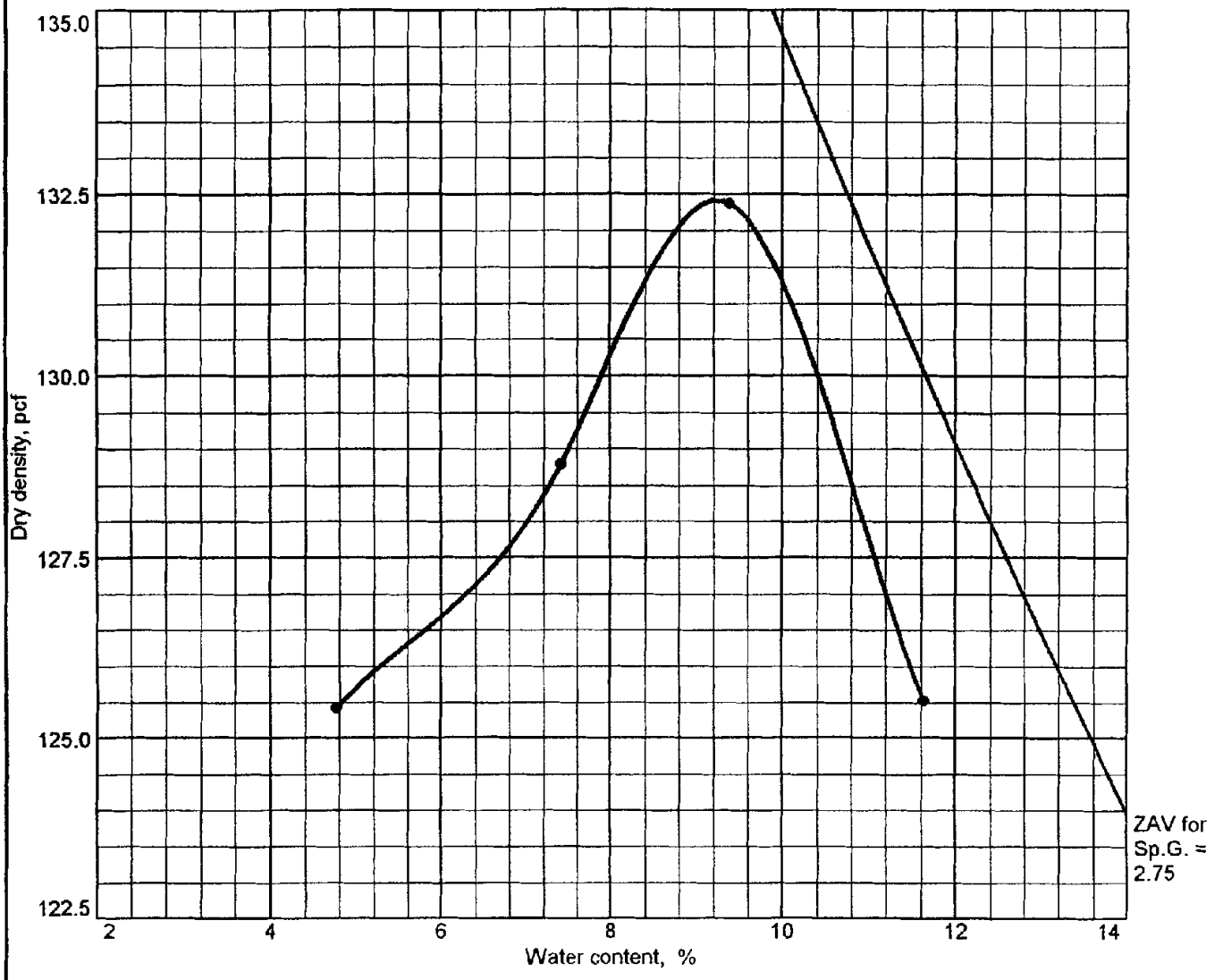
**Remarks**

**Sample No.:** 325 **Source of Sample:** Common Fill **Date:** 7/5/01
**Location:** B55, 35K Sample **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover
**Project No:** 2009053 **Plate**

# COMPACTION TEST REPORT




Test specification: ASTM D 1557-78 Method D Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | GC | | | | 29 | 8 | 21.8 | 45.2 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 132.4 pcf<br>Optimum moisture = 9.2 % | Common Fill, CF-12<br>Clayey gravel with sand |

**Project No.** 2009053 **Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

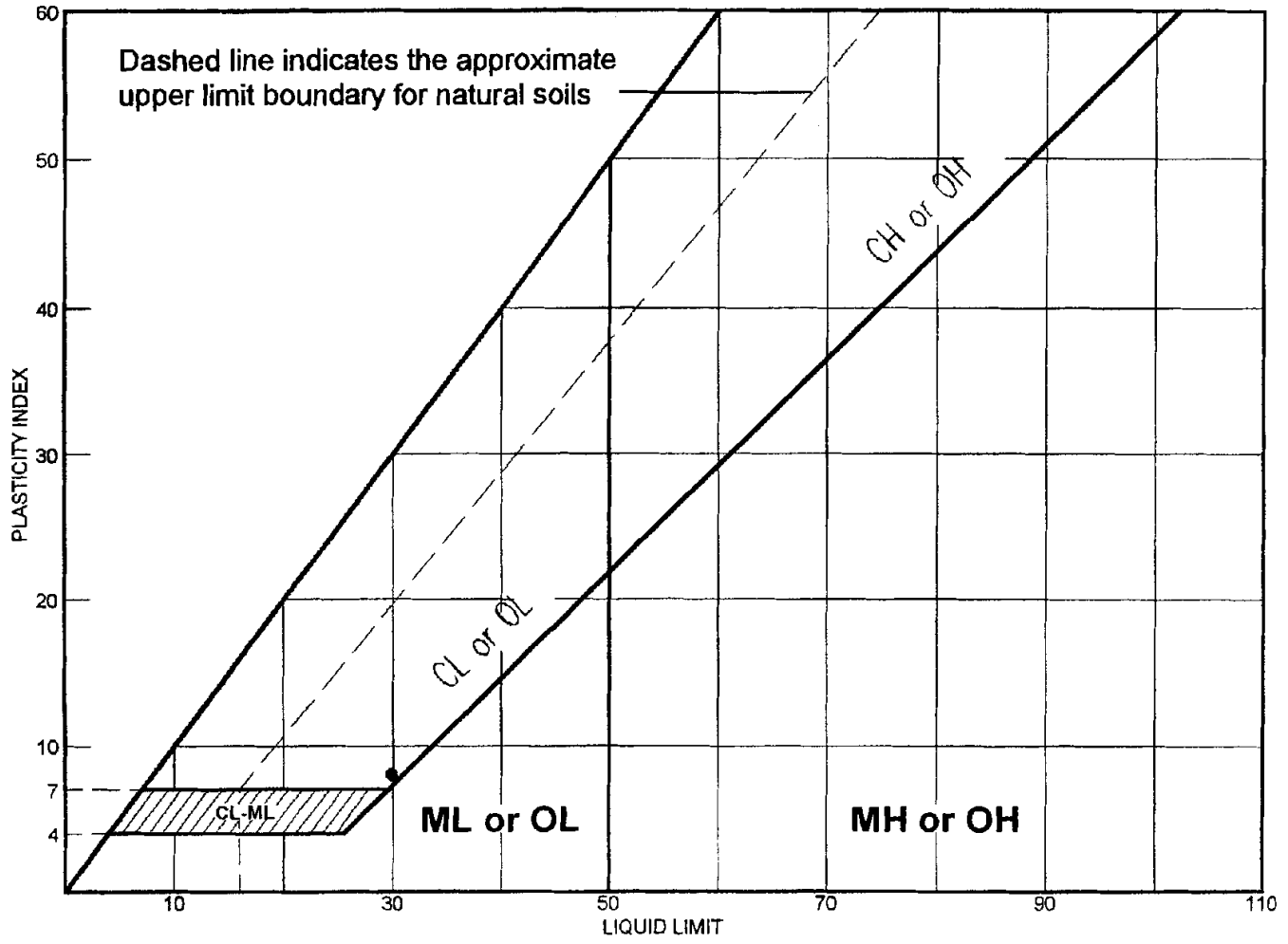
● **Location:** B55, 35K Sample

**Remarks:**

COMPACTION TEST REPORT

**SJB SERVICES, INC.**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | Common Fill, CF-13<br>Clayey gravel with sand | 30 | 22 | 8 | 57.1 | 49.5 | GC |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Project No.** 2009053 **Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

● **Location:** B65, 40K Sample

**Remarks:**

●

LIQUID AND PLASTIC LIMITS TEST REPORT

**SJB SERVICES, INC.**

**Plate**

# Particle Size Distribution Report


| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 0.5 | 28.6 | 21.4 | 49.5 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 4 in. | 100.0 | | |
| 2 in. | 97.3 | | |
| .75 in. | 83.5 | | |
| .25 in. | 72.9 | | |
| #10 | 65.5 | | |
| #40 | 57.1 | | |
| #100 | 52.7 | | |
| #200 | 49.5 | | |

* (no specification provided)

**Soil Description**

Common Fill, CF-13
Clayey gravel with sand

**Atterberg Limits**

PL= 22 LL= 30 PI= 8

**Coefficients**

$D_{85}$= 21.1 $D_{60}$= 0.763 $D_{50}$= 0.0833
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= GC AASHTO=

**Remarks**

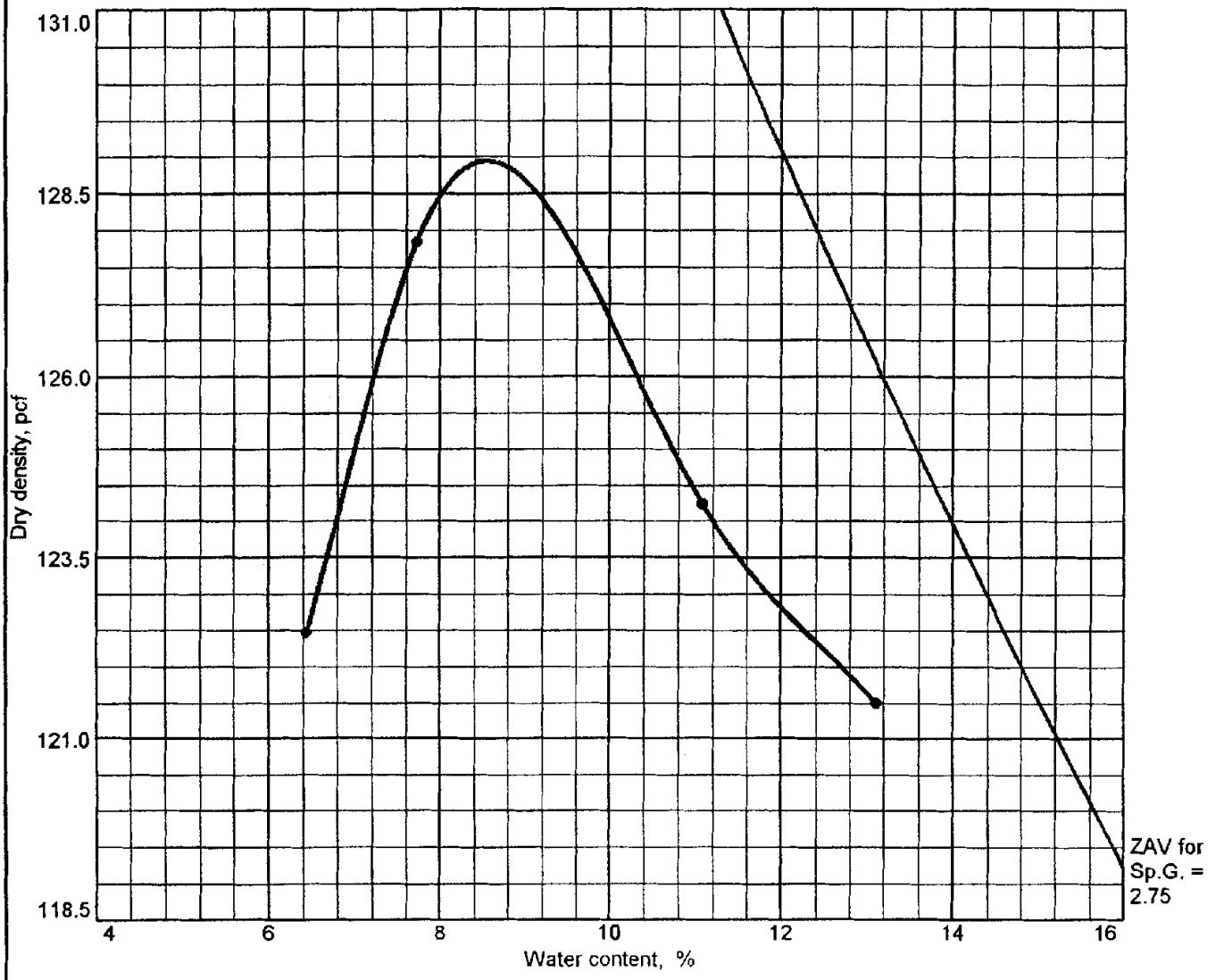
**Sample No.:** 326 **Source of Sample:** Common Fill **Date:** 7/5/01
**Location:** B65, 40K Sample **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover

**Project No:** 2009053 **Plate**

# COMPACTION TEST REPORT

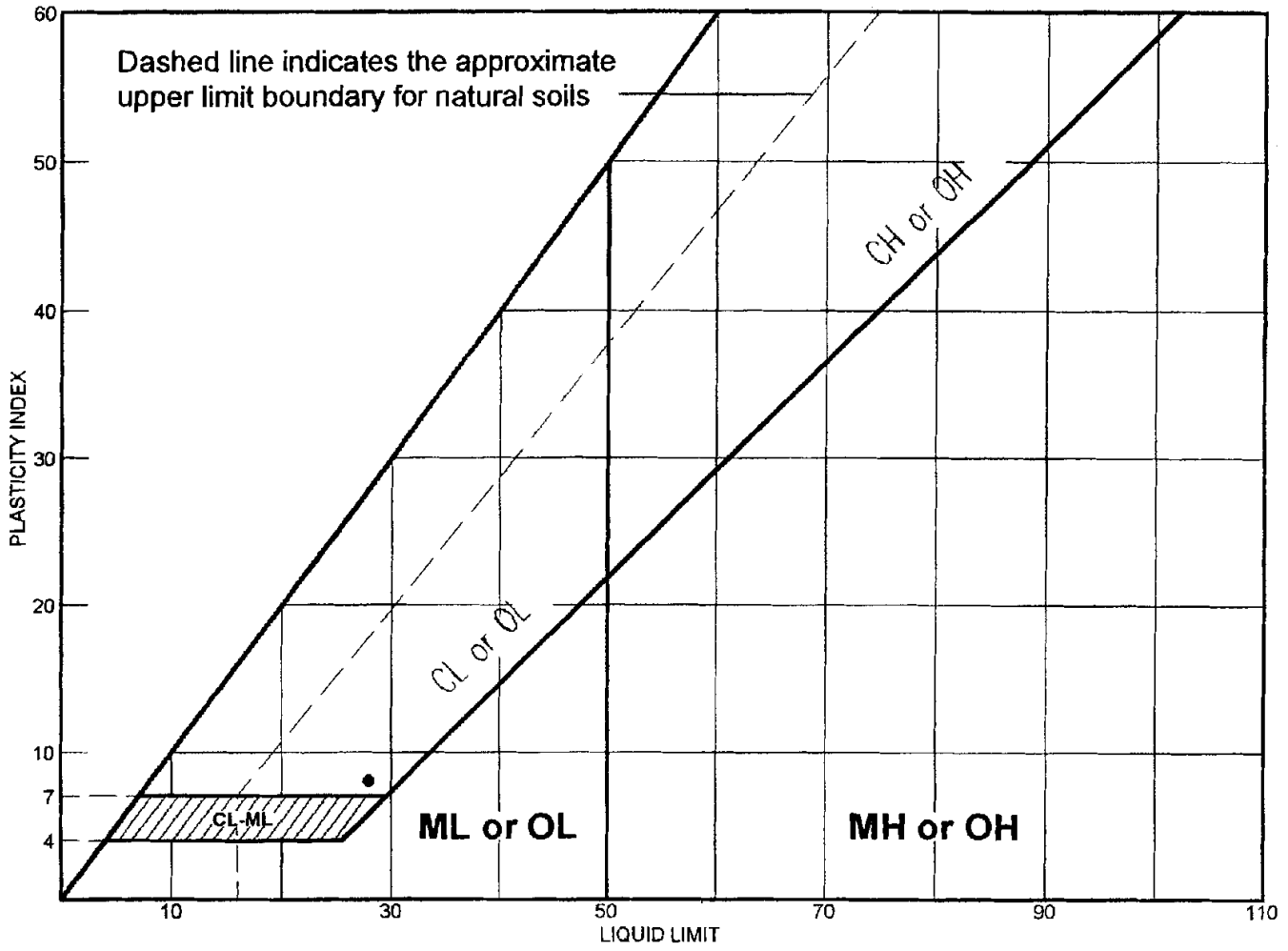



Test specification: ASTM D 1557-78 Method D Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | GC | | | | 30 | 8 | 16.5 | 49.5 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 128.9 pcf<br>Optimum moisture = 8.5 % | Common Fill, CF-13<br>Clayey gravel with sand |
| **Project No.** 2009053 **Client:** Marcy Excavation<br>**Project:** Cortland Landfill Cover<br>● **Location:** B65, 40K Sample | **Remarks:** |
| COMPACTION TEST REPORT<br>**SJB SERVICES, INC.** | **Plate** |

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | Clayey gravel with sand | 28 | 20 | 8 | 53.2 | 45.2 | GC |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Project No.** 2009053 **Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

● **Location:** B-67, 45K Sample

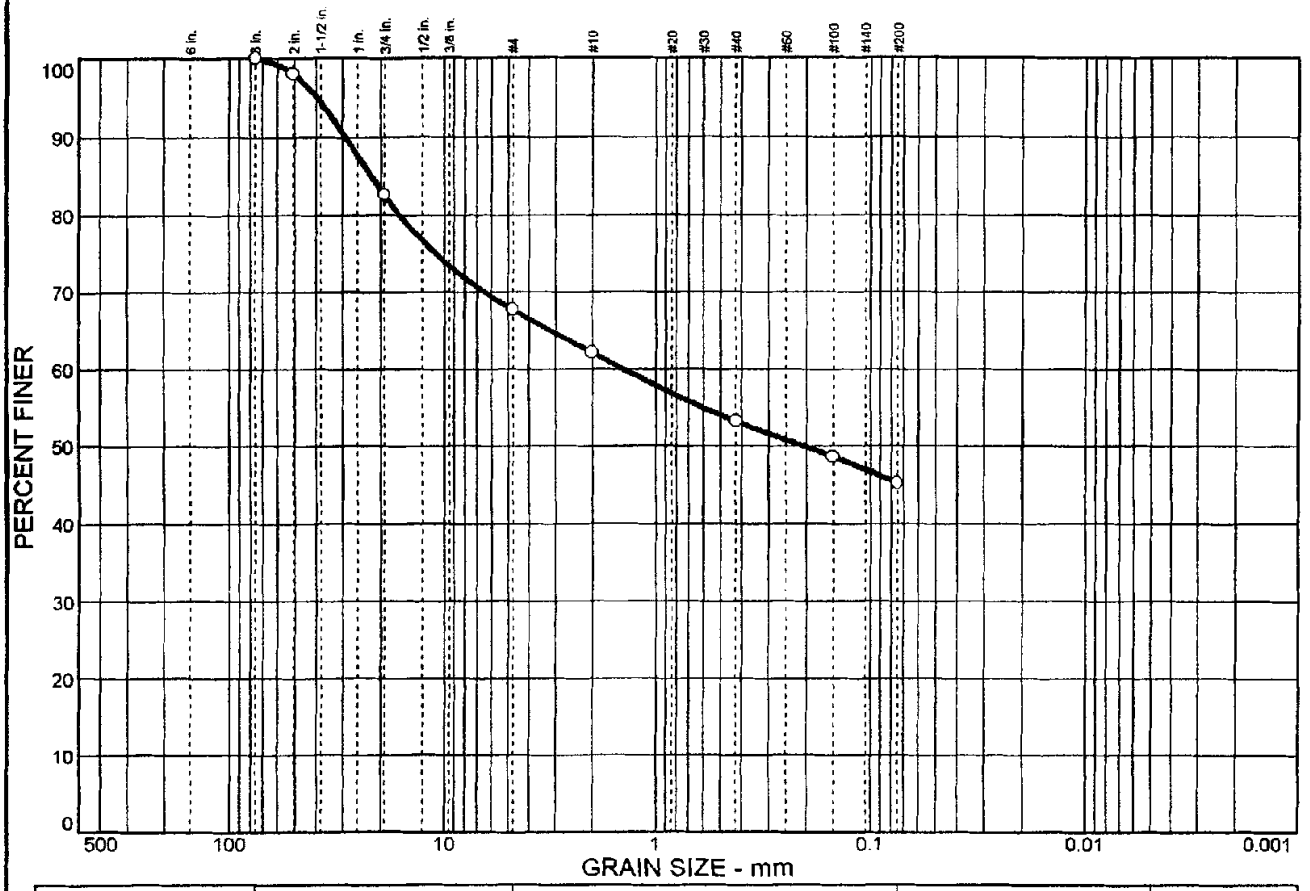
**Remarks:**

●

LIQUID AND PLASTIC LIMITS TEST REPORT

**SJB SERVICES, INC.**

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 0.0 | 32.3 | 22.5 | 45.2 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3 in. | 100.0 | | |
| 2 in. | 98.1 | | |
| .75 in. | 82.6 | | |
| #4 | 67.7 | | |
| #10 | 62.1 | | |
| #40 | 53.2 | | |
| #100 | 48.6 | | |
| #200 | 45.2 | | |

* (no specification provided)

**Soil Description**

Clayey gravel with sand

**Atterberg Limits**

PL= 20 LL= 28 PI= 8

**Coefficients**

$D_{85}$= 21.9 $D_{60}$= 1.42 $D_{50}$= 0.206
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= GC AASHTO=

**Remarks**

Sampled on 7/25/01

**Sample No.:** 373 **Source of Sample:** Common Fill **Date:** 7/27/01
**Location:** B-67, 45K Sample **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover
**Project No:** 2009053

# COMPACTION TEST REPORT


Test specification: ASTM D 1557-78 Method D Modified

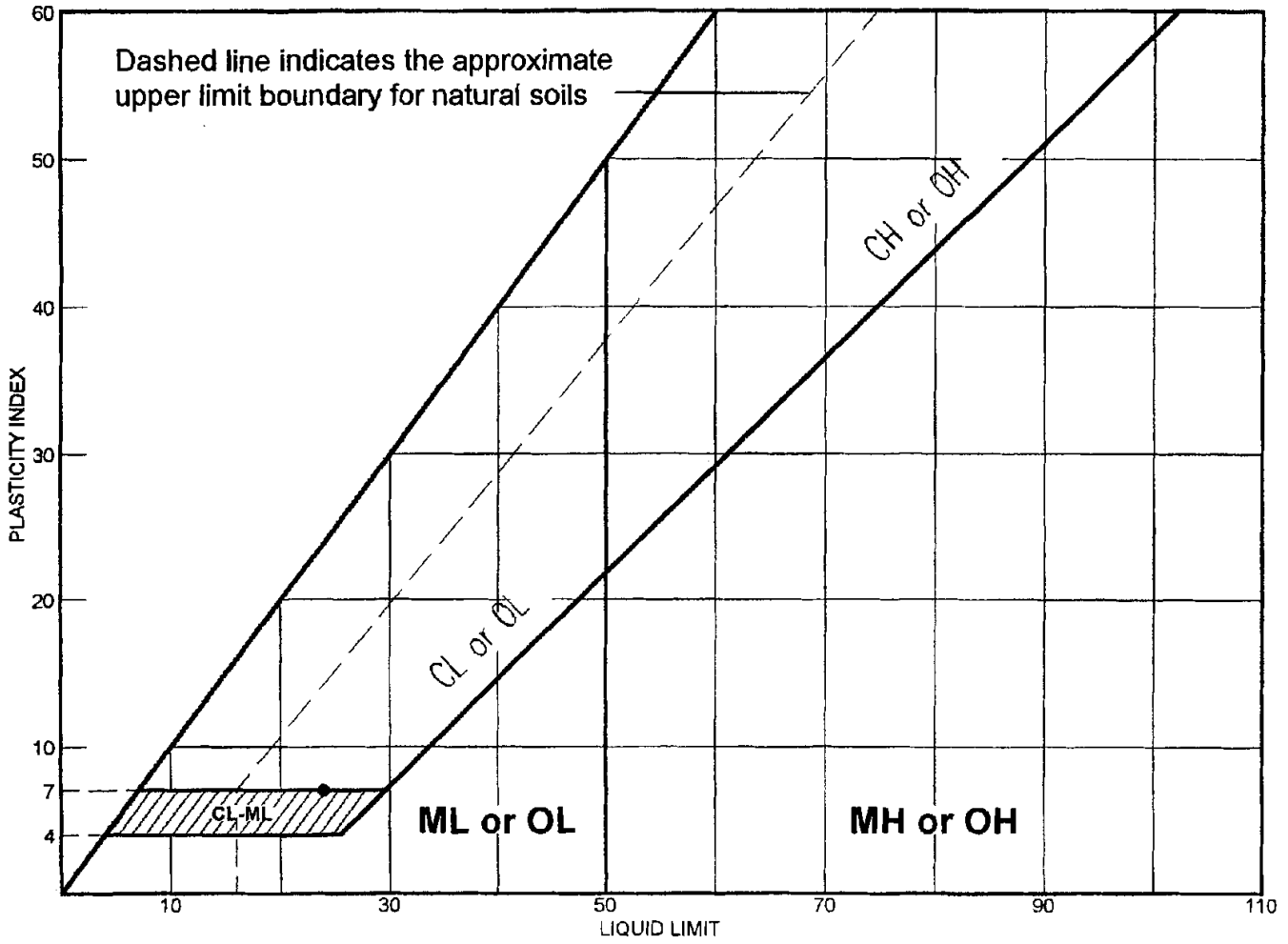
| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | GC | | | | 28 | 8 | 17.4 | 45.2 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 134.2 pcf<br>Optimum moisture = 8.1 % | Clayey gravel with sand |
| **Project No.** 2009053 **Client:** Marcy Excavation<br>**Project:** Cortland Landfill Cover<br>● **Location:** B-67, 45K Sample | **Remarks:** |

COMPACTION TEST REPORT

**SJB SERVICES, INC.**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | Silty clayey gravel with sand | 24 | 17 | 7 | 49.6 | 43.7 | GC-GM |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Project No.** 2009053 **Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

● **Location:** Common Fill 105-86, 50K Sample

**Remarks:**

●

LIQUID AND PLASTIC LIMITS TEST REPORT

**SJB SERVICES, INC.**

# Particle Size Distribution Report


| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 0.0 | 35.9 | 20.4 | 43.7 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3 in. | 100.0 | | |
| 2 in. | 93.9 | | |
| .75 in. | 81.9 | | |
| .25 in. | 66.9 | | |
| #10 | 58.5 | | |
| #40 | 49.6 | | |
| #100 | 46.4 | | |
| #200 | 43.7 | | |

* (no specification provided)

**Soil Description**

Silty clayey gravel with sand

**Atterberg Limits**

PL= 17 LL= 24 PI= 7

**Coefficients**

$D_{85}$= 24.5 $D_{60}$= 2.59 $D_{50}$= 0.467
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= GC-GM AASHTO=

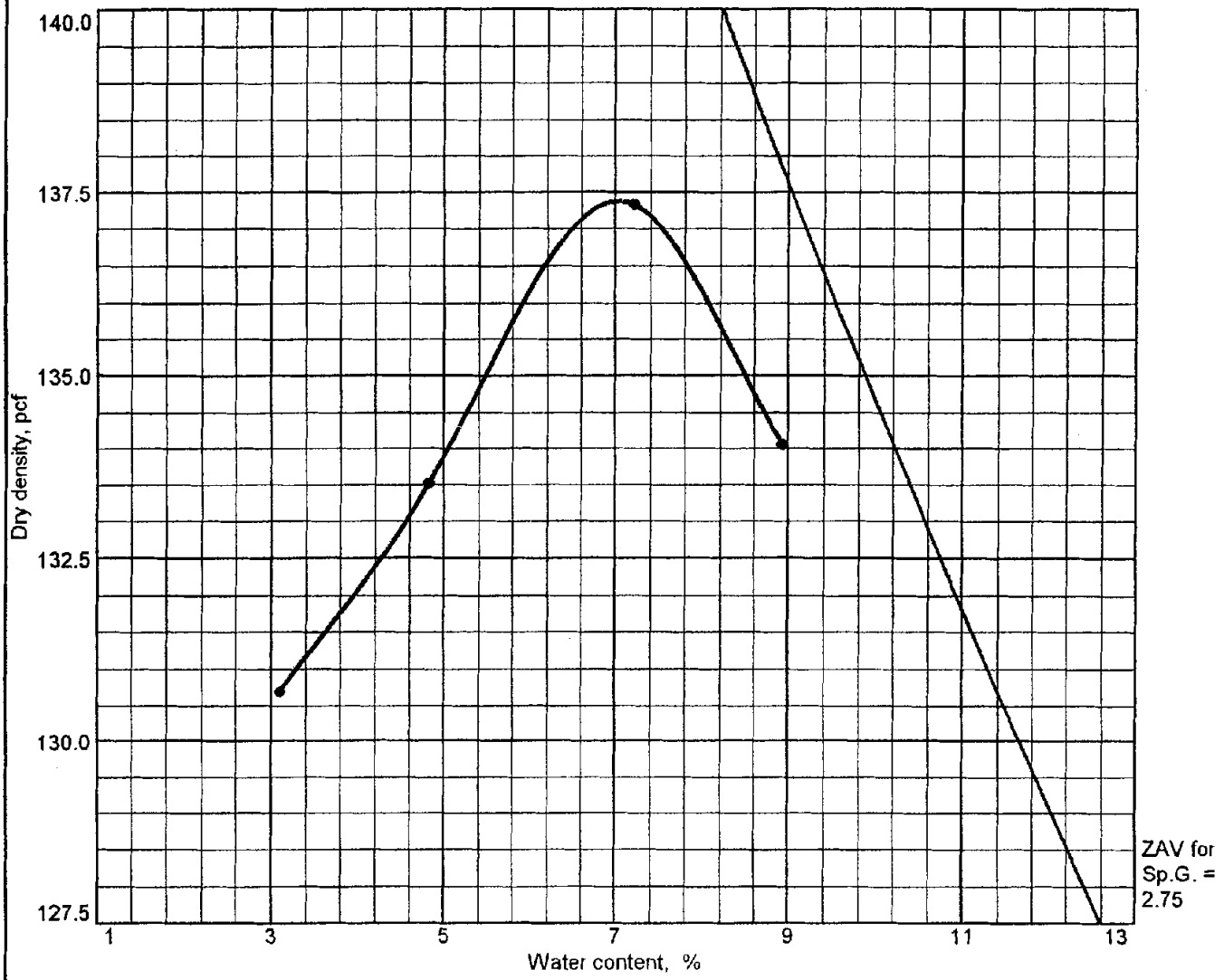
**Remarks**

**Sample No.:** 352 **Source of Sample:** Common Fill **Date:** 7/18/01
**Location:** Common Fill 105-86, 50K Sample **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover
**Project No:** 2009053

# COMPACTION TEST REPORT




**Test specification:** ASTM D 1557-78 Method D Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | GC-GM | | | | 24 | 7 | 18.1 | 43.7 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 137.4 pcf<br>Optimum moisture = 7.0 % | Silty clayey gravel with sand |

**Project No.** 2009053 **Client:** Marcy Excavation
**Project:** Cortland Landfill Cover

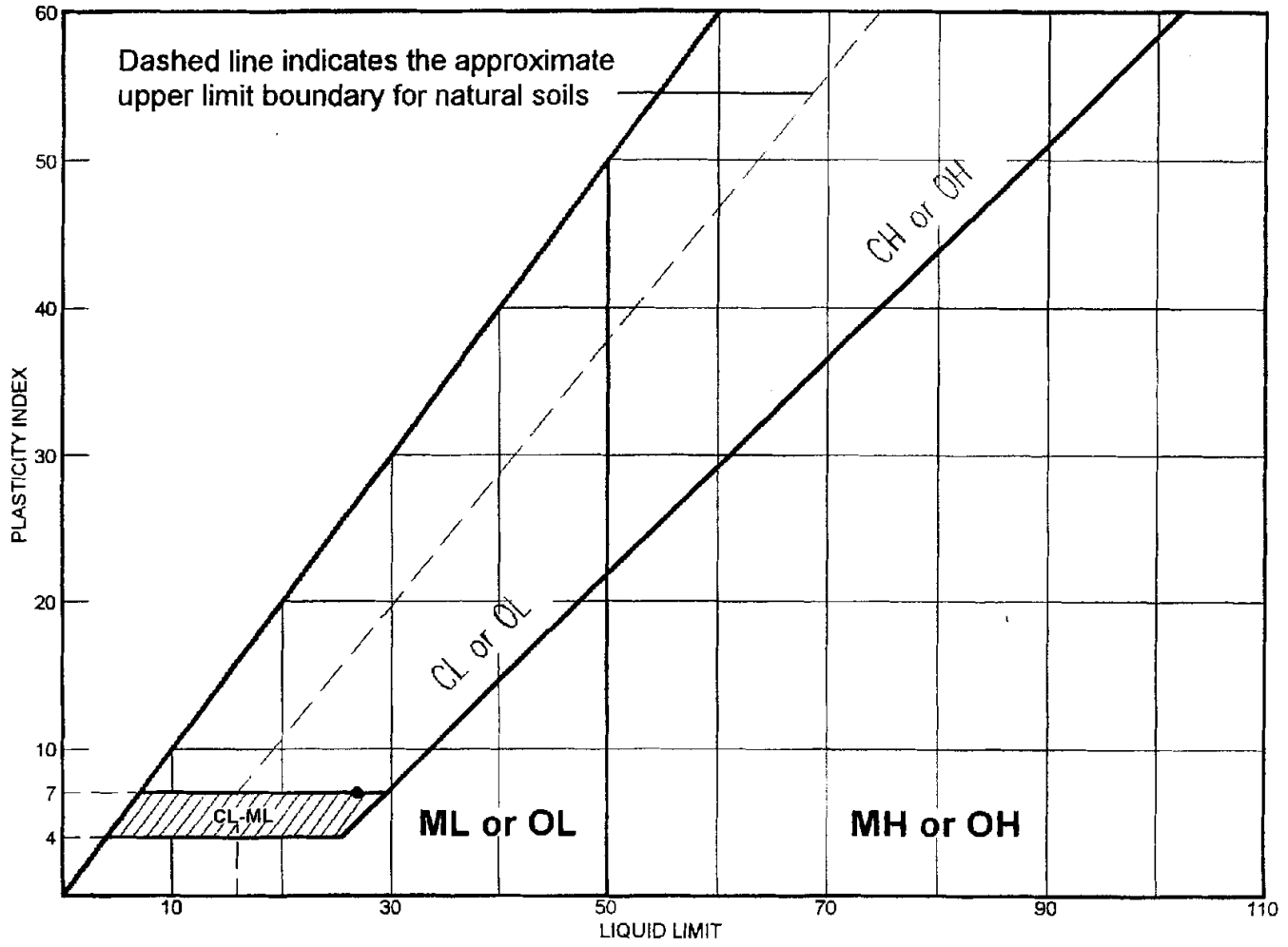
• **Location:** Common Fill 105-86, 50K Sample

**Remarks:**

COMPACTION TEST REPORT

**SJB SERVICES, INC.**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | Silty clayey gravel with sand | 27 | 20 | 7 | 56.1 | 47.4 | GC-GM |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Project No.** 2009053 **Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

● **Location:** B-76, 55K Sample

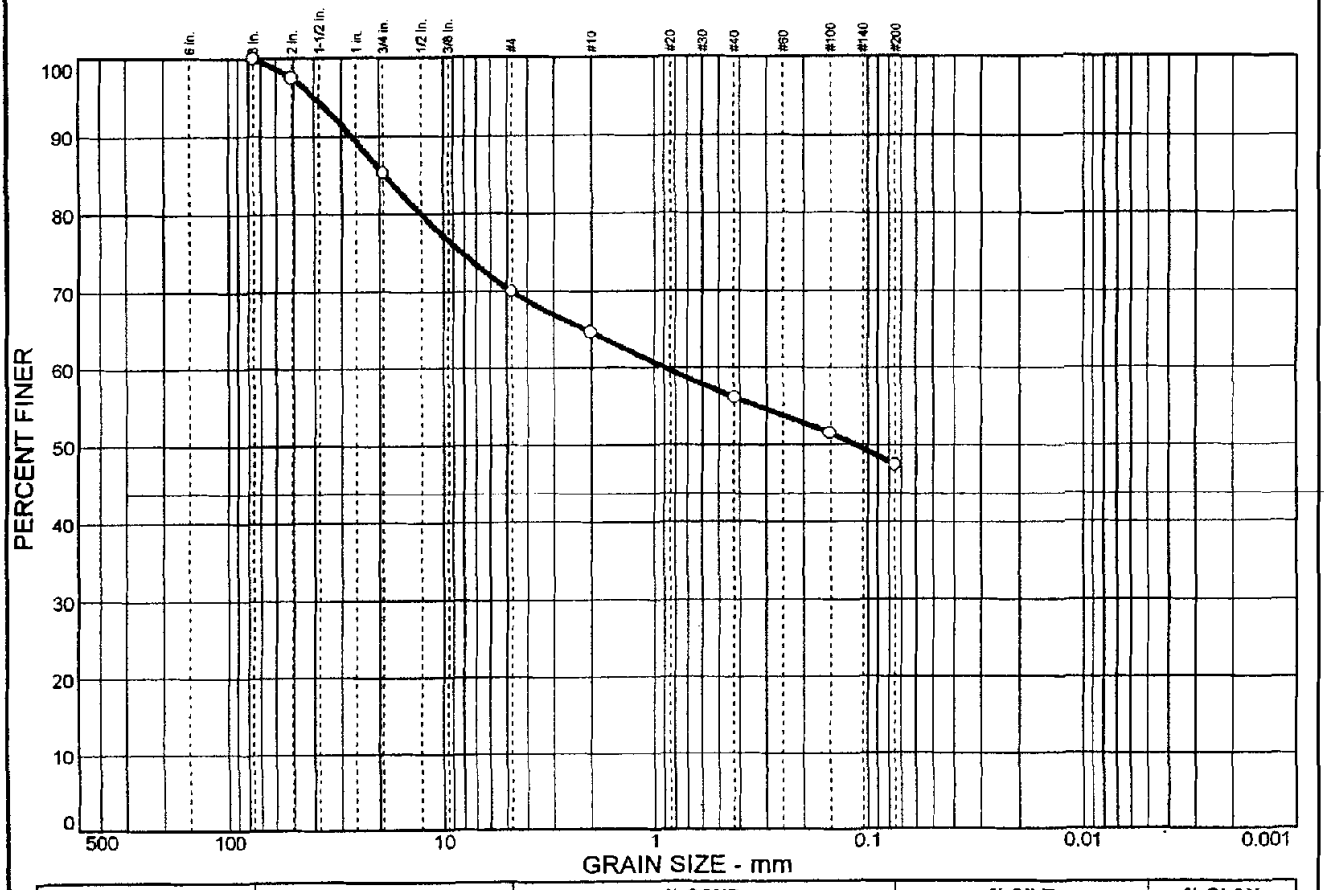
**Remarks:**

●

LIQUID AND PLASTIC LIMITS TEST REPORT

**SJB SERVICES, INC.**

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 0.0 | 30.0 | 22.6 | 47.4 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3 in. | 100.0 | | |
| 2 in. | 97.5 | | |
| .75 in. | 85.3 | | |
| #4 | 70.0 | | |
| #10 | 64.6 | | |
| #40 | 56.1 | | |
| #100 | 51.4 | | |
| #200 | 47.4 | | |

* (no specification provided)

**Soil Description**

Silty clayey gravel with sand

**Atterberg Limits**

PL= 20 LL= 27 PI= 7

**Coefficients**

$D_{85}$= 18.6 $D_{60}$= 0.895 $D_{50}$= 0.116
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= GC-GM AASHTO=

**Remarks**

Sampled on 7/25/01

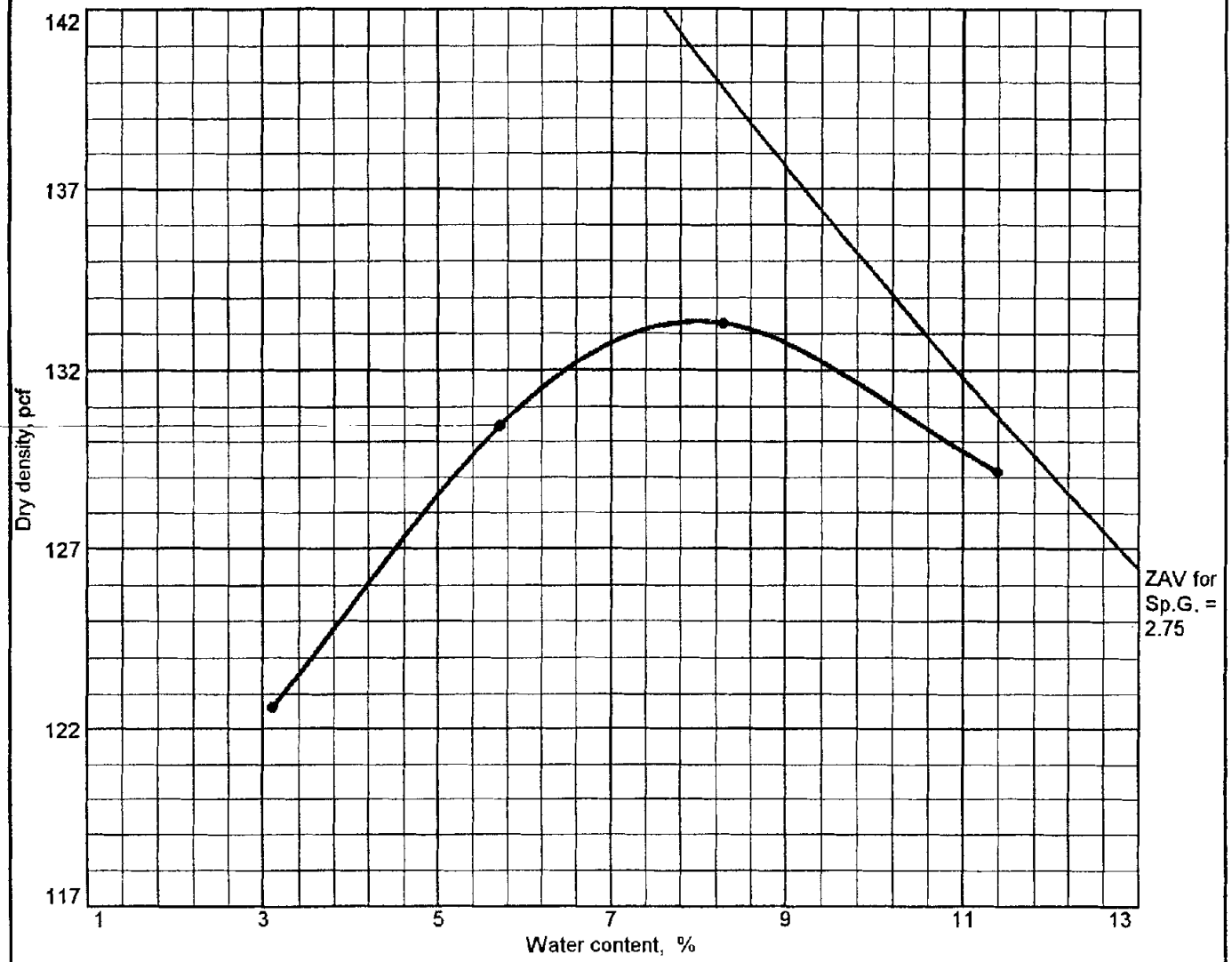
**Sample No.:** 374 **Source of Sample:** Common Fill **Date:** 7/27/01
**Location:** B-76, 55K Sample **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover

**Project No:** 2009053

# COMPACTION TEST REPORT




Test specification: ASTM D 1557-78 Method D Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | GC-GM | | | | 27 | 7 | 14.7 | 47.4 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 133.3 pcf<br>Optimum moisture = 8.0 % | Silty clayey gravel with sand |

**Project No.** 2009053 **Client:** Marcy Excavation
**Project:** Cortland Landfill Cover

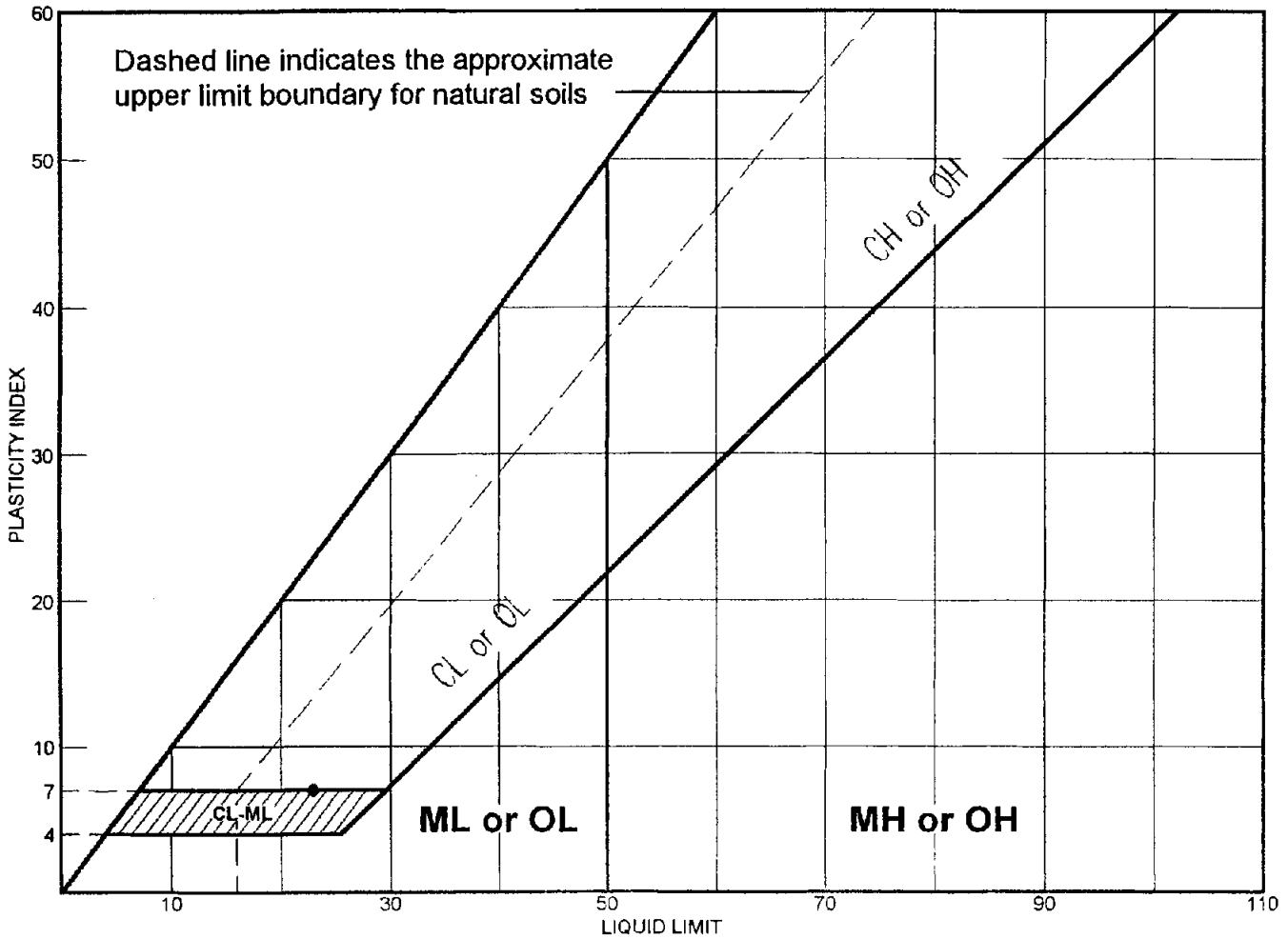
• **Location:** B-76, 55K Sample

**Remarks:**

COMPACTION TEST REPORT

**SJB SERVICES, INC.**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | Silty clayey gravel with sand | 23 | 16 | 7 | 53.2 | 46.5 | GC-GM |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Project No.** 2009053 **Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

● **Location:** 60K Sample

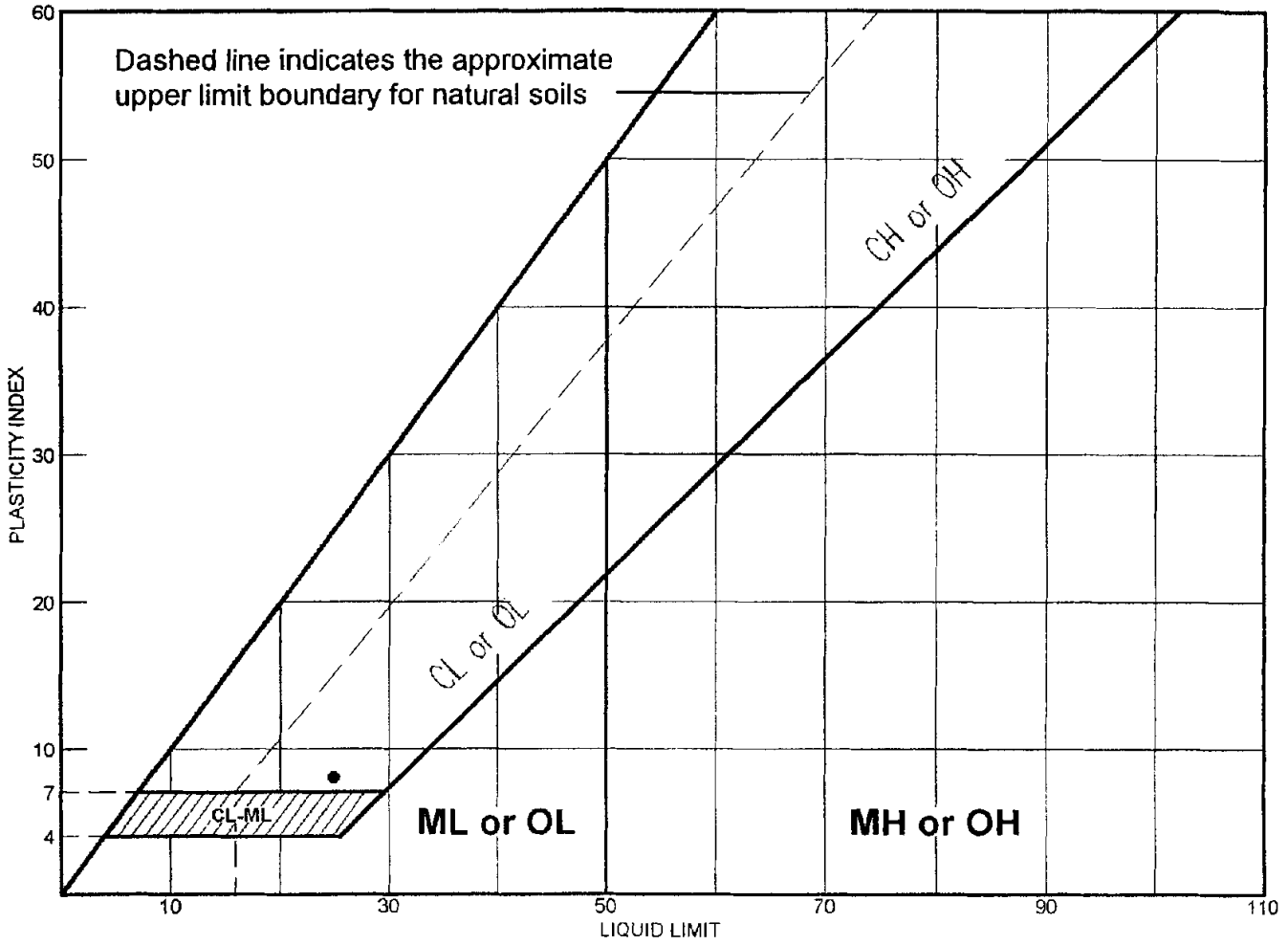
**Remarks:**

●

LIQUID AND PLASTIC LIMITS TEST REPORT

**SJB SERVICES, INC.**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | Common fill 65K<br>Silty gravel with sand | 25 | 17 | 8 | 51.7 | 43.2 | GC |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Project No.** 2009053 **Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

● **Location:** 65K cy sample

**Remarks:**

●

LIQUID AND PLASTIC LIMITS TEST REPORT

**SJB SERVICES, INC.**

# Particle Size Distribution Report


| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 0.0 | 37.4 | 19.4 | 43.2 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3 in. | 100.0 | | |
| 2 in. | 95.6 | | |
| .75 in. | 78.4 | | |
| #4 | 62.6 | | |
| #10 | 59.3 | | |
| #40 | 51.7 | | |
| #100 | 47.1 | | |
| #200 | 43.2 | | |

* (no specification provided)

**Soil Description**

Common fill 65K
Silty gravel with sand

**Atterberg Limits**

PL= 17 LL= 25 PI= 8

**Coefficients**

$D_{85}$= 27.2 $D_{60}$= 2.46 $D_{50}$= 0.289
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= GC AASHTO=

**Remarks**

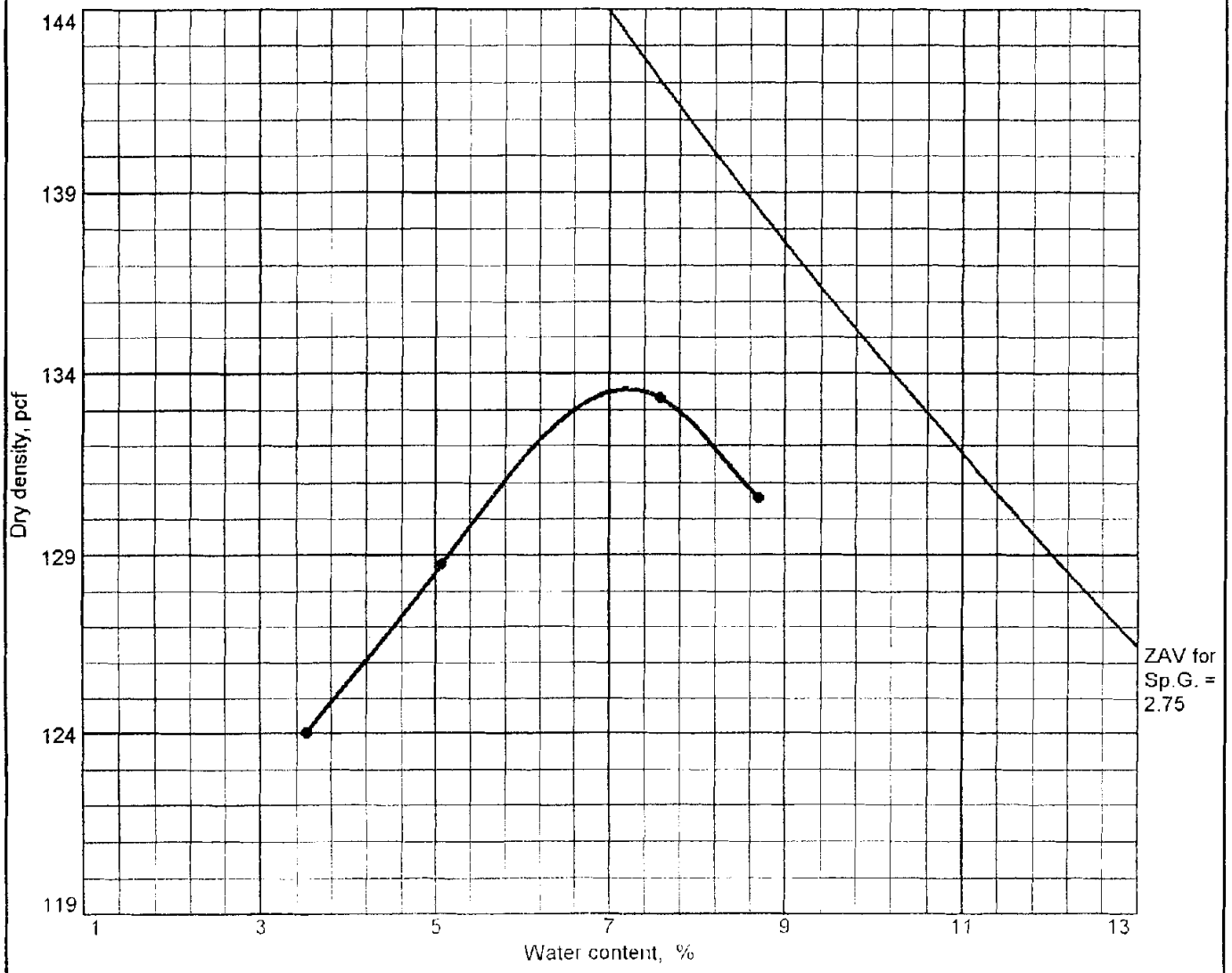
**Sample No.:** 415 **Source of Sample:** Common Fill **Date:** 8/15/01
**Location:** **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marey Excavation
**Project:** Cortland Landfill Cover

**Project No:** 2009053 415

# COMPACTION TEST REPORT




Test specification: ASTM D 1557-78 Method D Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | GC | | | | 25 | 8 | 21.6 | 43.2 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 133.5 pcf<br>Optimum moisture = 7.2 % | Common fill 65K<br>Silty gravel with sand |

**Project No.** 2009053 **Client:** Marcy Excavation
**Project:** Cortland Landfill Cover

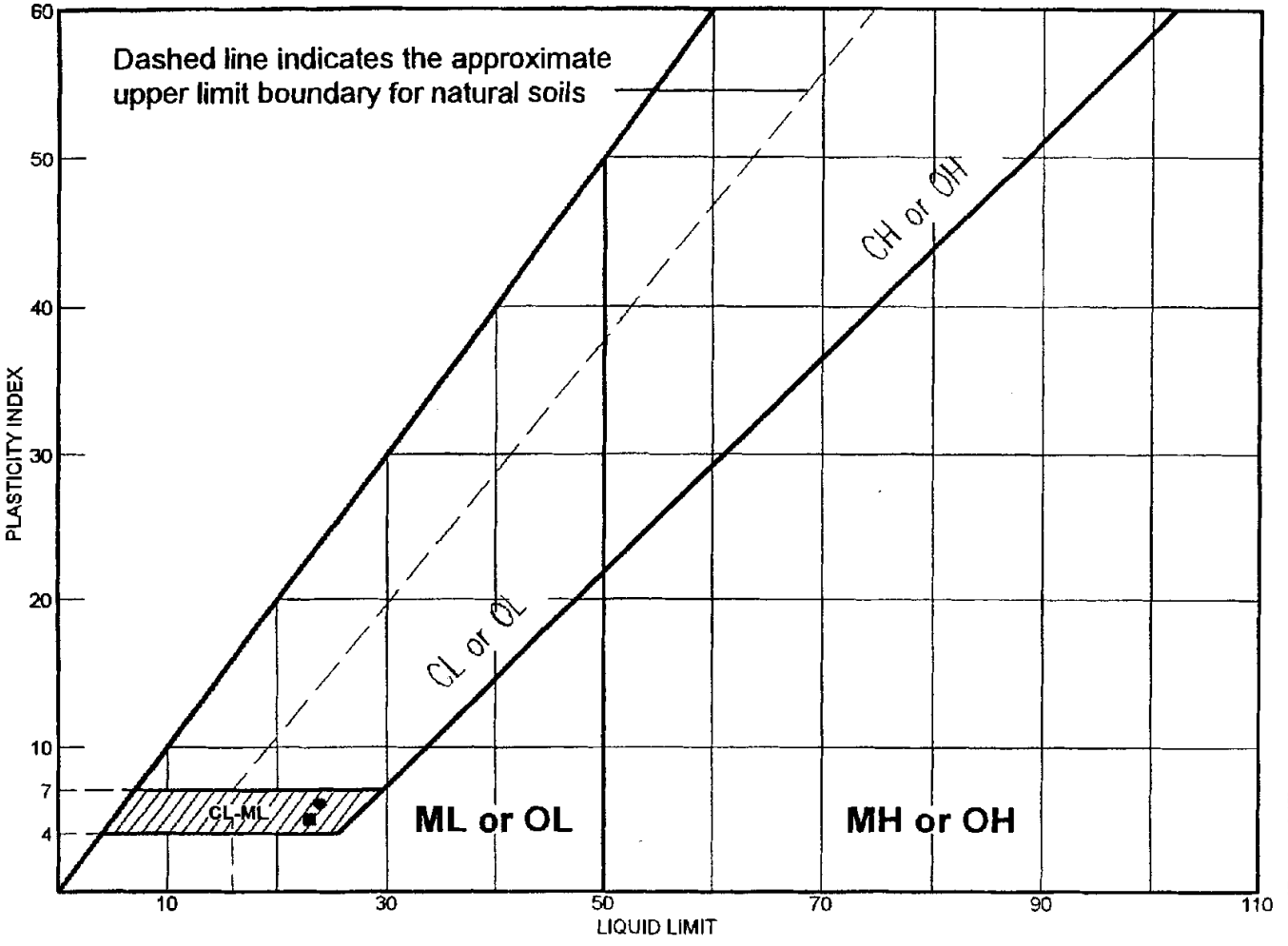
◆ **Location:** 65K cy sample

**Remarks:**

COMPACTION TEST REPORT

**SJB SERVICES, INC.**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | Silty clayey gravel with sand | 24 | 18 | 6 | 51.7 | 45.0 | GC-GM |
| ■ | Silty clayey gravel with sand | 23 | 18 | 5 | 55.8 | 47.2 | GC-GM |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Project No.** 2009053 **Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

◆ **Location:** Common Fill, 70 K Sample N106E91

■ **Location:** Common Fill, 75K Sample, N10 E84

**Remarks:**

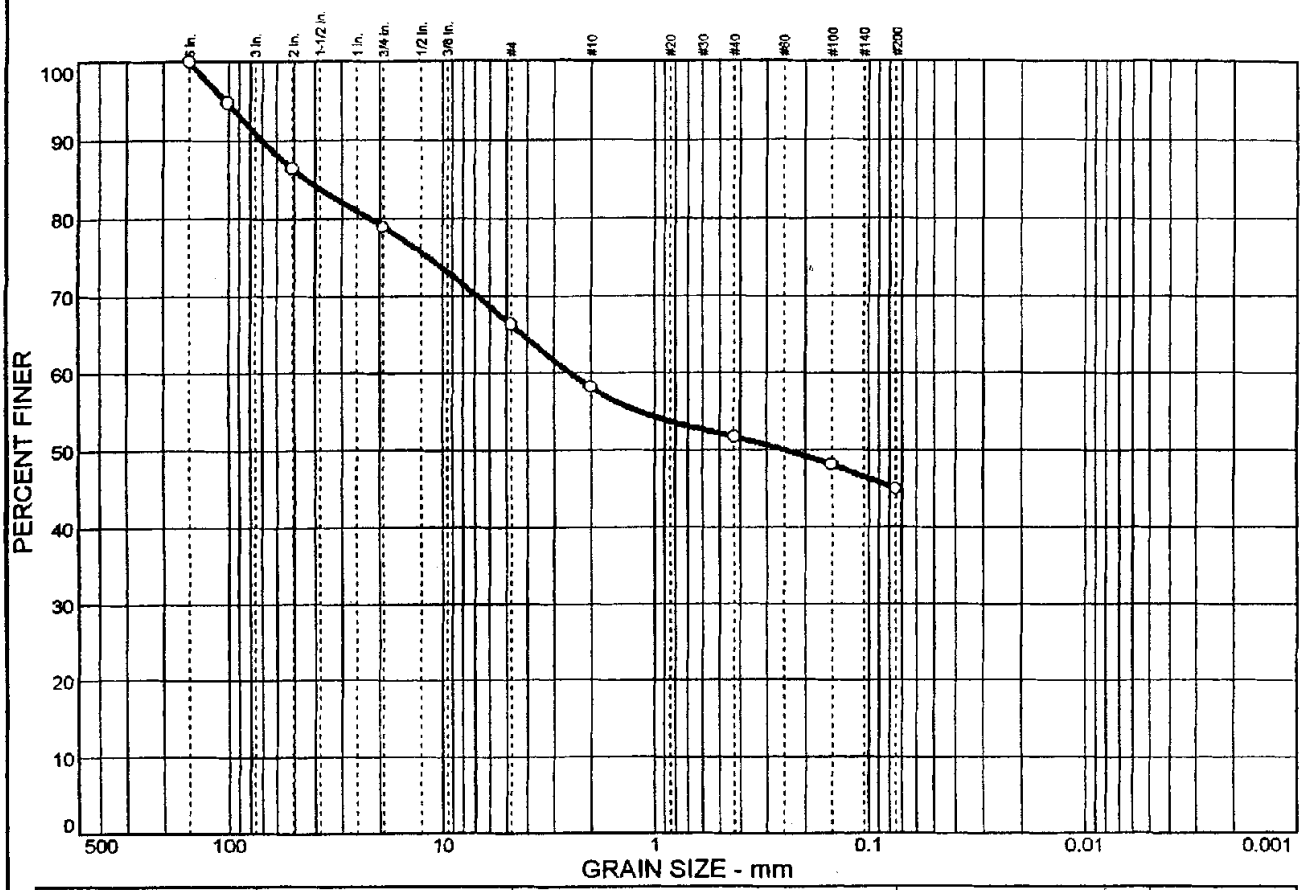
●

■

LIQUID AND PLASTIC LIMITS TEST REPORT

**SJB SERVICES, INC.**

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 9.0 | 24.7 | 21.3 | 45.0 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 6 in. | 100.0 | | |
| 4 in. | 94.7 | | |
| 2 in. | 86.4 | | |
| .75 in. | 78.9 | | |
| #4 | 66.3 | | |
| #10 | 58.1 | | |
| #40 | 51.7 | | |
| #100 | 48.1 | | |
| #200 | 45.0 | | |

* (no specification provided)

**Soil Description**

Silty clayey gravel with sand

**Atterberg Limits**

PL= 18 LL= 24 PI= 6

**Coefficients**

$D_{85}$= 43.7 $D_{60}$= 2.52 $D_{50}$= 0.247
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= GC-GM AASHTO=

**Remarks**

**Sample No.:** 438 **Source of Sample:** Common Fill **Date:** 8/28/01

**Location:** Common Fill, 70 K Sample N106E91 **Elev./Depth:**

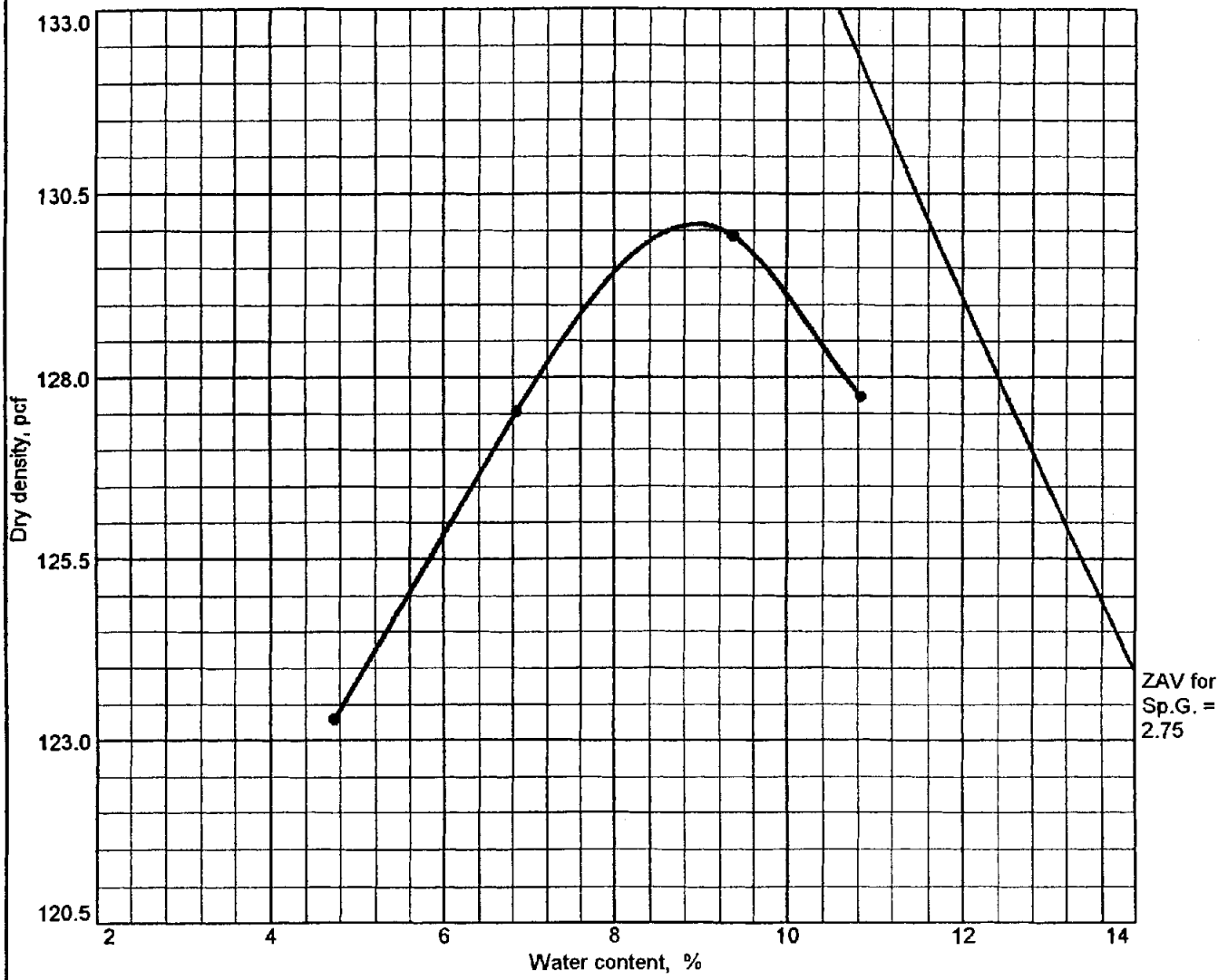
**SJB SERVICES, INC.**

**Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

**Project No:** 2009053

# COMPACTION TEST REPORT

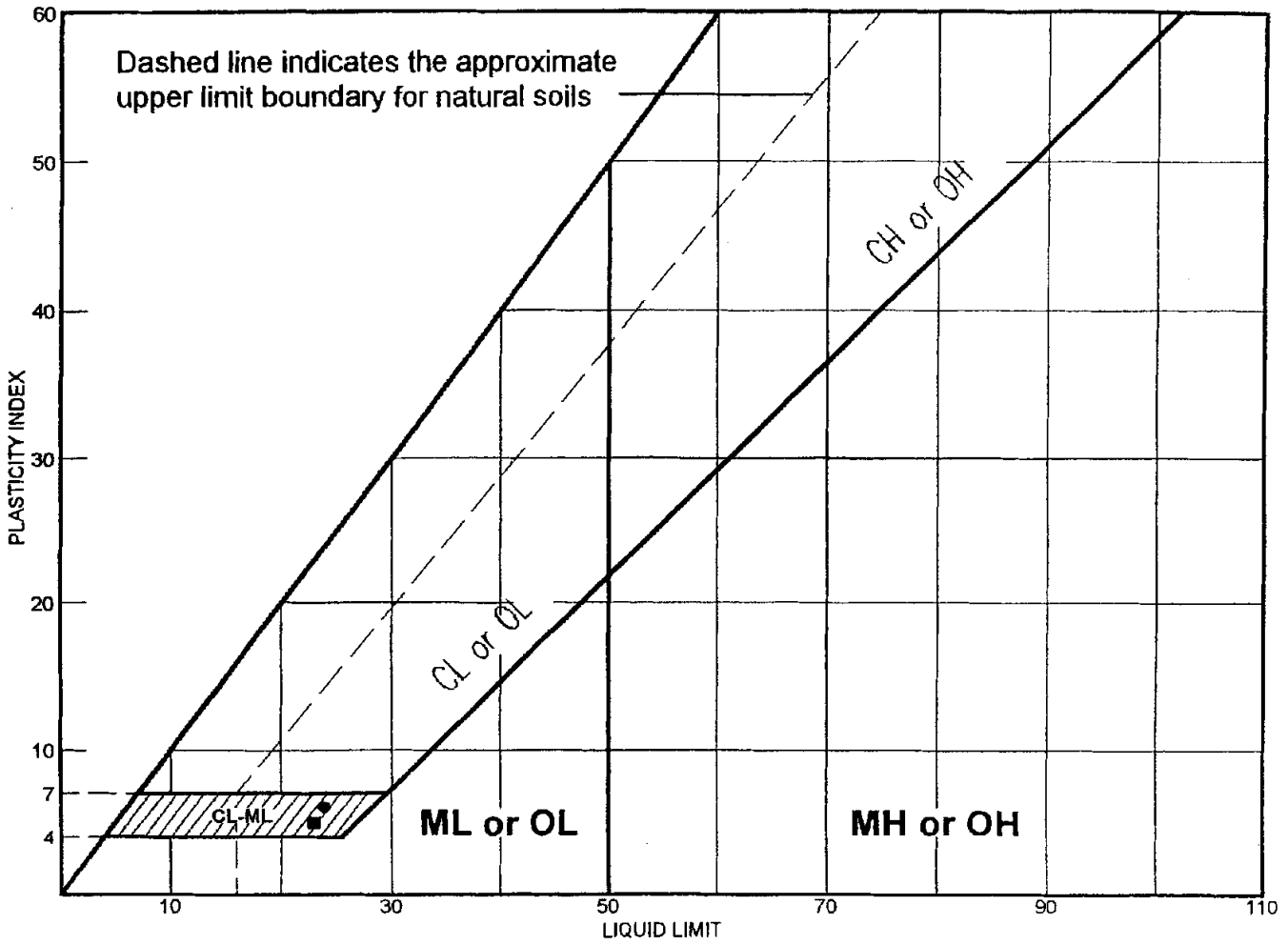



**Test specification:** ASTM D 1557-78 Method D Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | GC-GM | | | | 24 | 6 | 21.1 | 45.0 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 130.1 pcf<br>Optimum moisture = 8.9 % | Silty clayey gravel with sand |
| **Project No.** 2009053 **Client:** Marcy Excavation<br>**Project:** Cortland Landfill Cover<br>• **Location:** Common Fill, 70 K Sample N106E91 | **Remarks:** |
| COMPACTION TEST REPORT<br>**SJB SERVICES, INC.** | |

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | Silty clayey gravel with sand | 24 | 18 | 6 | 51.7 | 45.0 | GC-GM |
| ■ | Silty clayey gravel with sand | 23 | 18 | 5 | 55.8 | 47.2 | GC-GM |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Project No.** 2009053 **Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

● **Location:** Common Fill, 70 K Sample N106E91

■ **Location:** Common Fill, 75K Sample, N10 E84

**Remarks:**

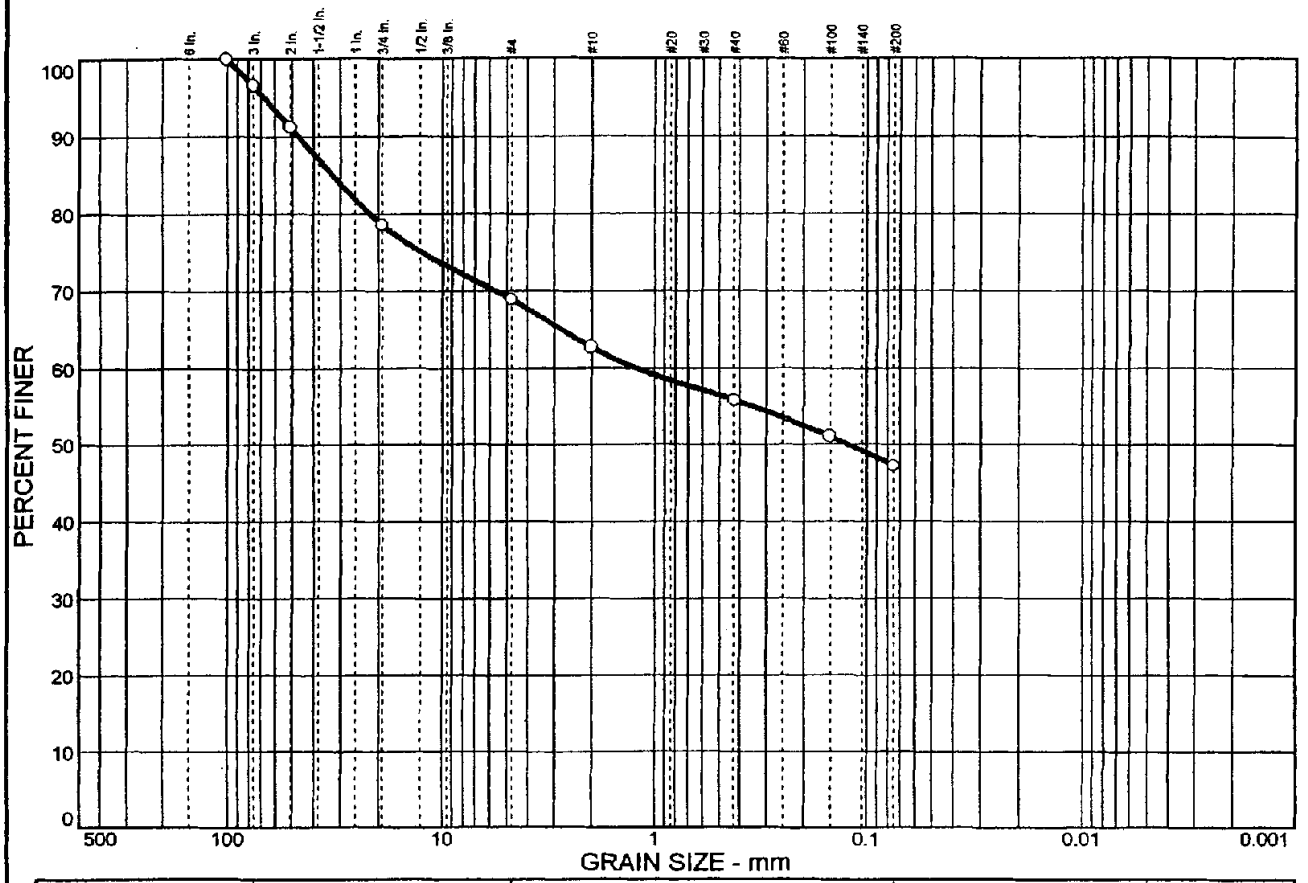
●

■

LIQUID AND PLASTIC LIMITS TEST REPORT

**SJB SERVICES, INC.**

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 3.4 | 27.7 | 21.7 | 47.2 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 4 in. | 100.0 | | |
| 3 in. | 96.6 | | |
| 2 in. | 91.2 | | |
| .75 in. | 78.6 | | |
| #4 | 68.9 | | |
| #10 | 62.7 | | |
| #40 | 55.8 | | |
| #100 | 51.0 | | |
| #200 | 47.2 | | |

* (no specification provided)

**Soil Description**

Silty clayey gravel with sand

**Atterberg Limits**

PL= 18 LL= 23 PI= 5

**Coefficients**

$D_{85}$= 32.4 $D_{60}$= 1.22 $D_{50}$= 0.124
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= GC-GM AASHTO=

**Remarks**

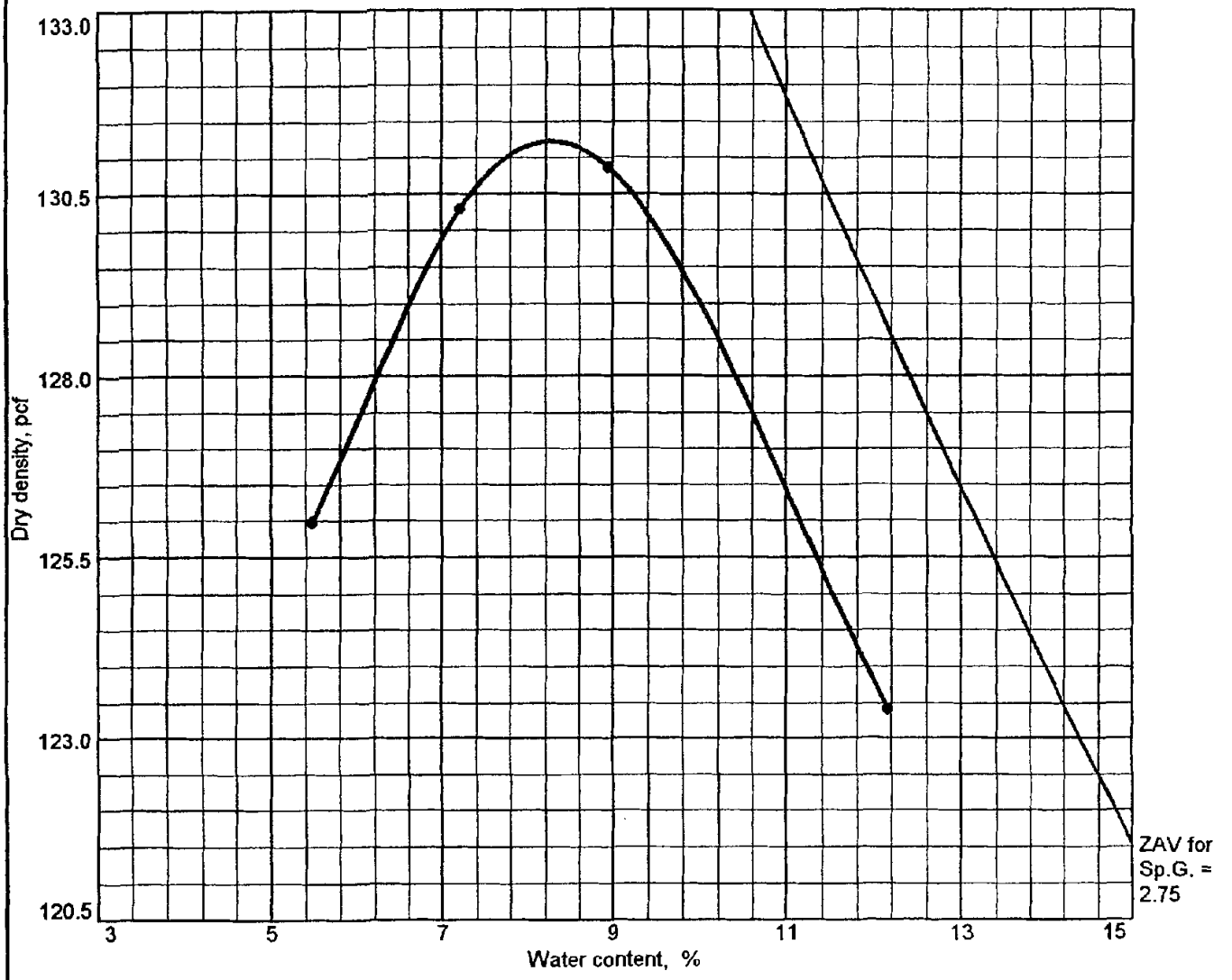
**Sample No.:** 439 **Source of Sample:** Common Fill **Date:** 8/29/01
**Location:** Common Fill, 75K Sample, N10 E84 **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover

**Project No:** 2009053

# COMPACTION TEST REPORT




Test specification: ASTM D 1557-78 Method D Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | GC-GM | | | | 23 | 5 | 21.4 | 47.2 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 131.2 pcf<br>Optimum moisture = 8.3 % | Silty clayey gravel with sand |

**Project No.** 2009053 **Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

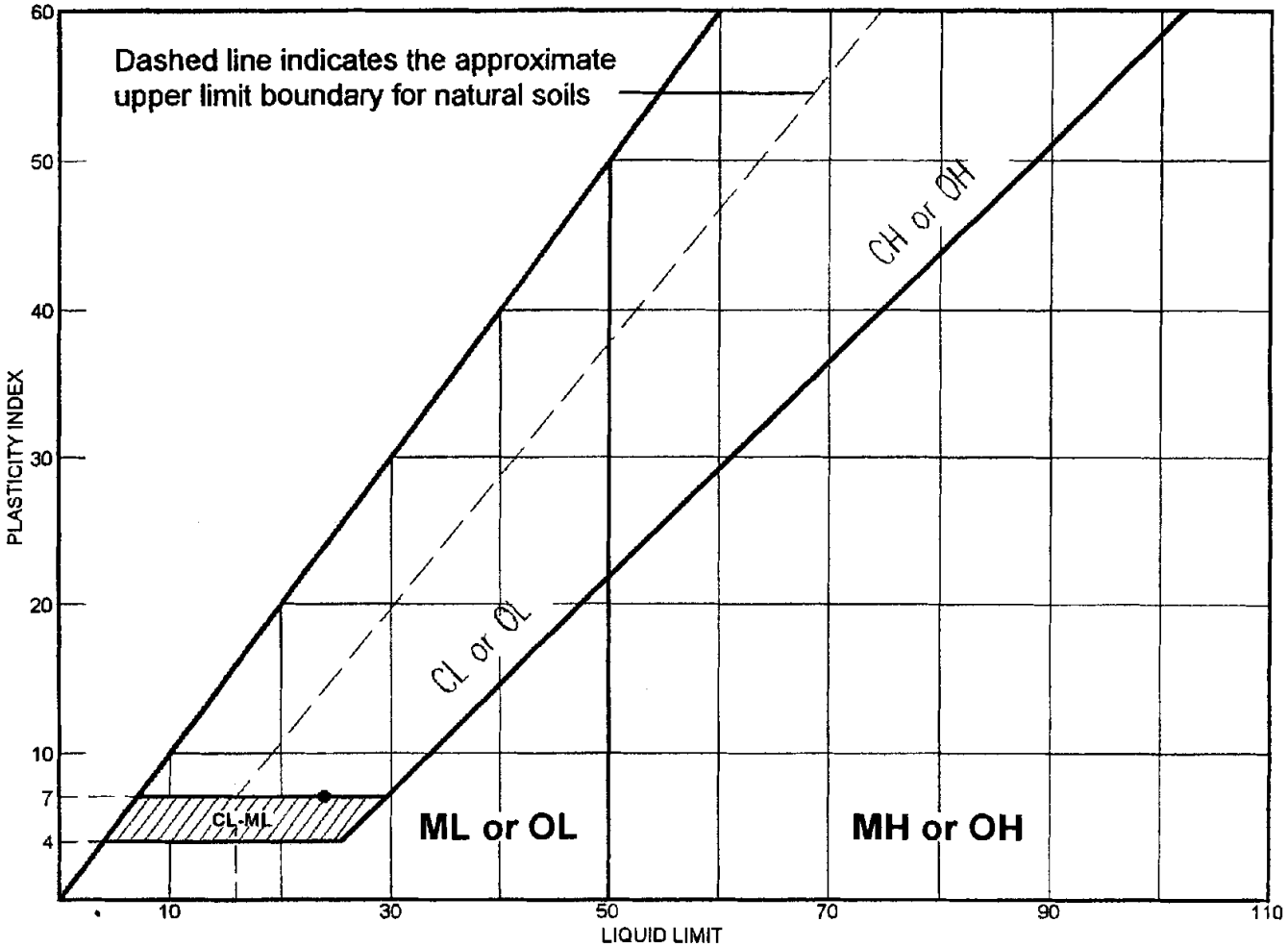
• **Location:** Common Fill, 75K Sample, N10 E84

**Remarks:**

COMPACTION TEST REPORT

**SJB SERVICES, INC.**

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | 80K N98 E 8 2 Silty clayey gravel with sand | 24 | 17 | 7 | 52.2 | 46.0 | GC-GM |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Project No.** 2009053 **Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

● **Source:** Common Fill **Sample No.:** 452

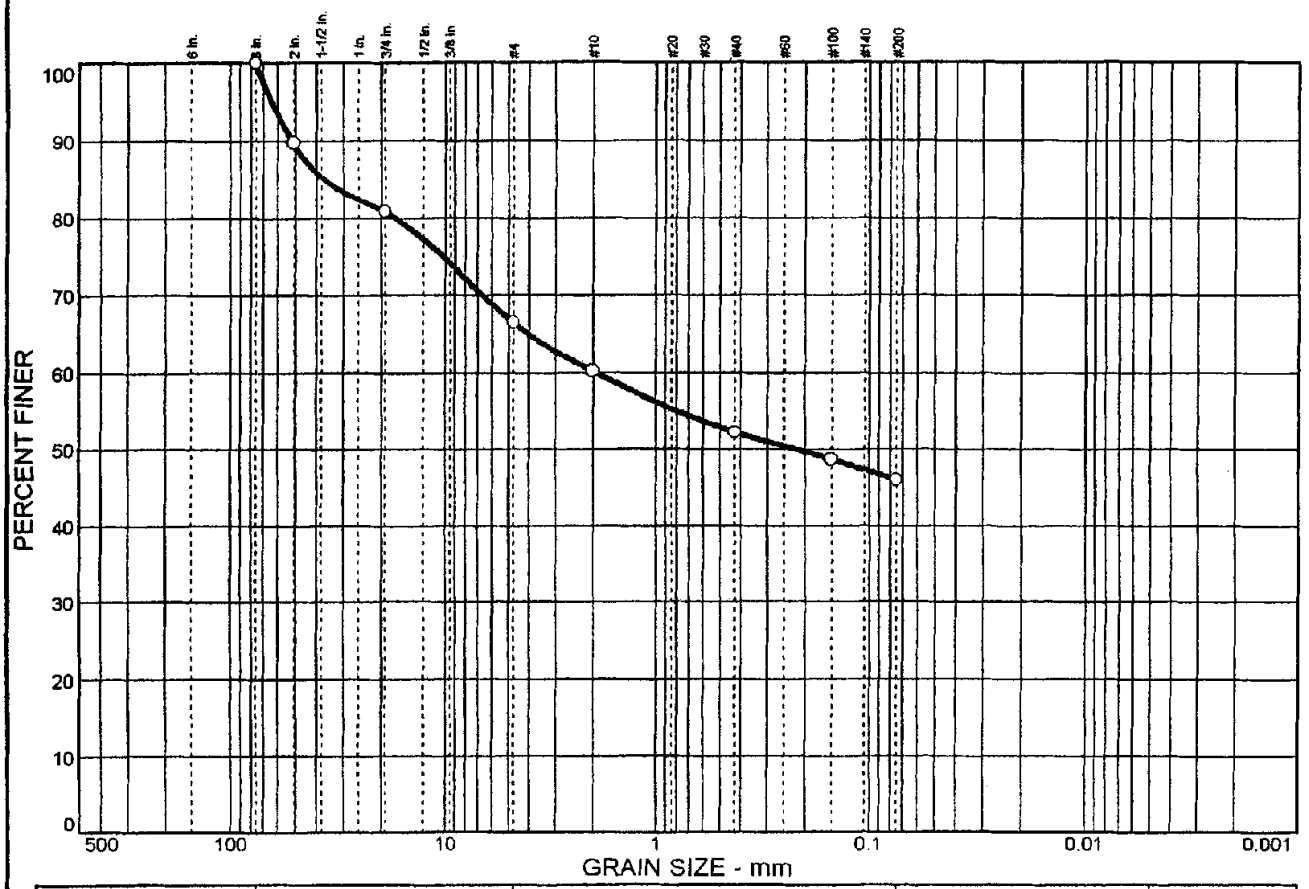
**Remarks:**

●

LIQUID AND PLASTIC LIMITS TEST REPORT

**SJB SERVICES, INC.**

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 0.0 | 33.5 | 20.5 | 46.0 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3 in. | 100.0 | | |
| 2 in. | 89.7 | | |
| .75 in. | 80.8 | | |
| #4 | 66.5 | | |
| #10 | 60.2 | | |
| #40 | 52.2 | | |
| #100 | 48.7 | | |
| #200 | 46.0 | | |

* (no specification provided)

**Soil Description**

80K N98 E 8 2 Silty clayey gravel with sand

**Atterberg Limits**

PL= 17 LL= 24 PI= 7

**Coefficients**

$D_{85}$= 36.8 $D_{60}$= 1.93 $D_{50}$= 0.222
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= GC-GM AASHTO=

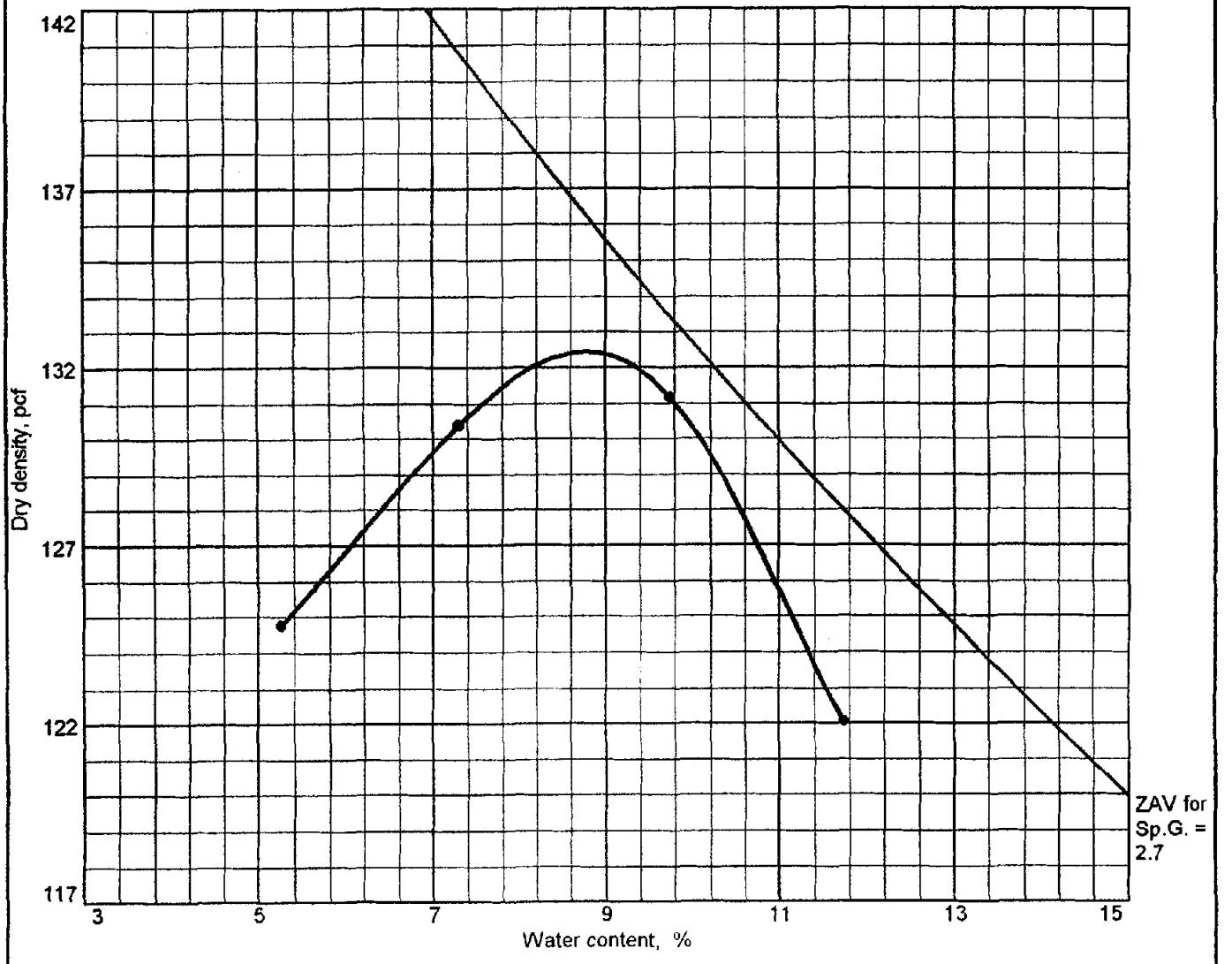
**Remarks**

**Sample No.:** 452 **Source of Sample:** Common Fill **Date:** Sept. 7, 2001
**Location:** **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover
**Project No:** 2009053 452

# COMPACTION TEST REPORT




**Test specification:** ASTM D 1557-78 Method D Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | GC-GM | | | 2.7 | 24 | 7 | 19.2 | 46.0 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 132.4 pcf<br>Optimum moisture = 8.8 % | 80K N98 E 8 2 Silty clayey gravel with sand |

**Project No.** 2009053 **Client:** Marcy Excavation
**Project:** Cortland Landfill Cover

● **Source:** Common Fill **Sample No.:** 452

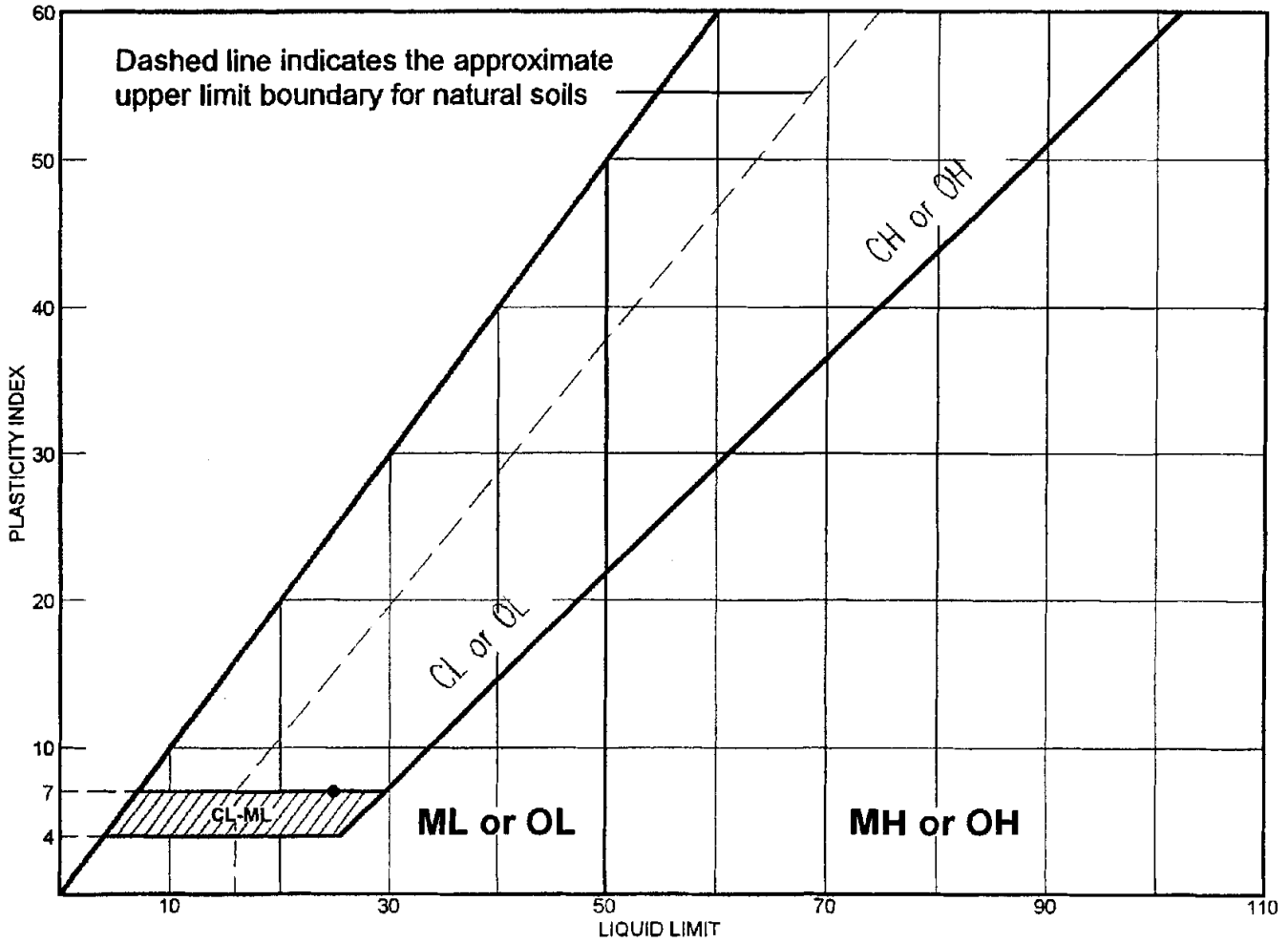
**Remarks:**

COMPACTION TEST REPORT

**SJB SERVICES, INC.**

452

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | 85K N96 E 82 Silty clayey gravel with sand | 25 | 18 | 7 | 49.2 | 42.9 | GC-GM |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Project No.** 2009053 **Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

● **Source:** Common Fill **Sample No.:** 453

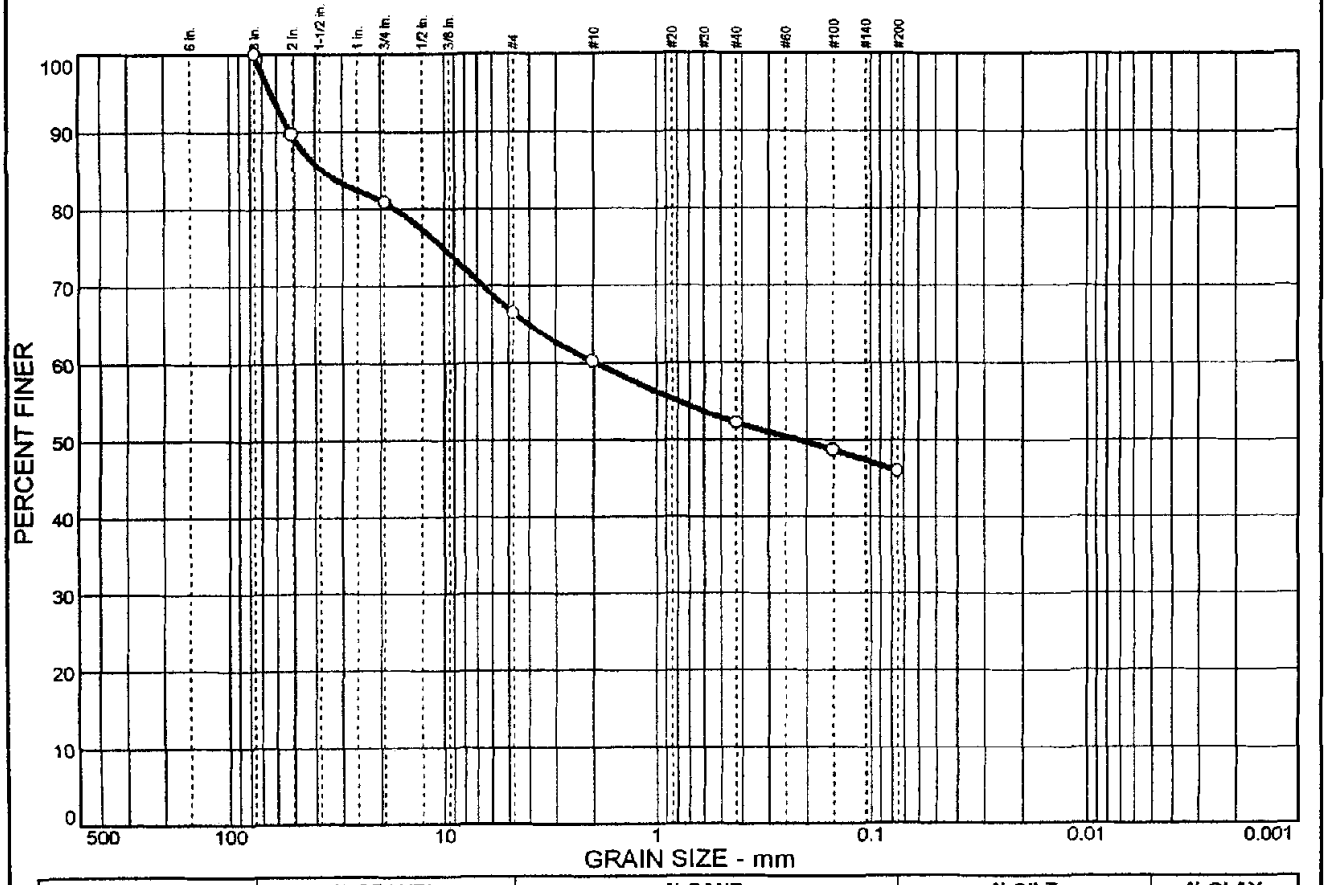
**Remarks:**

●

LIQUID AND PLASTIC LIMITS TEST REPORT

**SJB SERVICES, INC.**

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 0.0 | 33.5 | 20.5 | 46.0 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3 in. | 100.0 | | |
| 2 in. | 89.7 | | |
| .75 in. | 80.8 | | |
| #4 | 66.5 | | |
| #10 | 60.2 | | |
| #40 | 52.2 | | |
| #100 | 48.7 | | |
| #200 | 46.0 | | |

* (no specification provided)

**Soil Description**

80K N98 E 8 2 Silty clayey gravel with sand

**Atterberg Limits**

PL= 17 LL= 24 PI= 7

**Coefficients**

$D_{85}$= 36.8 $D_{60}$= 1.93 $D_{50}$= 0.222
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= GC-GM AASHTO=

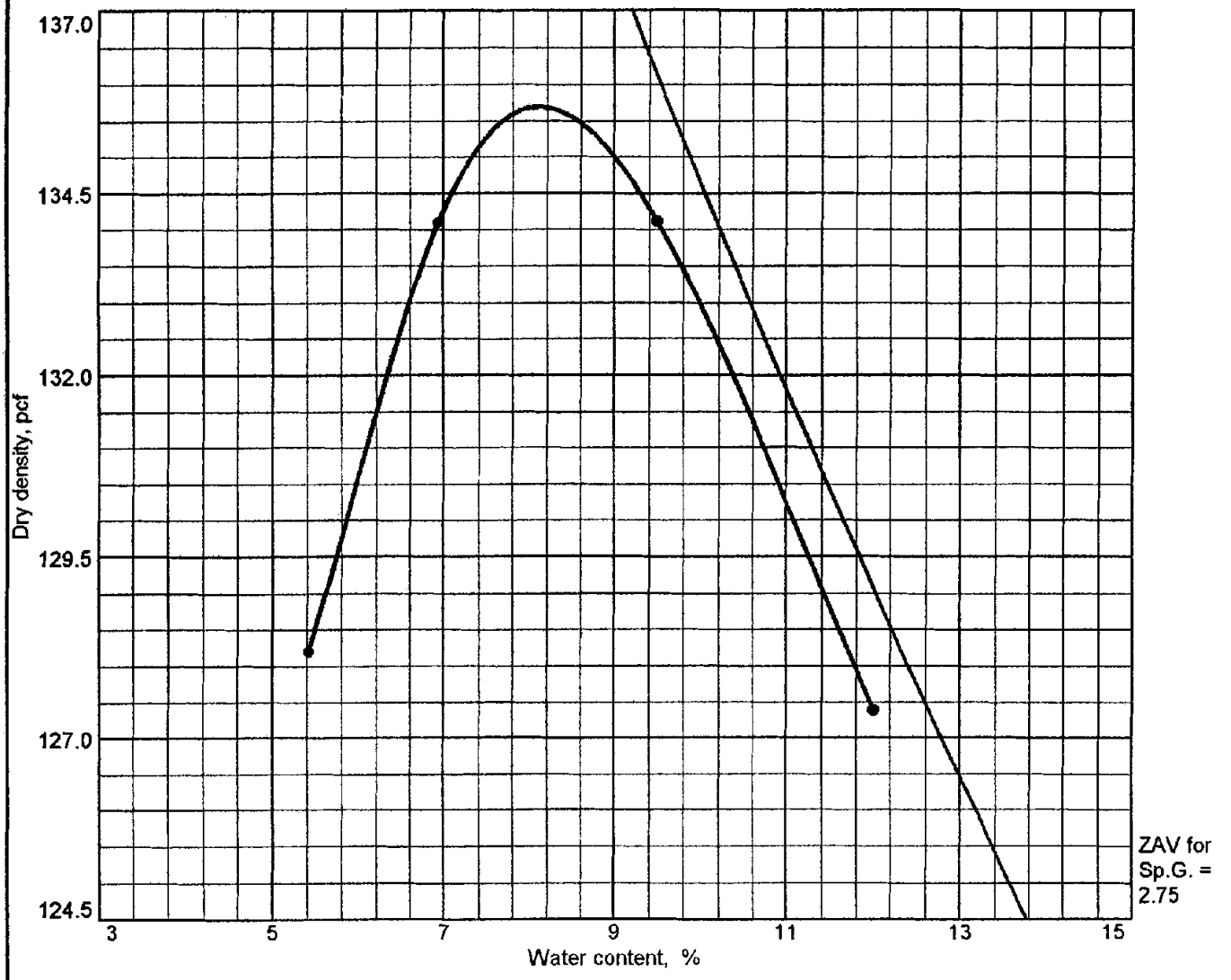
**Remarks**

**Sample No.:** 452 **Source of Sample:** Common Fill **Date:** Sept. 7, 2001
**Location:** **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover
**Project No:** 2009053

# COMPACTION TEST REPORT

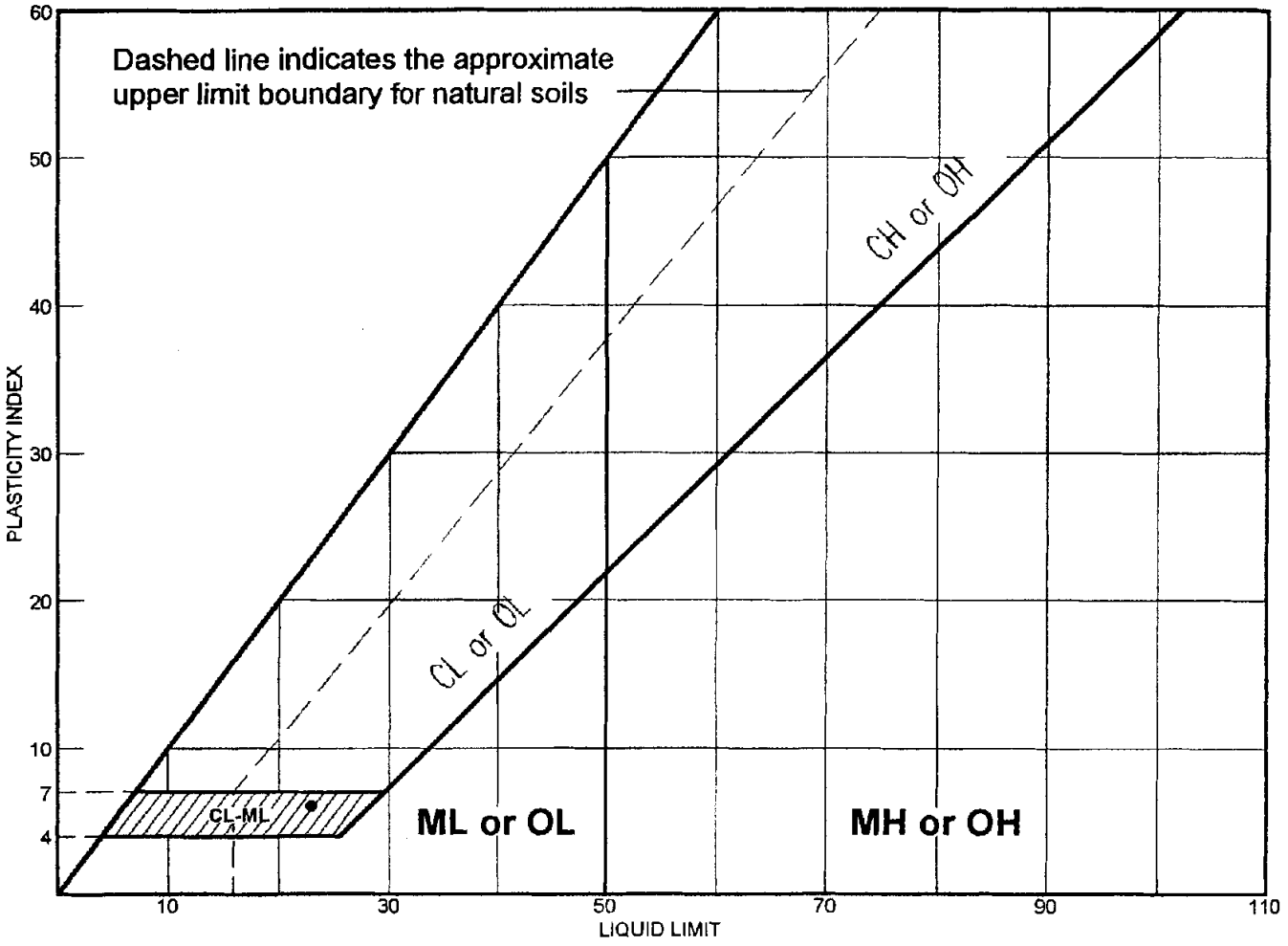



**Test specification:** ASTM D 1557-78 Method D Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | GC-GM | | | 2.75 | 25 | 7 | 27.4 | 42.9 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 135.7 pcf<br>Optimum moisture = 8.1 % | 85K N96 E 82 Silty clayey gravel with sand |
| **Project No.** 2009053 **Client:** Marcy Excavation<br>**Project:** Cortland Landfill Cover<br>● **Source:** Common Fill **Sample No.:** 453 | **Remarks:** |
| COMPACTION TEST REPORT<br>**SJB SERVICES, INC.** | 453 |

# LIQUID AND PLASTIC LIMITS TEST REPORT




| | MATERIAL DESCRIPTION | LL | PL | PI | %<#40 | %<#200 | USCS |
|---|---|---|---|---|---|---|---|
| ● | 90K N95 E84<br>Silty clayey gravel with sand | 23 | 17 | 6 | 50.2 | 43.9 | GC-GM |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Project No.** 2009053 **Client:** Marcy Excavation

**Project:** Cortland Landfill Cover

● **Source:** Common Fill **Sample No.:** 454

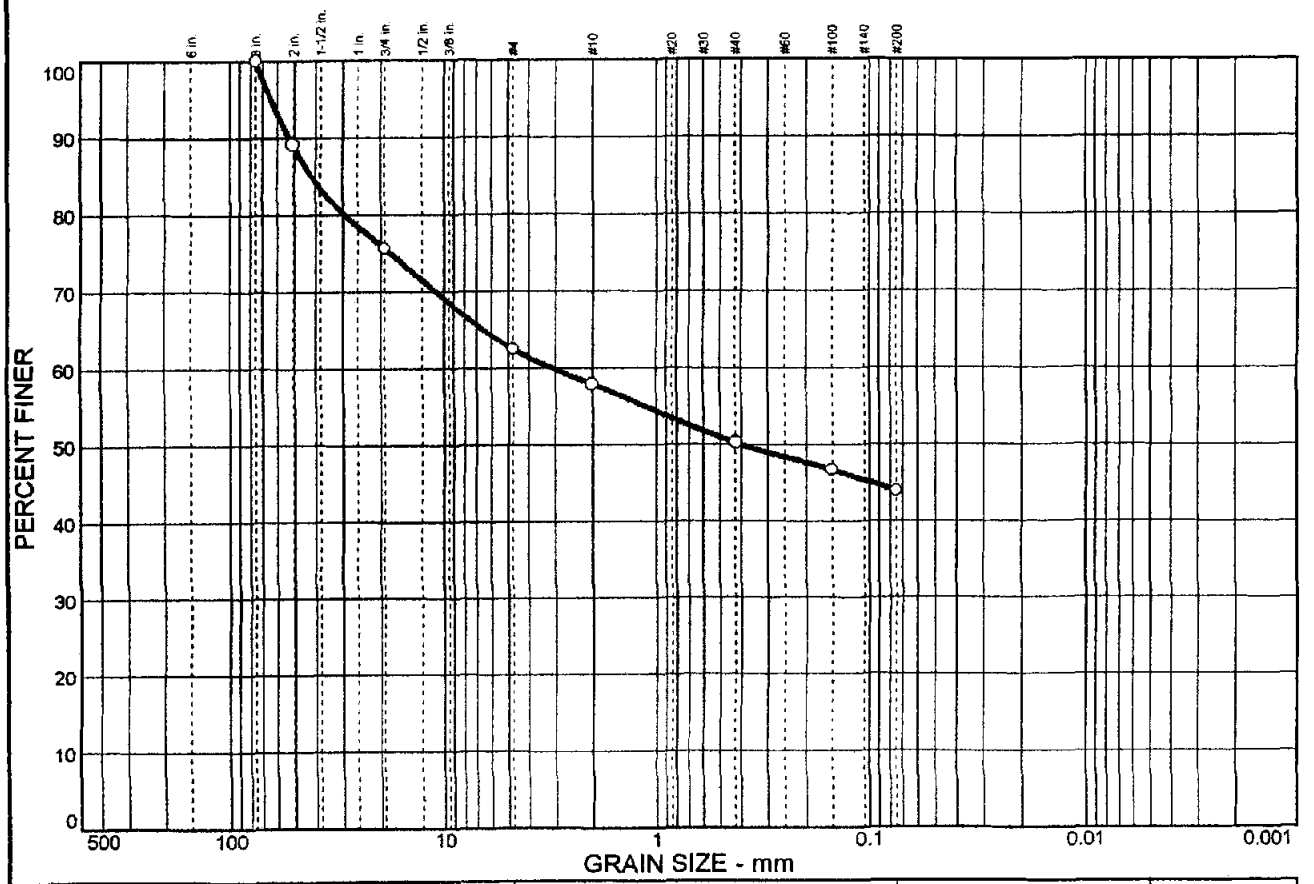
**Remarks:**

●

LIQUID AND PLASTIC LIMITS TEST REPORT

**SJB SERVICES, INC.**

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 0.0 | 37.5 | 18.6 | 43.9 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 3 in. | 100.0 | | |
| 2 in. | 89.1 | | |
| .75 in. | 75.6 | | |
| #4 | 62.5 | | |
| #10 | 57.9 | | |
| #40 | 50.2 | | |
| #100 | 46.7 | | |
| #200 | 43.9 | | |

* (no specification provided)

**Soil Description**

90K N95 E84
Silty clayey gravel with sand

**Atterberg Limits**

PL= 17 LL= 23 PI= 6

**Coefficients**

$D_{85}$= 41.5 $D_{60}$= 3.10 $D_{50}$= 0.404
$D_{30}$= $D_{15}$= $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= GC-GM AASHTO=

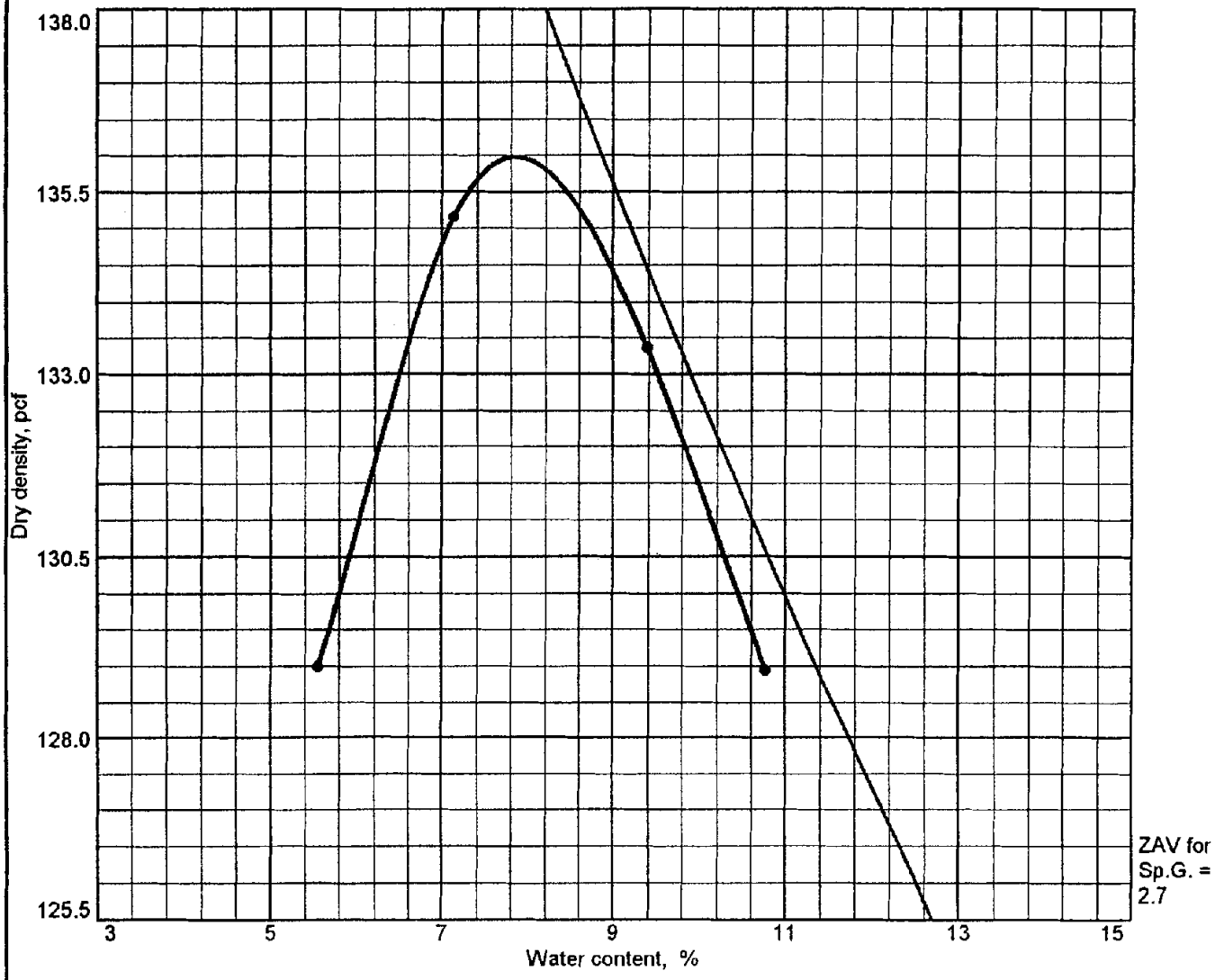
**Remarks**

**Sample No.:** 454 **Source of Sample:** Common Fill **Date:** Sept. 7, 2001
**Location:** **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover
**Project No:** 2009053

# COMPACTION TEST REPORT




**Test specification:** ASTM D 1557-78 Method D Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | GC-GM | | | 2.7 | 23 | 6 | 24.4 | 43.9 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 136.0 pcf<br>Optimum moisture = 7.9 % | 90K N95 E84<br>Silty clayey gravel with sand |

**Project No.** 2009053 **Client:** Marcy Excavation
**Project:** Cortland Landfill Cover

● **Source:** Common Fill **Sample No.:** 454

**Remarks:**

COMPACTION TEST REPORT

**SJB SERVICES, INC.**

# Appendix A

## Section: 1.B

## Common Fill Material

## Quality Assurance Testing

# SJB Services, Inc.

2415 N. Triphammer Rd., Suite 3
Ithaca, New York 14850
Telephone: (607) 266-0147
Fax: (607) 266-6409

## FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S052501 |
| Client: | Marcy Excavation Co. Inc. | Date: | 05-25-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | Cloudy | | |

| Test No. | Elevation | Location and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | Maxim (pcf) | |
| 1 | 1st Lift | 50' East of West Driveway & 100' North of East Hill | 12.0% | 147.2 | 135.2 | 139.7 | 96.8% |
| 2 | 1st Lift | 95' East of West Driveway & 60' North of East Hill | 12.6% | 145.4 | 132.8 | 139.7 | 95.1% |
| 3 | 1st Lift | 30' East of West Driveway & 25' North of East Hill | 9.3% | 146.0 | 136.7 | 139.7 | 97.9% |
| 4 | 1st Lift | 25' North of East Hill & 100' East of North Driveway | 12.1% | 148.1 | 132.1 | 139.7 | 94.6% |
| 5 | 1st Lift | 90' East of West of Driveway & 100' West of East Hill | 10.5% | 144.3 | 133.8 | 139.7 | 95.8% |
| | | | | | | | |
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| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 139.7 | 6.8 | Screened On Site Material | ASTM D 1557 |
| | | | |
| | | | |

REMARKS:

Gauge Model: Troxler 3411 B
Serial Number: 12455
Std. Counts : 2743-632
Technician: T. Wheeler

Respectfully submitted,
**SJB Services, Inc.**

T. Hamilton

Thomas A. Hamilton
Central Region Manager

**SJB Services, Inc.**

2415 N. Triphammer Rd., Suite 3
Ithaca, New York 14850
Telephone: (607) 266-0147
Fax: (607) 266-6409

# FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S052901 |
| Client: | Marcy Excavation Co. Inc. | Date: | 05-29-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | Sunny 60$^0$ | | |

| Test No. | Elevation | Location and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | Maxim (pcf) | |
| 1 | 2nd Lift | 135' North & 150' West of Existing Garage | 9.0% | 149.8 | 137.4 | 138.5 | 99.2% |
| 2 | 2nd Lift | 235' North & 150' West of Existing Garage | 8.7% | 144.9 | 133.3 | 138.5 | 96.2% |
| 3 | 2nd Lift | 310' North & 150' West of Existing Garage | 6.6% | 155.4 | 145.8 | 138.5 | 105.3% |
| 4 | 2nd Lift | 310' North & 80' West of Existing Garage | 8.6% | 141.0 | 129.7 | 138.5 | 93.6% |
| 5 | 2nd Lift | 400' North & 80' West of Existing Garage | 6.9% | 150.4 | 140.6 | 138.5 | 101.5% |
| 6 | 3rd Lift | 60' North & 80' West of Existing Garage | 10.3% | 142.6 | 129.3 | 138.5 | 93.4% |
| 7 | 3rd Lift | 60' North & 150' West of Existing Garage | 10.9% | 148.9 | 134.3 | 138.5 | 97.0% |
| 8 | 3rd Lift | 130' North & 120' West of Existing Garage | 8.5% | 149.1 | 137.4 | 138.5 | 99.2% |
| 9 | 3rd Lift | 140' North & 80' West of Existing Garage | 8.1% | 148.8 | 137.7 | 138.5 | 99.4% |
| 10 | 3rd Lift | 170' North & 150' West of Existing Garage | 8.5% | 144.2 | 132.8 | 138.5 | 95.9% |
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| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 139.7 | 6.8 | Screened On Site Material | ASTM D 1557 |
| 138.5 | 7.0 | Common Fill | ASTM D 1557 |
| | | | |

REMARKS:

Gauge Model: Troxler 3411 B
Serial Number: 10654
Std. Counts : 494-2405
Technician: R. Truex

Respectfully submitted,
**SJB Services, Inc.**

T. Hamilton

Thomas A. Hamilton
Central Region Manager

# SJB Services, Inc.

2415 N. Triphammer Rd., Suite 3
Ithaca, New York 14850
Telephone: (607) 266-0147
Fax: (607) 266-6409

## FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S053101 |
| Client: | Marcy Excavation Co. Inc. | Date: | 05-31-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | Partly Cloudy | | |

| Test No. | Elevation | Location and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | Maxim (pcf) | |
| 1 | 4th Lift | 17' West of East Bank & 37' Southeast of West Parking Lot | 7.3% | 141.3 | 131.7 | 139.7 | 94.3% |
| 2 | 4th Lift | 17' West of East Bank & 150' North of Garage | 9.3% | 139.1 | 127.2 | 139.7 | 91.1% |
| 3 | 4th Lift | 90' East of Job Trailer & 150' North of Garage | 7.6% | 139.7 | 129.8 | 139.7 | 92.9% |
| 4 | 4th Lift | 65' East of Road Way & 125' North of Garage | 7.5% | 142.1 | 132.2 | 139.7 | 94.6% |
| 5 | 4th Lift | 80' East of Road Way & 95' North of Garage | 6.5% | 146.2 | 137.3 | 139.7 | 98.3% |
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| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 139.7 | 6.8 | Screened On Site Material | ASTM D 1557 |
| | | | |
| | | | |

REMARKS:

Gauge Model: Troxler 3411 B
Serial Number: 14833
Std. Counts : 2713-611
Technician: T. Wheeler

Respectfully submitted,
**SJB Services, Inc.**

T. Hamilton

Thomas A. Hamilton
Central Region Manager

**SJB Services, Inc.**

2415 N. Triphammer Rd., Suite 3
Ithaca, New York 14850
Telephone: (607) 266-0147
Fax: (607) 266-6409

# FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S061201 |
| Client: | Marcy Excavation Co. Inc. | Date: | 06-12-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | Partly Sunny | | |

| Test No. | Elevation | Location and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | Maxim (pcf) | |
| 1 | 1st Lift | 40' North of South Driveway & 50' West of East Pond | 9.2% | 138.3 | 126.6 | 139.7 | 90.6% |
| 2 | 1st Lift | 80' North of S Driveway & 40' West of E Pond | 11.5% | 133.1 | 119.4 | 139.7 | 85.5% |
| 3 | 1st Lift | 40' North of S Driveway & 60' West of E Pond | 8.5% | 132.4 | 122.0 | 139.7 | 87.3% |
| 4 | 6th Lift | 50' North of South Driveway & 140' West of East Garage | 8.2% | 137.5 | 127.1 | 139.7 | 91.0% |
| 5 | 6th Lift | 50' North of South Driveway & 135' West of East Garage | 7.9% | 136.3 | 126.3 | 139.7 | 90.4% |
| 6 | 6th Lift | 70' North of South Driveway & 125' West of East Garage | 8.3% | 141.0 | 130.1 | 139.7 | 93.1% |
| 7 | 6th Lift | 80' North of South Driveway & 120' West of East Garage | 8.9% | 140.2 | 128.8 | 139.7 | 92.2% |
| 8 | 6th Lift | 50' North of South Driveway & 115' West of East Garage | 7.3% | 141.7 | 132.1 | 139.7 | 94.6% |
| 9 | 1st Lift | Retest of # 2 | 8.1% | 137.6 | 127.2 | 139.7 | 91.1% |
| 10 | 1st Lift | Retest of # 3 | 9.2% | 138.7 | 126.9 | 139.7 | 90.8% |
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| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 139.7 | 6.8 | Screened On Site Material from County Pile | ASTM D 1557 |
| | | | |
| | | | |

REMARKS:

Gauge Model: Troxler 3411 B
Serial Number: 13429
Std. Counts : 2259-637
Technician: T. Wheeler

Respectfully submitted,
**SJB Services, Inc.**

T. Hamilton

Thomas A. Hamilton
Central Region Manager

# SJB Services, Inc.

2415 N. Triphammer Rd., Suite 3
Ithaca, New York 14850
Telephone: (607) 266-0147
Fax: (607) 266-6409

## FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S061401 |
| Client: | Marcy Excavation Co. Inc. | Date: | 06-14-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | Partly Cloudy | | |

| Test No. | Elevation | Locations and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | Maxim (pcf) | |
| 1 | 7th Lift | 20' South of North Driveway & 90' West of East Road Way | 5.8% | 142.2 | 134.5 | 139.7 | 96.3% |
| 2 | 7th Lift | 48' South of North Driveway & 95' West of East Road Way | 6.5% | 143.7 | 134.9 | 139.7 | 96.6% |
| 3 | 7th Lift | 71' South of North Driveway & 85' West of East Road Way | 6.6% | 142.3 | 133.5 | 139.7 | 95.6% |
| 4 | 7th Lift | 150' North of South Garage & 90' West of East Road Way | 8.4% | 141.1 | 130.2 | 139.7 | 93.2% |
| 5 | 7th Lift | 138' North of South Garage & 88' West of East Road Way | 7.1% | 143.3 | 133.8 | 139.7 | 95.8% |
| 6 | 7th Lift | 118' North of South Garage & 93' West of East Road Way | 7.8% | 144.2 | 133.8 | 139.7 | 95.8% |
| 7 | 7th Lift | 108' North of South Garage & 103' West of East Road Way | 8.5% | 143.8 | 132.5 | 139.7 | 94.8% |
| 8 | 7th Lift | 88' North of South Garage & 108' West of East Road Way | 7.4% | 143.4 | 133.5 | 139.7 | 95.6% |
| 9 | 2nd Lift | 50' West of East Road Way & 90' East of West Pond | 6.6% | 149.6 | 140.3 | 139.7 | 100.4% |
| 10 | 2nd Lift | 73' West of East Road Way & 40' East of West Pond | 8.3% | 141.1 | 130.2 | 139.7 | 93.2% |
| 11 | 2nd Lift | 60' West of East Road Way & 50' East of West Pond | 10.7% | 143.5 | 129.6 | 139.7 | 92.8% |
| 12 | 3rd Lift | 50' West of East Road Way & 90' East of West Pond | 9.8% | 144.0 | 131.1 | 139.7 | 93.8% |
| 13 | 3rd Lift | 60' West of East Road Way & 50' East of West Pond | 9.8% | 138.9 | 126.5 | 139.7 | 90.6% |
| 14 | 3rd Lift | 70' West of East Road Way & 45' East of West Pond | 10.5% | 145.0 | 131.2 | 139.7 | 93.9% |
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| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 139.7 | 6.8 | Screened On Site Material from County Pile | ASTM D 1557 |
| | | | |
| | | | |

REMARKS:

Gauge Model: Troxler 3411 B
Serial Number: 13428
Std. Counts : 2190-596
Technician: T. Wheeler

Respectfully submitted,
**SJB Services, Inc.**

T. Hamilton

Thomas A. Hamilton
Central Region Manager

# SJB Services, Inc.

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Telephone: (607) 266-0147
Fax: (607) 266-6409


## FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S061801 |
| Client: | Marcy Excavation Co. Inc. | Date: | 06-18-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | Sunny | | |

| Test No. | Elevation | Locations and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | Maxim (pcf) | |
| 1 | 8th Lift | 50' North of South Road Way & 115' West of East Garage | 8.8% | 144.4 | 132.7 | 139.7 | 95.0% |
| 2 | 8th Lift | 45' North of South Road Way & 125' West of East Garage | 9.4% | 142.9 | 130.6 | 139.7 | 93.5% |
| 3 | 8th Lift | 65' North of South Road Way & 120' West of East Garage | 7.7% | 142.1 | 132.0 | 139.7 | 94.5% |
| 4 | 8th Lift | 70' North of South Road Way & 115' West of East Garage | 7.6% | 142.1 | 132.1 | 139.7 | 94.6% |
| 5 | 8th Lift | 35' North of South Road Way & 225' West of East Garage | 7.2% | 142.4 | 132.7 | 139.7 | 95.0% |
| 6 | 4th Lift | 50' West of East Pond & 80' East of West Roadway | 8.8% | 146.4 | 134.6 | 139.7 | 96.3% |
| 7 | 4th Lift | 40' West of East Pond & 95' East of West Roadway | 7.7% | 143.9 | 133.6 | 139.7 | 95.6% |
| 8 | 4th Lift | 70' West of East Pond & 35' East of West Roadway | 8.2% | 145.6 | 134.6 | 139.7 | 96.3% |
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| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 139.7 | 6.8 | Screened On Site Material from County Pile | ASTM D 1557 |
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REMARKS:

Gauge Model: Troxler 3411 B
Serial Number: 13428
Std. Counts : 2179-603
Technician: T. Wheeler

Respectfully submitted,
**SJB Services, Inc.**

T. Hamilton

Thomas A. Hamilton
Central Region Manager

**SJB Services, Inc.**

2415 N. Triphammer Rd., Suite 3
Ithaca, New York 14850
Telephone: (607) 266-0147
Fax: (607) 266-6409

# FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S061901 |
| Client: | Marcy Excavation Co. Inc. | Date: | 06-19-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | Clear | | |

| Test No. | Elevation | Locations and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | Maxim (pcf) | |
| 1 | 9th Lift | 180' North & 89' West of Utility Building Northwest Corner | 5.8% | 136.6 | 129.1 | 136.4 | 94.6% |
| 2 | 9th Lift | 102' North & 93' West of Utility Building Northwest Corner | 6.0% | 137.0 | 129.2 | 136.4 | 94.7% |
| 3 | 9th Lift | 81' North & 63' West of Utility Building Northwest Corner | 6.7% | 145.3 | 136.1 | 136.4 | 99.8% |
| 4 | 9th Lift | 36' North & 63' West of Utility Building Northwest Corner | 6.4% | 139.3 | 131.0 | 136.4 | 96.0% |
| 5 | 9th Lift | 33' North & 96' West of Utility Building Northwest Corner | 5.3% | 138.4 | 131.4 | 136.4 | 96.3% |
| 6 | 5th Lift | 28' North & 37' West of Northwest Corner of Pond | 8.4% | 146.8 | 135.4 | 136.4 | 99.3% |
| 7 | 5th Lift | 10' North & 52' West of Northwest Corner of Pond | 6.6% | 133.1 | 124.9 | 136.4 | 91.6% |
| 8 | 5th Lift | 31' South & 66' West of Northwest Corner of Pond | 6.2% | 138.6 | 130.5 | 136.4 | 95.7% |
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| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 136.4 | 7.0 | Common Fill | ASTM D 1557 |
| | | | |
| | | | |

REMARKS:

Gauge Model: Troxler 3411 B
Serial Number: 12455
Std. Counts : 2751-610
Technician: D. Jennings

Respectfully submitted,
**SJB Services, Inc.**

T. Hamilton

Thomas A. Hamilton
Central Region Manager

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## FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S070501 |
| Client: | Marcy Excavation Co. Inc. | Date: | 07-05-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | Sunny | | |

| Test No. | Elevation | Locations and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | Maxim (pcf) | |
| 1 | 1st Lift | 100' West of Southwest Corner of 3 Stall Garage | 8.7% | 147.6 | 135.7 | 139.3 | 97.4% |
| 2 | 1st Lift | 100' West of Center Line of South Garage Door | 8.5% | 148.6 | 137.0 | 139.3 | 98.3% |
| 3 | 1st Lift | 100' West of Center Line of Middle Garage Bay Door | 8.2% | 143.5 | 132.6 | 139.3 | 95.2% |
| 4 | 2nd Lift | 50' West of Southwest Corner of 3 Stall Garage | 10.2% | 146.3 | 132.7 | 139.3 | 95.3% |
| 5 | 2nd Lift | 50' West of Center Line of Middle Garage Door | 10.1% | 150.4 | 136.6 | 139.3 | 98.1% |
| 6 | 2nd Lift | 50' West of Center Line of South Garage | 10.3% | 147.9 | 134.1 | 139.3 | 96.3% |
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| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 139.3 | 7.5 | Existing On Site Material | ASTM D 1557 |
| | | | |
| | | | |

REMARKS:

Gauge Model: Troxler 3411 B
Serial Number: 10654
Std. Counts : 2386-492
Technician: R. Truex

Respectfully submitted,
**SJB Services, Inc.**

T. Hamilton

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Fax: (607) 266-6409


## FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S071901 |
| Client: | Marcy Excavation Co. Inc. | Date: | 07-19-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | Sunny | | |

| Test No. | Elevation | Locations and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | maxim (pcf) | |
| 1 | 4th Lift | 20' West of North Garage Door & 100' East of W Driveway | 8.4% | 143.8 | 132.7 | 139.3 | 95.3% |
| 2 | 4th Lift | 30' West of Center Garage Door & 90' East of W Driveway | 6.9% | 144.7 | 135.4 | 139.3 | 97.2% |
| 3 | 4th Lift | 24' West of South Garage Door & 96' East of W Driveway | 8.6% | 145.0 | 133.5 | 139.3 | 95.8% |
| 4 | 3rd Lift | 47' West of S Corner of Garage & 72' East of W Driveway | 9.0% | 148.2 | 137.2 | 139.3 | 98.5% |
| 5 | 3rd Lift | 50' West of South Garage Door & 60' East of W Driveway | 8.3% | 144.5 | 133.4 | 139.3 | 95.8% |
| 6 | 3rd Lift | 55' West of Center Garage Door & 50' East of W Driveway | 8.3% | 140.6 | 129.9 | 132.4 | 98.1% |
| 7 | -1.0 | N 10 500 E 8900 | 5.9% | 133.4 | 125.9 | 128.9 | 97.7% |
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| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 139.3 | 7.5 | Existing On Site Material | ASTM D 1557 |
| 128.9 | 8.5 | Common Fill | ASTM D 1557 |
| 132.4 | 9.2 | Common Fill | ASTM D 1557 |

REMARKS:

Gauge Model: Troxler 3411 B
Serial Number: 13428
Std. Counts : 2188-604
Technician: T. Wheeler

Respectfully submitted,
**SJB Services, Inc.**

T. Hamilton

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# FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S072601 |
| Client: | Marcy Excavation Co. Inc. | Date: | 07-26-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | Cloudy | | |

| Test No. | Elevation | Locations and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | maxim (pcf) | |
| 1 | FG | 7' West of Center Line Middle Door of Garage | 3.8% | 145.4 | 140.1 | 145.6 | 96.2% |
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| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 145.6 | 4.6 | Granular Fill | ASTM D 1557 |
| | | | |
| | | | |

REMARKS:

Gauge Model: Troxler 3411 B
Serial Number: 10654
Std. Counts : 494-2835
Technician: R. Truex

Respectfully submitted,
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T. Hamilton

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# FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S090601 |
| Client: | Marcy Excavation Co. Inc. | Date: | 09-06-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | | | |

| Test No. | Elevation | Locations and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | maxim (pcf) | |
| 1 | FG | 11850, 8850 #1 | 4.8% | 129.8 | 123.8 | 135.7 | 91.2% |
| 2 | FG | 11850, 885 #2 | 4.8% | 134.4 | 128.3 | 135.7 | 94.5% |
| 3 | FG | 11850, 8850 #3 | 4.6% | 134.1 | 128.3 | 135.7 | 94.5% |
| 4 | FG | 11850, 8850 #4 | 5.8% | 135.6 | 128.1 | 135.7 | 94.4% |
| 5 | FG | 11850, 8850 #5 | 5.0% | 128.8 | 122.7 | 135.7 | 90.4% |
| 6 | FG | 11850, 8850 #6 | 5.8% | 131.0 | 123.9 | 135.7 | 91.3% |
| 7 | FG | 11850, 8850 #7 | 5.0% | 143.7 | 136.9 | 140.2 | 97.6% |
| 8 | FG | 11850, 8850 #8 | 4.6% | 141.4 | 135.1 | 140.2 | 96.4% |
| 9 | FG | 11850, 8850 #9 | 4.6% | 135.6 | 129.8 | 140.2 | 92.6% |
| 10 | FG | 11850, 8850 #10 | 4.6% | 130.1 | 124.4 | 135.7 | 91.7% |
| 11 | FG | 11850, 8850 #11 | 5.6% | 133.2 | 126.2 | 135.7 | 93.0% |
| 12 | FG | 11850, 8850 #12 | 4.6% | 134.7 | 128.8 | 135.7 | 94.9% |
| 13 | FG | 11850, 8850 #13 | 4.3% | 132.7 | 127.2 | 135.7 | 93.7% |
| 14 | FG | 11850, 8850 #14 | 3.7% | 132.0 | 127.3 | 135.7 | 93.8% |
| 15 | FG | 11850, 8850 #15 | 5.2% | 138.4 | 131.5 | 135.7 | 96.9% |
| 16 | FG | 11850, 8850 #16 | 4.3% | 137.5 | 131.9 | 135.7 | 97.2% |
| 17 | FG | 11850, 8850 #17 | 4.0% | 130.7 | 125.6 | 135.7 | 92.6% |
| 18 | FG | 11850, 8850 #18 | 5.5% | 133.3 | 126.4 | 135.7 | 93.1% |
| 19 | FG | 11850, 8850 #19 | 5.0% | 135.3 | 128.9 | 135.7 | 95.0% |
| 20 | FG | 11850, 8850 #20 | 4.4% | 132.4 | 126.9 | 135.7 | 93.5% |

| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 140.2 | 8.5 | Common Fill | ASTM D 1557 |
| 135.7 | 7.4 | Common Fill | ASTM D 1557 |
| | | | |

REMARKS: FG: Finish Grade

Gauge Model: Troxler 3440
Serial Number: 14656
Std. Counts : 2696-521
Technician: R. Terwillegar

Respectfully submitted,
**SJB Services, Inc.**

Mike Warner
Testing Manager

**SJB Services, Inc.**

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## FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S090601 |
| Client: | Marcy Excavation Co. Inc. | Date: | 09-06-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | | | |

| Test No. | Elevation | Locations and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | maxim (pcf) | |
| 21 | FG | 11850, 8850 #21 | 4.8% | 129.8 | 123.8 | 135.7 | 91.2% |
| 22 | FG | 11850, 8850 #22 | 4.4% | 139.4 | 133.5 | 135.7 | 98.4% |
| 23 | FG | 11850, 8850 #23 | 4.9% | 129.9 | 123.8 | 135.7 | 91.2% |
| 24 | FG | 11850, 8850 #24 | 4.4% | 139.1 | 133.2 | 135.7 | 98.2% |
| 25 | FG | 11850, 8850 #25 | 5.4% | 135.4 | 128.5 | 135.7 | 94.7% |
| 26 | FG | 11850, 8850 #26 | 5.3% | 131.0 | 124.5 | 135.7 | 91.7% |
| 27 | FG | 11850, 8850 #27 | 6.0% | 132.9 | 125.5 | 135.7 | 92.5% |
| 28 | FG | 11850, 8850 #28 | 4.1% | 128.5 | 123.5 | 135.7 | 91.0% |
| 29 | FG | 11850, 8850 #29 | 4.2% | 135.6 | 130.2 | 135.7 | 95.9% |
| 30 | FG | 11850, 8850 #30 | 4.1% | 133.2 | 127.9 | 135.7 | 94.3% |
| 31 | FG | 11850, 8850 #31 | 5.6% | 131.0 | 124.1 | 135.7 | 91.5% |
| 32 | FG | 11850, 8850 #32 | 4.1% | 130.0 | 124.9 | 135.7 | 92.0% |
| 33 | FG | 11850, 8850 #33 | 4.6% | 137.3 | 131.4 | 135.7 | 96.8% |
| 34 | FG | 11850, 8850 #34 | 4.5% | 128.0 | 122.4 | 135.7 | 90.2% |
| 35 | FG | 11850, 8850 #35 | 4.3% | 130.9 | 125.5 | 135.7 | 92.5% |
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| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 140.2 | 8.5 | Common Fill | ASTM D 1557 |
| 135.7 | 7.4 | Common Fill | ASTM D 1557 |
| | | | |

REMARKS: FG: Finish Grade

Gauge Model: Troxler 3440
Serial Number: 14656
Std. Counts : 2696-521
Technician: R. Terwillegar

Respectfully submitted,
**SJB Services, Inc.**

Mike Warner
Testing Manager

# SJB Services, Inc.

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Fax: (607) 266-6409


## FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S091201 |
| Client: | Marcy Excavation Co. Inc. | Date: | 09-12-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | Partly Sunny | | |

| Test No. | Elevation | Locations and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | maxim (pcf) | |
| 1 | FG | North 10900 & East 9100 #36 | 4.8% | 138.6 | 133.2 | 140.2 | 95.0% |
| 2 | FG | North 10500 & East 9200 #37 | 9.0% | 146.2 | 134.1 | 140.2 | 95.6% |
| 3 | FG | North 10500 & East 9300 #38 | 8.4% | 138.5 | 127.8 | 140.2 | 91.2% |
| 4 | FG | North 10500 & East 9100 #39 | 8.5% | 139.5 | 128.6 | 140.2 | 91.7% |
| 5 | FG | North 10600 & East 9300 #40 | 5.7% | 134.2 | 126.9 | 140.2 | 90.5% |
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| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 140.2 | 8.5 | Common Fill | ASTM D 1557 |
| | | | |
| | | | |

REMARKS: FG: Finish Grade

Gauge Model: Troxler 3411B
Serial Number: 13428
Std. Counts : 2186-586
Technician: T. Wheeler

Respectfully submitted,
SJB Services, Inc.

Mike Warner
Testing Manager

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# FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S091401 |
| Client: | Marcy Excavation Co. Inc. | Date: | 09-14-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | | | |

| Test No. | Elevation | Locations and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | maxim (pcf) | |
| 41 | | 50' North & 30' East of Station N10300 E8200 | 6.6% | 136.5 | 128.0 | 140.2 | 91.3% |
| 42 | | 4' North & 30' East of Station N10300 E8400 | 7.4% | 134.6 | 125.3 | 135.7 | 92.3% |
| 43 | | 27' North & 38' East of Station N10300 E8500 | 6.3% | 134.2 | 126.2 | 135.7 | 93.0% |
| 44 | | 30' North & 47' West of Station N10300 E8500 | 6.8% | 131.4 | 128.6 | 135.7 | 94.8% |
| 45 | | 21' North & 69' West of Station N10300 E8600 | 8.2% | 137.5 | 127.1 | 135.7 | 93.7% |
| 46 | | 18' South & 39' West of Station N10500 E9000 | 8.7% | 135.2 | 124.4 | 135.7 | 91.7% |
| 47 | | 21' North & 33' West of Station N10400 E9100 | 10.1% | 143.8 | 130.6 | 135.7 | 96.2% |
| 48 | | 15' North & 39' West of Station N10400 E9200 | 10.3% | 135.7 | 123.0 | 135.7 | 90.6% |
| 49 | | 41' South & 15' East of Station N10300 E8200 | 7.9% | 136.8 | 126.8 | 135.7 | 93.4% |
| 50 | | 31' North & 36' East of Station N10200 E8300 | 7.1% | 133.3 | 124.5 | 135.7 | 91.7% |
| 51 | | 24' North & 42' West of Station N10200 E8400 | 7.6% | 138.1 | 128.4 | 135.7 | 94.6% |
| 52 | | 18' North & 27' West of Station N10200 E8400 | 5.8% | 131.1 | 123.9 | 135.7 | 91.3% |
| 53 | | 33' North & 39' West of Station N10100 E8300 | 6.9% | 136.1 | 127.3 | 135.7 | 93.8% |
| 54 | | 45' North & 2' West of Station N10100 E8300 | 7.3% | 138.7 | 129.3 | 135.7 | 95.3% |
| 55 | | 57' North & 15' West of Station N10100 E8200 | 6.2% | 144.9 | 136.5 | 140.2 | 97.4% |
| 56 | | 30' North & 30' West of Station N10100 E8100 | 6.4% | 138.3 | 130.0 | 140.2 | 92.7% |
| 57 | | 60' North & 33' West of Station N10000 E8100 | 5.9% | 135.4 | 127.8 | 140.2 | 91.2% |
| 58 | | 45' North & 39' West of Station N10000 E8200 | 6.2% | 140.5 | 132.2 | 140.2 | 94.3% |
| 59 | | 43' North & 42' West of Station N10000 E8300 | 6.1% | 135.5 | 127.7 | 140.2 | 91.1% |
| 60 | | 33' North & 54' West of Station N10000 E8400 | 5.7% | 142.8 | 135.0 | 140.2 | 96.3% |

| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 140.2 | 8.5 | Common Fill | ASTM D 1557 |
| 135.7 | 7.4 | Common Fill | ASTM D 1557 |
| | | | |

REMARKS:

Gauge Model: Troxler 3411B
Serial Number: 12475
Std. Counts : 2721-603
Technician: D. Jennings

Respectfully submitted,
SJB Services, Inc.

Mike Warner
Testing Manager

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## FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S091401 |
| Client: | Marcy Excavation Co. Inc. | Date: | 09-14-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | | | |

| Test No. | Elevation | Locations and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | maxim (pcf) | |
| 61 | | 51' North & 33' East of Station N10000 E8400 | 6.0% | 145.8 | 137.6 | 140.2 | 98.1% |
| 62 | | 60' North & 27' East of Station N9900 E8400 | 5.4% | 142.6 | 135.4 | 140.2 | 96.6% |
| 63 | | 63' North & 26' West of Station N9900 E8400 | 6.5% | 141.3 | 132.7 | 140.2 | 94.7% |
| 64 | | 12' North & 12' West of Station N9900 E8300 | 6.1% | 139.8 | 131.8 | 140.2 | 94.0% |
| 65 | | 18' North & 24' West of Station N9900 E8200 | 6.0% | 147.4 | 139.0 | 140.2 | 99.1% |
| 66 | | 54' North & 21' West of Station N9900 E8100 | 5.6% | 134.1 | 126.9 | 140.2 | 90.5% |
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| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 140.2 | 8.5 | Common Fill | ASTM D 1557 |
| 135.7 | 7.4 | Common Fill | ASTM D 1557 |
| | | | |

REMARKS:

Gauge Model: Troxler 3411B
Serial Number: 12475
Std. Counts : 2721-603
Technician: D. Jennings

Respectfully submitted,
SJB Services, Inc.

Mike Warner
Testing Manager

**SJB Services, Inc.**

2415 N. Triphammer Rd., Suite 3
Ithaca, New York 14850
Telephone: (607) 266-0147
Fax: (607) 266-6409

# FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S092801 |
| Client: | Marcy Excavation Co. Inc. | Date: | 09-28-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | Cloudy 40$^0$ | | |

| Test No. | Elevation | Locations and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | maxim (pcf) | |
| 1 | FL | # 67 | 9.3% | 134.3 | 122.9 | 135.7 | 90.6% |
| 2 | FL | # 68 | 7.6% | 132.9 | 123.6 | 135.7 | 91.1% |
| 3 | FL | # 69 | 8.6% | 140.0 | 128.9 | 140.2 | 91.9% |
| 4 | FL | # 70 | 8.5% | 136.4 | 125.7 | 135.7 | 92.6% |
| 5 | FL | # 71 | 7.3% | 142.3 | 132.6 | 140.2 | 94.6% |
| 6 | FL | # 72 | 8.5% | 132.5 | 122.1 | 135.7 | 90.0% |
| 7 | FL | # 73 | 9.0% | 142.9 | 131.1 | 140.2 | 93.5% |
| 8 | FL | # 74 | 8.2% | 137.2 | 126.8 | 140.2 | 90.4% |
| 9 | FL | # 75 | 8.9% | 135.6 | 124.5 | 135.7 | 91.7% |
| 10 | FL | # 76 | 8.6% | 137.6 | 126.7 | 135.7 | 93.4% |
| 11 | FL | # 77 | 8.6% | 136.7 | 125.8 | 135.7 | 92.7% |
| 12 | FL | # 78 | 7.1% | 136.5 | 127.6 | 135.7 | 94.0% |
| 13 | FL | # 79 | 6.8% | 139.7 | 130.8 | 140.2 | 93.3% |
| 14 | FL | # 80 | 8.6% | 138.1 | 127.1 | 140.2 | 90.7% |
| 15 | FL | # 81 | 7.8% | 145.2 | 134.6 | 140.2 | 96.0% |
| 16 | FL | # 82 | 7.7% | 143.9 | 133.6 | 140.2 | 95.3% |
| 17 | FL | # 83 | 8.4% | 136.2 | 125.7 | 135.7 | 92.6% |
| 18 | FL | # 84 | 7.8% | 143.3 | 132.9 | 140.2 | 94.8% |
| 19 | FL | # 85 | 6.7% | 139.7 | 130.9 | 140.2 | 93.4% |
| 20 | FL | # 86 | 8.3% | 139.0 | 128.4 | 140.2 | 91.6% |

| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 140.2 | 8.5 | Common Fill | ASTM D 1557 |
| 135.7 | 7.4 | Common Fill | ASTM D 1557 |
| | | | |

REMARKS: FL: Final Lift

Gauge Model: Troxler 3440
Serial Number: 14656
Std. Counts : 524-2672
Technician: R. Terwillegar

Respectfully submitted,
**SJB Services, Inc.**

Mike Warner
Testing Manager

**SJB Services, Inc.**

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Ithaca, New York 14850
Telephone: (607) 266-0147
Fax: (607) 266-6409

# FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S092801 |
| Client: | Marcy Excavation Co. Inc. | Date: | 09-28-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | Cloudy 40$^0$ | | |

| Test No. | Elevation | Locations and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | maxim (pcf) | |
| 21 | FL | # 87 | 6.7% | 144.3 | 135.3 | 140.2 | 96.5% |
| 22 | FL | # 88 | 9.5% | 135.1 | 123.4 | 135.7 | 90.9% |
| 23 | FL | # 89 | 7.9% | 134.7 | 124.9 | 135.7 | 92.0% |
| 24 | FL | # 90 | 8.1% | 133.3 | 123.4 | 135.7 | 90.9% |
| 25 | FL | # 91 | 9.5% | 137.8 | 125.8 | 135.7 | 92.7% |
| 26 | FL | # 92 | 7.4% | 140.1 | 130.5 | 140.2 | 93.1% |
| 27 | FL | # 93 | 7.0% | 141.8 | 132.6 | 140.2 | 94.6% |
| 28 | FL | # 94 | 8.7% | 138.6 | 127.5 | 140.2 | 90.9% |
| 29 | FL | # 95 | 7.8% | 137.0 | 127.5 | 140.2 | 90.9% |
| 30 | FL | # 96 | 8.3% | 139.8 | 129.0 | 140.2 | 92.0% |
| 31 | FL | # 97 | 7.9% | 135.7 | 125.8 | 135.7 | 92.7% |
| 32 | FL | # 98 | 7.0% | 141.7 | 132.4 | 140.2 | 94.4% |
| 33 | FL | # 99 | 7.6% | 143.9 | 133.7 | 140.2 | 95.4% |
| 34 | FL | # 100 | 6.7% | 145.5 | 136.3 | 140.2 | 97.2% |
| 35 | FL | # 101 | 8.1% | 140.1 | 129.5 | 140.2 | 92.4% |
| 36 | FL | # 102 | 8.3% | 145.4 | 134.3 | 140.2 | 95.8% |
| 37 | FL | # 103 | 8.6% | 142.8 | 131.5 | 135.7 | 96.9% |
| 38 | FL | # 104 | 8.9% | 137.9 | 126.6 | 135.7 | 93.3% |
| 39 | FL | # 105 | 9.4% | 137.3 | 125.5 | 135.7 | 92.5% |
| 40 | FL | # 106 | 8.4% | 139.7 | 128.9 | 135.7 | 95.0% |

| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 140.2 | 8.5 | Common Fill | ASTM D 1557 |
| 135.7 | 7.4 | Common Fill | ASTM D 1557 |
| | | | |

REMARKS: FL: Final Lift

Gauge Model: Troxler 3440
Serial Number: 14656
Std. Counts : 524-2672
Technician: R. Terwillegar

Respectfully submitted,
**SJB Services, Inc.**

Mike Warner
Testing Manager

**SJB Services, Inc.**

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Fax: (607) 266-6409

# FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S092801 |
| Client: | Marcy Excavation Co. Inc. | Date: | 09-28-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | Cloudy 40$^0$ | | |

| Test No. | Elevation | Locations and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | maxim (pcf) | |
| 41 | FL | # 107 | 8.3% | 144.1 | 133.0 | 140.2 | 94.9% |
| 42 | FL | # 108 | 9.7% | 140.0 | 127.7 | 140.2 | 91.1% |
| 43 | FL | # 109 | 7.9% | 144.4 | 133.8 | 140.2 | 95.4% |
| 44 | FL | # 110 | 8.2% | 140.5 | 129.9 | 140.2 | 92.7% |
| 45 | FL | # 111 | 9.0% | 137.4 | 126.0 | 135.7 | 92.9% |
| 46 | FL | # 112 | 8.2% | 140.9 | 130.2 | 140.2 | 92.9% |
| 47 | FL | # 113 | 9.4% | 134.4 | 122.9 | 135.7 | 90.6% |
| 48 | FL | # 114 | 8.8% | 140.6 | 129.2 | 140.2 | 92.2% |
| 49 | FL | # 115 | 9.0% | 133.8 | 122.7 | 135.7 | 90.4% |
| 50 | FL | # 116 | 8.8% | 134.5 | 123.6 | 135.7 | 91.1% |
| 51 | FL | # 117 | 8.1% | 139.3 | 128.7 | 135.7 | 94.8% |
| | | | | | | | |
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| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 140.2 | 8.5 | Common Fill | ASTM D 1557 |
| 135.7 | 7.4 | Common Fill | ASTM D 1557 |
| | | | |

REMARKS: FL: Final Lift

Gauge Model: Troxler 3440
Serial Number: 14656
Std. Counts : 524-2672
Technician: R. Terwillegar

Respectfully submitted,
**SJB Services, Inc.**

Mike Warner
Testing Manager

**SJB Services, Inc.**

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# FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S100301 |
| Client: | Marcy Excavation Co. Inc. | Date: | 10-03-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | | | |

| Test No. | Elevation | Locations and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | maxim (pcf) | |
| 118 | | #118 | 7.7% | 144.2 | 133.9 | 140.2 | 95.5% |
| 119 | | #119 | 8.2% | 141.6 | 130.8 | 140.2 | 93.3% |
| 120 | | #120 | 7.1% | 139.5 | 130.2 | 140.2 | 92.9% |
| 121 | | #121 | 8.1% | 137.6 | 127.3 | 140.2 | 90.8% |
| 122 | | #122 | 8.1% | 131.3 | 126.1 | 135.7 | 92.9% |
| 123 | | #123 | 7.3% | 132.2 | 123.2 | 135.7 | 90.8% |
| 124 | | #124 | 9.2% | 134.5 | 123.2 | 135.7 | 90.8% |
| 125 | | #125 | 8.2% | 132.5 | 122.4 | 135.7 | 90.2% |
| 126 | | #126 | 6.7% | 136.1 | 127.6 | 135.7 | 94.0% |
| 127 | | #127 | 6.6% | 141.7 | 132.9 | 140.2 | 94.8% |
| 128 | | #128 | 7.3% | 141.7 | 132.1 | 140.2 | 94.2% |
| 129 | | #129 | 7.8% | 139.1 | 130.1 | 140.2 | 92.8% |
| 130 | | #130 | 8.2% | 144.1 | 133.2 | 140.2 | 95.0% |
| 131 | | #131 | 8.2% | 138.3 | 127.8 | 140.2 | 91.2% |
| 132 | | #132 | 6.9% | 134.5 | 126.2 | 140.2 | 90.0% |
| 133 | | #133 | 7.6% | 137.5 | 127.7 | 140.2 | 91.1% |
| 134 | | #134 | 6.5% | 131.1 | 123.1 | 135.7 | 90.7% |
| 135 | | #135 | 6.5% | 135.3 | 127.1 | 135.7 | 93.7% |
| 136 | | #136 | 6.5% | 131.3 | 123.3 | 135.7 | 90.9% |
| | | | | | | | |

| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 135.7 | 7.4 | Common Fill | ASTM D 1557 |
| 140.2 | 8.5 | Common Fill | ASTM D 1557 |
| | | | |

REMARKS:

Gauge Model: Troxler 3440
Serial Number: 14656
Std. Counts : 528(1.1) 2688(0.4)
Technician: R. Terwilligar

Respectfully submitted,
**SJB Services, Inc.**

Mike Warner
Testing Manager

# SJB Services, Inc.

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Ithaca, New York 14850
Telephone: (607) 266-0147
Fax: (607) 266-6409


## FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S101901 |
| Client: | Marcy Excavation Co. Inc. | Date: | 10-19-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | Cloudy | | |

| Test No. | Elevation | Locations and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | maxim (pcf) | |
| 1 | FL | #136 | 9.3% | 144.8 | 132.5 | 135.7 | 97.6% |
| 2 | FL | #137 | 9.0% | 143.9 | 132.0 | 135.7 | 97.3% |
| 3 | FL | #138 | 8.0% | 135.7 | 125.6 | 135.7 | 92.6% |
| 4 | FL | #139 | 9.2% | 140.4 | 128.6 | 135.7 | 94.8% |
| 5 | FL | #140 | 8.9% | 138.6 | 127.2 | 135.7 | 93.7% |
| 6 | FL | #141 | 8.1% | 134.8 | 124.7 | 135.7 | 91.9% |
| 7 | FL | #142 | 8.5% | 142.9 | 131.7 | 135.7 | 97.1% |
| 8 | FL | #143 | 8.6% | 142.7 | 131.4 | 135.7 | 96.8% |
| 9 | FL | #144 | 9.8% | 144.9 | 131.9 | 135.7 | 97.2% |
| 10 | FL | #145 | 9.0% | 145.9 | 133.8 | 135.7 | 98.6% |
| 11 | FL | #146 | 10.0% | 140.4 | 127.7 | 135.7 | 94.1% |
| 12 | FL | #147 | 8.8% | 142.6 | 131.0 | 135.7 | 96.5% |
| 13 | FL | #148 | 11.2% | 146.1 | 131.4 | 135.7 | 96.8% |
| 14 | FL | #149 | 10.1% | 142.3 | 129.2 | 135.7 | 95.2% |
| 15 | FL | #150 | 9.2% | 141.5 | 129.6 | 135.7 | 95.5% |
| 16 | FL | #151 | 7.1% | 149.9 | 140.0 | 140.2 | 99.9% |
| 17 | FL | #152 | 7.6% | 146.3 | 135.9 | 140.2 | 96.9% |
| 18 | FL | #153 | 8.3% | 143.0 | 132.0 | 140.2 | 94.2% |
| 19 | FL | #154 | 9.5% | 140.4 | 128.2 | 140.2 | 91.4% |
| 20 | FL | #155 | 8.8% | 141.8 | 130.3 | 140.2 | 92.9% |

| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 135.7 | 7.4 | Common Fill | ASTM D 1557 |
| 140.2 | 8.5 | Common Fill | ASTM D 1557 |
| | | | |

REMARKS: FL=Final Lift

Gauge Model: Troxler 3411-B
Serial Number: 13428
Std. Counts : 2167/595
Technician: T. Wheeler

Respectfully submitted,
SJB Services, Inc.

Mike Warner
Testing Manager

**SJB Services, Inc.**

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Fax: (607) 266-6409

# FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S101901 |
| Client: | Marcy Excavation Co. Inc. | Date: | 10-19-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | Cloudy | | |

| Test No. | Elevation | Locations and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | maxim (pcf) | |
| 21 | FL | #156 | 7.6% | 140.0 | 130.1 | 140.2 | 92.8% |
| 22 | FL | #157 | 7.3% | 142.5 | 132.8 | 140.2 | 94.7% |
| 23 | FL | #158 | 8.7% | 144.1 | 132.5 | 140.2 | 94.5% |
| 24 | FL | #159 | 7.3% | 143.1 | 133.3 | 140.2 | 95.1% |
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| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 135.7 | 7.4 | Common Fill | ASTM D 1557 |
| 140.2 | 8.5 | Common Fill | ASTM D 1557 |
| | | | |

REMARKS: FL=Final Lift

Gauge Model: Troxler 3411-B
Serial Number: 13428
Std. Counts : 2167/595
Technician: T. Wheeler

Respectfully submitted,
**SJB Services, Inc.**

Mike Warner
Testing Manager

# SJB Services, Inc.

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## FIELD IN-PLACE DENSITY TEST REPORT

| | | | |
|---|---|---|---|
| Project: | Cortland County Landfill | Report No. | S102301 |
| Client: | Marcy Excavation Co. Inc. | Date: | 10-23-01 |
| Contractor | Marcy Excavation Co. Inc. | Project No. | 2009053 |
| Weather | Windy | | |

| Test No. | Elevation | Locations and Comments | In-place moisture | Density | | | % compact |
|---|---|---|---|---|---|---|---|
| | | | | Wet (pcf) | Dry (pcf) | maxim (pcf) | |
| 160 | FG | N 9600 E 8600 SE | 10.0% | 138.8 | 126.2 | 140.2 | 90.0% |
| 161 | FG | N 9600 E 8600 NE | 10.0% | 143.4 | 130.4 | 140.2 | 93.0% |
| 162 | FG | N 9700 E 8600 NE | 10.4% | 135.6 | 122.9 | 135.7 | 90.6% |
| 163 | FG | N 9800 E 8600 NE | 11.2% | 138.8 | 124.8 | 135.7 | 92.0% |
| 164 | FG | N 9900 E 8600 NE | 8.3% | 142.8 | 131.8 | 140.2 | 94.0% |
| 165 | FG | N 10,100 E 9100 NE | 8.8% | 134.8 | 123.9 | 135.7 | 91.3% |
| 166 | FG | N 10,100 E 9200 NE | 10.0% | 140.1 | 127.3 | 140.2 | 90.8% |
| 167 | FG | N 10,100 E 9200 SE | 9.9% | 139.7 | 127.1 | 140.2 | 90.7% |
| 168 | FG | N 10,100 E 9100 SE | 8.7% | 139.3 | 128.4 | 140.2 | 91.6% |
| 169 | FG | N 10,000 E 9100 SE | 9.3% | 139.6 | 127.8 | 140.2 | 91.2% |
| 170 | FG | N 10,000 E 9200 SE | 7.5% | 141.8 | 131.9 | 140.2 | 94.1% |
| 171 | FG | N 9900 E 9200 SE | 7.7% | 137.6 | 127.8 | 140.2 | 91.2% |
| 172 | FG | N 9900 E 9100 SE | 11.3% | 141.3 | 127.0 | 140.2 | 90.6% |
| 173 | FG | N 9800 E 9100 SE | 9.1% | 141.4 | 129.5 | 140.2 | 92.4% |
| 174 | FG | N 9700 E 9100 SE | 9.1% | 144.2 | 134.7 | 140.2 | 96.1% |
| 175 | FG | N 9500 E 8100 SW | 7.7% | 145.4 | 135.0 | 140.2 | 96.3% |
| 176 | FG | N 9500 E 8100 SE | 9.2% | 138.2 | 126.5 | 140.2 | 90.2% |
| 177 | FG | N 9500 E 8200 SE | 7.2% | 137.5 | 128.3 | 140.2 | 91.5% |
| 178 | FG | N 9500 E 8300 SE | 8.5% | 139.3 | 128.3 | 140.2 | 91.5% |
| | | | | | | | |

| Max Density | Optimum Moisture | Material Type and Source | Method |
|---|---|---|---|
| 135.7 | 7.4 | Common Fill | ASTM D 1557 |
| 140.2 | 8.5 | Common Fill | ASTM D 1557 |
| | | | |

REMARKS: FG=Final Grade

Gauge Model: Troxler 3411-B
Serial Number: 13414
Std. Counts : 2178/631
Technician: D. Jennings

Respectfully submitted,
**SJB Services, Inc.**

Dave Verdon
Dave Verdon
Testing Manager

# Appendix A

## Section: 2.0

## Select Fill Material Test Results

# Appendix A

## Section: 2.A

## Type B Select Fill Test Results

# TYPE B SELECT FILL MATERIAL (SECTION (02225)
# TEST RESULTS SUMMARY

Cortland County Landfill
Remedial Action Landfill Closure

REL. DEN =90%

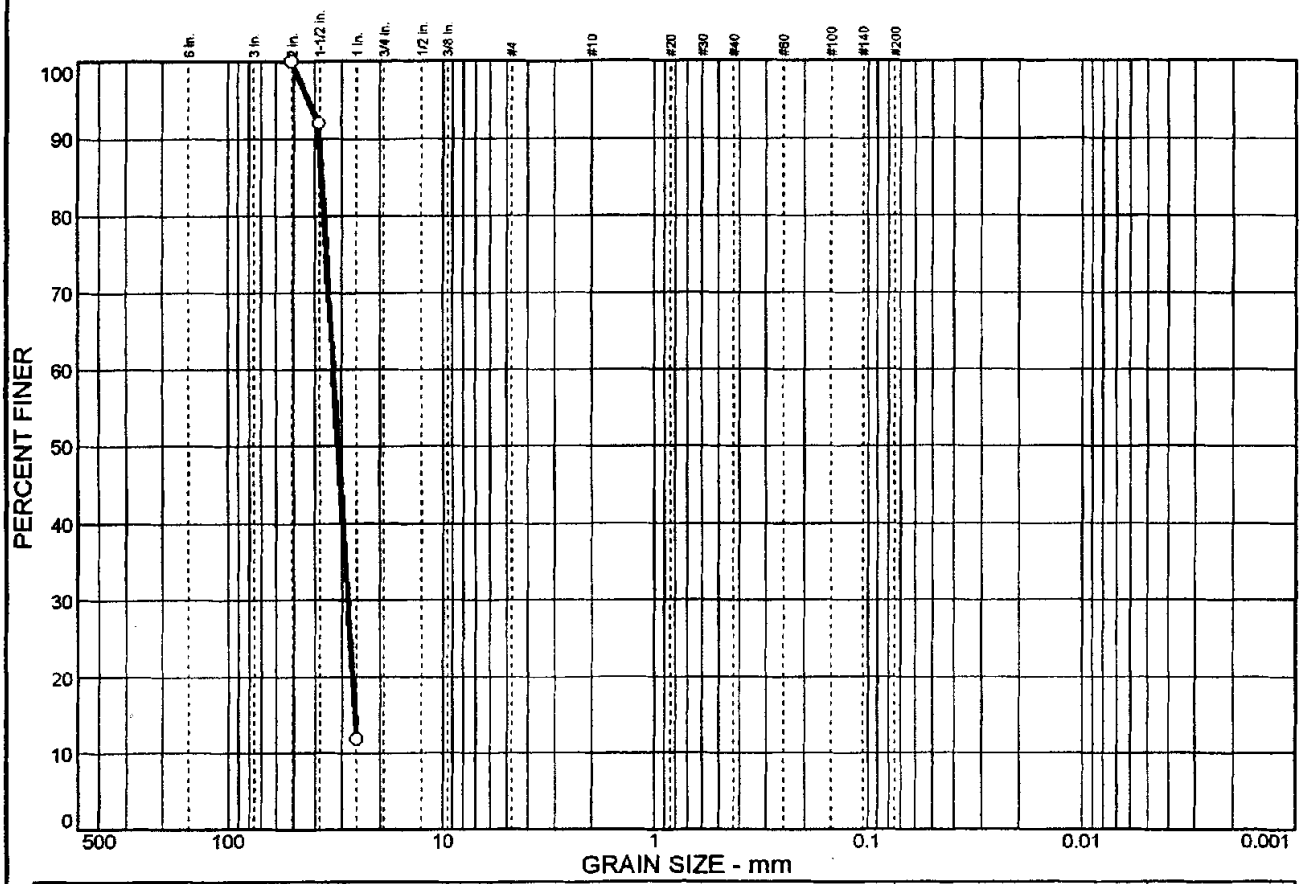
| SAMPLE NO. | DATE SAMPLED | LOCATION | CUMULATIVE VOLUME (cy) | GRAIN SIZE ANALYSIS | | | | COEFFICIENT OF PERMEABILITY | RELATIVE DENSITY | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2" (% Passing) | 1-1/2" (% Passing) | 1" (% Passing) | No. 200 (% Passing) | (cm/s) | MIN (pcf) | MAX (pcf) |
| TEST METHOD → | | | | D422 | D422 | D422 | D422 | ASTM D2434 | D4253 | D4253 |
| SAMPLE FREQUENCY → | | | | 1,000 cy | | | | NA | 5000cy | |
| SPECIFICATIONS → | | | | 100 | 90-100 | 0-15 | 0-3 | > 1 x $10^{-1}$ cm/s | 50% REL | |
| NA | 5/8/01 | Suit-Kote Pit | Prequalification | 100.0 | 92.7 | 17.9 | 0.0 | | | |
| 215, B-1 | 5/11/01 | on-site | 1000 | 100.0 | 92.0 | 11.8 | 0.7 | 9.5 | 87.8 | 100.5 |

Stone

TYPE B SELECT FILL

| Stockpile sample sheet | | | | | | | |
|---|---|---|---|---|---|---|---|
| Location | Polkville | | | | | | |
| Date | 4/18/01 | | | | | | |
| | | | | | | | |
| 3's | wgt | | %ret | | %pass | | Spec |
| 2 | 0 | | 0.0 | | 100.0 | | |
| 1 1/2 | 0.874 | | 7.3 | | 92.7 | | 90-100 |
| 1 | 9.016 | | 74.8 | | 17.9 | | |
| 3/4 | 2.004 | | 16.6 | | 1.3 | | 0-15 |
| 1/2 | 0.064 | | 0.5 | | 0.7 | | |
| pan | 0.09 | | 0.7 | | 0.0 | | |
| total | 12.048 | | 100.0 | | | | |
| CRUSH COUNT | | ONE FACE | | 100 | TWO FACE | | 95 |
| 0 | Round wt | | 1 Face wt | 220.2 | | 2 Face wt | 3966.2 |
| | | | | | | | |
| 2's | | | | | | | |
| 1 1/2 | 0 | | 0.0 | | 100 | | |
| 1 | 0.456 | | 5.0 | | 95.0 | | 90-100 |
| 3/4 | 4.188 | | 46.3 | | 48.7 | | |
| 1/2 | 4.202 | | 46.4 | | 2.2 | | 0-15 |
| 3/8 | 0.13 | | 1.4 | | 0.8 | | |
| 1/4 | 0.018 | | 0.2 | | 0.6 | | |
| pan | 0.056 | | 0.6 | | 0.0 | | |
| total | 9.048 | | 100.0 | | | | |
| CRUSH COUNT | | ONE FACE | | 98 | TWO FACE | | 94 |
| 63 | Round wt | | 1 Face wt | 101.6 | | 2 Face wt | 2409.4 |
| | | | | | | | |
| 1's | | | | | | | |
| 3/4 | 0 | | 0.0 | | 100.0 | | |
| 1/2 | 0.726 | | 8.8 | | 91.2 | | 90-100 |
| 3/8 | 2.808 | | 34.0 | | 57.2 | | |
| 1/4 | 3.742 | | 45.3 | | 11.9 | | 0-15 |
| #4 | 0.648 | | 7.8 | | 4.0 | | |
| 1/8 | 0.196 | | 2.4 | | 1.6 | | |
| pan | 0.136 | | 1.6 | | 0.0 | | |
| total | 8.256 | | 100 | | | | |
| CRUSH COUNT | | ONE FACE | | 97 | TWO FACE | | 94 |
| 31.9 | Round wt | | 1 Face wt | 43.4 | | 2 Face wt | 1151 |
| | | | | | | | |
| 1 A's | | | | | | | |
| 3/8 | 0 | | 0.0 | | 100.0 | | |
| 1/4 | 1.828 | | 14.9 | | 85.1 | | 90-100 |
| #4 | 6.164 | | 56.3 | | 28.9 | | |
| 1/8 | 2.748 | | 25.1 | | 3.8 | | 0-15 |
| #8 | 0.276 | | 2.5 | | 1.3 | | |
| #16 | 0.082 | | 0.7 | | 0.5 | | |
| pan | 0.056 | | 0.5 | | 0.0 | | |
| total | 10.954 | | 100 | | | | |
| CRUSH COUNT | | ONE FACE | | 98 | TWO FACE | | 95 |
| 5 | Round wt | | 1 Face wt | 9.7 | | 2 Face wt | 298.3 |

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 0.0 | | | | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 2 in. | 100.0 | | |
| 1.5 in. | 92.0 | | |
| 1 in. | 11.8 | | |

* (no specification provided)

**Soil Description**

Gravel Aggregate

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{85}$= 36.8 $D_{60}$= 32.4 $D_{50}$= 30.8
$D_{30}$= 27.8 $D_{15}$= 25.8 $D_{10}$=
$C_u$= $C_c$=

**Classification**

USCS= GP AASHTO=

**Remarks**

#200 Wash: 0.7%

**Sample No.:** 215, B-1 **Source of Sample:** Type B Select Fill **Date:** 5/11/01
**Location:** **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover
**Project No:** 2009053 **Plate**

## PERMEABILITY TEST ON GRANULAR SOIL

### ASTM D2434

Project No.: 2009053

Date Sampled: May 2001

Project Name: Cortland Landfill Cover

Client: Marcy Excavation

Sample No. #1 (Lab No. 215)

Date Tested: June 7, 2001

Sample Description: Type B Select Fill, Crushed Gravel

Unit Weight Determination:

Diameter, D, cm.: 22.91

Height of cylinder, cm: 29.8

Area, A, cm2: 412.23

Height of Void, cm: 2.54

Length, l, cm.: 27.3

Sample Height, cm: 27.3

Sample Wt., g: 17826.0

Manometer, L, cm.: 23.5

Dry Unit Wt.: 99.0 pcf

Moisture Content:

| | Before | After |
|---|---|---|
| Wet Wt. | | |
| Dry Wt. | | |
| Tare Wt. | | |
| Moisture % | 8.8 | |

W (max): 100.5 pcf

W (Min): 87.8 pcf

Relative Dens: 90 %

Test Run No. 1 k=QL/Ath 2

Head, h, cm. 0.053 0.132

| Flow @ | #1 | #2 | Total | #1 | #2 | Total |
|---|---|---|---|---|---|---|
| 30 | 254.3 | | 254.3 | 670.9 | | 670.9 |
| 60 | | 281 | 535.3 | | 645.9 | 1316.8 |
| 90 | 266.6 | | 801.9 | 659.5 | | 1976.3 |
| 120 | | 272 | 1073.9 | | 638.7 | 2615 |
| 150 | 267.6 | | 1341.5 | 644.9 | | 3259.9 |
| 180 | | 269.1 | 1610.6 | | 675.7 | 3935.6 |
| 210 | 268.3 | | 1878.9 | 633.7 | | 4569.3 |
| 240 | | 270.2 | 2149.1 | | 676 | 5245.3 |
| 270 | 267.2 | | 2416.3 | 635.6 | | 5880.9 |
| 300 | | 271.8 | 2688.1 | | 675.2 | 6556.1 |
| 330 | 268.6 | | 2956.7 | 636.5 | | 7192.6 |
| 360 | | 271.8 | 3228.5 | | 675.5 | 7868.1 |
| | | | | | | |
| Tare: | | | | | | |

**Permeability: 9.6 cm./sec.** **9.4 cm./sec.**

Tested by: A. Marks

Calculations by: T. Hamilton

# Appendix A

## Section: 2.B

## Type D Select Fill Test Results

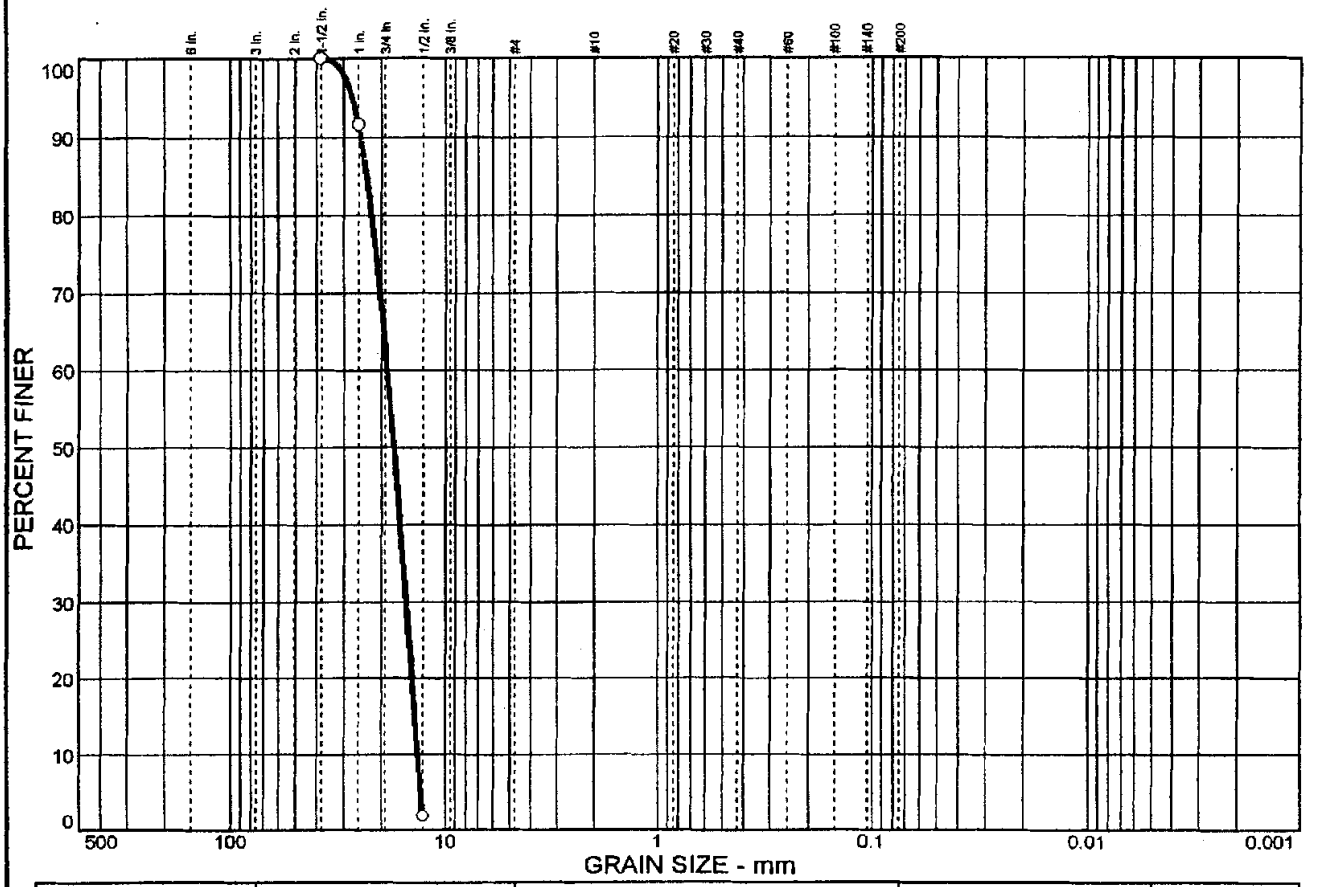
# TYPE D SELECT FILL MATERIAL (SECTION (02225)
## TEST RESULTS SUMMARY

Cortland County Landfill
Remedial Action Landfill Closure

REL. DEN =90%

| SAMPLE NO. | DATE SAMPLED | LOCATION | CUMULATIVE VOLUME (cy) | CALCIUM CARBONATE CONTENT (%) | Grain Size Analysis | | | | COEFFICIENT OF PERMEABILITY | RELATIVE DENSITY | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1-1/2" (% Passing) | 1" (% Passing) | 1/2 " (% Passing) | No. 200 (% Passing) | (cm/s) | MIN (pcf) | MAX (pcf) |
| TEST METHOD → | | | | D3042 | D422 | D422 | d422 | D422 | ASTM D2434 | D4253 | D4253 |
| SAMPLE FREQUENCY → | | | | PREQUALIFICATION | 1000 cy | | | | NA | 5000cy | |
| SPECIFICATIONS → | | | | Less than 30% | 100 | 90-100 | 0-15 | 0-3 | > 1 x $10^{-1}$ cm/s | 50% REL | |
| NA | 5/11/01 | Suit-Kote Pit | Prequalification | 25.7 | 100.0 | 91.6 | 1.9 | 0.3 | 2.85 | 84.2 | 99.7 |
| 466 | 9/12/01 | on-site | 1000 | | 100.0 | 94.5 | 5.0 | 0.5 | 2.47 | 89.2 | 94.3 |

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 0.0 | | | | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1.5 in. | 100.0 | | |
| 1 in. | 91.6 | | |
| .5 in. | 1.9 | | |

* (no specification provided)

**Soil Description**

Gravel Aggregate

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{85}$= 23.2 $D_{60}$= 18.5 $D_{50}$= 17.3
$D_{30}$= 15.1 $D_{15}$= 13.8 $D_{10}$= 13.3
$C_u$= 1.39 $C_c$= 0.92

**Classification**

USCS= GP AASHTO=

**Remarks**

#200 Wash: 0.3%

**Sample No.:** 216, D-1 **Source of Sample:** Type D Select Fill **Date:** 5/11/01
**Location:** 1st 1,000 cy **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover

**Project No:** 2009053 **Plate**

## PERMEABILITY TEST ON GRANULAR SOIL

### ASTM D2434

Project No.: 9902753 — Date Sampled: July 1, 1999

Project : Material Testing — Client: Suit-Kote, Inc.

Sample No. 99389 — Date Tested: July 2, 1999

Sample Description: NYSDOT #2 Aggregate

Unit Weight Determination:

| | | | | | |
|---|---|---|---|---|---|
| Diameter, D, cm.: | 22.91 | Height of cylinder, cm: | 29.8 | Wet Wt. | |
| Area, A, sq.cm.: | 412.23 | Height of Void, cm: | 2.54 | Dry Wt. | |
| Length of sample,cm: | 27.26 | Sample Vol.,cc: | 11,237 | Tare Wt. | |
| Sample Weight, g: | 17,622 | Manometer, L, cm.: | 23.5 | Moisture % | |

Moisture Content:

| | Before | After |
|---|---|---|
| Wet Wt. | | |
| Dry Wt. | | |
| Tare Wt. | | |
| Moisture % | | |

| | | |
|---|---|---|
| W (max): | 99.7 | pcf |
| W (min): | 84.2 | pcf |
| Rel. Dens. | 89.9 | % |

Dry Unit Wt 97.9

Test Run No. 1 — k=QL/Ath — 2

Head, h, cm. 0.27 — 0.44

| Flow, t @ | #1 | #2 | Q | #1 | #2 | Q |
|---|---|---|---|---|---|---|
| 30 | 386 | | 386 | 658 | | 658 |
| 60 | | 408 | 794 | | 680 | 1338 |
| 90 | 386 | | 1180 | 658 | | 1996 |
| 120 | | 408 | 1588 | | 680 | 2676 |
| 150 | 386 | | 1974 | 658 | | 3334 |
| 180 | | 408 | 2382 | | 680 | 4014 |
| 210 | 386 | | 2768 | 658 | | 4672 |
| 240 | | 408 | 3176 | | 680 | 5352 |
| 270 | 386 | | 3562 | 658 | | 6010 |
| 300 | | 408 | 3970 | | 680 | 6690 |
| 330 | 386 | | 4356 | 658 | | 7348 |
| 360 | | 408 | 4764 | | 680 | 8028 |
| | | | | | | |
| Tare: | | | | | | |

**Permeability: 2.8 cm./sec.** — **Permeability: 2.9 cm./sec.**

Tested by: A. Marks — Calculations by: T. Hamilton

MAXIM TECHNOLOGIES INC

Empire Soils Investigations, Inc., Division
2615 N. Triphammer Rd., Suite 3
Ithaca, New York 14850
Telephone: (607) 266-0147
Fax: (607) 266-0409

August 26, 1999

# REPORT OF MATERIAL TESTING

**Project:** Material Testing

**Client:** Suit-Kote Corporation

**Material:** Proposed "Type A - Select Fill" Fine Gravel, sampled by client and tested for Carbonate Content in accordance with ASTM D 3042. Stockpile No. 5, Polkville Pit.

| | Trial #1 | Trial #2 | Trial #3 | Average |
|---|---|---|---|---|
| *Initial Weight (gms.)* | 500.54 | 504.57 | 506.60 | |
| *Residue Weight (gms.)* | 368.62 | 390.70 | 363.75 | |
| *Weight Loss (gms.)* | 131.92 | 113.87 | 142.85 | |
| *Loss (%)* | 26.4 | 22.6 | 28.2 | 25.7 |

Respectfully submitted,

MAXIM TECHNOLOGIES OF NEW YORK, INC.

Jeffrey Truax
Construction Services Manager

F:\Public\Data\Carbonate

# Particle Size Distribution Report


| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 0.0 | | | | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 1.5 in. | 100.0 | | |
| 1 in. | 94.5 | | |
| .5 in. | 5.0 | | |

* (no specification provided)

**Soil Description**

Select Fill, Type D
#200 Wash 0.5%

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{85}$= 23.6 $D_{60}$= 19.4 $D_{50}$= 18.0
$D_{30}$= 15.4 $D_{15}$= 13.7 $D_{10}$= 13.2
$C_u$= 1.47 $C_c$= 0.93

**Classification**

USCS= AASHTO=

**Remarks**

**Sample No.:** 466 **Source of Sample:** Type D Select Fill **Date:** 9/12/2001
**Location:** **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover

**Project No:** 2009053 466

# PERMEABILITY TEST REPORT

SJB SERVICES, INC.

Cortland County Landfill

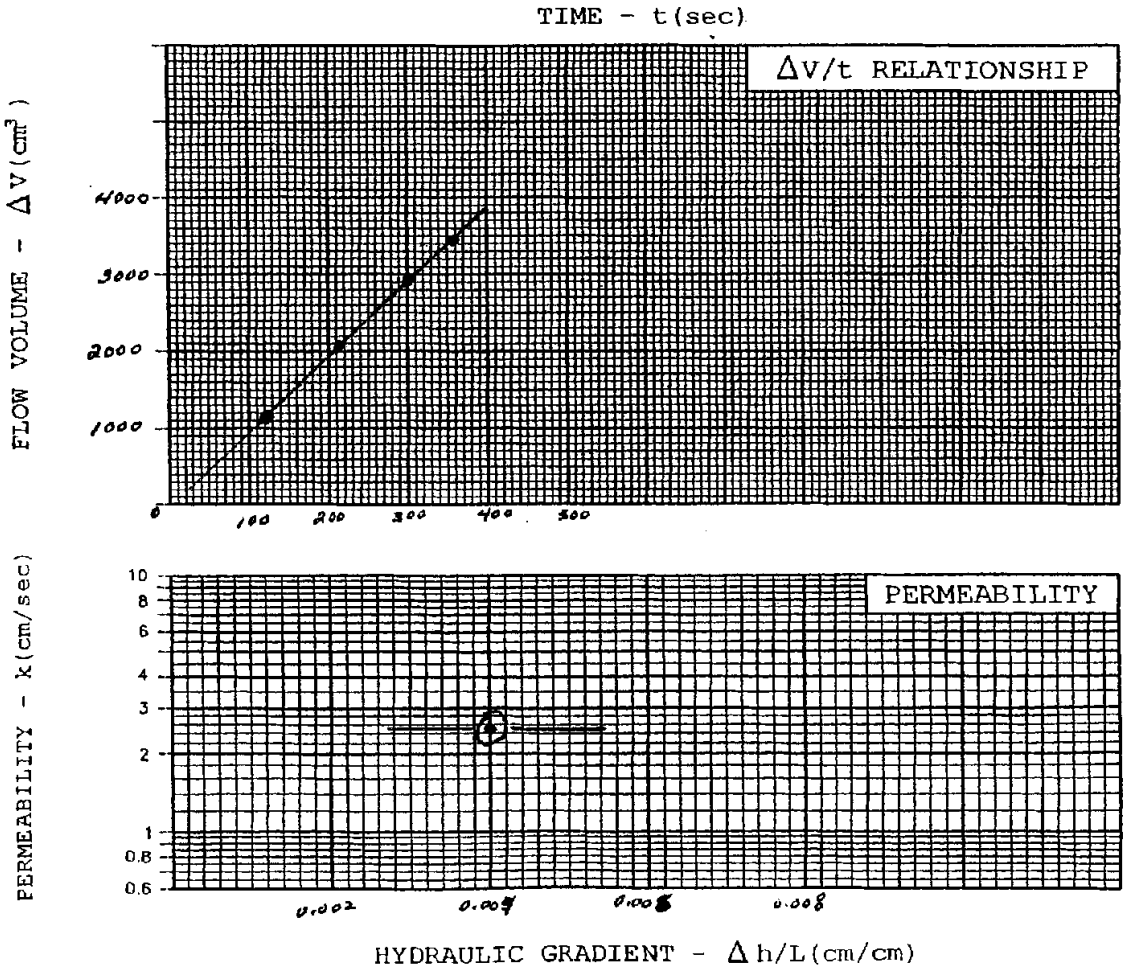
| BY: AM | CK'D: WS | DATE: 10-16-01 | PROJ. NO: 2009053 |
|---|---|---|---|

**TEST DATA:**

Specimen Height (cm) : 26.035
Specimen Diameter (cm) : 22.254
Dry Unit Weight (pcf) : Min dry density 89.2 pcf
Moisture Content Before Test (%) : 0
Moisture Content After Test (%) : 10
Permeameter Type : Rigid Wall
Differential Head (cm) : .1016
Flow Rate ($\Delta V/t$) ($cm^3/sec$): ● 9.8 ▲
Permeability (cm/sec): ● 2.47 ▲

**SAMPLE DATA:**

Sample Identification : 466, Select Fill
Type D
Visual Description : Crushed Stone #2
Remarks :
Maximum Dry Density : 94.3
Optimum Moisture Content (%) :
Percent Compaction : 95

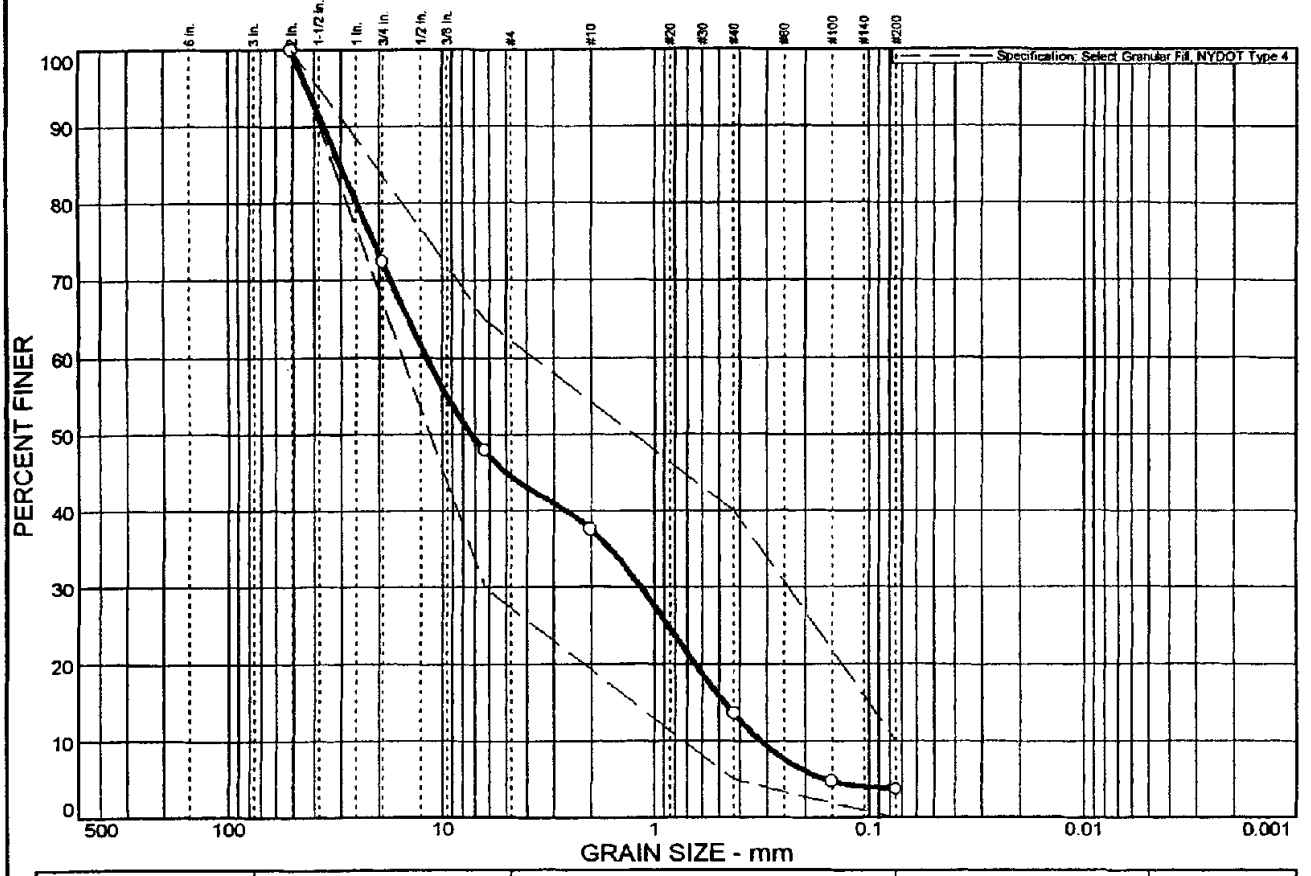


# Appendix A

## Section: 3.0

## Granular Fill Prequalification Test Results

# Particle Size Distribution Report




| % COBBLES | % GRAVEL | % SAND | % SILT | % CLAY |
|---|---|---|---|---|
| 0.0 | 55.4 | 40.8 | 3.8 | |

| SIEVE SIZE | PERCENT FINER | SPEC.* PERCENT | PASS? (X=NO) |
|---|---|---|---|
| 2 in. | 100.0 | 100 - 100.0 | |
| .75 in. | 72.4 | | |
| .25 in. | 47.9 | 30.0 - 65.0 | |
| #10 | 37.6 | | |
| #40 | 13.6 | 5.0 - 40.0 | |
| #100 | 4.8 | | |
| #200 | 3.8 | 0.0 - 10.0 | |

* Select Granular Fill, NYDOT Type 4

**Soil Description**

Granular Fill
Poorly graded gravel with sand

**Atterberg Limits**

PL= LL= PI=

**Coefficients**

$D_{85}$= 30.0 $D_{60}$= 11.8 $D_{50}$= 7.27
$D_{30}$= 1.16 $D_{15}$= 0.469 $D_{10}$= 0.316
$C_u$= 37.31 $C_c$= 0.36

**Classification**

USCS= GP AASHTO=

**Remarks**

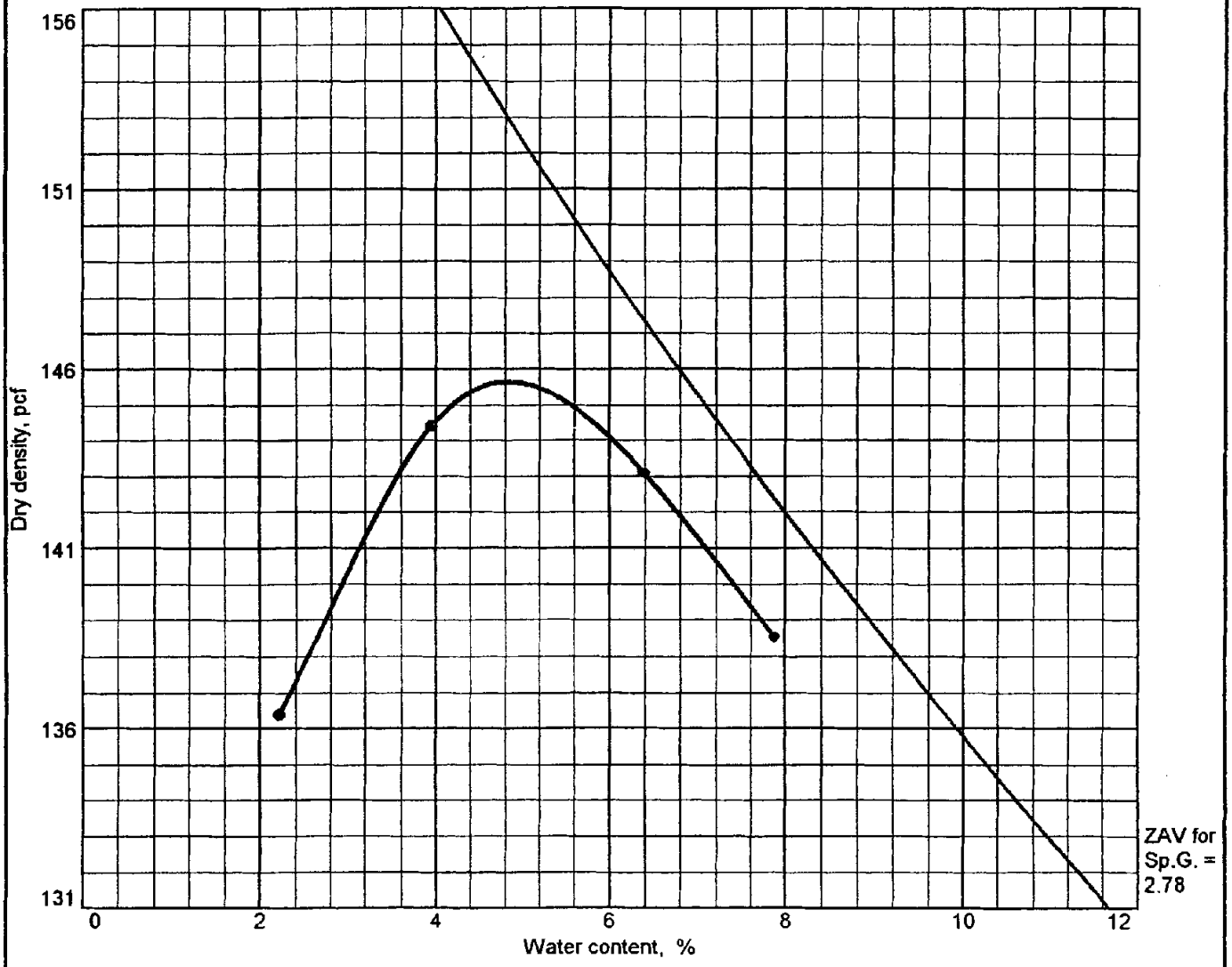
Granular Fill

**Sample No.:** 244 **Source of Sample:** Granular Fill **Date:**
**Location:** Suite Kote **Elev./Depth:**

**SJB SERVICES, INC.**

**Client:** Marcy Excavation
**Project:** Cortland Landfill Cover
**Project No:** 2009053 **Plate**

# COMPACTION TEST REPORT




Test specification: ASTM D 1557-78 Method D Modified

| Elev/ Depth | Classification | | Nat. Moist. | Sp.G. | LL | PI | % > 3/4 in. | % < No.200 |
|---|---|---|---|---|---|---|---|---|
| | USCS | AASHTO | | | | | | |
| | GP | | | | | | 27.6 | 3.8 |

| TEST RESULTS | MATERIAL DESCRIPTION |
|---|---|
| Maximum dry density = 145.6 pcf<br>Optimum moisture = 4.8 % | Granular Fill<br>Poorly graded gravel with sand |

**Project No.** 2009053 **Client:** Marcy Excavation
**Project:** Cortland Landfill Cover

• **Location:** Suite Kote

**Remarks:**

COMPACTION TEST REPORT

**SJB SERVICES, INC.**

**Plate**

# Appendix A

## Section: 4.0

## Cover Soil Thickness Verification Results

# Appendix A

## Section: 4.A

## In-Place Layer Thickness

# Cortland County Landfill
# Remedial Action Landfill Closure
# Protective Cover Thickness

| Coordinates | | Material Thickness | | |
|---|---|---|---|---|
| North: (feet) | East: (feet) | Barrier: (inches) | Topsoil: (inches) | Final: (inches) |
| 961000 | 639000 | 12.5 | 6.0 | 18.48 |
| 961000 | 638900 | 12.5 | 6.2 | 18.70 |
| 961000 | 638800 | 12.6 | 6.5 | 19.10 |
| 960900 | 639100 | 12.2 | 6.3 | 18.54 |
| 960900 | 639000 | 12.1 | 6.0 | 18.12 |
| 960900 | 638900 | 12.4 | 6.2 | 18.56 |
| 960900 | 638800 | 12.0 | 6.5 | 18.50 |
| 960800 | 639200 | 12.5 | 6.5 | 19.00 |
| 960800 | 639100 | 12.6 | 6.3 | 18.90 |
| 960800 | 639000 | 12.8 | 6.5 | 19.34 |
| 960800 | 638900 | 12.5 | 6.7 | 19.18 |
| 960800 | 638800 | 13.2 | 6.8 | 20.00 |
| 960700 | 639200 | 12.0 | 6.5 | 18.50 |
| 960700 | 639100 | 13.0 | 6.2 | 19.20 |
| 960700 | 639000 | 12.6 | 6.1 | 18.70 |
| 960700 | 638900 | 12.4 | 6.7 | 19.06 |
| 960700 | 638800 | 12.8 | 7.0 | 19.84 |
| 960600 | 639300 | 12.2 | 5.7 | 17.90 |
| 960600 | 639200 | 12.4 | 6.8 | 19.20 |
| 960600 | 639100 | 12.8 | 6.8 | 19.60 |
| 960600 | 639000 | 12.5 | 7.0 | 19.50 |
| 960600 | 638900 | 12.2 | 6.5 | 18.70 |
| 960600 | 638800 | 12.7 | 6.8 | 19.52 |
| 960600 | 638700 | 12.5 | 6.4 | 18.88 |
| 960500 | 639300 | 12.2 | 6.0 | 18.20 |
| 960500 | 639200 | 12.3 | 6.3 | 18.60 |
| 960500 | 639100 | 12.8 | 6.7 | 19.50 |
| 960500 | 639000 | 12.5 | 6.5 | 19.00 |
| 960500 | 638900 | 12.4 | 6.5 | 18.90 |
| 960500 | 638800 | 12.5 | 6.0 | 18.48 |
| 960500 | 638700 | 12.7 | 6.1 | 18.82 |
| 960500 | 638600 | 12.5 | 6.0 | 18.50 |
| 960400 | 639300 | 12.2 | 6.5 | 18.70 |
| 960400 | 639200 | 12.1 | 6.3 | 18.40 |
| 960400 | 639100 | 12.6 | 6.5 | 19.10 |
| 960400 | 639000 | 12.6 | 6.2 | 18.80 |
| 960400 | 638900 | 12.3 | 6.7 | 19.00 |
| 960400 | 638800 | 12.6 | 6.2 | 18.80 |
| 960400 | 638700 | 12.4 | 6.0 | 18.36 |
| 960400 | 638600 | 12.6 | 6.7 | 19.30 |
| 960400 | 638500 | 13.2 | 6.5 | 19.70 |
| 960400 | 638400 | 13.8 | 6.3 | 20.10 |
| 960300 | 639200 | 12.4 | 6.5 | 18.86 |
| 960300 | 639100 | 13.2 | 6.3 | 19.50 |
| 960300 | 639000 | 12.2 | 7.2 | 19.44 |

| Coordinates | | Material Thickness | | |
|---|---|---|---|---|
| North: (feet) | East: (feet) | Barrier: (inches) | Topsoil: (inches) | Final: (inches) |
| | | | | |
| 960300 | 638900 | 12.0 | 6.8 | 18.80 |
| 960300 | 638800 | 12.1 | 6.2 | 18.32 |
| 960300 | 638700 | 12.4 | 6.2 | 18.56 |
| 960300 | 638600 | 12.6 | 6.2 | 18.80 |
| 960300 | 638500 | 12.0 | 6.5 | 18.50 |
| 960300 | 638400 | 14.4 | 6.5 | 20.90 |
| 960300 | 638300 | 12.6 | 6.5 | 19.10 |
| 960300 | 638200 | 12.6 | 6.0 | 18.60 |
| 960200 | 639200 | 12.4 | 6.3 | 18.66 |
| 960200 | 639100 | 12.6 | 6.2 | 18.80 |
| 960200 | 639000 | 12.6 | 6.2 | 18.80 |
| 960200 | 638900 | 12.6 | 5.0 | 17.60 |
| 960200 | 638800 | 12.2 | 6.2 | 18.44 |
| 960200 | 638700 | 13.8 | 6.2 | 20.00 |
| 960200 | 638600 | 14.4 | 6.2 | 20.60 |
| 960200 | 638500 | 12.6 | 6.5 | 19.10 |
| 960200 | 638400 | 14.4 | 6.5 | 20.90 |
| 960200 | 638300 | 12.8 | 6.5 | 19.34 |
| 960200 | 638200 | 12.6 | 6.0 | 18.60 |
| 960200 | 638100 | 12.1 | 6.0 | 18.12 |
| 960100 | 639200 | 12.6 | 6.3 | 18.90 |
| 960100 | 639100 | 12.6 | 6.4 | 19.00 |
| 960100 | 639000 | 12.4 | 6.3 | 18.66 |
| 960100 | 638900 | 12.6 | 6.5 | 19.10 |
| 960100 | 638800 | 12.2 | 6.7 | 18.94 |
| 960100 | 638700 | 12.1 | 6.5 | 18.62 |
| 960100 | 638600 | 12.6 | 6.3 | 18.90 |
| 960100 | 638500 | 12.6 | 6.0 | 18.60 |
| 960100 | 638400 | 12.6 | 6.4 | 19.00 |
| 960100 | 638300 | 12.0 | 6.6 | 18.60 |
| 960100 | 638200 | 13.8 | 6.5 | 20.30 |
| 960100 | 638100 | 12.2 | 5.7 | 17.94 |
| 960000 | 639200 | 12.4 | 6.2 | 18.56 |
| 960000 | 639100 | 12.6 | 6.4 | 19.00 |
| 960000 | 639000 | 13.8 | 6.4 | 20.20 |
| 960000 | 638900 | 13.2 | 6.6 | 19.80 |
| 960000 | 638800 | 12.6 | 6.2 | 18.80 |
| 960000 | 638700 | 12.6 | 6.1 | 18.70 |
| 960000 | 638600 | 13.2 | 6.5 | 19.70 |
| 960000 | 638500 | 14.4 | 6.5 | 20.90 |
| 960000 | 638400 | 14.4 | 6.5 | 20.90 |
| 960000 | 638300 | 14.4 | 6.8 | 21.20 |
| 960000 | 638200 | 13.8 | 6.3 | 20.10 |
| 960000 | 638100 | 12.6 | 6.3 | 18.90 |
| 959900 | 639200 | 12.6 | 6.5 | 19.10 |
| 959900 | 639100 | 12.6 | 6.5 | 19.10 |
| 959900 | 639000 | 12.2 | 6.2 | 18.44 |
| 959900 | 638900 | 12.8 | 6.7 | 19.54 |
| 959900 | 638800 | 13.8 | 6.2 | 20.00 |
| 959900 | 638700 | 14.4 | 24.0 | 38.40 |
| 959900 | 638600 | 13.8 | 6.5 | 20.30 |

| Coordinates | | Material Thickness | | |
|---|---|---|---|---|
| North: (feet) | East: (feet) | Barrier: (inches) | Topsoil: (inches) | Final: (inches) |
| | | | | |
| 959900 | 638500 | 13.2 | 7.0 | 20.20 |
| 959900 | 638400 | 12.2 | 6.0 | 18.24 |
| 959900 | 638300 | 13.2 | 6.3 | 19.50 |
| 959900 | 638200 | 12.1 | 6.5 | 18.62 |
| 959900 | 638100 | 13.2 | 8.0 | 21.20 |
| 959800 | 639400 | 13.8 | 7.0 | 20.80 |
| 959800 | 639300 | 12.6 | 6.0 | 18.60 |
| 959800 | 639200 | 12.4 | 6.3 | 18.66 |
| 959800 | 639100 | 12.1 | 6.3 | 18.42 |
| 959800 | 639000 | 12.2 | 6.2 | 18.44 |
| 959800 | 638900 | 12.6 | 6.2 | 18.80 |
| 959800 | 638800 | 13.2 | 6.5 | 19.70 |
| 959800 | 638700 | 13.8 | 24.0 | 37.80 |
| 959800 | 638600 | 12.6 | 6.0 | 18.60 |
| 959800 | 638500 | 12.6 | 6.5 | 19.10 |
| 959800 | 638400 | 12.7 | 6.3 | 19.02 |
| 959800 | 638300 | 13.2 | 6.3 | 19.50 |
| 959800 | 638200 | 14.4 | 6.8 | 21.20 |
| 959800 | 638100 | 12.6 | 6.4 | 19.00 |
| 959700 | 639500 | 12.1 | 6.5 | 18.62 |
| 959700 | 639400 | 12.2 | 6.5 | 18.74 |
| 959700 | 639300 | 12.0 | 8.0 | 20.00 |
| 959700 | 639200 | 12.6 | 6.8 | 19.40 |
| 959700 | 639100 | 12.6 | 6.5 | 19.10 |
| 959700 | 639000 | 12.1 | 6.2 | 18.32 |
| 959700 | 638900 | 12.2 | 6.2 | 18.44 |
| 959700 | 638800 | 12.0 | 7.2 | 19.20 |
| 959700 | 638700 | 13.2 | 24.0 | 37.20 |
| 959700 | 638600 | 13.2 | 4.5 | 17.70 |
| 959700 | 638500 | 12.6 | 6.2 | 18.80 |
| 959700 | 638400 | 12.6 | 6.8 | 19.40 |
| 959700 | 638300 | 14.4 | 6.0 | 20.40 |
| 959700 | 638200 | 12.6 | 6.0 | 18.60 |
| 959700 | 638100 | 12.1 | 6.2 | 18.32 |
| 959600 | 639500 | 13.2 | 8.0 | 21.20 |
| 959600 | 639400 | 13.2 | 6.5 | 19.70 |
| 959600 | 639300 | 12.6 | 6.5 | 19.10 |
| 959600 | 639200 | 13.2 | 7.0 | 20.20 |
| 959600 | 639100 | 13.2 | 6.5 | 19.70 |
| 959600 | 639000 | 13.8 | 6.0 | 19.80 |
| 959600 | 638900 | 12.2 | 6.0 | 18.24 |
| 959600 | 638800 | 13.2 | 7.0 | 20.20 |
| 959600 | 638700 | 12.6 | 6.5 | 19.10 |
| 959600 | 638600 | 12.6 | 7.0 | 19.60 |
| 959600 | 638500 | 12.6 | 6.3 | 18.90 |
| 959600 | 638400 | 12.6 | 6.0 | 18.60 |
| 959600 | 638300 | 13.2 | 6.1 | 19.30 |
| 959600 | 638200 | 12.0 | 7.0 | 19.00 |
| 959600 | 638100 | 12.2 | 6.5 | 18.74 |
| 959500 | 639500 | 13.8 | 7.5 | 21.30 |
| 959500 | 639400 | 12.4 | 8.0 | 20.36 |

| Coordinates | | Material Thickness | | |
|---|---|---|---|---|
| North: (feet) | East: (feet) | Barrier: (inches) | Topsoil: (inches) | Final: (inches) |
| | | | | |
| 959500 | 639300 | 12.2 | 8.0 | 20.24 |
| 959500 | 639200 | 12.2 | 6.0 | 18.24 |
| 959500 | 639100 | 12.1 | 7.0 | 19.12 |
| 959500 | 638600 | 13.2 | 6.3 | 19.50 |
| 959500 | 638500 | 12.6 | 7.0 | 19.60 |
| 959500 | 638400 | 12.6 | 6.5 | 19.10 |
| 959500 | 638300 | 12.2 | 6.5 | 18.74 |
| 959500 | 638200 | 12.6 | 6.2 | 18.80 |
| 959500 | 638100 | 12.6 | 6.8 | 19.40 |
| 959400 | 639500 | 13.0 | 7.5 | 20.46 |
| 959400 | 639400 | 12.0 | 6.5 | 18.50 |
| 959400 | 638400 | 18.0 | 6.7 | 24.70 |
| 959400 | 638300 | 20.4 | 6.2 | 26.60 |
| | | | | |
| | | | | |

Note: 24" Topsoil thickness refers to RipRap thickness in downchute.

Appendix A

Section: 4.B

Final Layer Elevation

# Appendix A

## Section: 5.0

## Topsoil Prequalification Test Results

SJB SERVICES, INC.

**Contract Drilling and Testing**

**Central New York Office**
2415 N. Triphammer Road
Suite 3
Ithaca, NY 14850
Phone: (607) 266-0147
Fax: (607) 266-6409

| Buffalo, NY | Albany, NY | Falconer, NY | Gilbert, PA |
|---|---|---|---|
| (716) 649-8110 | (518) 899-7491 | (716) 487-1481 | (610) 681-8500 |


# REPORT OF MATERIAL TESTING

Project: Cortland Landfill, Cover

Client: Marcy Excavation

Material: Topsoil for Landfill Cover sampled on July 25, 2001 from the East Side (Pile #1) Stockpile, and South End (County Pile #1).

| Test Performed | Pile #1, East Side S-1 | Pile #1, East Side S-2 | County Pile #1 South End |
|---|---|---|---|
| Ph | 8.4 | 7.6 | 7.8 |
| Loss on Ignition | 6.4 % | 7.0% | 3.9% |

Respectfully submitted,

SJB Services, Inc.

Thomas Hamilton

Thomas A. Hamilton
Central Region Manager

SJB SERVICES, INC.

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# REPORT OF MATERIAL TESTING

Project: Cortland Landfill, Cover

Client: Marcy Excavation

Material: Topsoil for Landfill Cover sampled on July 19, 2001 from the Southern On Site Stockpile.

| Test Performed | S-1 | S-2 |
|---|---|---|
| Ph | 7.9 | 8.4 |
| Loss on Ignition | 5.2 % | 6.0% |

Respectfully submitted,

SJB Services, Inc.

T. Hamilton

Thomas A. Hamilton
Regional Manager