

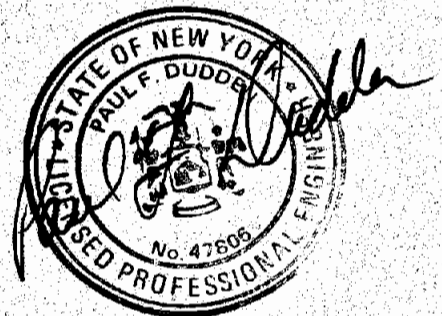
**CORTLAND COUNTY LANDFILL
REMEDIAL ACTION LANDFILL CLOSURE**

**TOWNLINE ROAD
CORTLAND COUNTY, NEW YORK**

**CONSTRUCTION CERTIFICATION
REPORT**

VOLUME I OF III

JUNE, 2002



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

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

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APPENDICES

- Appendix A – Soil Test Results
- Appendix B – Geosynthetic Test Results (Bound Separately, Volume II)
- Appendix C – Well and Vent Installation Logs (Bound Separately, Volume III)
- Appendix D – Inspector's Reports (Bound Separately, Volume III)
- Appendix E – Construction Photographs (Bound Separately, Volume III)
- Appendix F – Completed Construction Drawings (Bound Separately)

CERTIFICATION STATEMENT

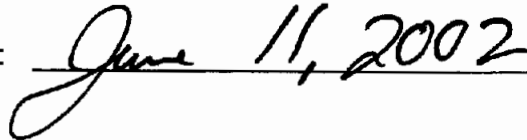
Barton & Loguidice, P.C. herein provides the Construction Certification Report for the Cortland County Landfill Remedial Action Landfill Closure, located at the Cortland County Landfill, Town Line Road, McGraw, New York.

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:



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

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

Common Fill	Marcy Excavation Company, Inc. 2256 Broad Street Frankfort, New York 13390	Marcy Excavation Company, Inc. Heath Road Pit Cortlandville, New York 13101
Topsoil	Marcy Excavation Company, Inc. 2256 Broad Street Frankfort, New York 13390	Marcy Excavation Company, Inc. Heath Road Pit Cortlandville, New York 13101
PVC Pipe	National Pipe & Plastics PO Box 174 Binghamton, New York 13920	American Indian Builders and Suppliers Inc. 1162 Ridge Road Lewiston, New York 14092
PVC Fittings	Multi Fittings 4607 LeSaint Court Fairfield, Ohio 45014	American Indian Builders and Suppliers Inc. 1162 Ridge Road Lewiston, New York 14092
Culvert Pipe	Lane-Bath May Street Bath, New York 14810	MS Unlimited, Inc. PO Box 577 Syracuse, New York 13206
Corrugated PE Pipe	Advanced Drainage Systems 3300 Riverside Drive Columbus, Ohio 43221	Martisco Corporation PO Box 2067 Syracuse, New York 13220
Grass Seed	Merritt Seed Company 7880 Gates Road Baldwinsville, New York 13027	Merritt Seed Company 7880 Gates Road Baldwinsville, New York 13027
Turf Reinforcement Matting (TRM)	North American Green 14649 Highway 41 North Evansville, Indiana 47725	Everett J. Prescott, Inc. 198 Ushers Road Round Lake, New York 12151
Precast Concrete Tanks	Binghamton Precast Phelps Street Binghamton, New York 13901	MS Unlimited, Inc. PO Box 577 Syracuse, New York 13206
Concrete	Cortland Ready-Mix 6 Locust Avenue Cortland, New York 13045	Cortland Ready-Mix 6 Locust Avenue 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 $\frac{3}{4}$ 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/yd² 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/yd²) 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:

<u>Type B Select Fill</u>	% 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 than 30% calcium carbonate. Grain size specifications for Type D select fill material are summarized below:

<u>Type D Select Fill</u>	% 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/yd² 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



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

Appendix A

Soil Test Results

Table of Contents

Section 1.0	Common Fill Test Results
	A. Common Fill Material Quality Control Testing
	B. Common Fill Material Quality Assurance Testing
Section 2.0	Select Fill Material Test Results
	A. Type B Select Fill Test Results
	B. Type D Select Fill Rest Results
Section 3.0	Granular Fill Prequalification Test Results
Section 4.0	Cover Soil Thickness Verification Results
	A. In-Place Layer Thickness
	B. Final Layer Elevation
Section 5.0	Topsoil Prequalifiaction Test Results

Appendix A

Section: 1.0

Common Fill Material Test Results

Appendix A
Section: 1.A
Common Fill Material
Quality Control Testing

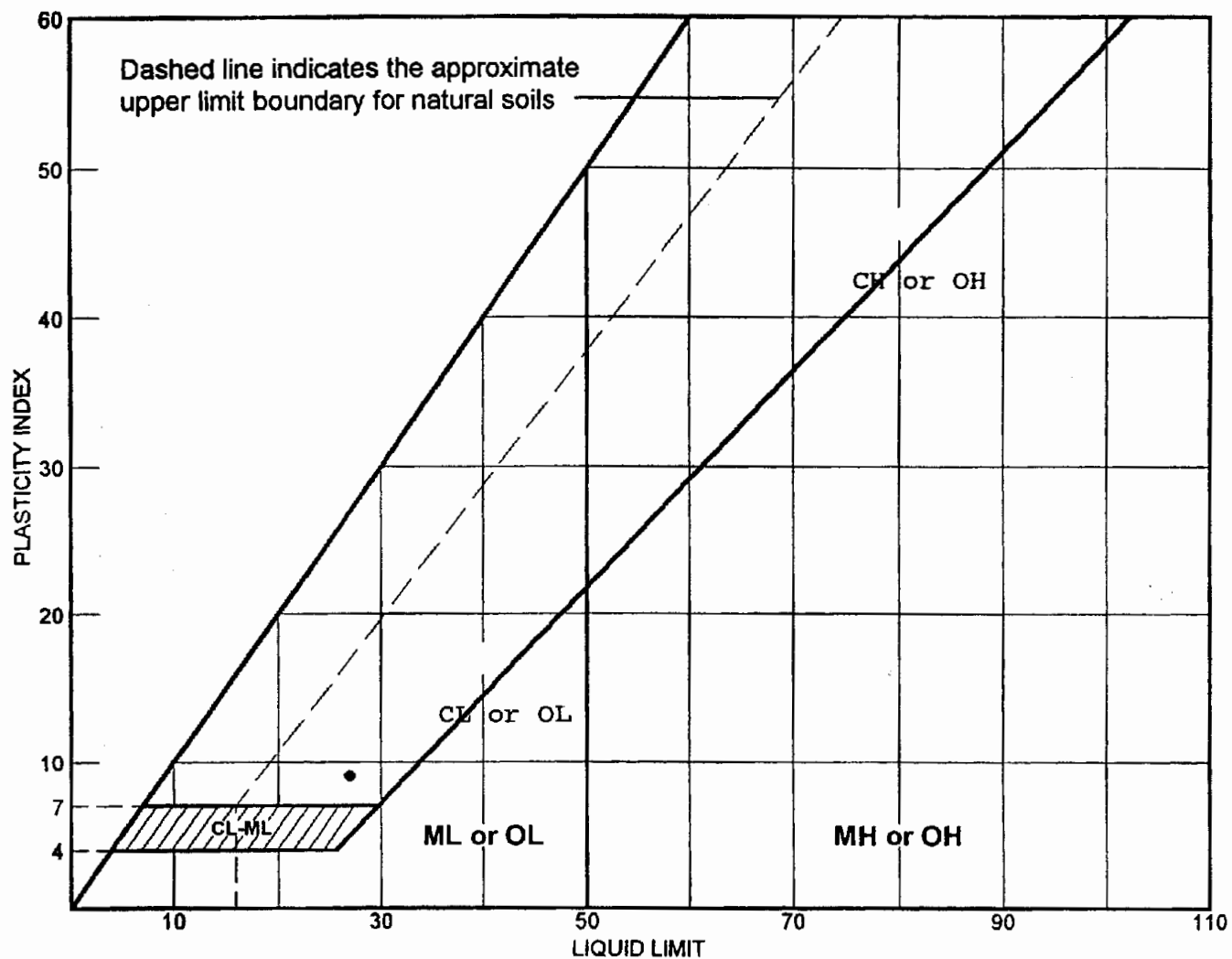
COMMON FILL (SECTION 02255)

TEST RESULTS SUMMARY

Cortland County Landfill Remedial Action Landfill 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.

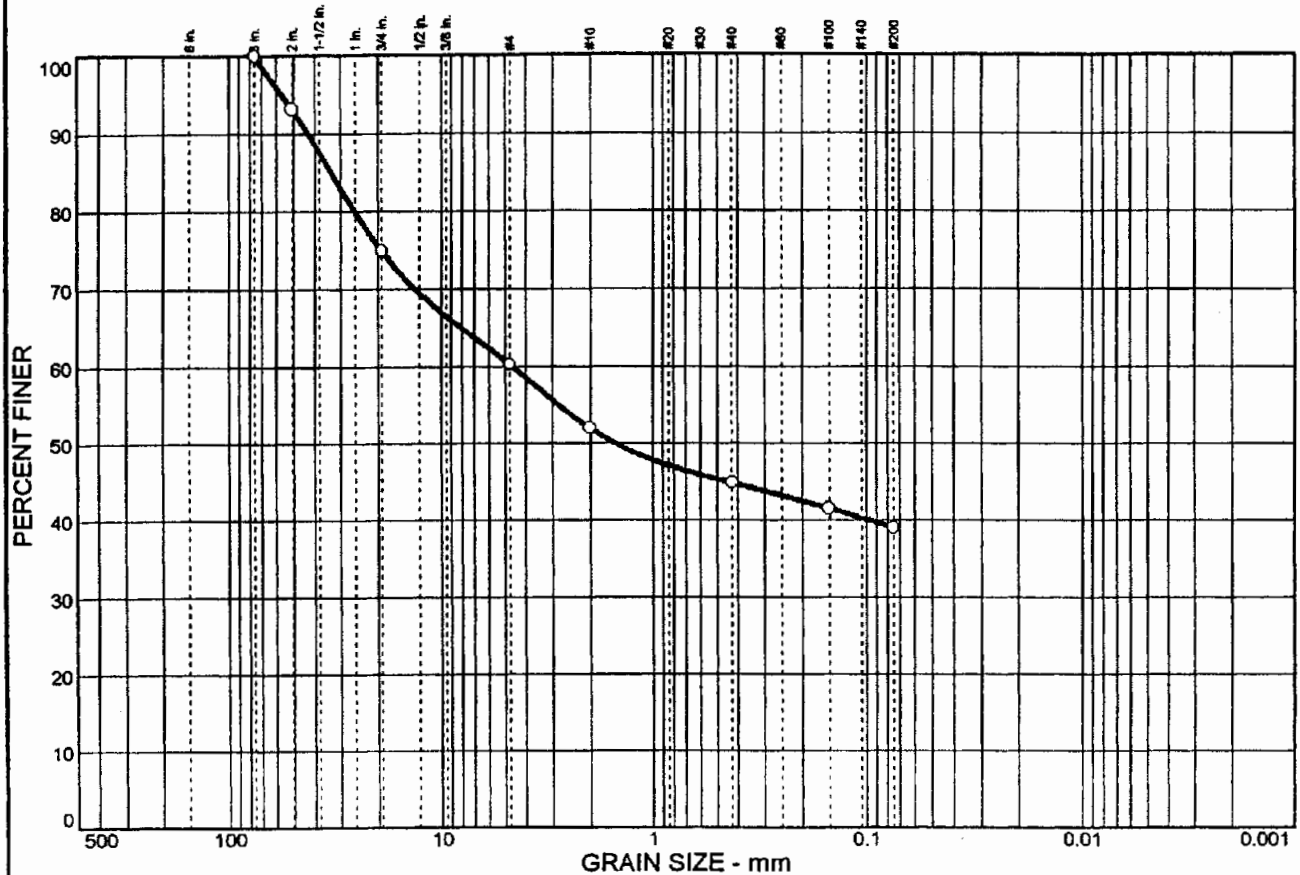
Client: Marcy Excavation

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

D₈₅= 33.1 D₆₀= 4.60 D₅₀= 1.52
D₃₀= D₁₅=
C_u= C_c=

Classification

USCS= GC AASHTO=

Remarks

CF-2

Sample No.: 209, CF-2
Location: Pile #5

Source of Sample: Common Fill

Date: 5/4/01
Elev./Depth:

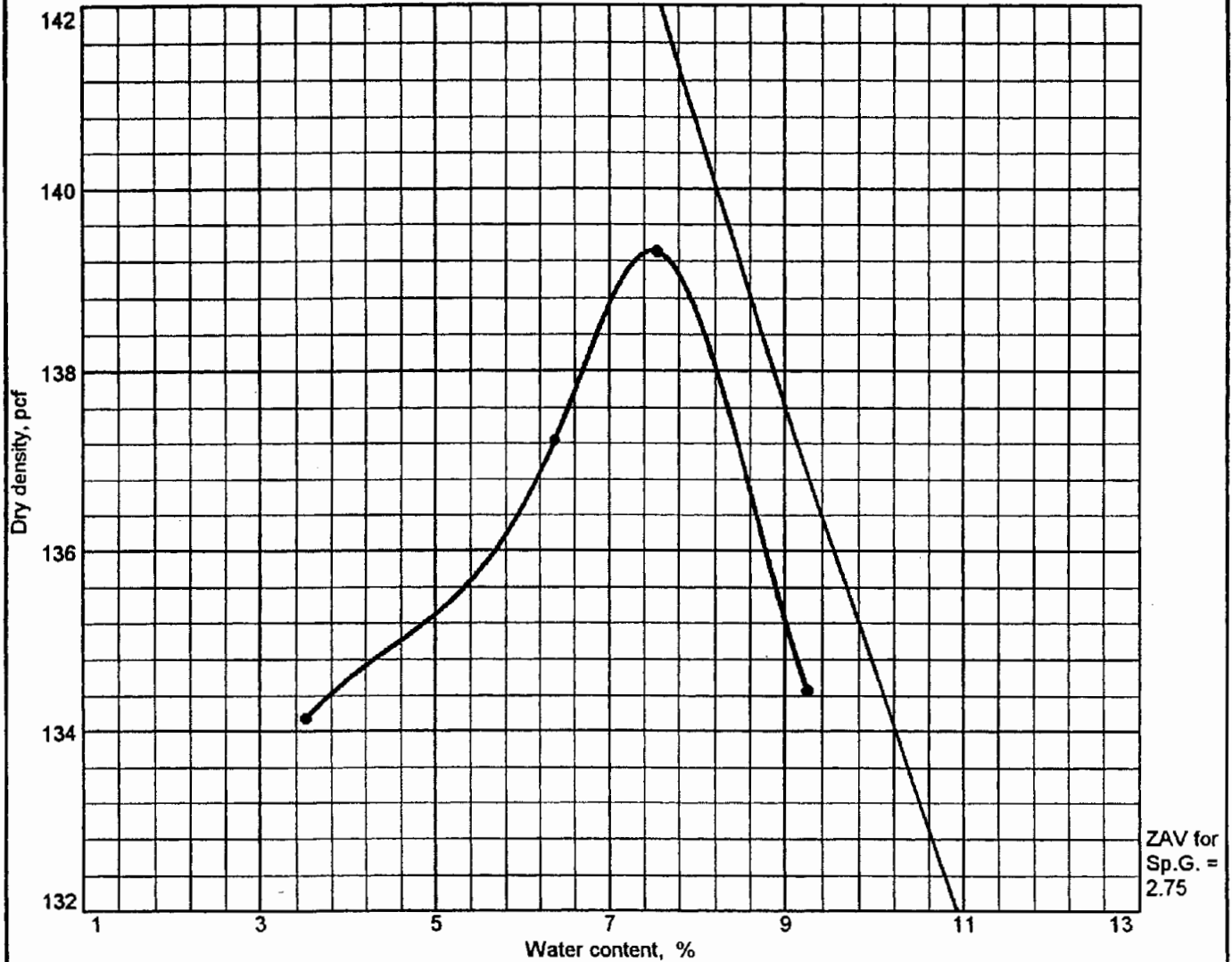
SJB
SERVICES, INC.

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				27	9	25.1	39.0

TEST RESULTS		MATERIAL DESCRIPTION
Maximum dry density = 139.3 pcf		Clayey gravel with sand
Optimum moisture = 7.5 %		
Project No. 2009053 Client: Marcy Excavation Project: Cortland Landfill Cover		Remarks:
● Location: Pile #5		
COMPACTION TEST REPORT SJB SERVICES, INC.		
		Plate

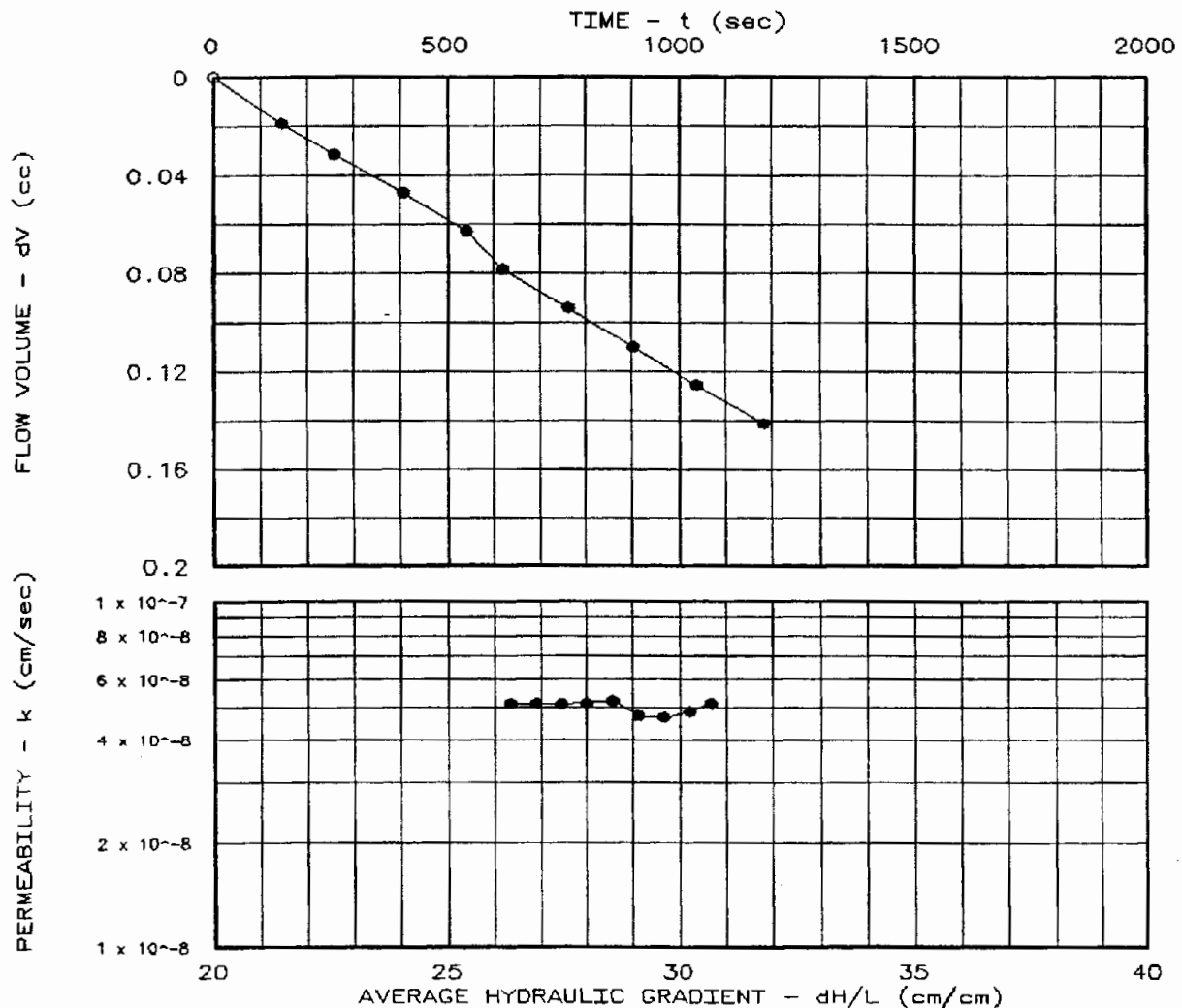
PERMEABILITY TEST REPORT

TEST DATA:

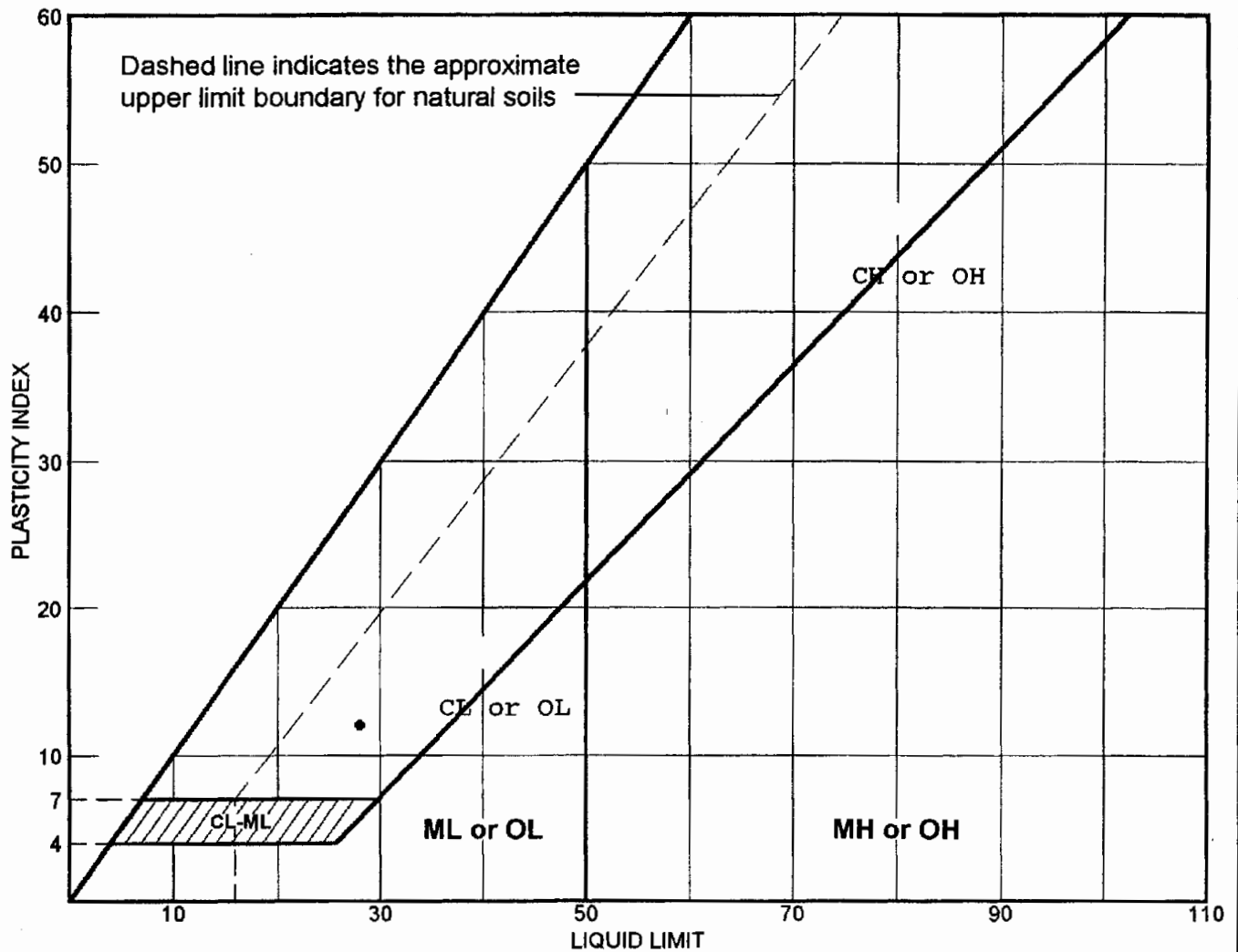
Specimen Height (cm): 11.81
 Specimen Diameter (cm): 10.16
 Dry Unit Weight (pcf): 124.0
 Moisture Before Test (%): 8.4
 Moisture After Test (%): 11.6
 Run Number: 1 • 2 ▲
 Cell Pressure (psi): 90.0
 Sat. Pressure (psi): 80.0
 Diff. Head (psi): 4.8
 Perm. (cm/sec): 4.89×10^{-8}

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



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.

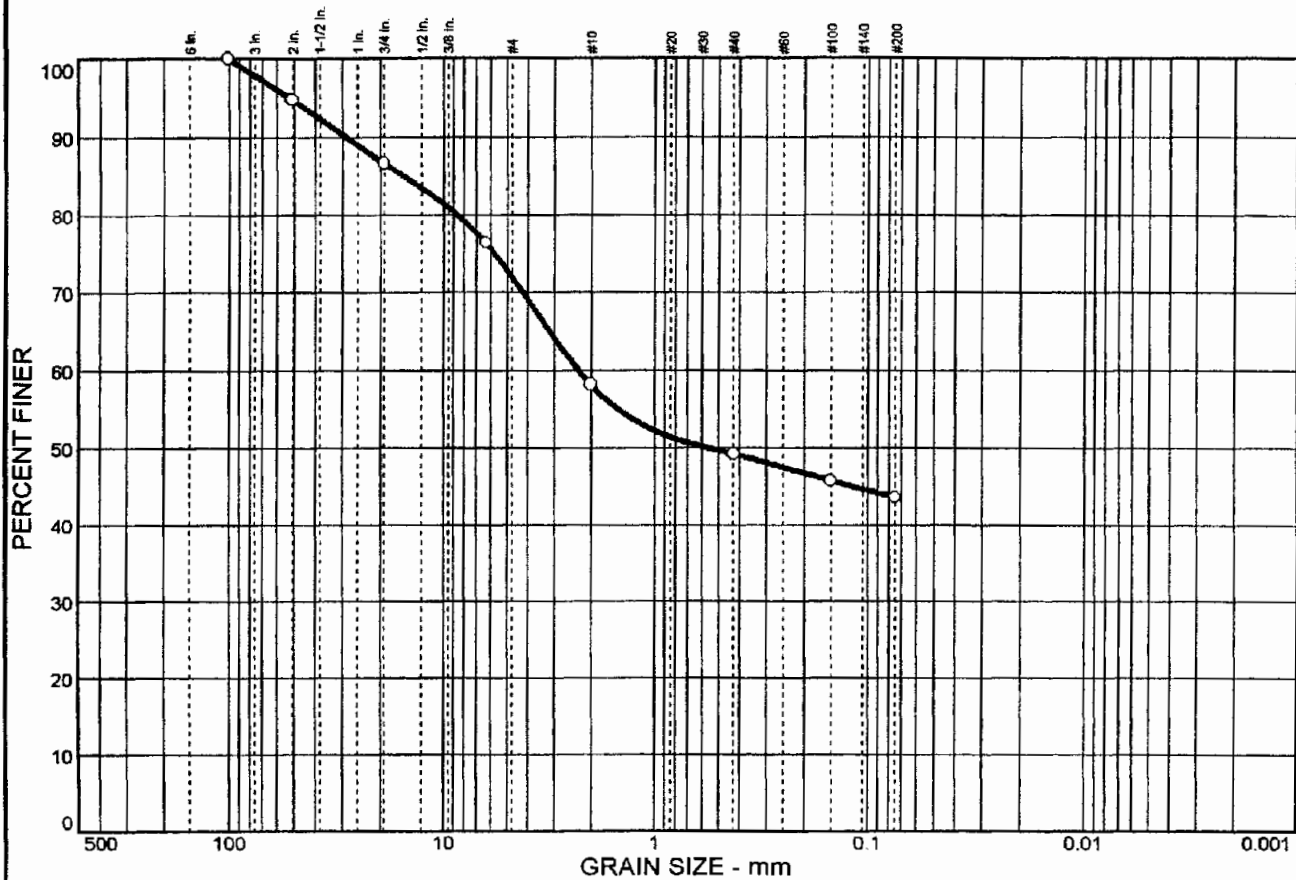
Client: Marcy Excavation

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
 D₈₅= 15.5 D₆₀= 2.28 D₅₀= 0.565
 D₃₀= D₁₅= D₁₀=
 C_u= C_c=

Classification
USCS= SC AASHTO=

Remarks

Sample No.: 217, CF-3
Location: Pile #3

Source of Sample: Common Fill

Date: 5/11/01
Elev./Depth:

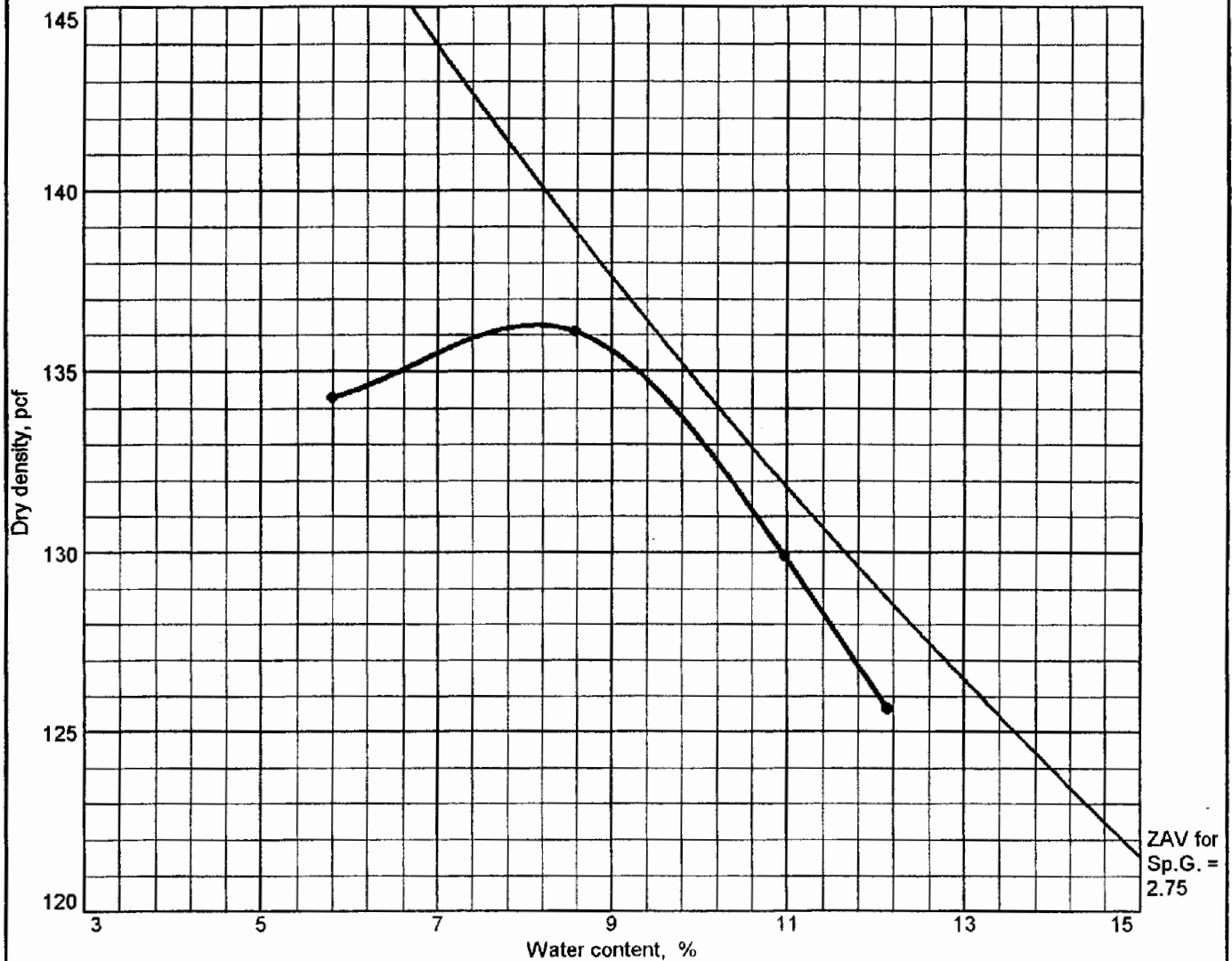
**SJB
SERVICES, INC.**

Client: Marcy Excavation
Project: Cortland Landfill Cover

Project No: 2009053

Plate

COMPACTION TEST REPORT

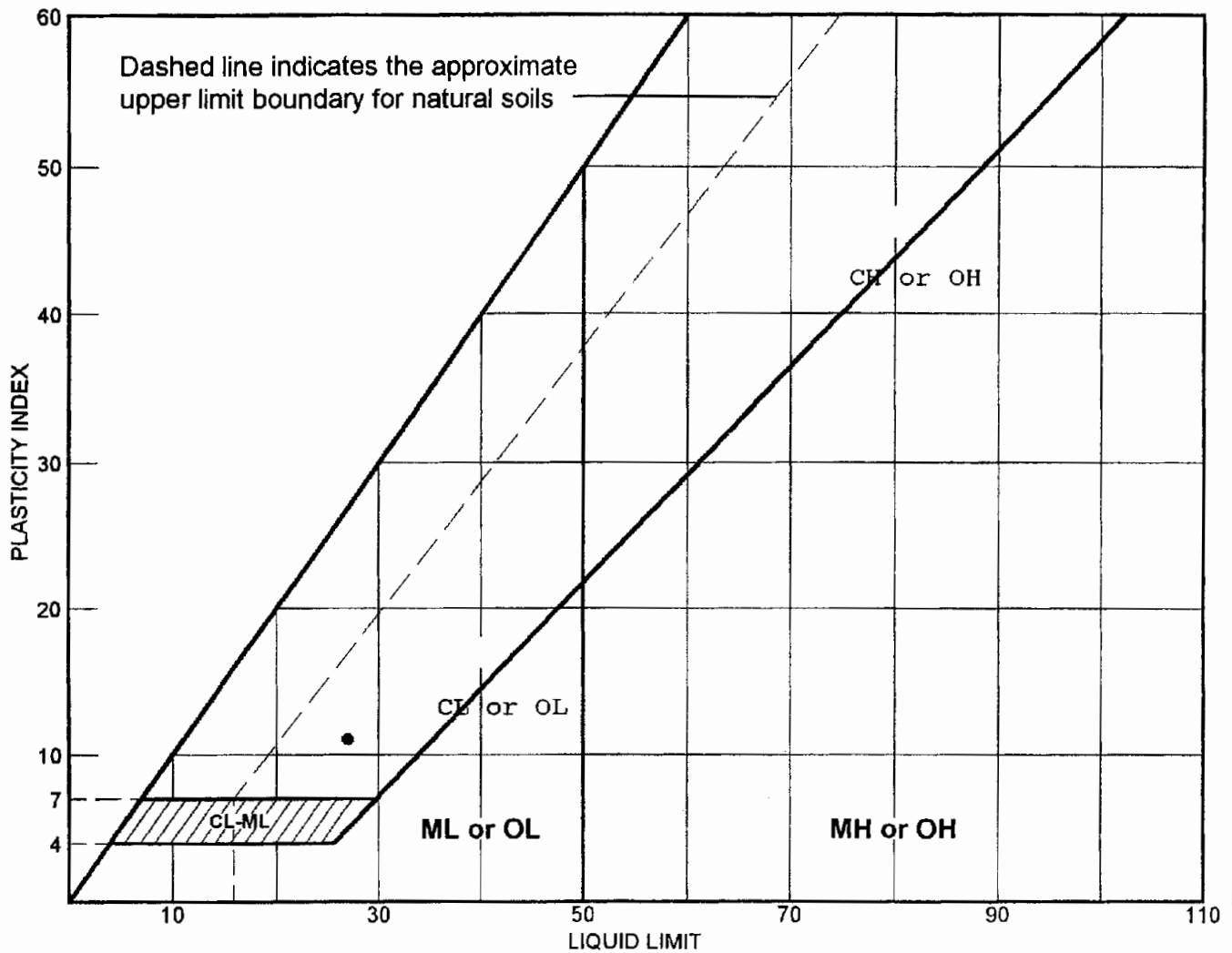


Test specification: ASTM D 1557-78 Method D Modified

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

TEST RESULTS		MATERIAL DESCRIPTION
Maximum dry density = 136.3 pcf		Clayey sand with gravel Retest of CF #1
Optimum moisture = 8.1 %		
Project No. 2009053 Client: Marcy Excavation Project: Cortland Landfill Cover ● Location: Pile #3		Remarks:
COMPACTON 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

SJB
SERVICES, INC.

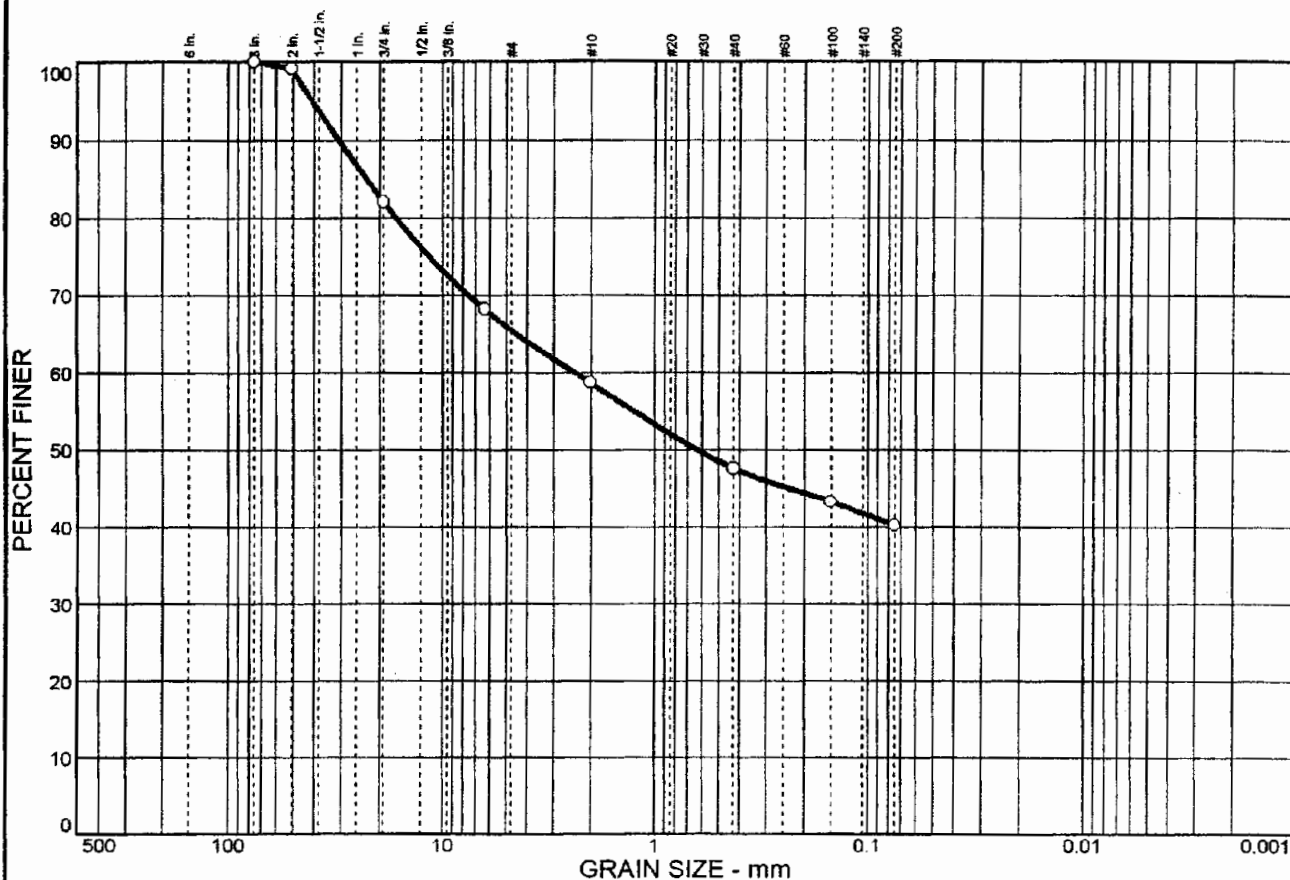
Client: Marcy Excavation

Project: Cortland Landfill Cover

Project No.: 2009053

Plate

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	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
D₈₅= 22.8 D₆₀= 2.37 D₅₀= 0.633
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification
USCS= GC AASHTO=

Remarks

Sample No.: 225, CF-4
Location: 5/10/01, S-1

Source of Sample: Common Fill

Date: 5/14/01
Elev./Depth:

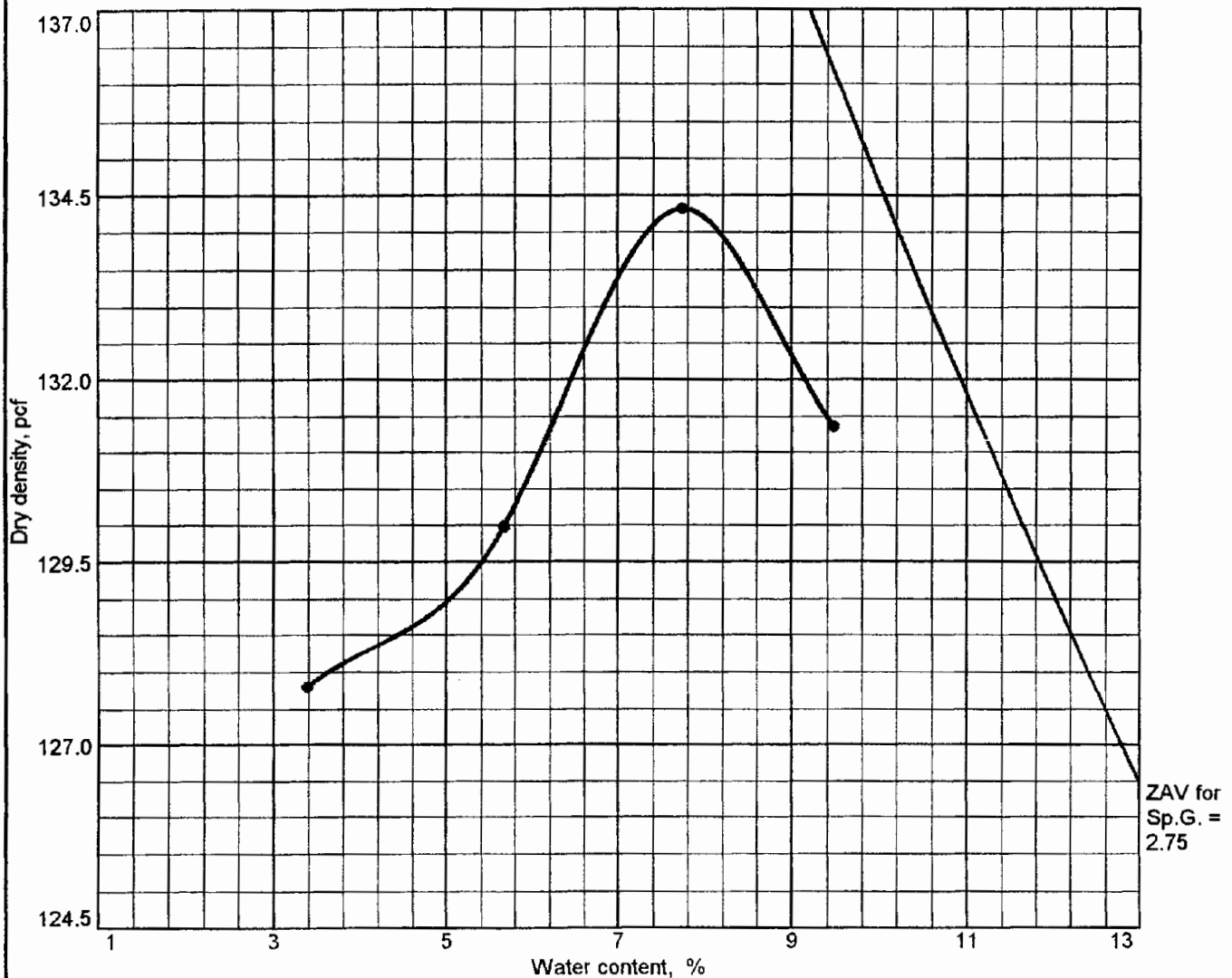
**SJB
SERVICES, INC.**

Client: Marcy Excavation
Project: Cortland Landfill Cover

Project No: 2009053

Plate

COMPACTION TEST REPORT

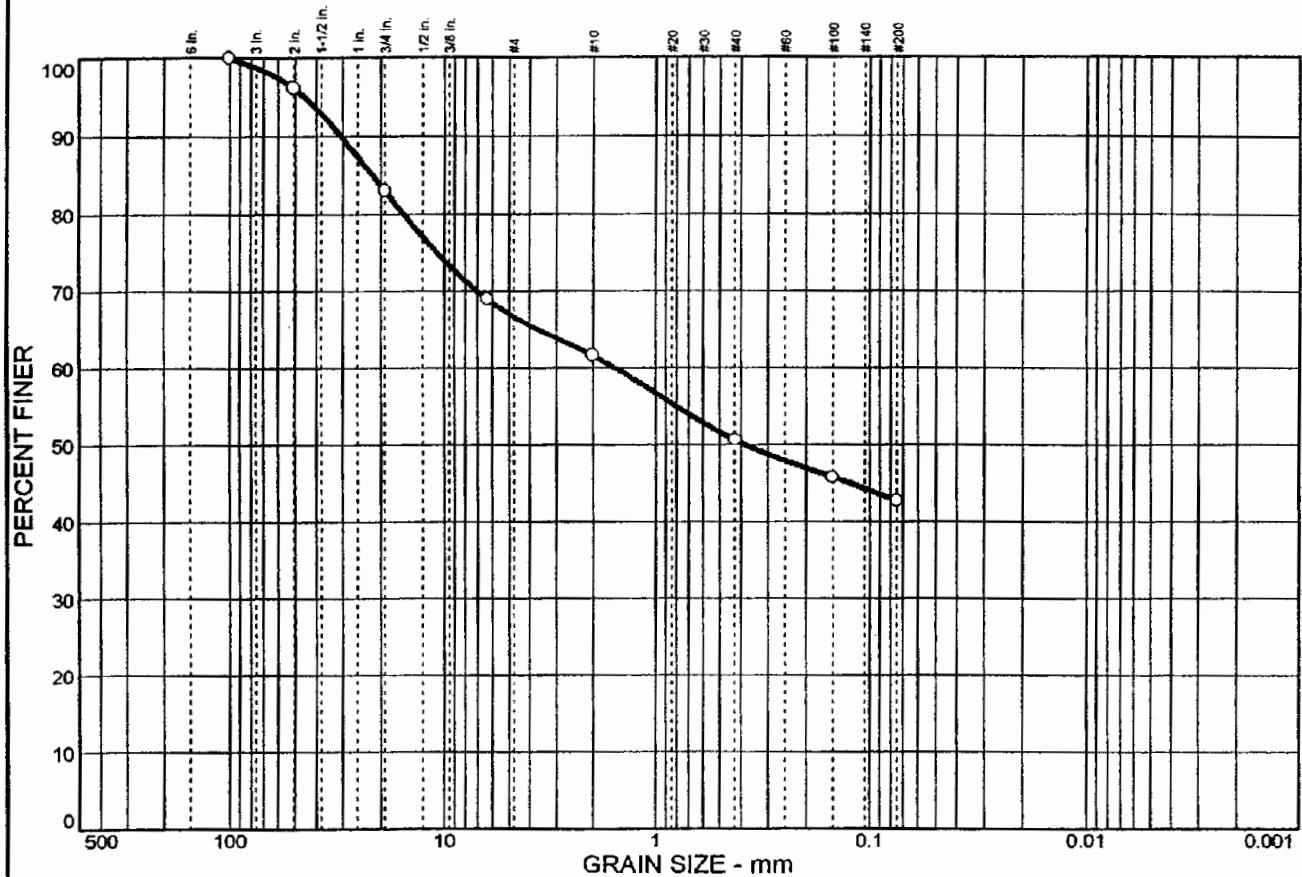


Test specification: ASTM D 1557-78 Method D Modified

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

TEST RESULTS		MATERIAL DESCRIPTION
Maximum dry density = 134.3 pcf Optimum moisture = 7.7 %		Clayey gravel with sand 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		

Soil Description

Common Fill, 5K
Clayey gravel with sand

Atterberg Limits

PL= 16 LL= 28 PI= 12

Coefficients

D₈₅= 21.7 D₆₀= 1.57 D₅₀= 0.382
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= GC AASHTO=

Remarks

* (no specification provided)

Sample No.: 242, CF-5

Source of Sample: Common Fill

Date: 5/18/01

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

Elev./Depth:

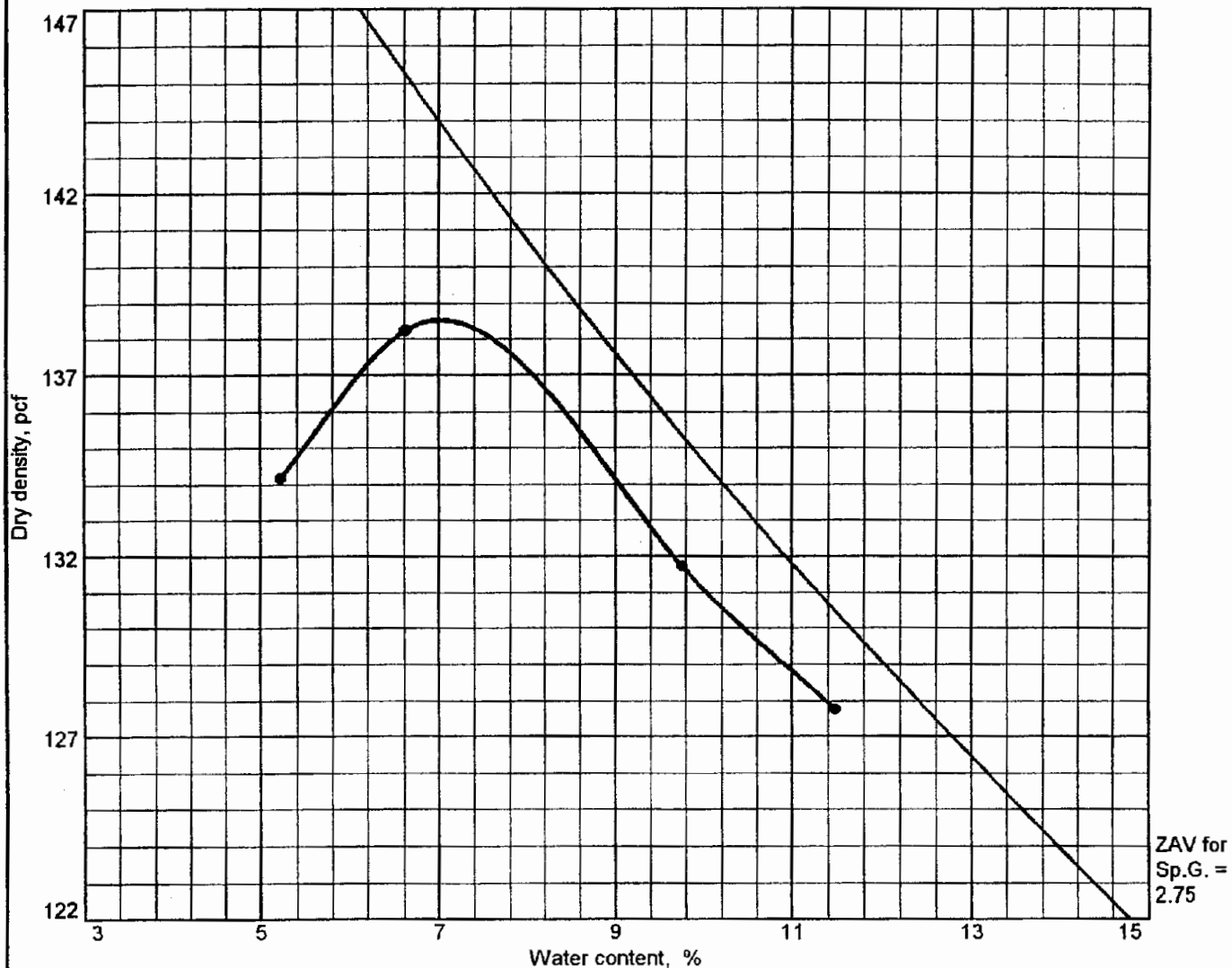
**SJB
SERVICES, INC.**

Client: Marcy Excavation
Project: Cortland Landfill Cover

Project No: 2009053

Plate

COMPACTION TEST REPORT

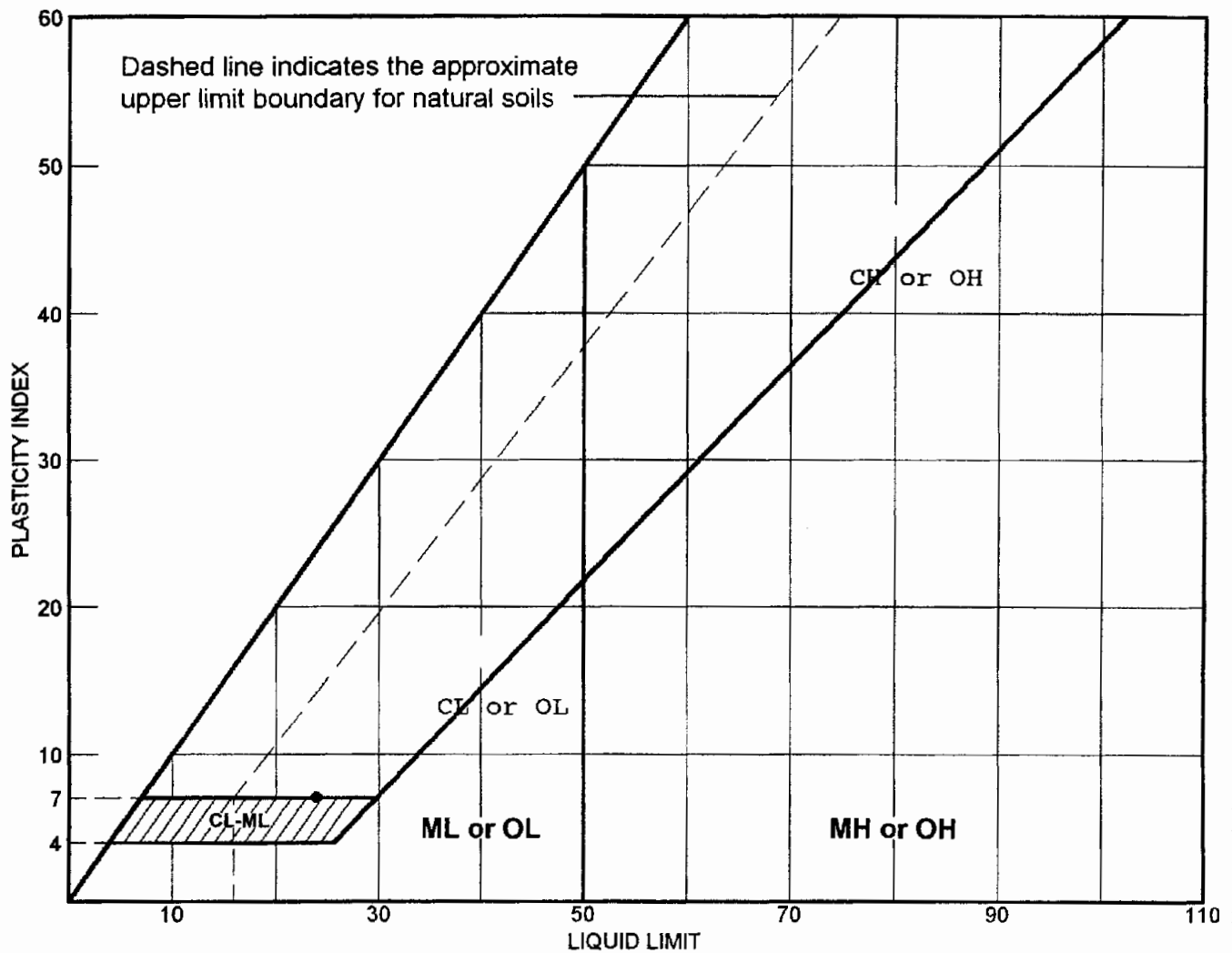


Test specification: ASTM D 1557-78 Method D Modified

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 Optimum moisture = 7.0 %	Common Fill, 5K 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.**

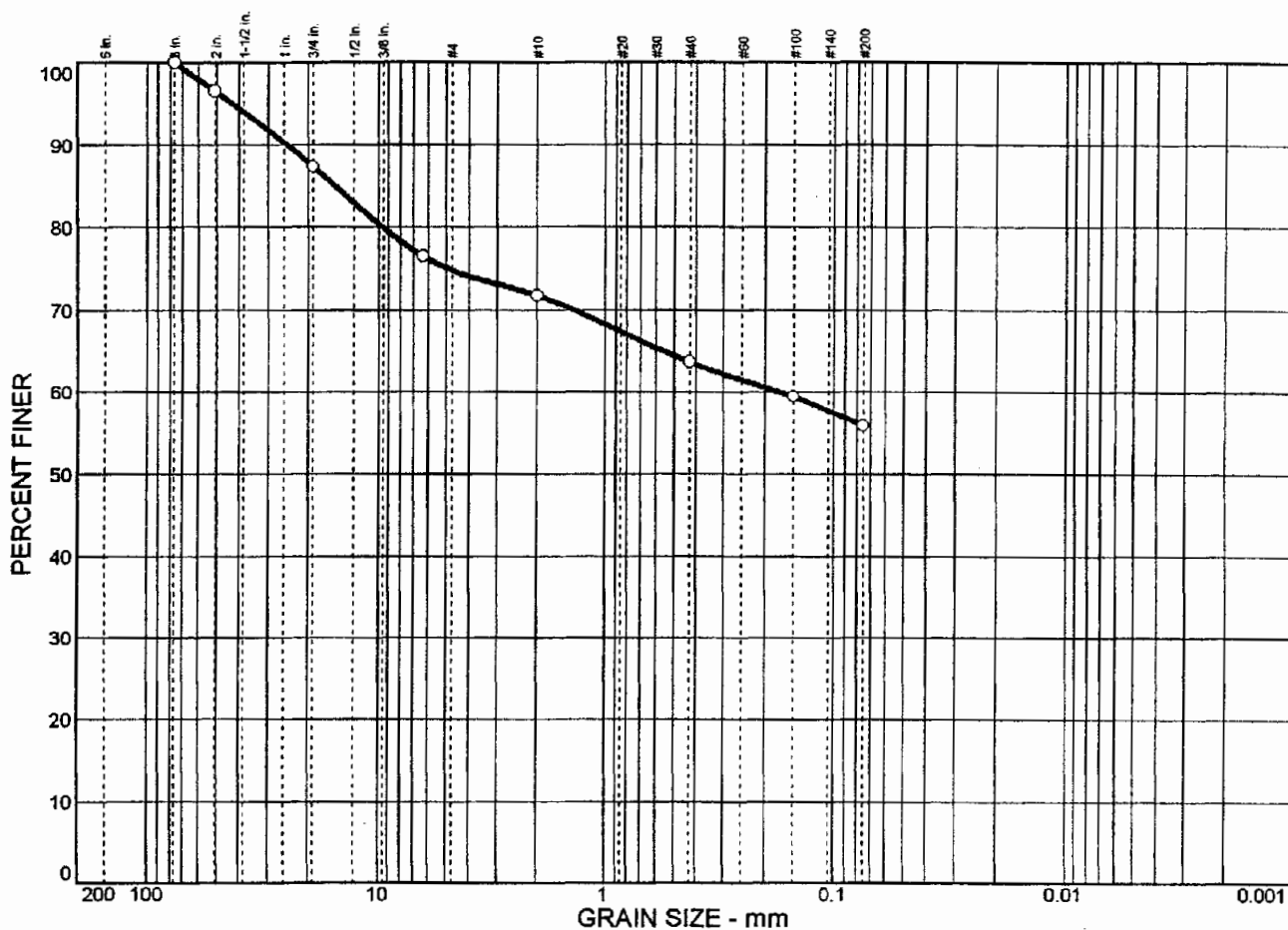
Client: Marcy Excavation

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.

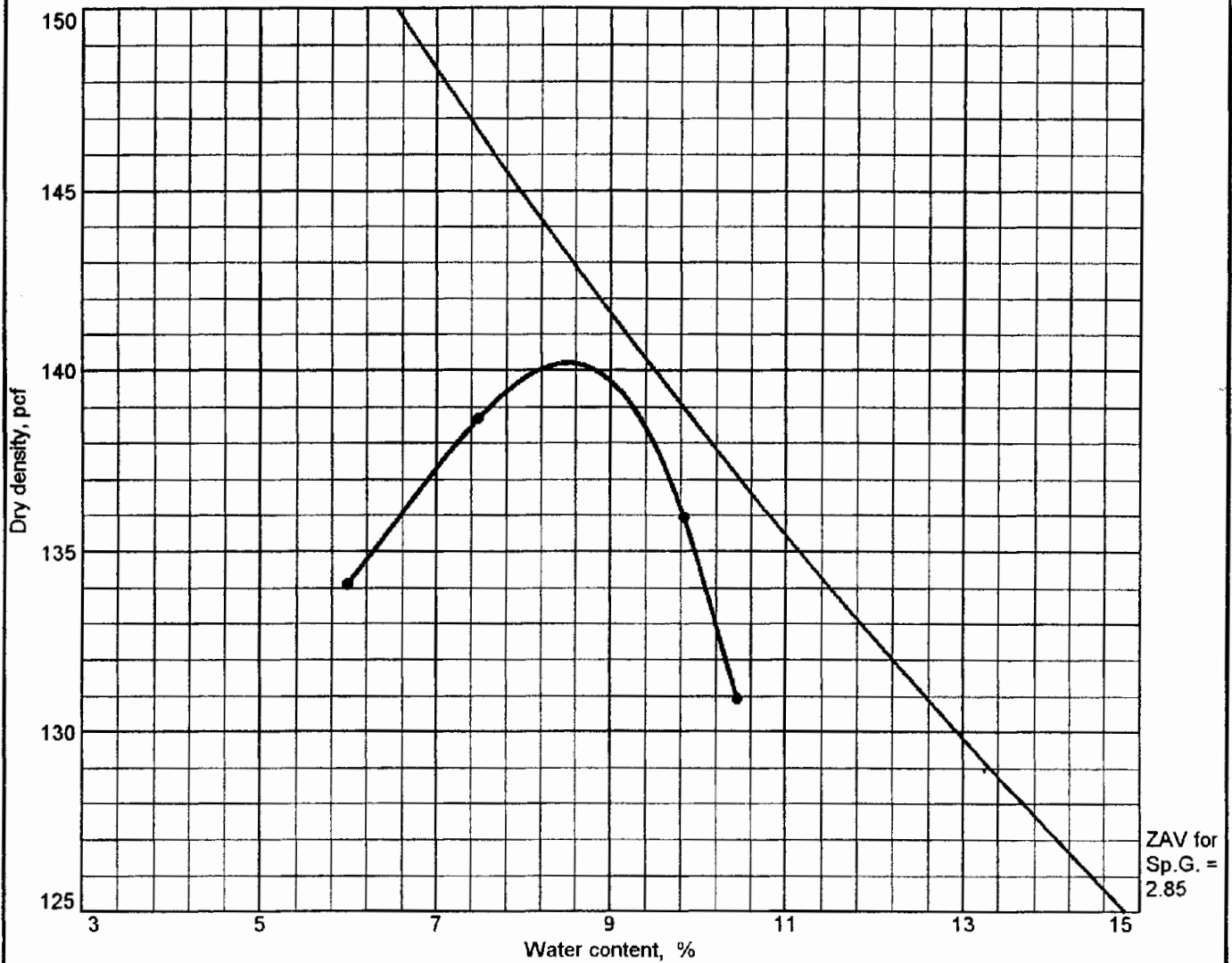
Client: Marcy Excavation

Project: Cortland Landfill Cover

Project No.: 2009053

Plate

COMPACTION TEST REPORT

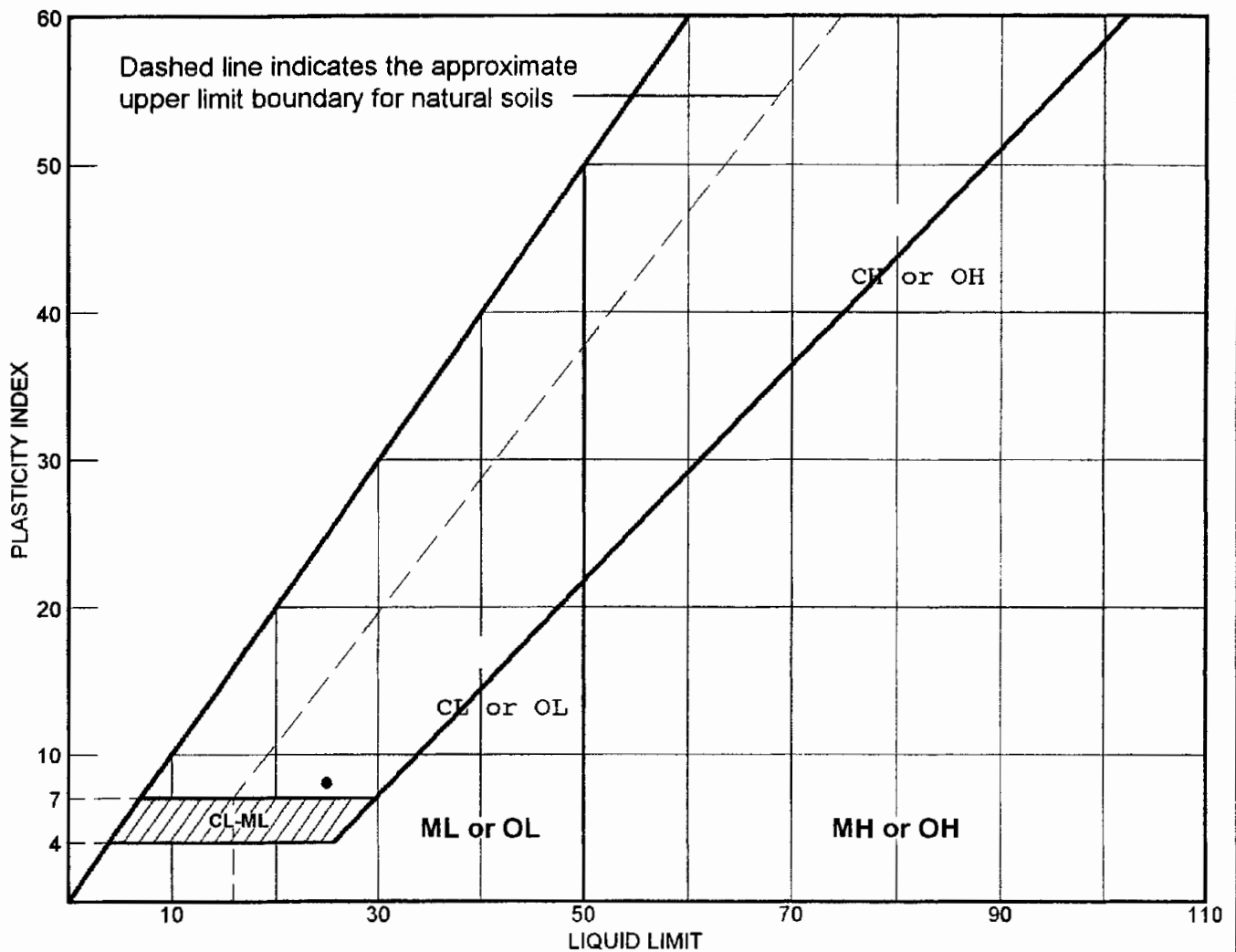


Test specification: ASTM D 1557-78 Method D Modified

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 Optimum moisture = 8.5 %		Common Fill, Gravelly silty clay with sand B-74, Sampled on 5/25/01
Project No. 2009053 Client: Marey Excavation Project: Cortland Landfill Cover		
● Location: 5-10K cy, B-74		
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

SJB
SERVICES, INC.

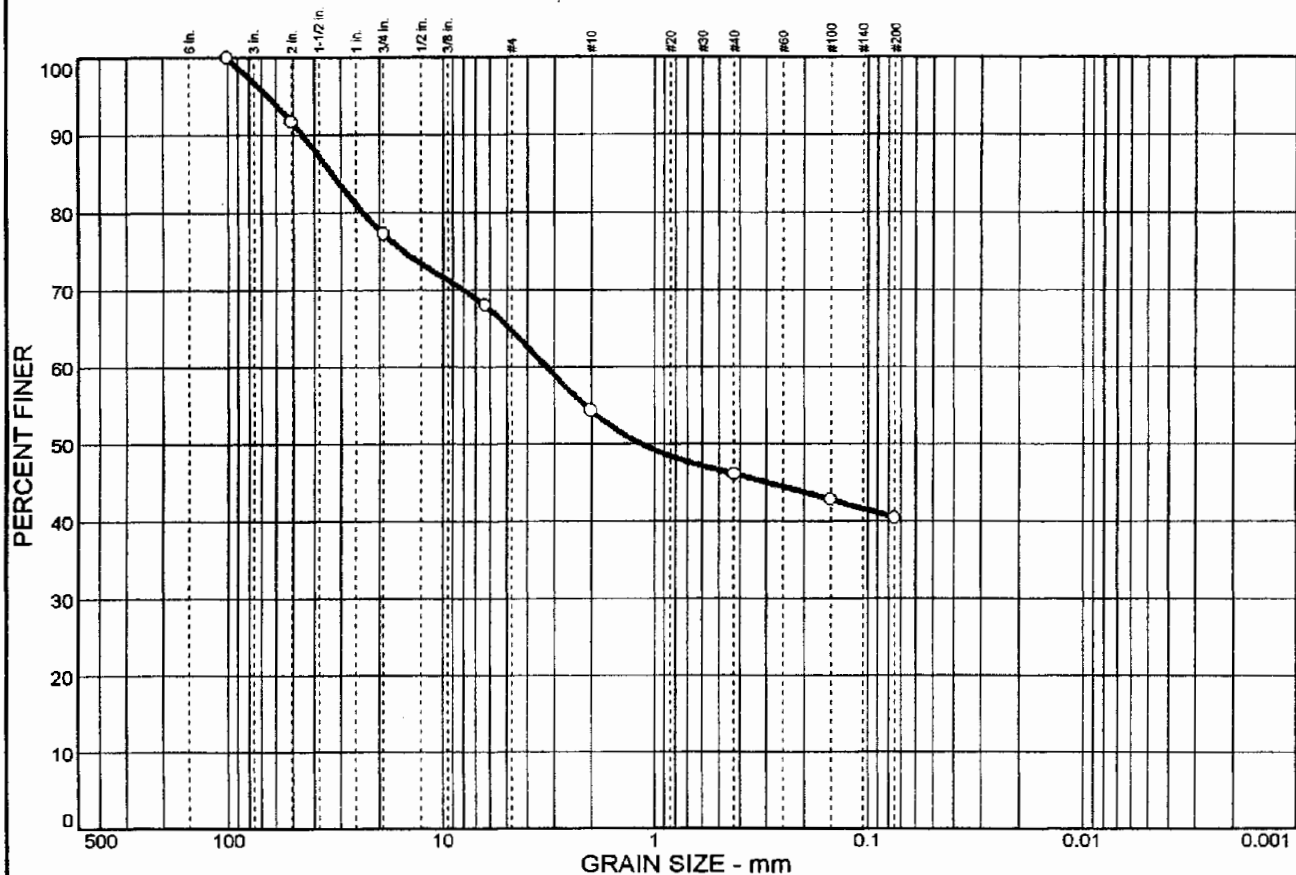
Client: Marcy Excavation

Project: Cortland Landfill Cover

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

D₈₅= 32.8 D₆₀= 3.24 D₅₀= 1.16
D₃₀= D₁₅=
C_u= C_c=

Classification

USCS= GC AASHTO=

Remarks

F.M.=0.80

Sample No.: 256
Location: CF-7, BGV 97, 15K

Source of Sample: Common Fill

Date: 6/5/01
Elev./Depth:

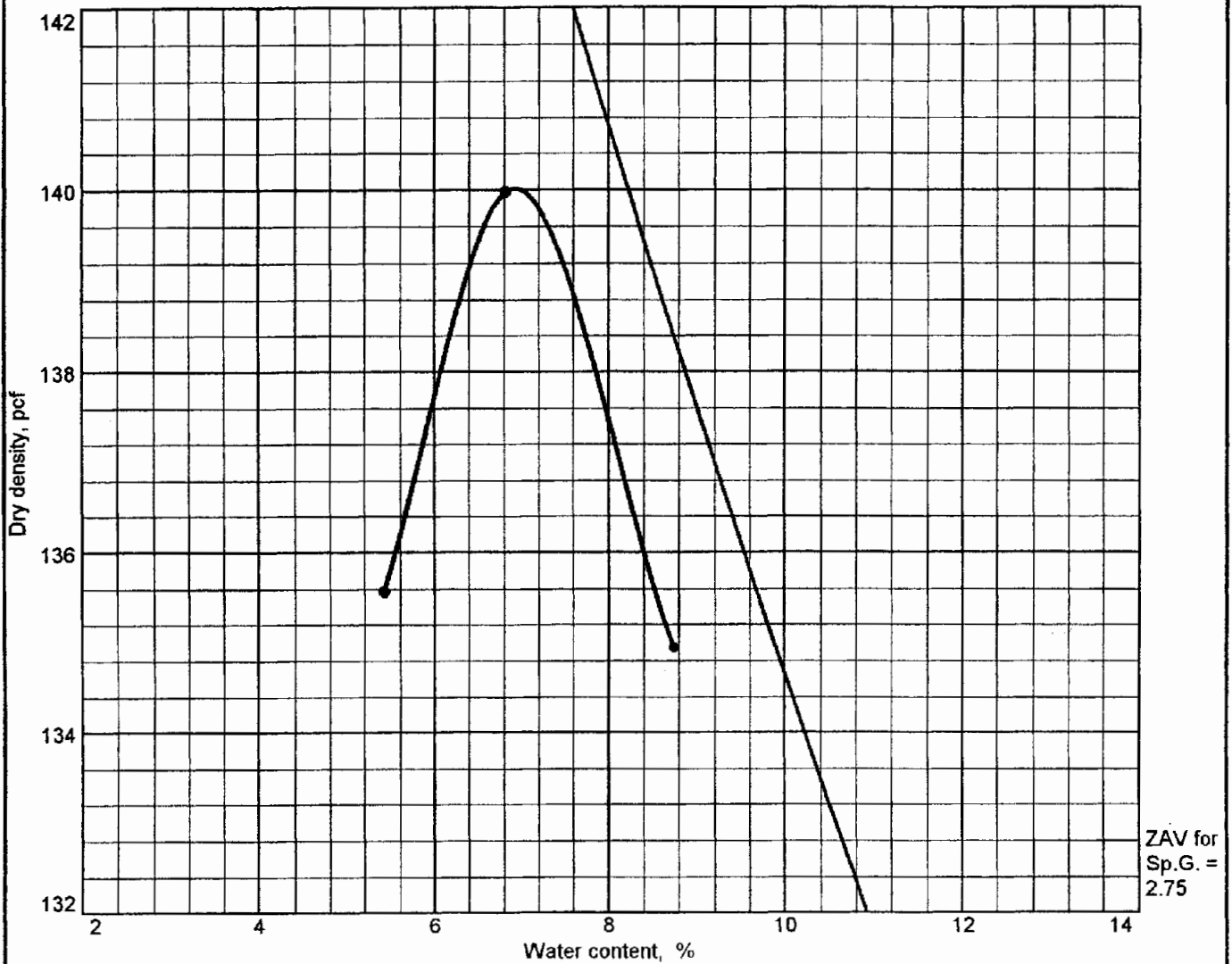
SJB
SERVICES, INC.

Client: Marcy Excavation
Project: Cortland Landfill Cover

Project No: 2009053

Plate

COMPACTION TEST REPORT

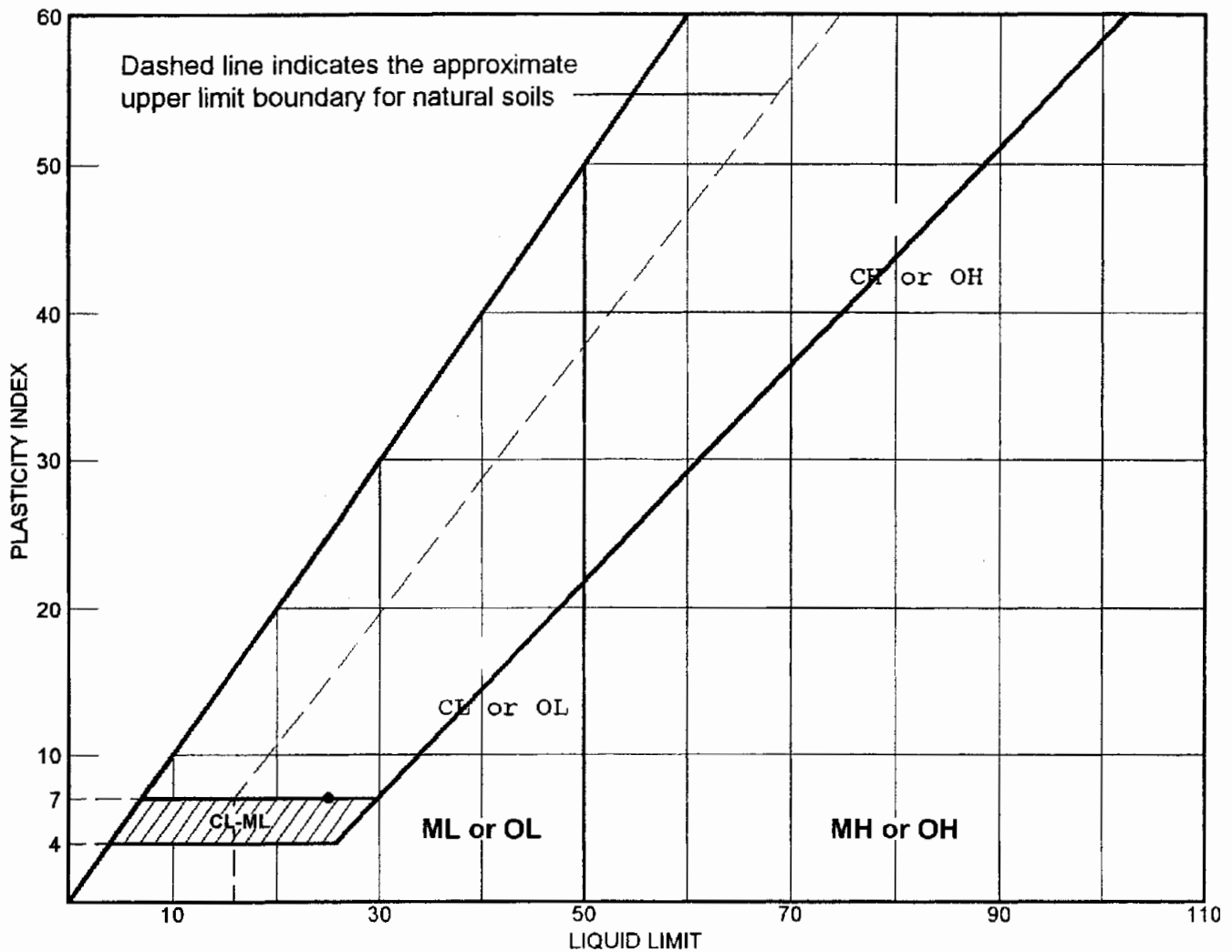


Test specification: ASTM D 1557-78 Method D Modified

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

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

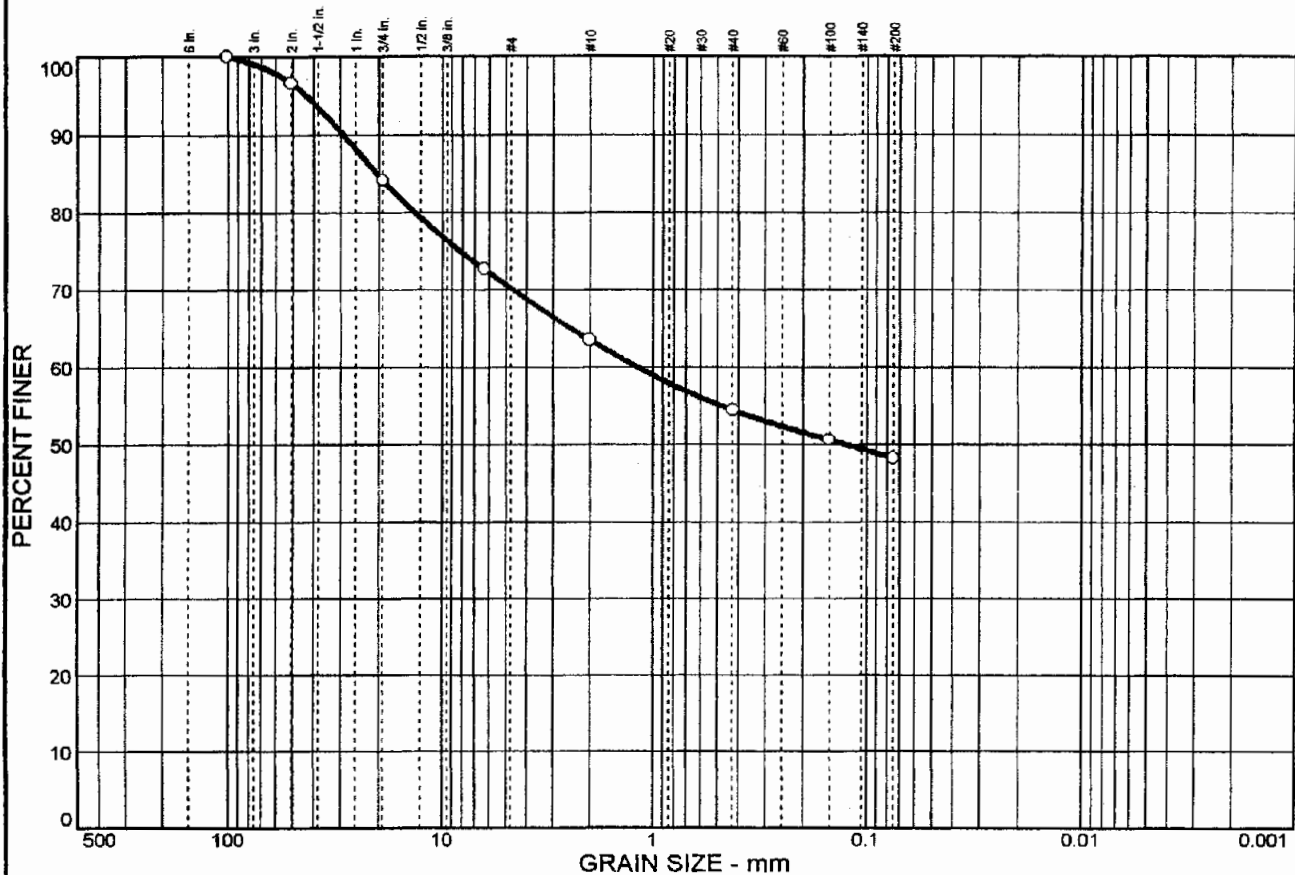
Client: Marcy Excavation

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

D₈₅= 20.2 D₆₀= 1.19 D₅₀= 0.126
D₃₀= D₁₅=
C_u= C_c=

Classification

USCS= GC-GM AASHTO=

Remarks

F.M.=0.65

Sample No.: 266, CF-8
Location: AV-10, 20K

Source of Sample: Common Fill

Date: 6/7/01
Elev./Depth:

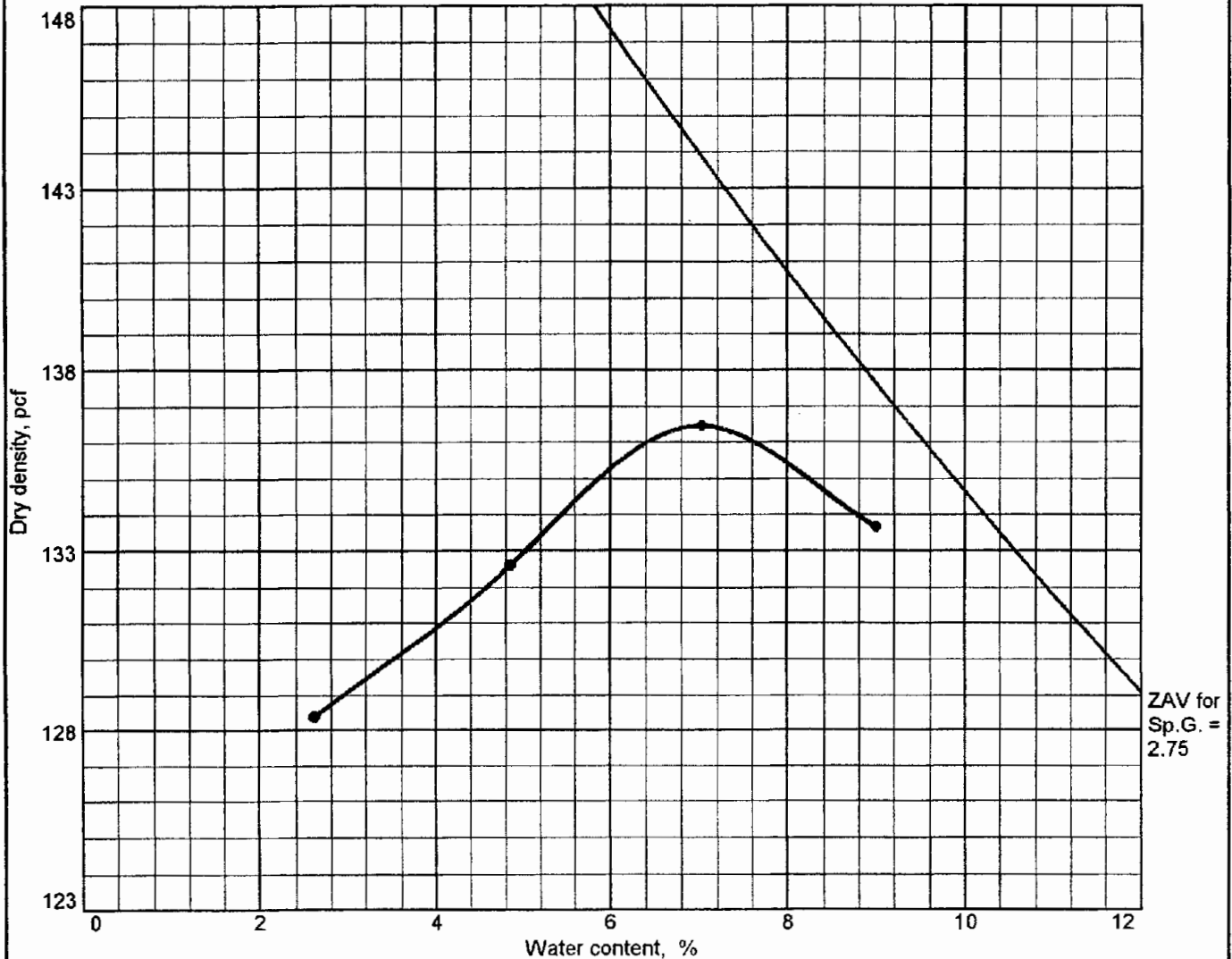
SJB
SERVICES, INC.

Client: Macey Excavation
Project: Cortland Landfill Cover

Project No: 2009053

Plate

COMPACTION TEST REPORT

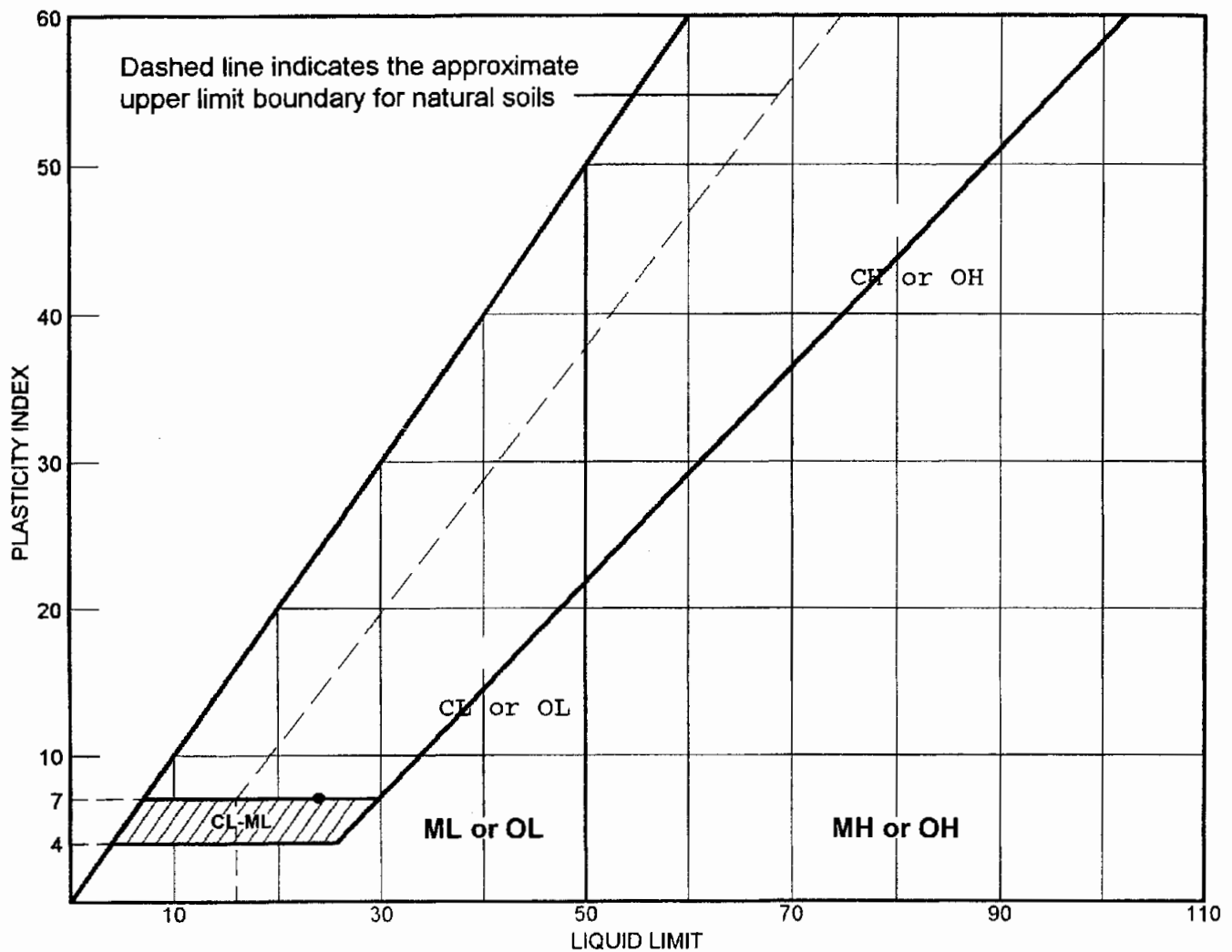


Test specification: ASTM D 1557-78 Method C Modified

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		Common Fill CF-8, @ AV-10, Sampled 6-6-01 Silty clayey gravel with sand.
Optimum moisture = 7.0 %		
Project No. 2009053 Client: Marcy Excavation Project: Cortland Landfill Cover		Remarks: Common Fill CF-8, @ AV-10, Sampled 6-6-01.
● Location: AV-10, 20K		
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	267, CF-9			17	24	7	GC-GM

LIQUID AND PLASTIC LIMITS TEST REPORT

SJB
SERVICES, INC.

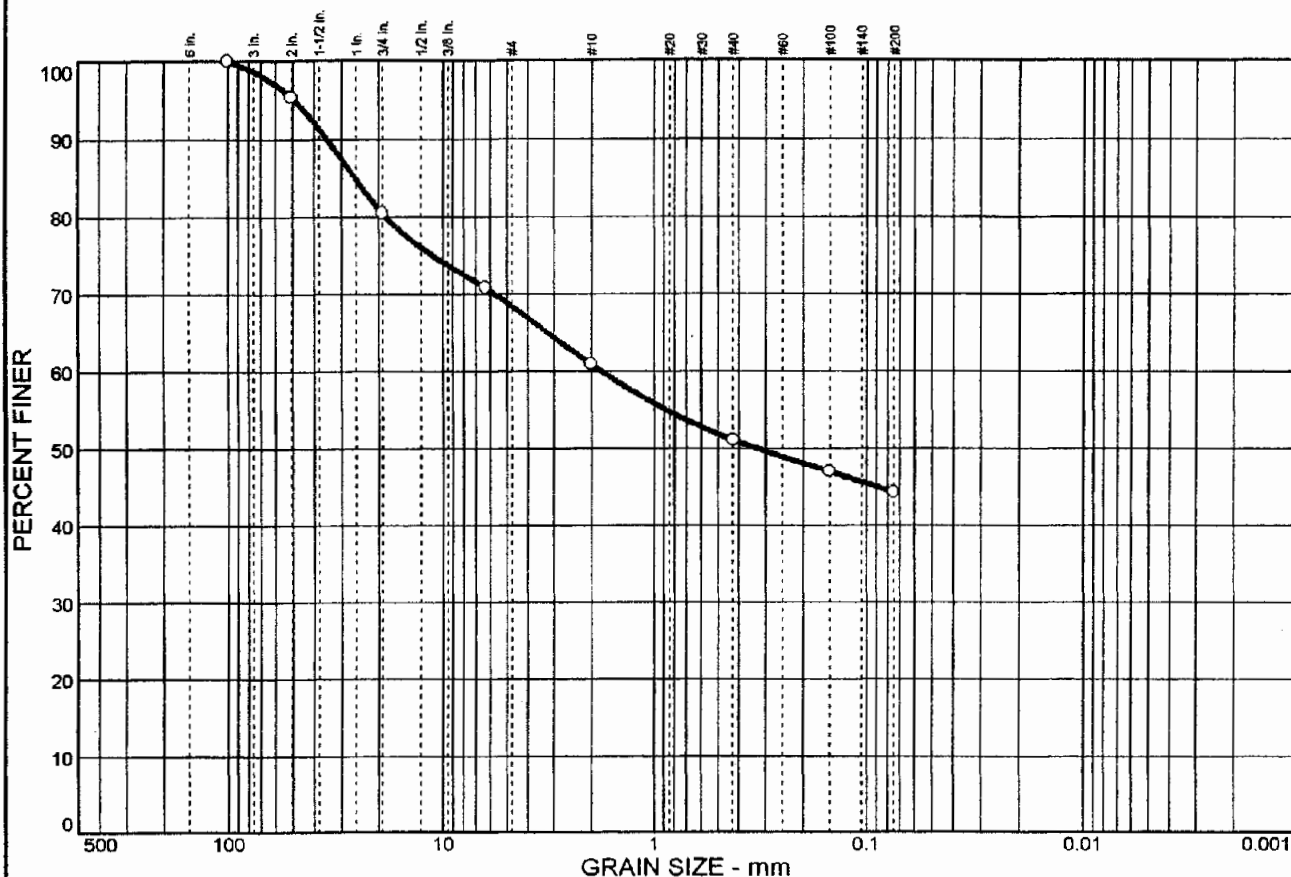
Client: Marcy Excavation

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		

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
D₈₅= 25.6 D₆₀= 1.79 D₅₀= 0.329
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification
USCS= GC-GM AASHTO=

Remarks
F.M.=0.73

* (no specification provided)

Sample No.: 267, CF-9
Location: 25K

Source of Sample: Common Fill

Date: 6/11/01
Elev./Depth:

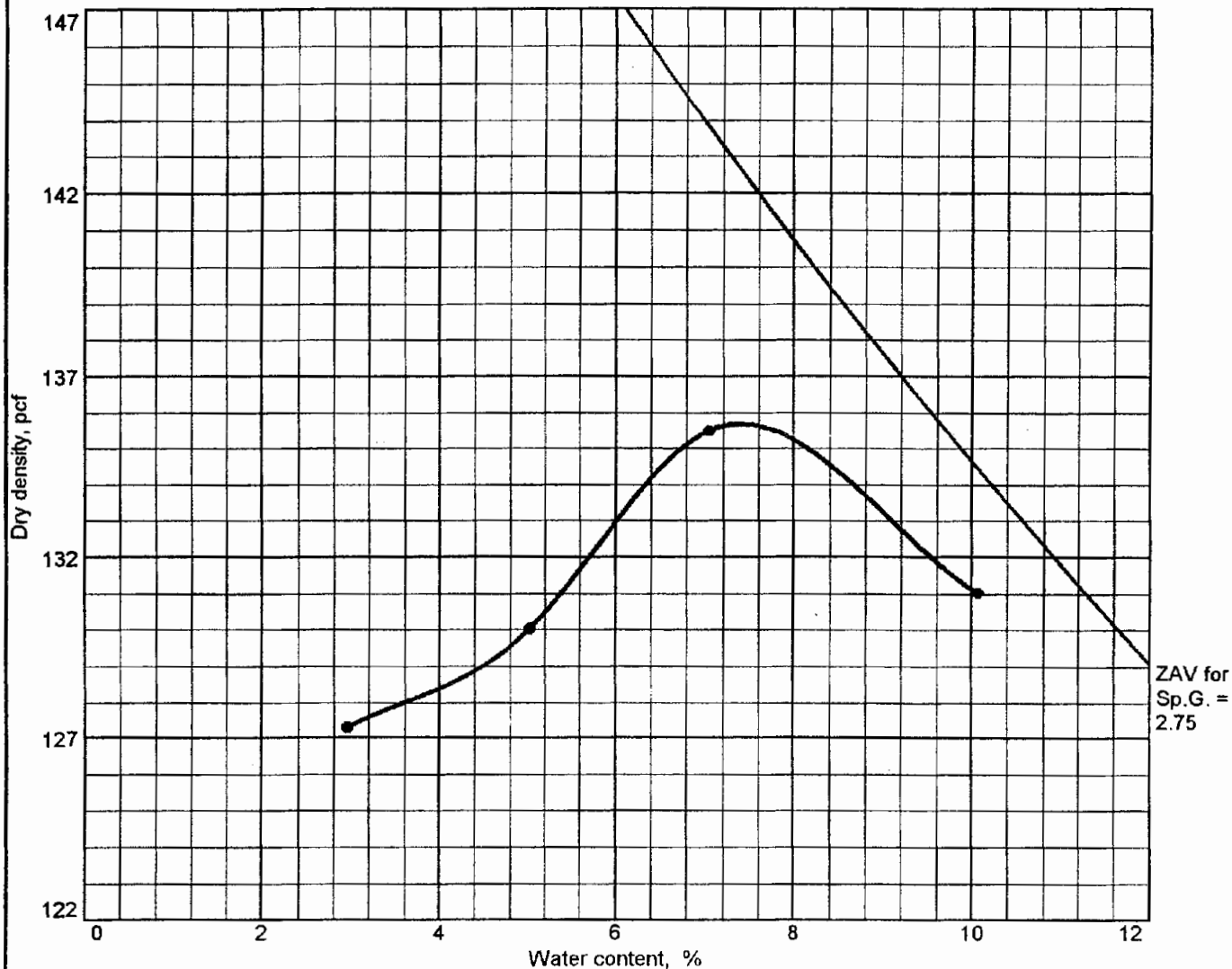
**SJB
SERVICES, INC.**

Client: Marcy Excavation
Project: Cortland Landfill Cover

Project No: 2009053

Plate

COMPACTION TEST REPORT

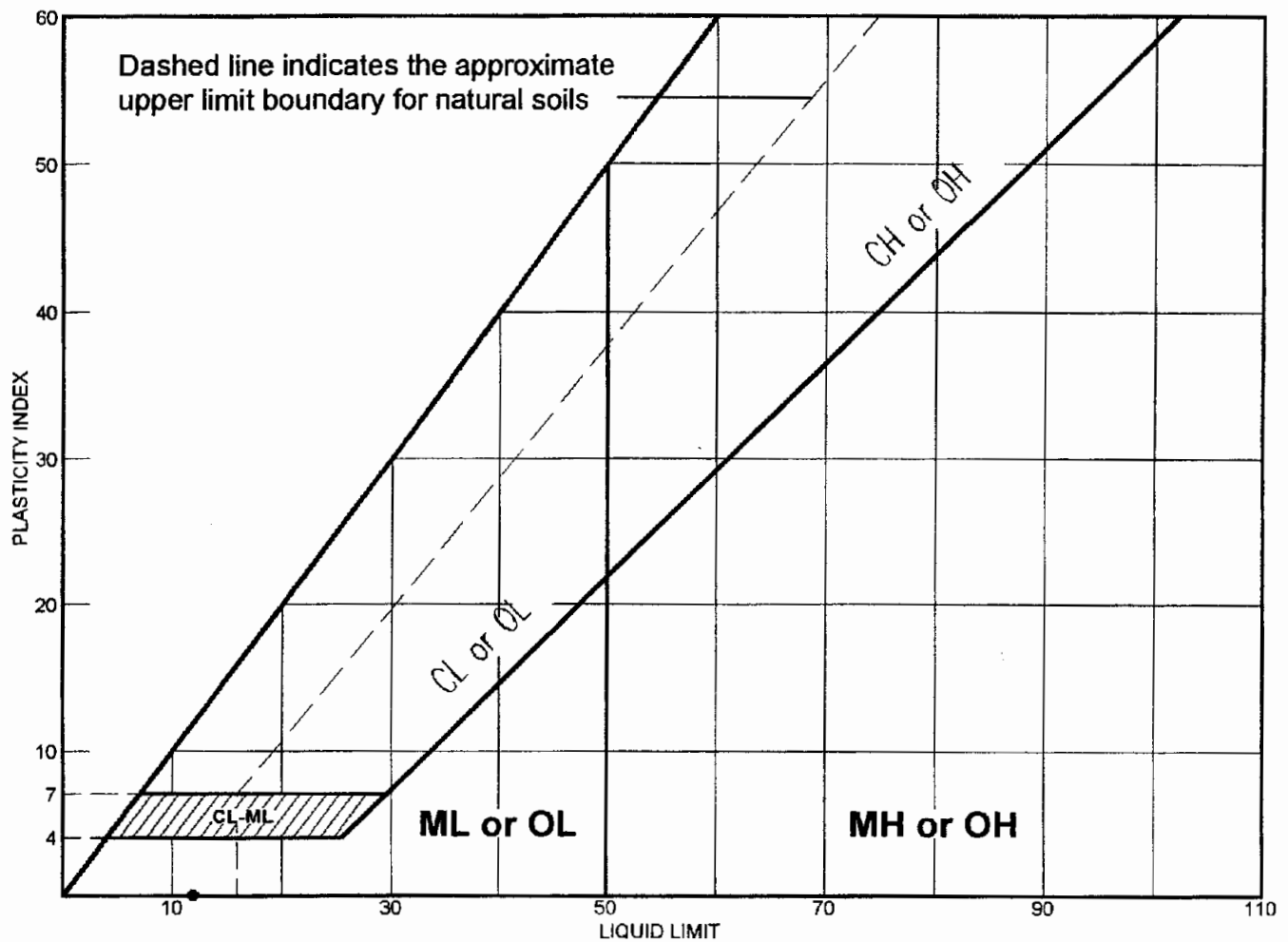


Test specification: ASTM D 1557-78 Method D Modified

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

TEST RESULTS		MATERIAL DESCRIPTION
Maximum dry density = 135.7 pcf Optimum moisture = 7.4 %		Common Fill, CF-9, 25K, Sampled 6/7/01 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 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:

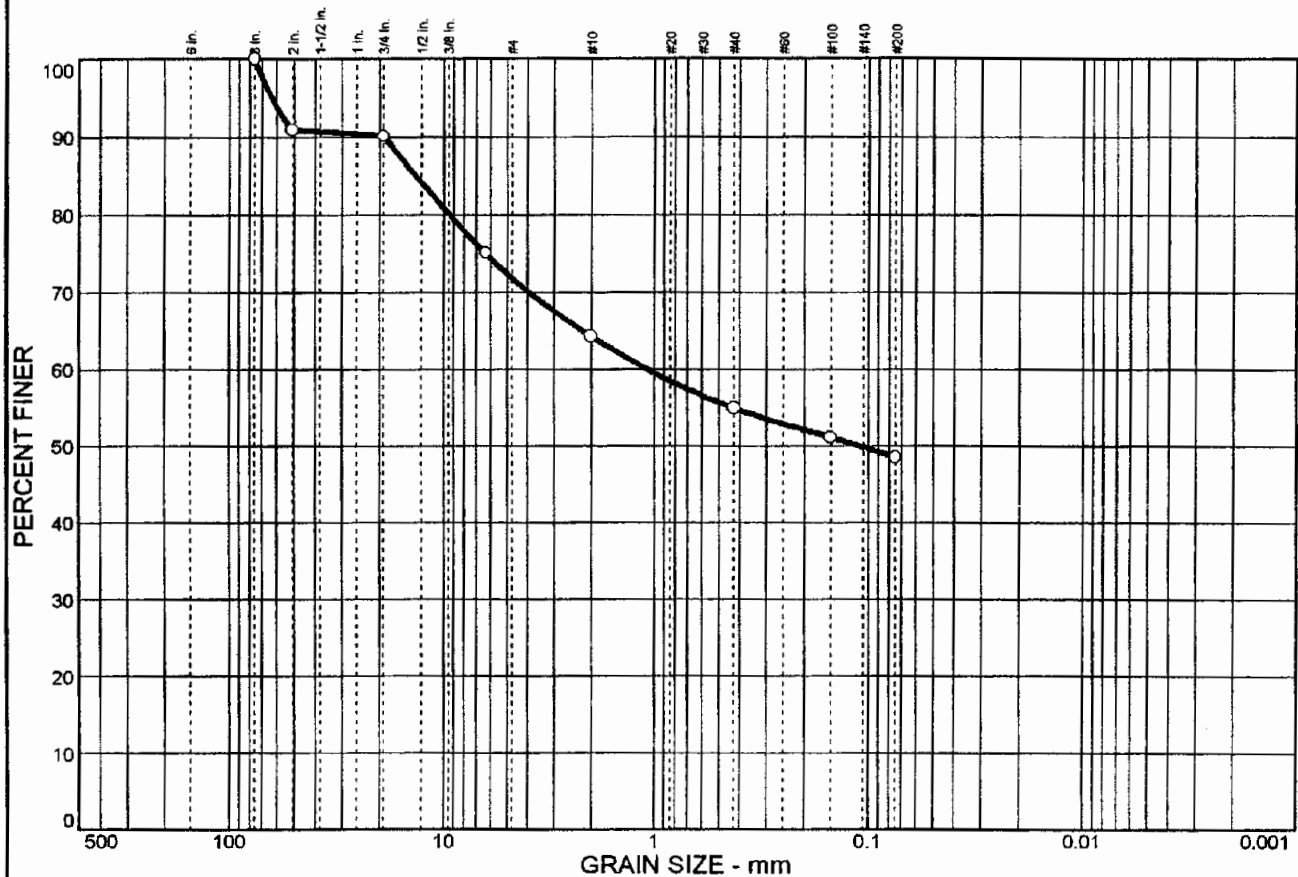
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LIQUID AND PLASTIC LIMITS TEST REPORT

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

D₈₅= 13.4

D₆₀= 1.09

D₅₀= 0.111

D₃₀=

D₁₅=

D₁₀=

C_u=

C_c=

Classification

USCS= GC-GM

AASHTO=

Remarks

Performed Grain Size only.

F.M.=0.59

Sample No.: 285

Location: CF-10, #3P

Source of Sample: Common Fill

Date: 6/18/01

Elev./Depth:

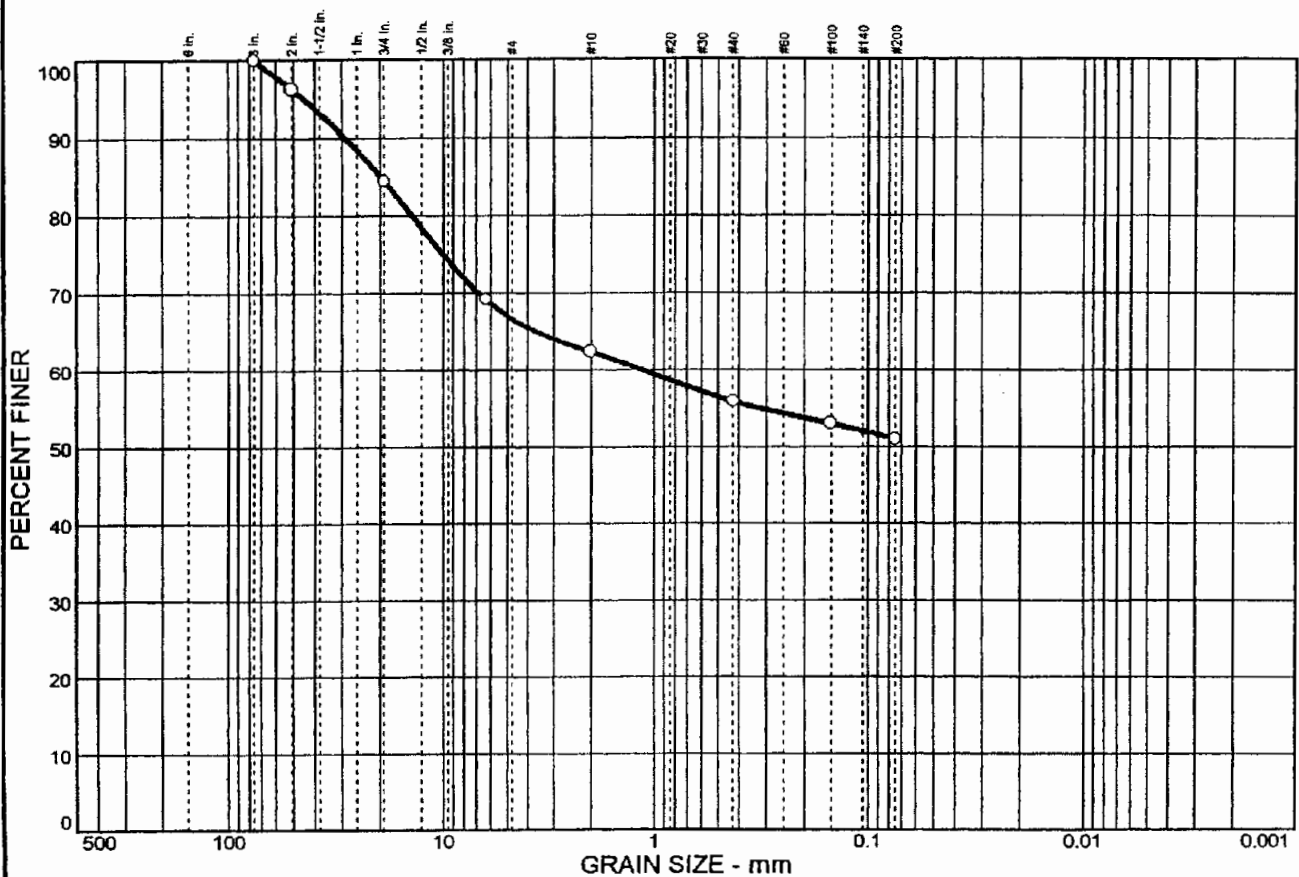
SJB
SERVICES, INC.

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

D₈₅= 19.7 D₆₀= 1.15 D₅₀=
D₃₀= D₁₅= D₁₀=
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:

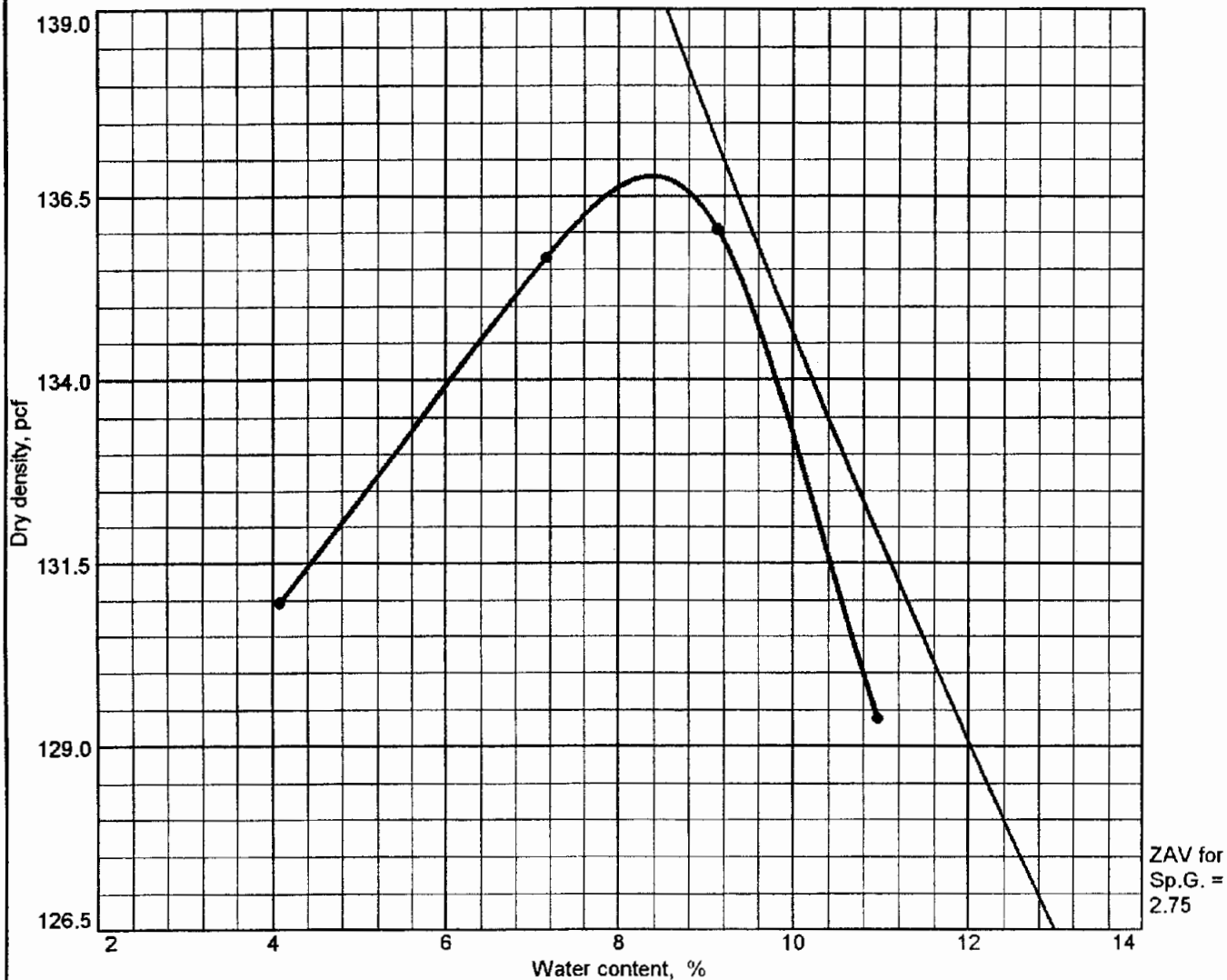
SJB
SERVICES, INC.

Client: Marcy Excavation
Project: Cortland Landfill Cover

Project No: 2009053

Plate

COMPACTION TEST REPORT

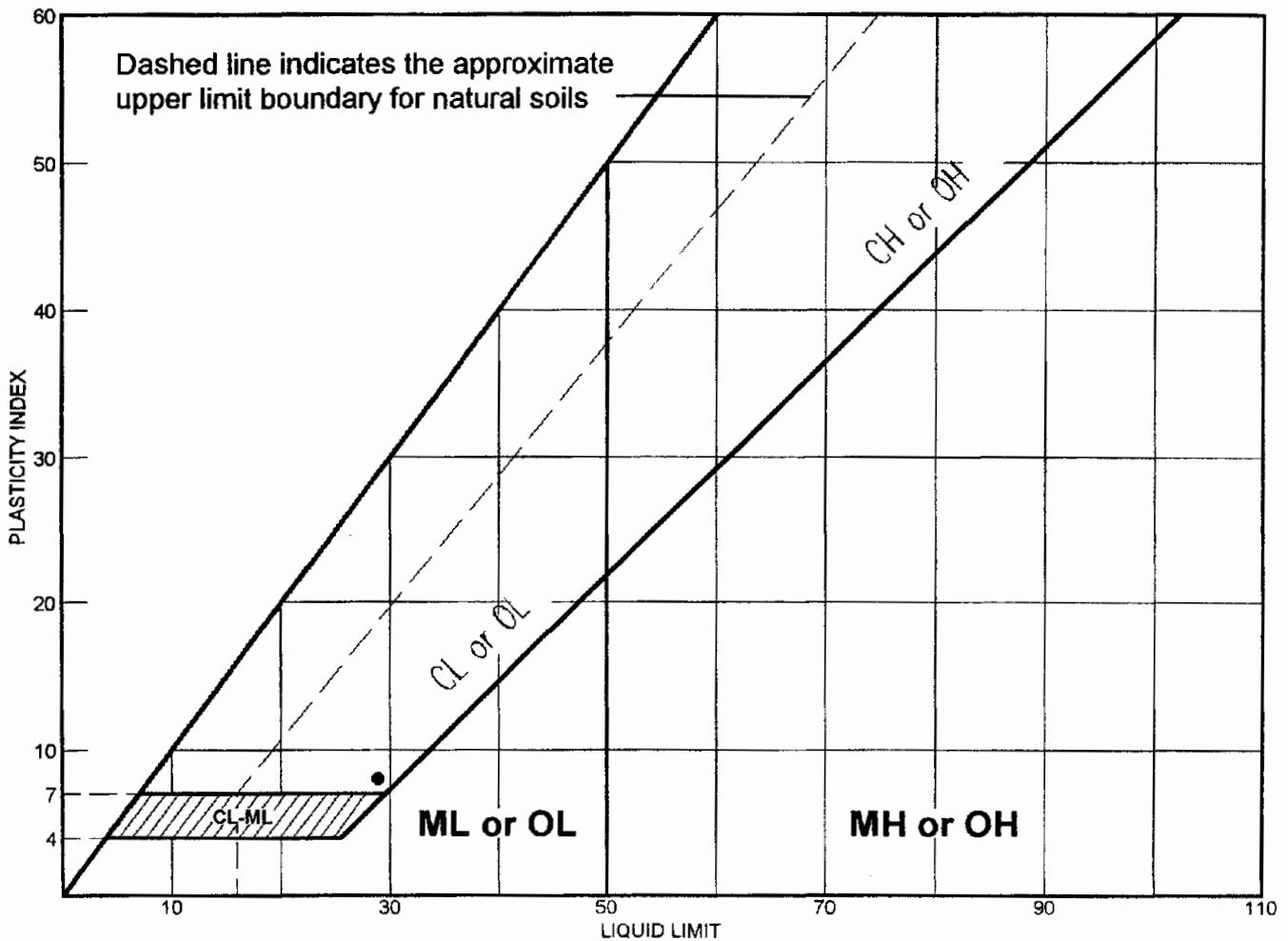


Test specification: ASTM D 1557-78 Method D Modified

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		Common Fill, CF-11 Gravelly silt with sand
Optimum moisture = 8.4 %		
Project No. 2009053 Client: Marcy Excavation Project: Cortland Landfill Cover ● Location: LF Road, 30 K Sample		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-12 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:

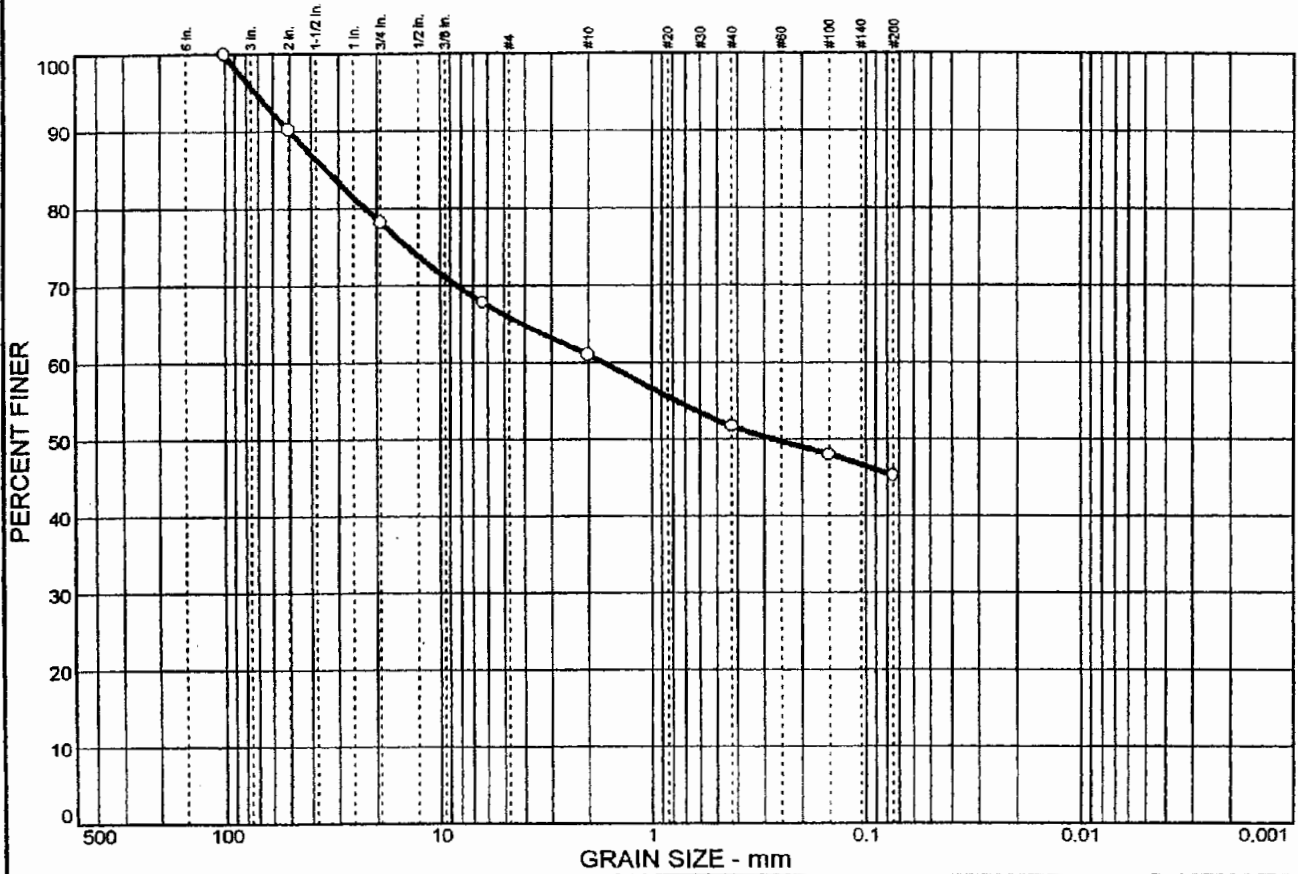
•

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

D₈₅= 34.0 D₆₀= 1.69 D₅₀= 0.275
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= GC AASHTO=

Remarks

Sample No.: 325
Location: B55, 35K Sample

Source of Sample: Common Fill

Date: 7/5/01
Elev./Depth:

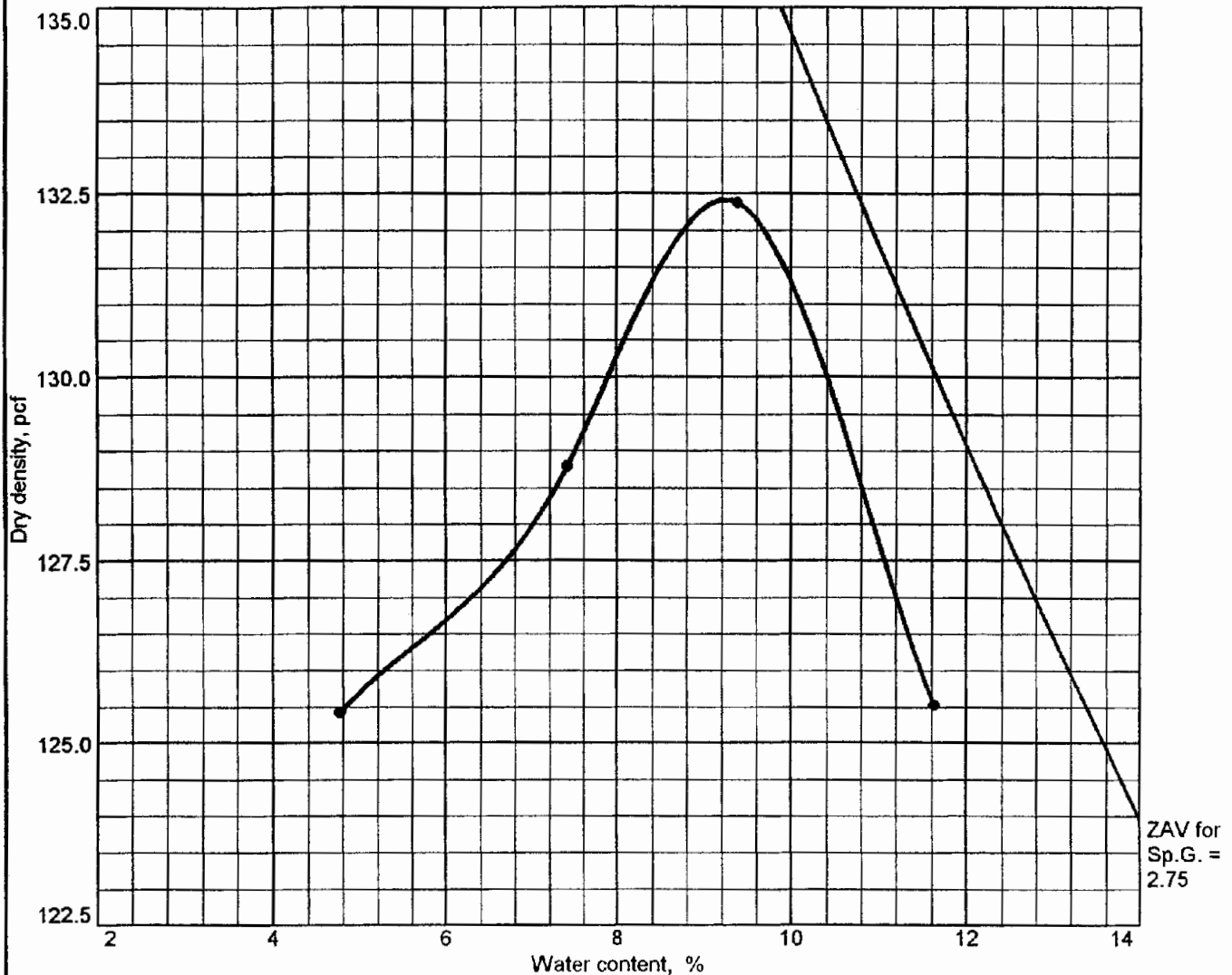
SJB
SERVICES, INC.

Client: Marcy Excavation
Project: Cortland Landfill Cover

Project No: 2009053

Plate

COMPACTION TEST REPORT

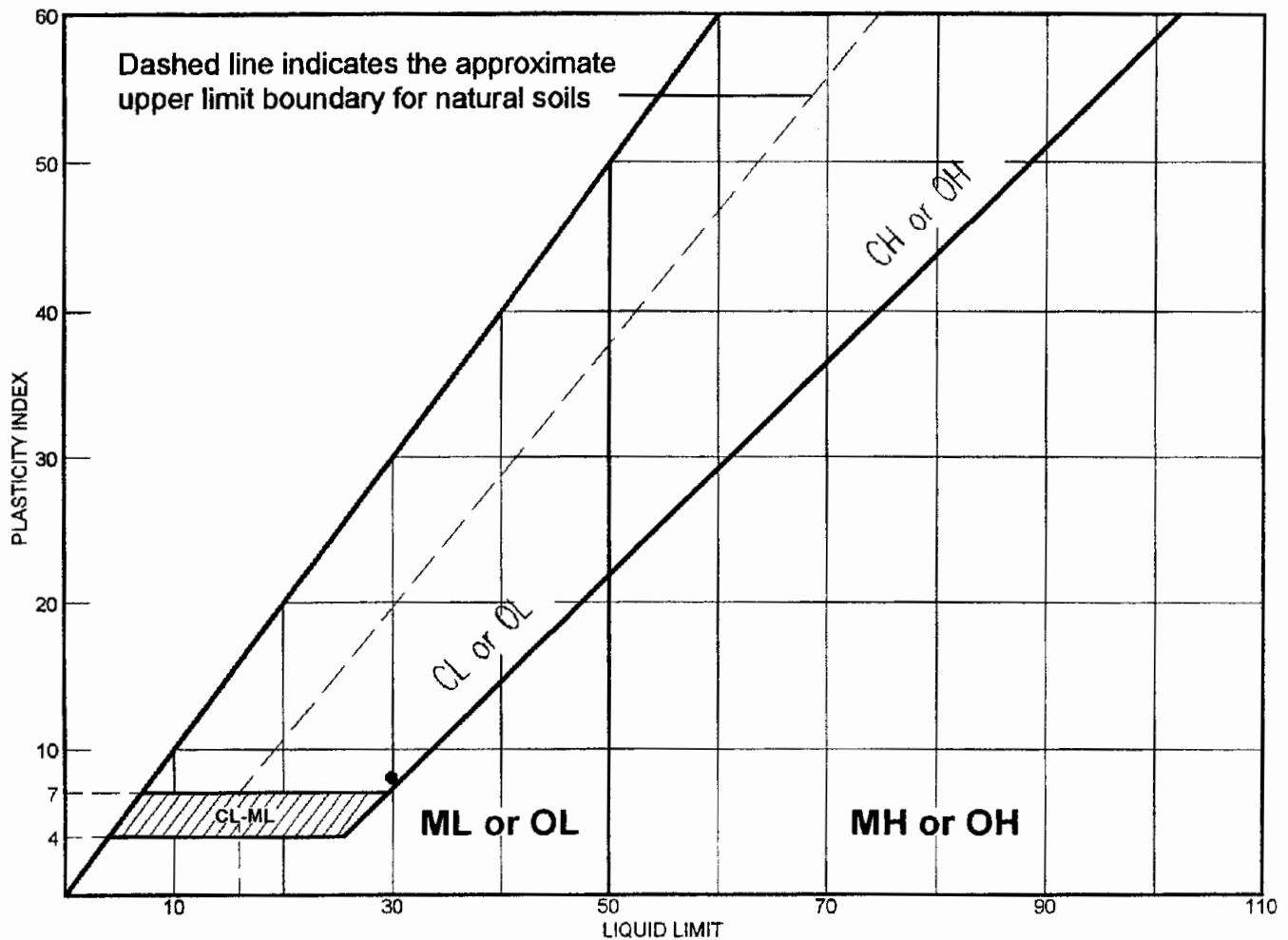


Test specification: ASTM D 1557-78 Method D Modified

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

TEST RESULTS		MATERIAL DESCRIPTION
Maximum dry density = 132.4 pcf		Common Fill, CF-12 Clayey gravel with sand
Optimum moisture = 9.2 %		
Project No. 2009053 Client: Marcy Excavation Project: Cortland Landfill Cover		Remarks:
● Location: B55, 35K Sample		
COMPACTION TEST REPORT SJB SERVICES, INC.		

LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
Common Fill, CF-13 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:

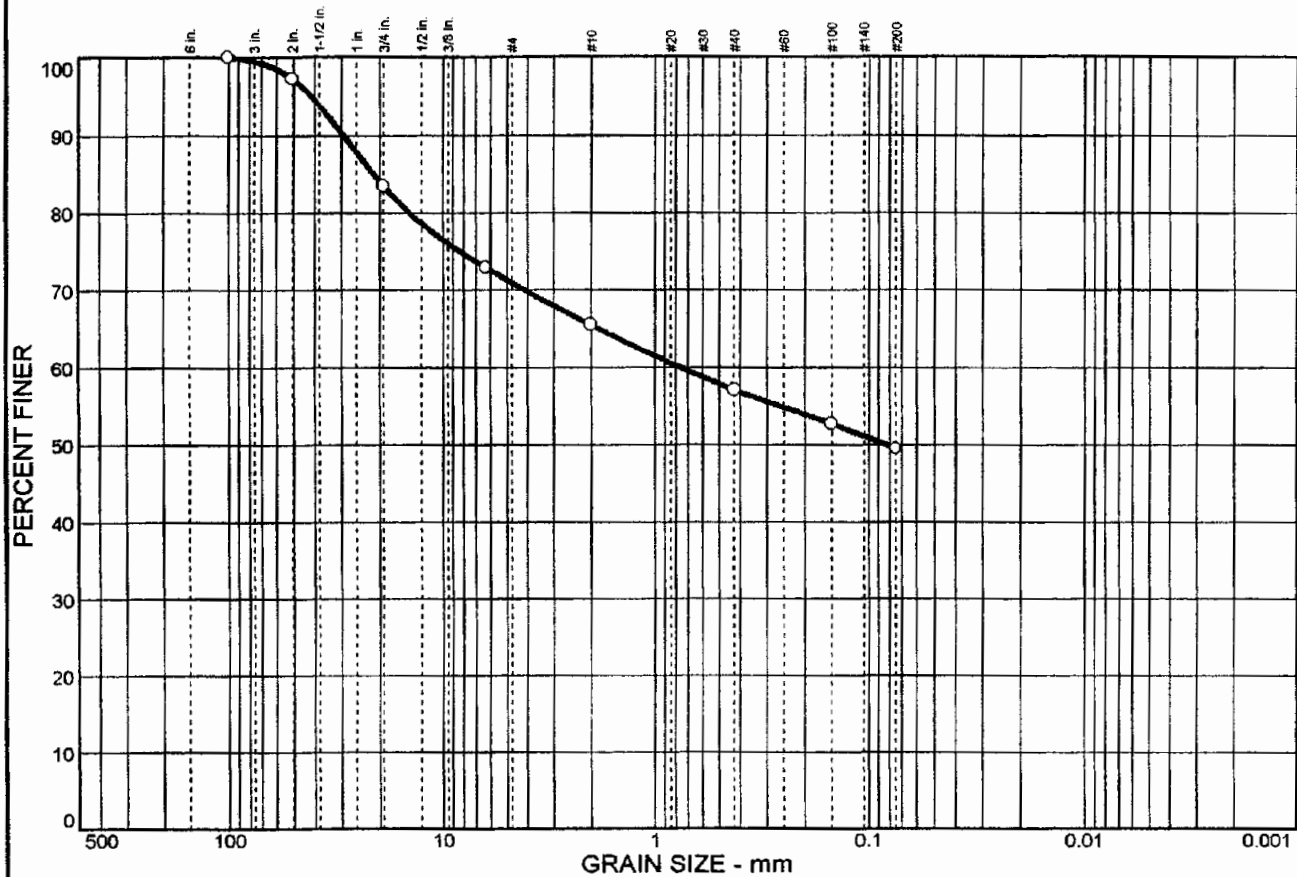
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LIQUID AND PLASTIC LIMITS TEST REPORT

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

D₈₅= 21.1 D₆₀= 0.763 D₅₀= 0.0833
D₃₀= D₁₅=
C_u= C_c=

Classification

USCS= GC AASHTO=

Remarks

Sample No.: 326
Location: B65, 40K Sample

Source of Sample: Common Fill

Date: 7/5/01
Elev./Depth:

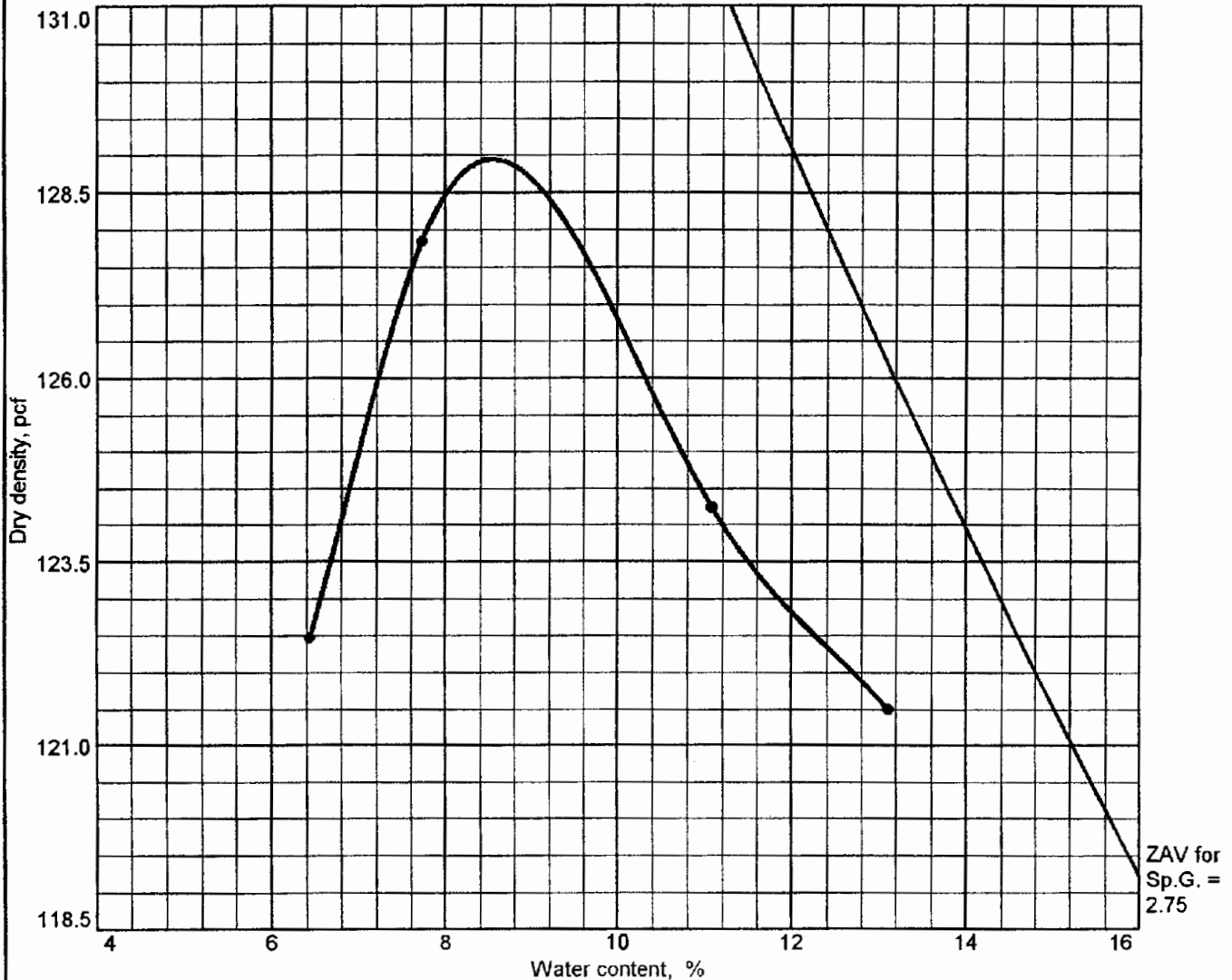
SJB
SERVICES, INC.

Client: Marcy Excavation
Project: Cortland Landfill Cover

Project No: 2009053

Plate

COMPACTION TEST REPORT

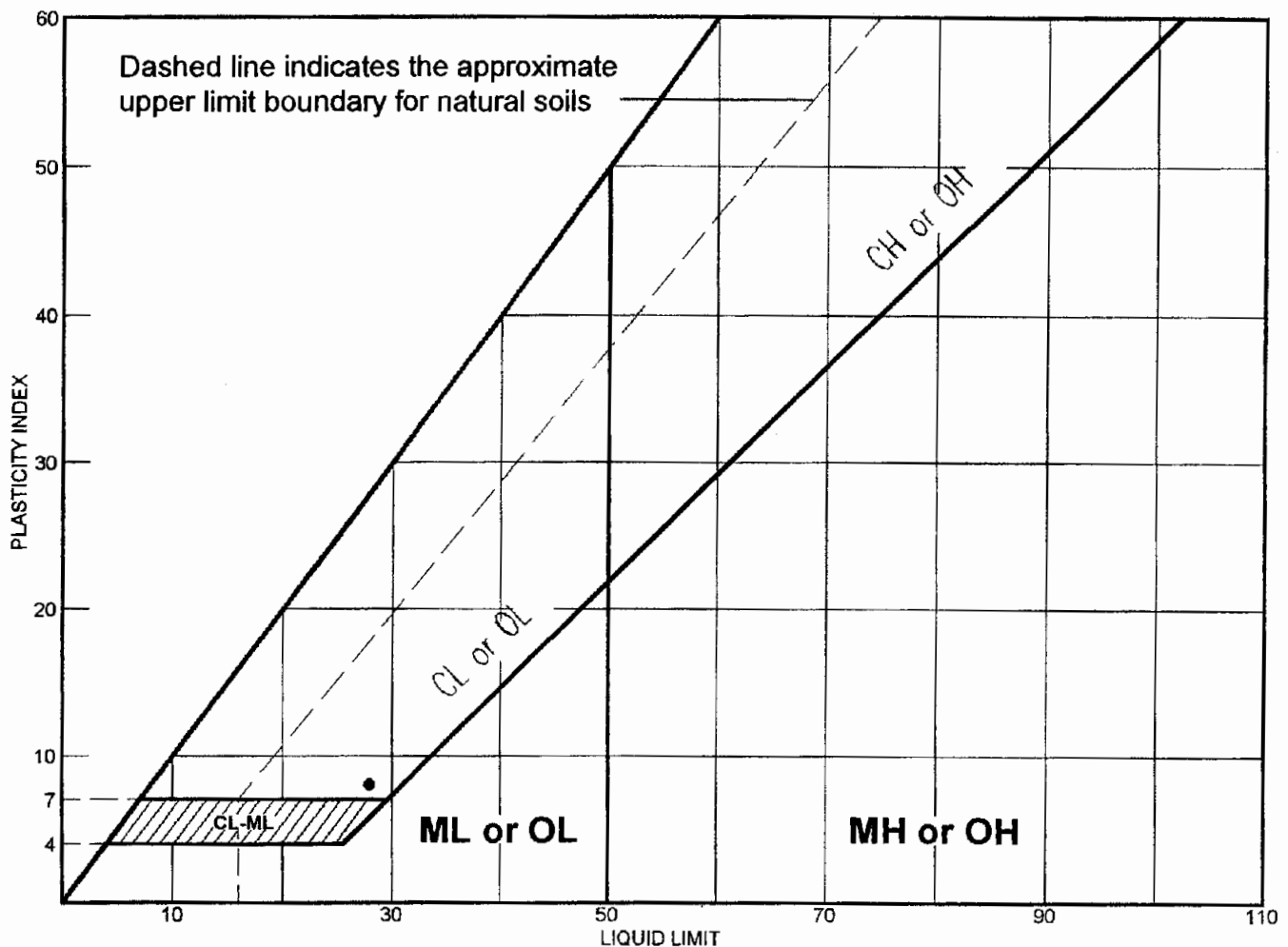


Test specification: ASTM D 1557-78 Method D Modified

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

TEST RESULTS		MATERIAL DESCRIPTION
Maximum dry density = 128.9 pcf		Common Fill, CF-13 Clayey gravel with sand
Optimum moisture = 8.5 %		
Project No. 2009053 Client: Marcy Excavation Project: Cortland Landfill Cover ● Location: B65, 40K Sample		Remarks:
COMPACTATION TEST REPORT 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

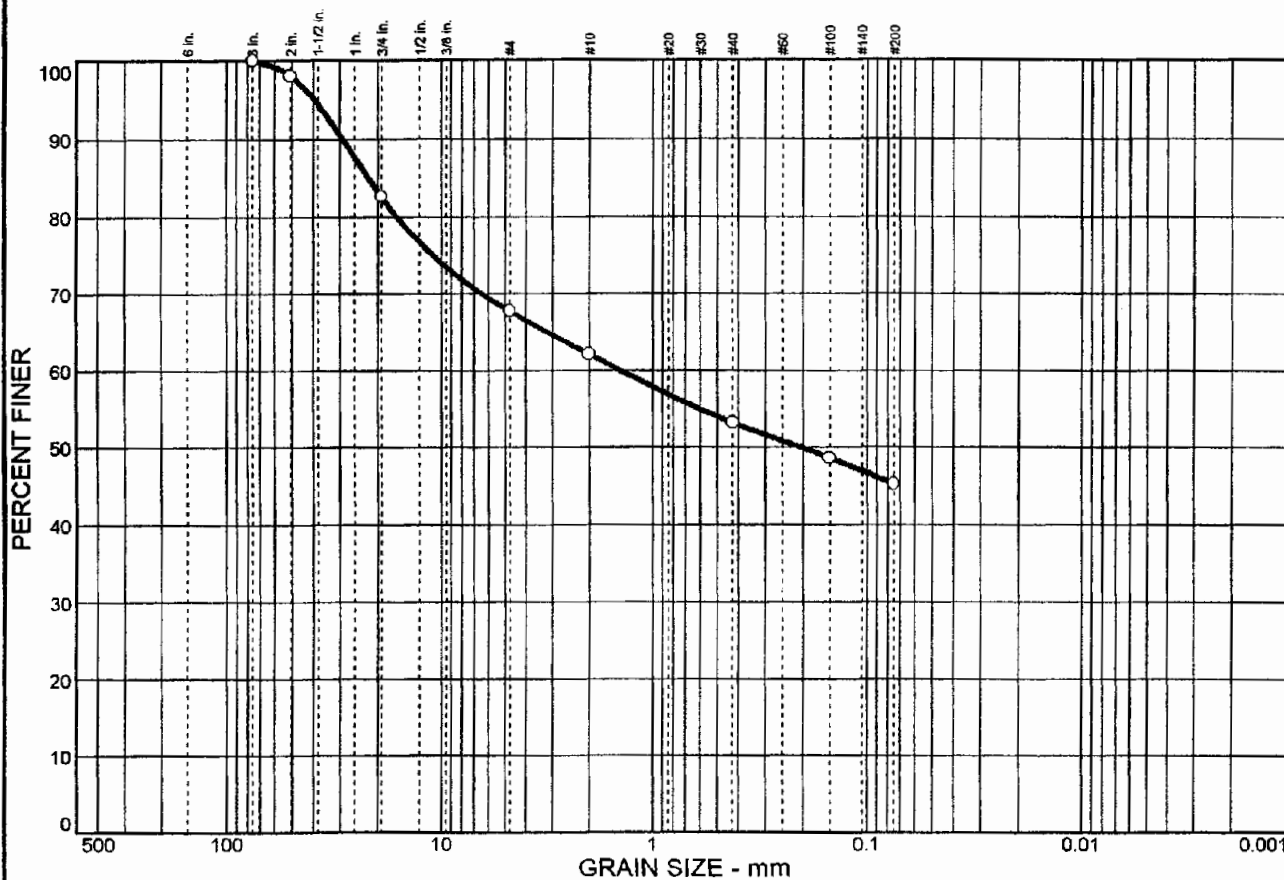
Remarks:

•

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

PL= 20 Atterberg Limits LL= 28 PI= 8

Coefficients
D₈₅= 21.9 D₆₀= 1.42 D₅₀= 0.206
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification
USCS= GC AASHTO=

Remarks
Sampled on 7/25/01

Sample No.: 373
Location: B-67, 45K Sample

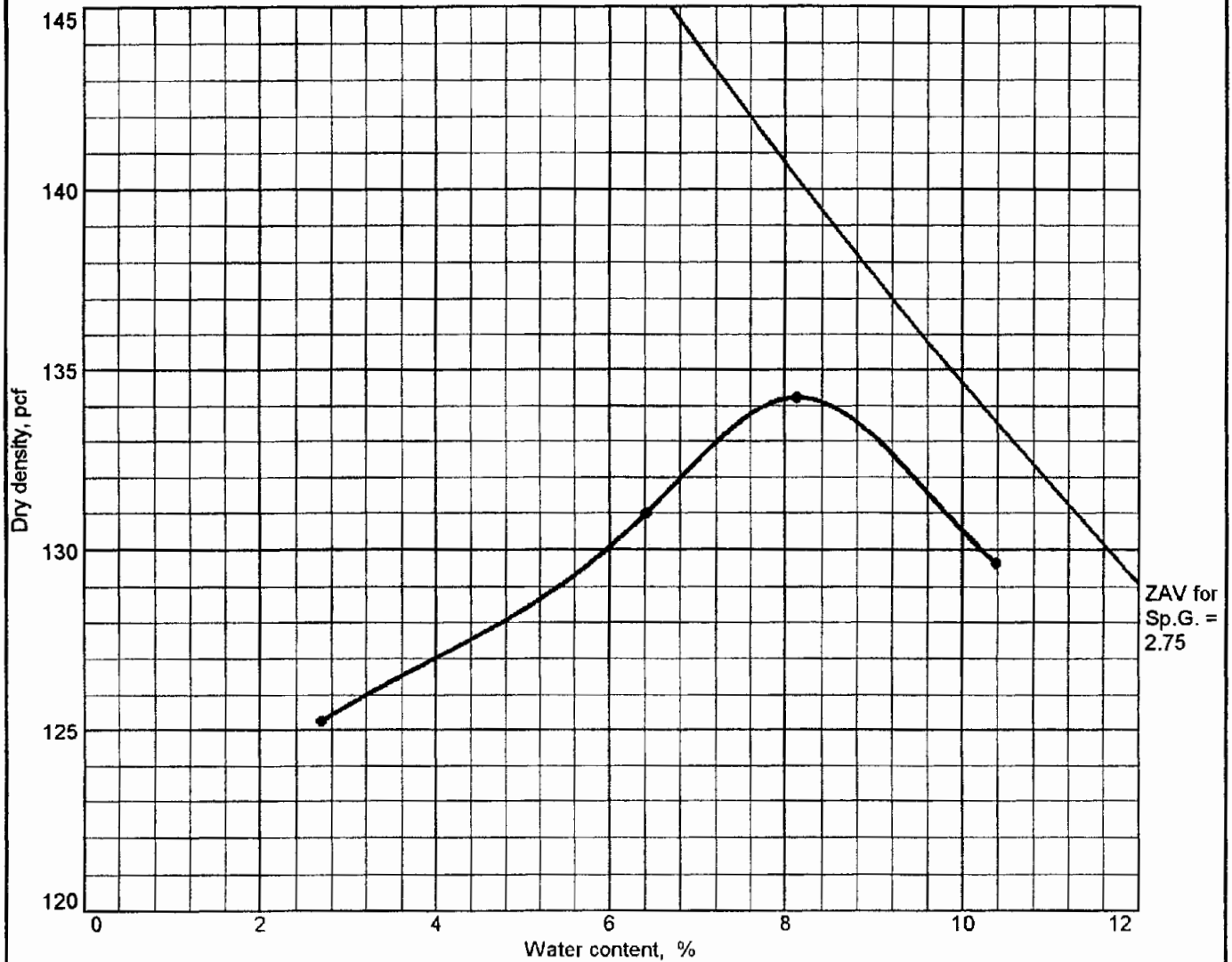
Source of Sample: Common Fill

Date: 7/27/01
Elev./Depth:

**SJB
SERVICES, INC.**

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

COMPACTION TEST REPORT

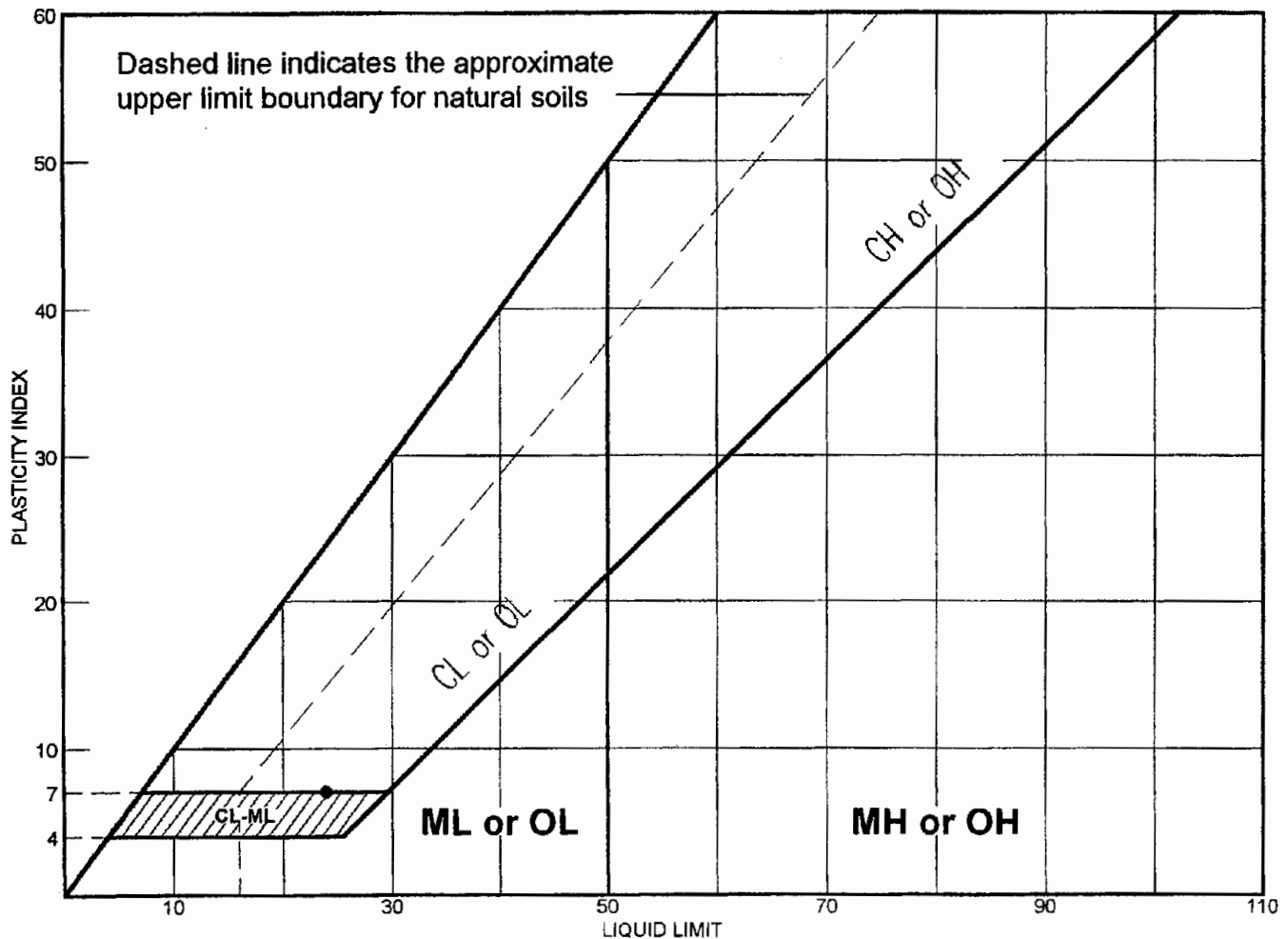


Test specification: ASTM D 1557-78 Method D Modified

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		Clayey gravel with sand
Optimum moisture = 8.1 %		
Project No. 2009053 Client: Marcy Excavation Project: Cortland Landfill Cover ● 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

D₈₅= 24.5

D₆₀= 2.59

D₅₀= 0.467

D₃₀=

D₁₅=

D₁₀=

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:

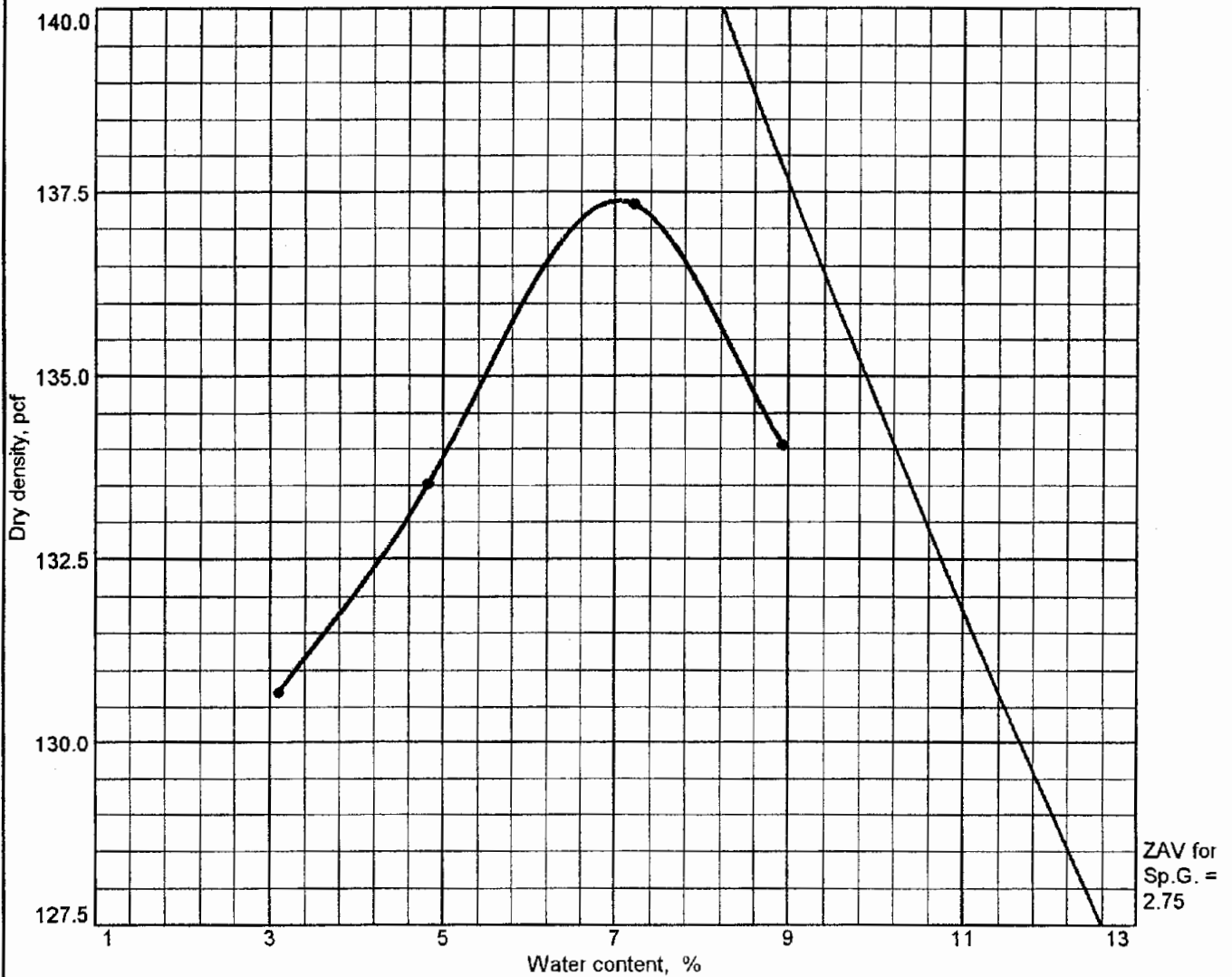
**SJB
SERVICES, INC.**

Client: Marcy Excavation

Project: Cortland Landfill Cover

Project No: 2009053

COMPACTION TEST REPORT

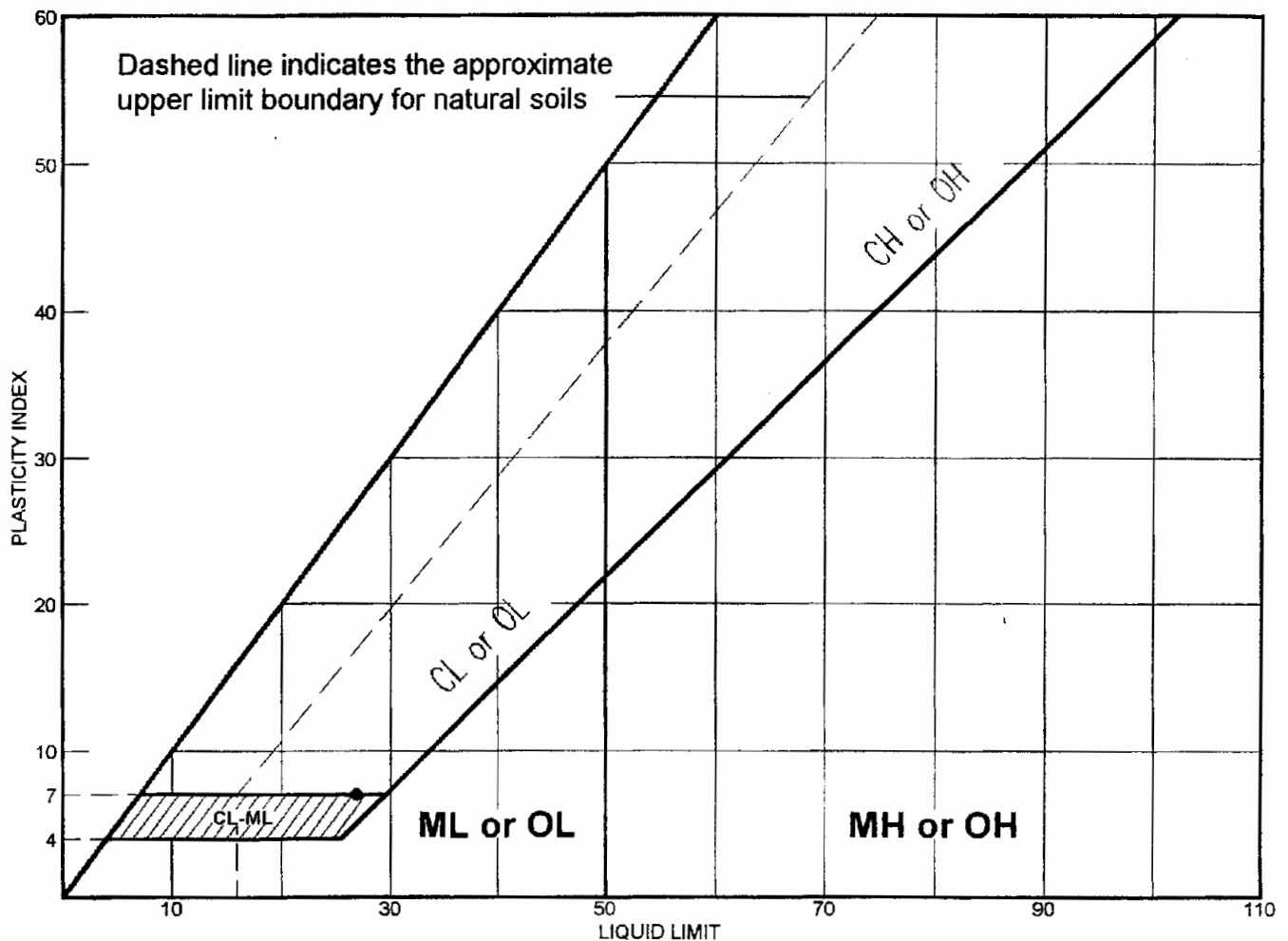


Test specification: ASTM D 1557-78 Method D Modified

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		Silty clayey gravel with sand
Optimum moisture = 7.0 %		
Project No. 2009053 Client: Marey 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

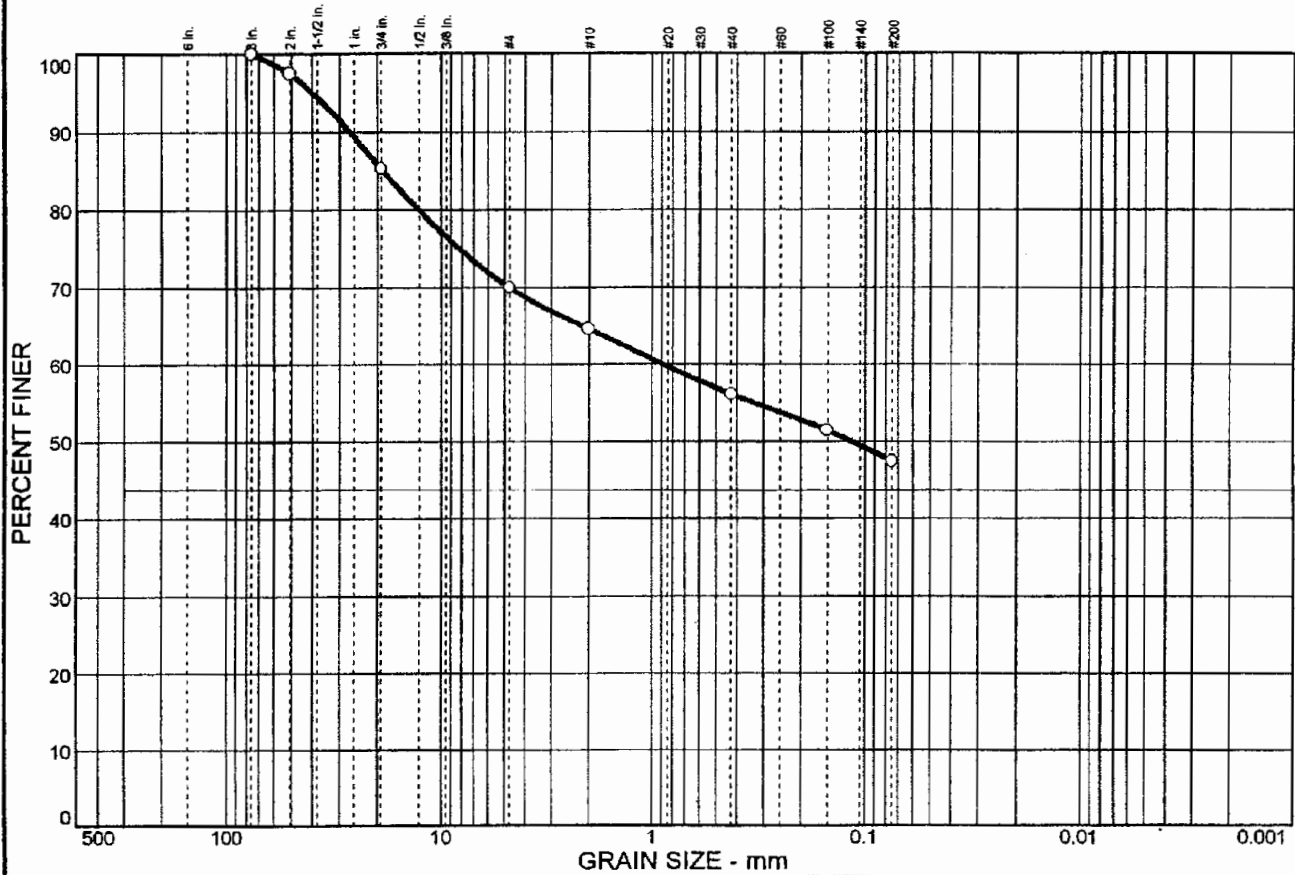
Remarks:

•

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		
1.5 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
 D₈₅= 18.6 D₆₀= 0.895 D₅₀= 0.116
 D₃₀= D₁₅= D₁₀=
 C_u= C_c=

Classification
 USCS= GC-GM AASHTO=

Remarks
 Sampled on 7/25/01

Sample No.: 374
Location: B-76, 55K Sample

Source of Sample: Common Fill

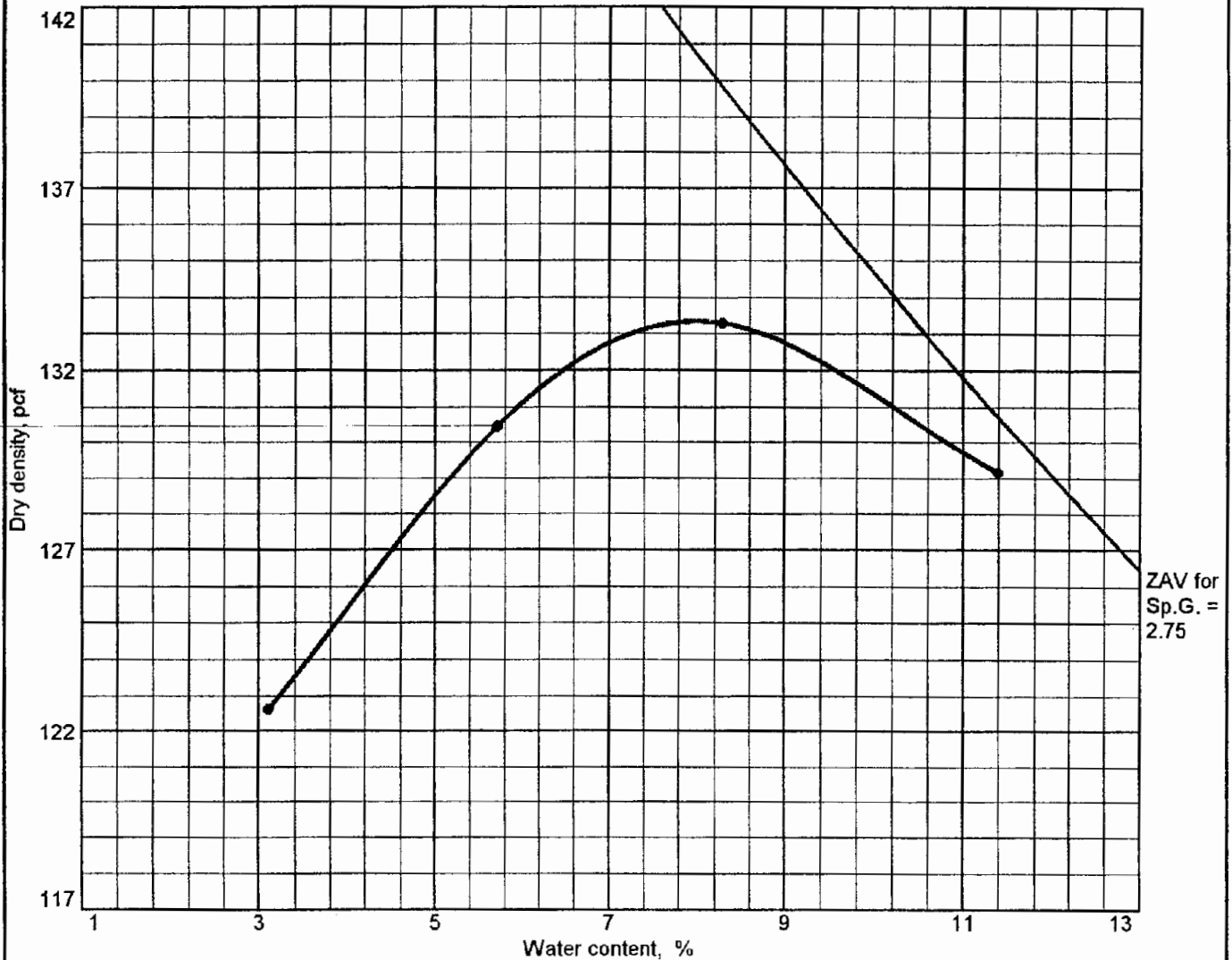
Date: 7/27/01
Elev./Depth:

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SERVICES, INC.**

Client: Marcy Excavation
Project: Cortland Landfill Cover

Project No: 2009053

COMPACTION TEST REPORT

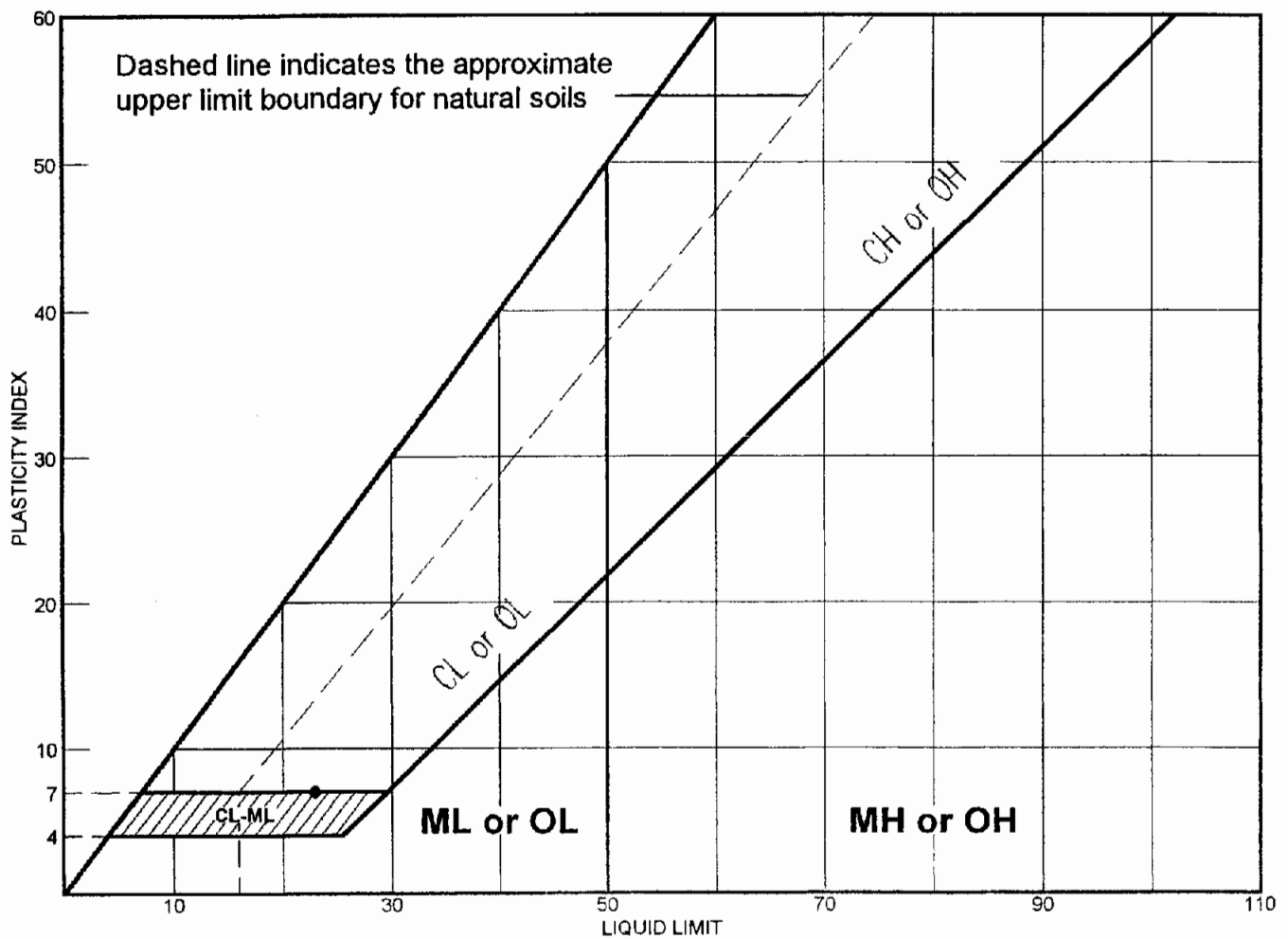


Test specification: ASTM D 1557-78 Method D Modified

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		Silty clayey gravel with sand
Optimum moisture = 8.0 %		
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:** Marey Excavation

Project: Cortland Landfill Cover

• **Location:** 60K Sample

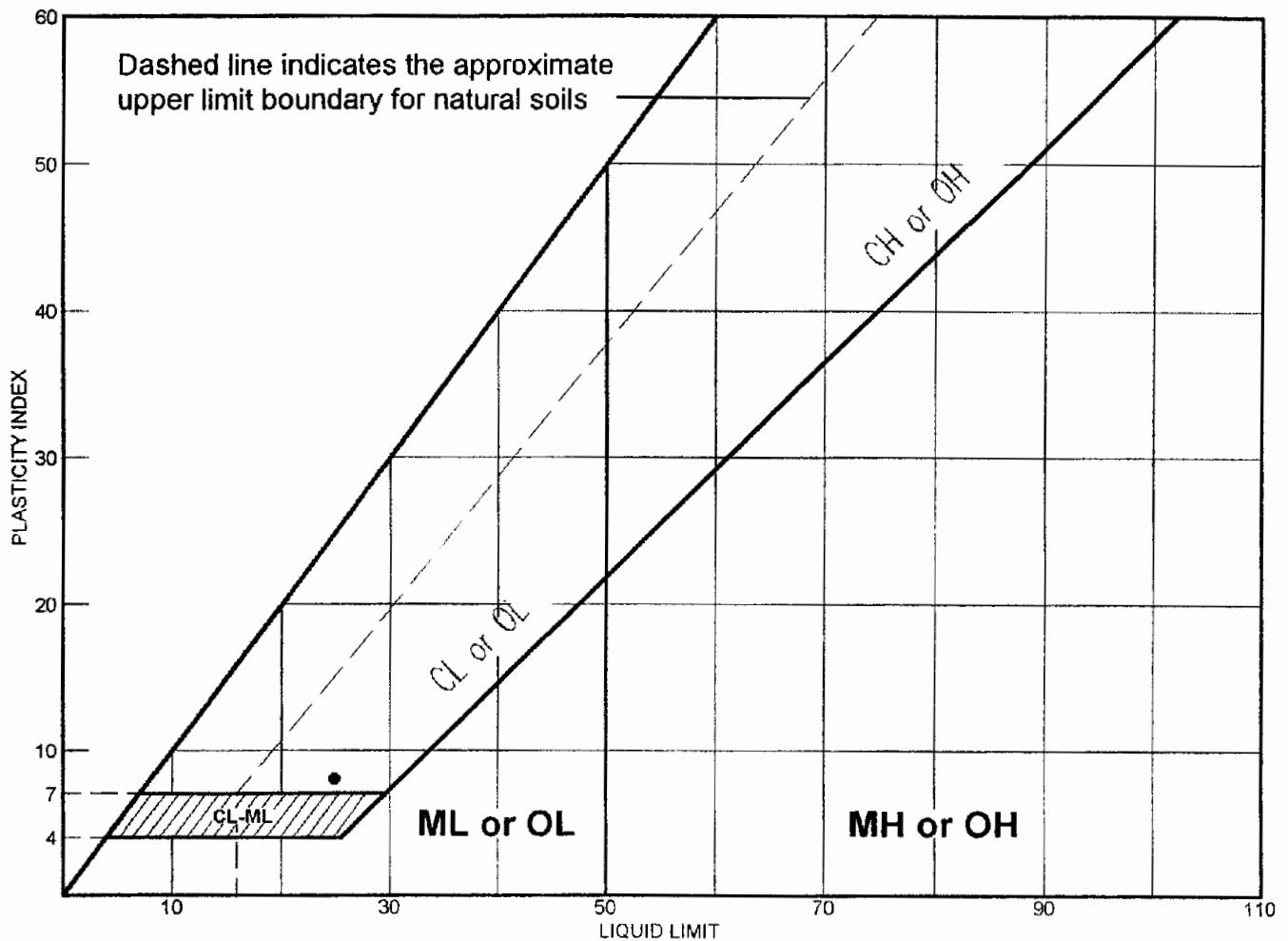
Remarks:

•

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 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

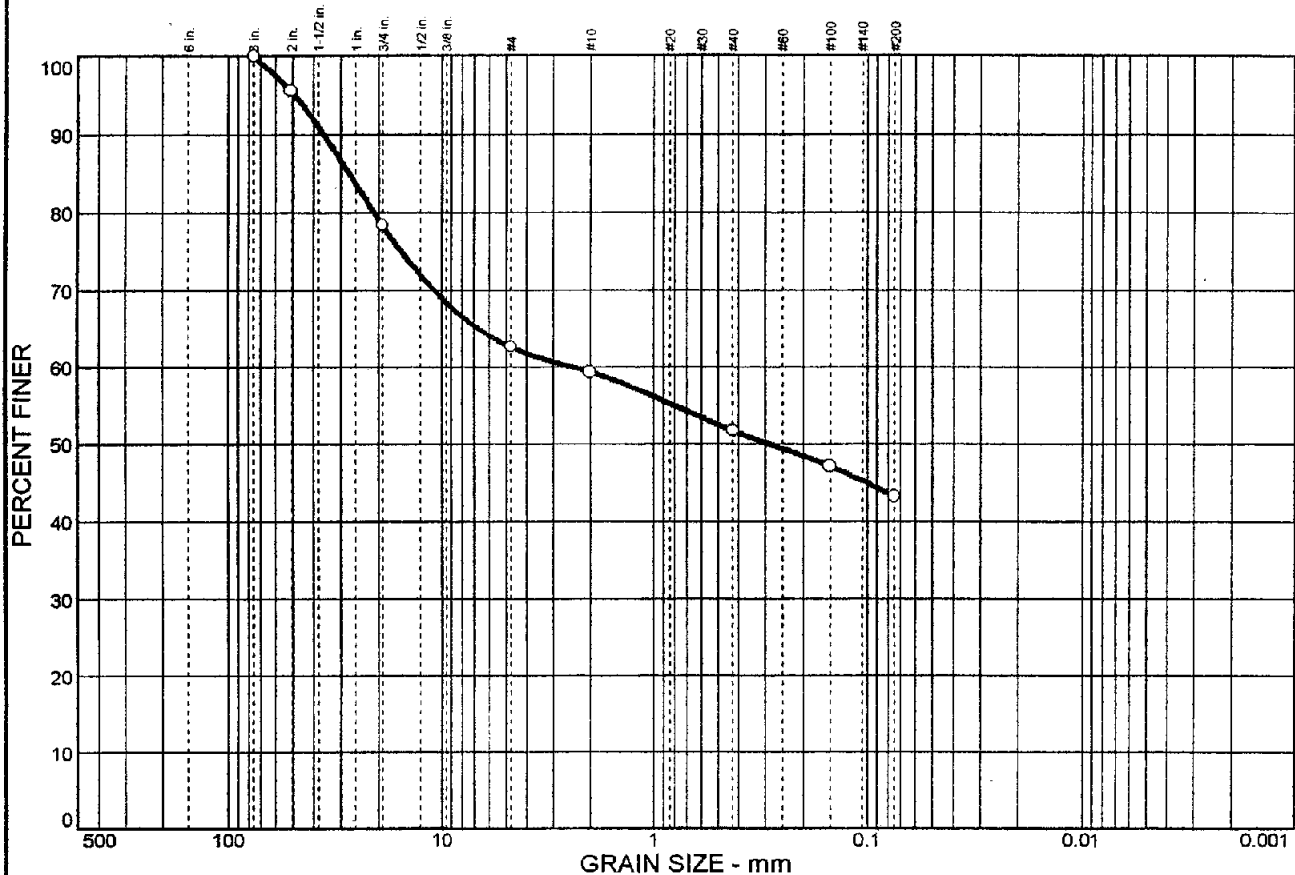
Remarks:

•

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		
1.5 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

D₈₅= 27.2 D₆₀= 2.46 D₅₀= 0.289
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= GC AASHTO=

Remarks

Sample No.: 415

Location:

Source of Sample: Common Fill

Date: 8/15/01

Elev./Depth:

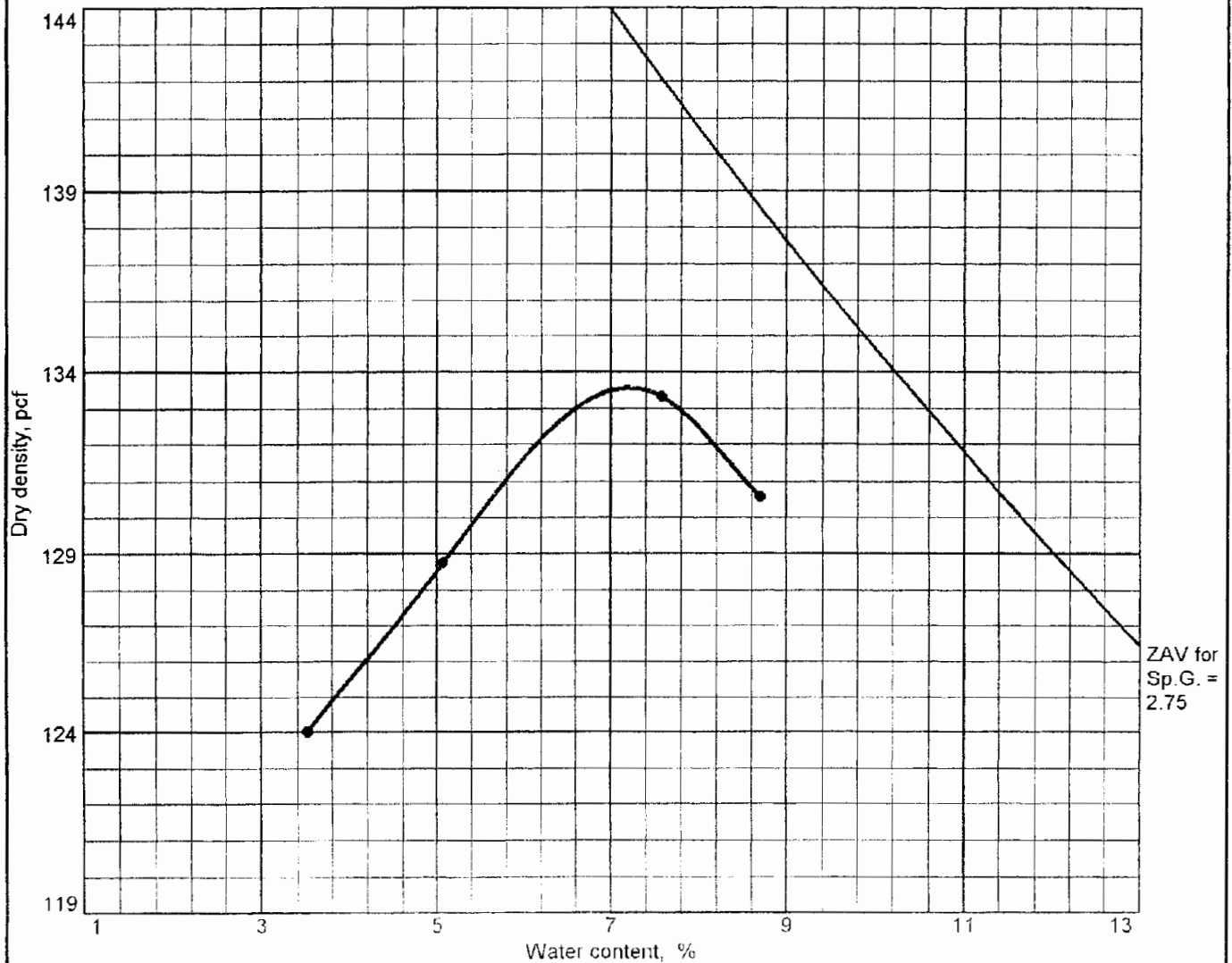
SJB
SERVICES, INC.

Client: Macey Excavation
Project: Cortland Landfill Cover

Project No: 2009053

415

COMPACTION TEST REPORT

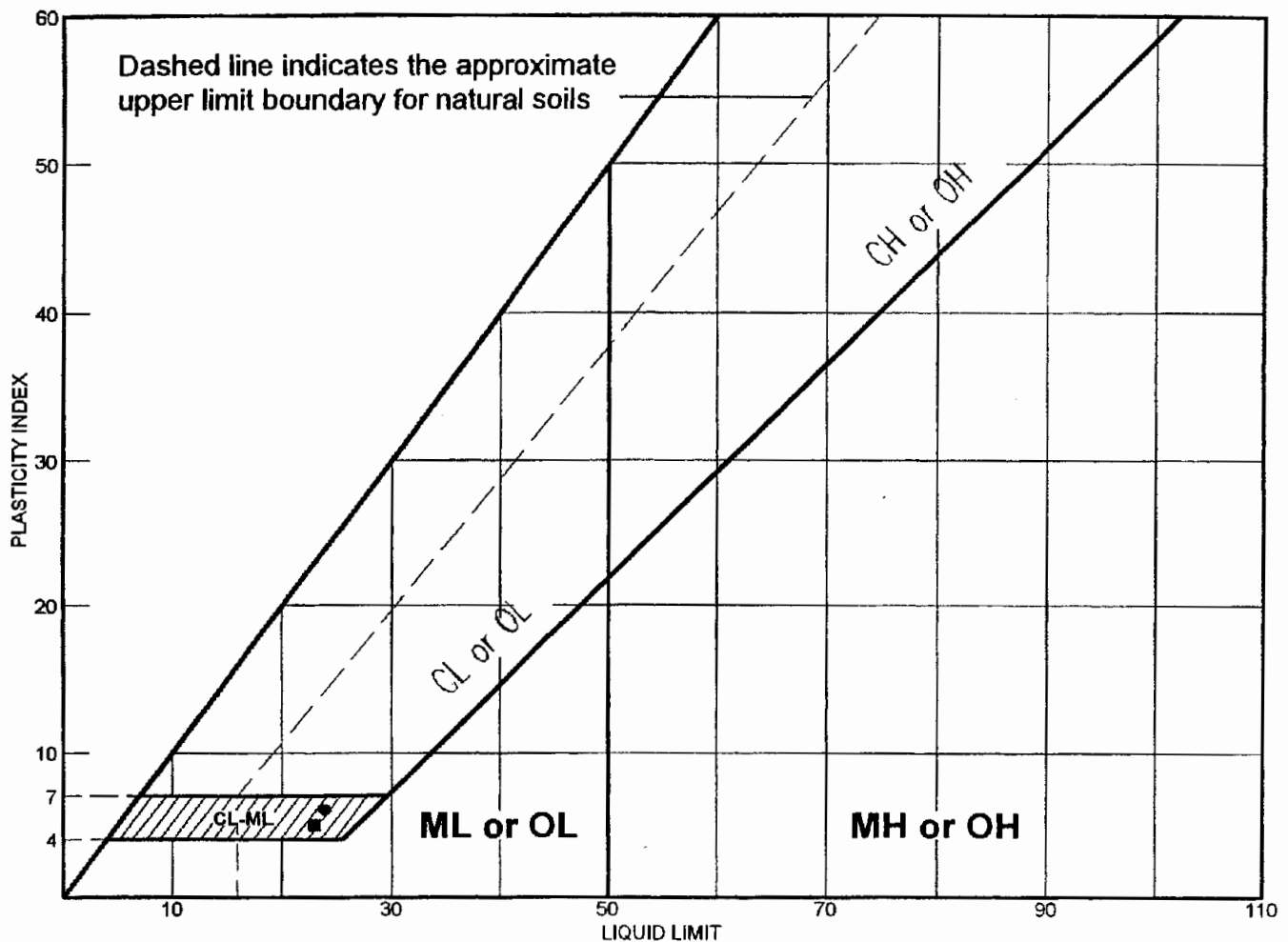


Test specification: ASTM D 1557-78 Method D Modified

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		Common fill 65K Silty gravel with sand
Optimum moisture = 7.2 %		
Project No. 2009053 Client: Marey Excavation Project: Cortland Landfill Cover ● Location: 65K cy sample		Remarks:
COMPACTON 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

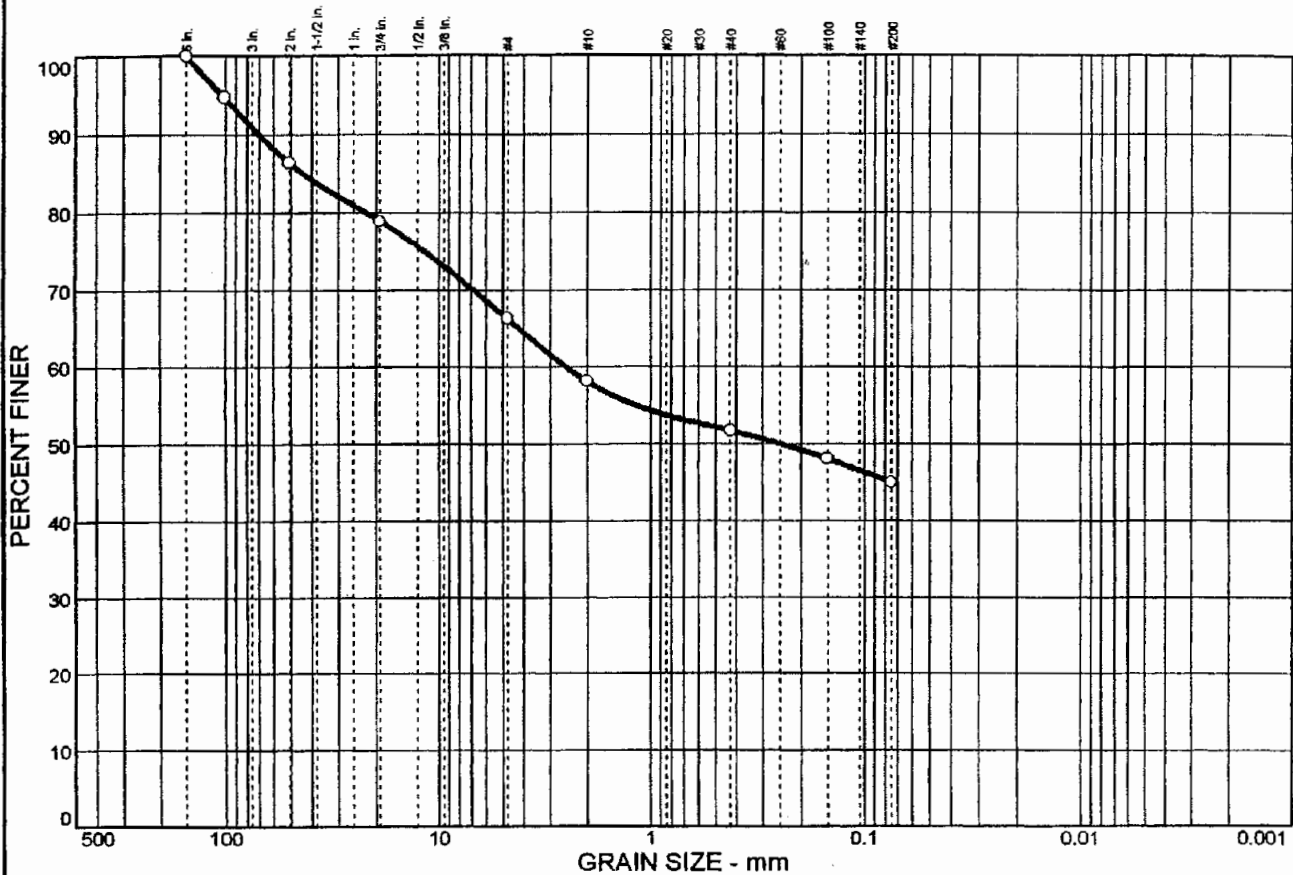
Remarks:

●
■

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

D₈₅= 43.7

D₆₀= 2.52

D₅₀= 0.247

D₃₀=

D₁₅=

D₁₀=

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:

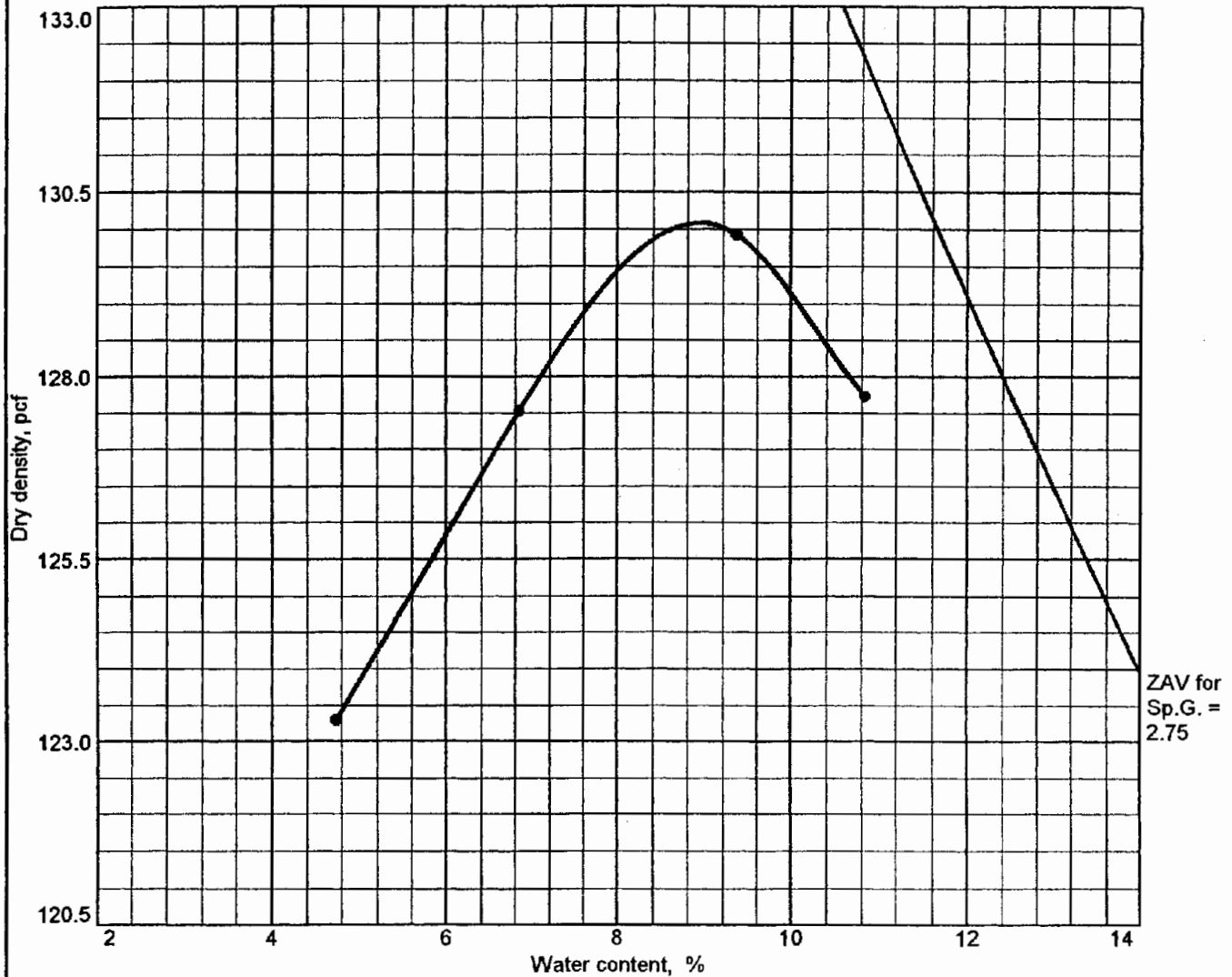
**SJB
SERVICES, INC.**

Client: Marcy Excavation

Project: Cortland Landfill Cover

Project No: 2009053

COMPACTION TEST REPORT

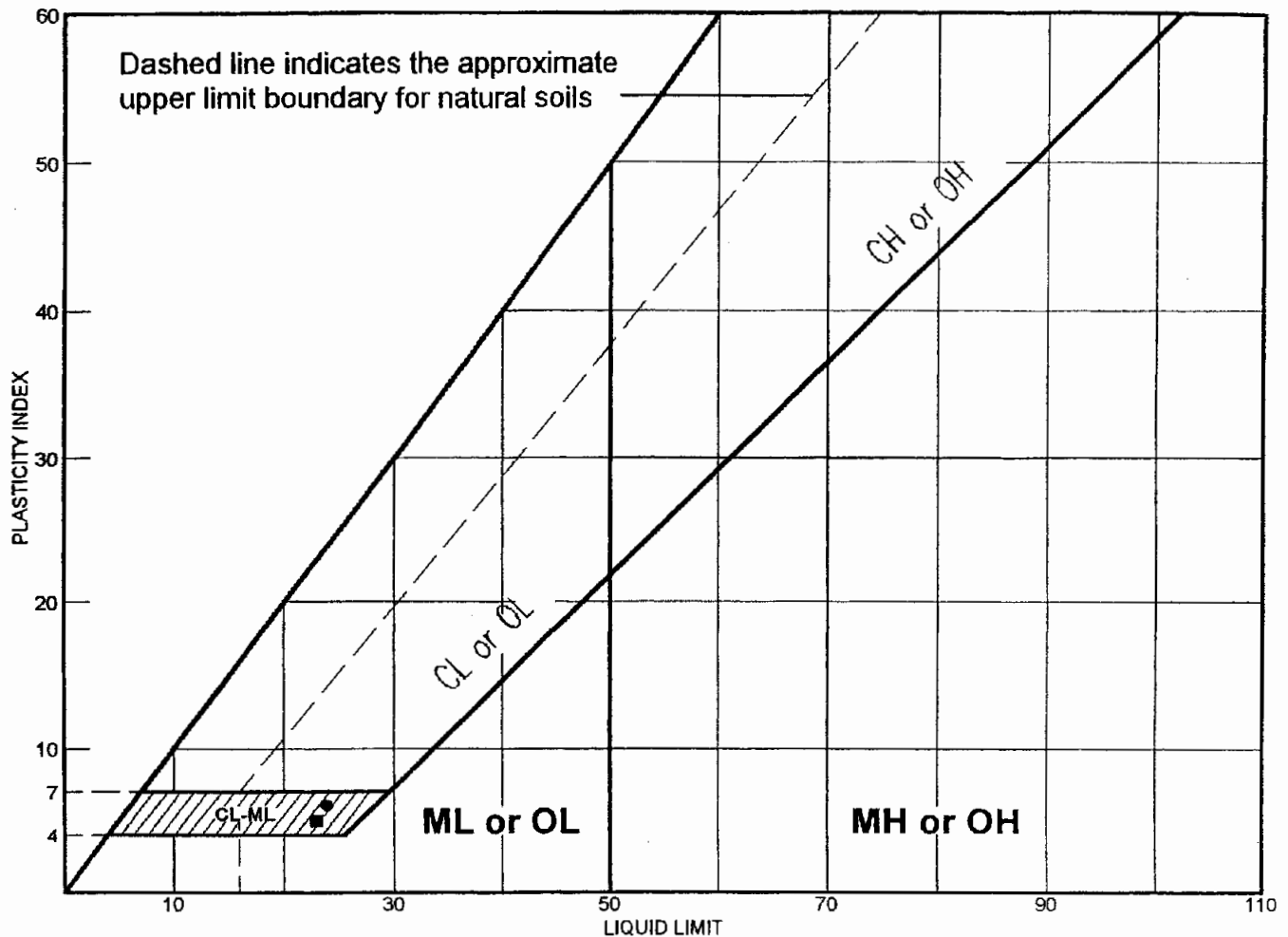


Test specification: ASTM D 1557-78 Method D Modified

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 Optimum moisture = 8.9 %	Silty clayey gravel with sand
Project No. 2009053 Client: Marcy Excavation Project: Cortland Landfill Cover Location: Common Fill, 70 K Sample N106E91	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

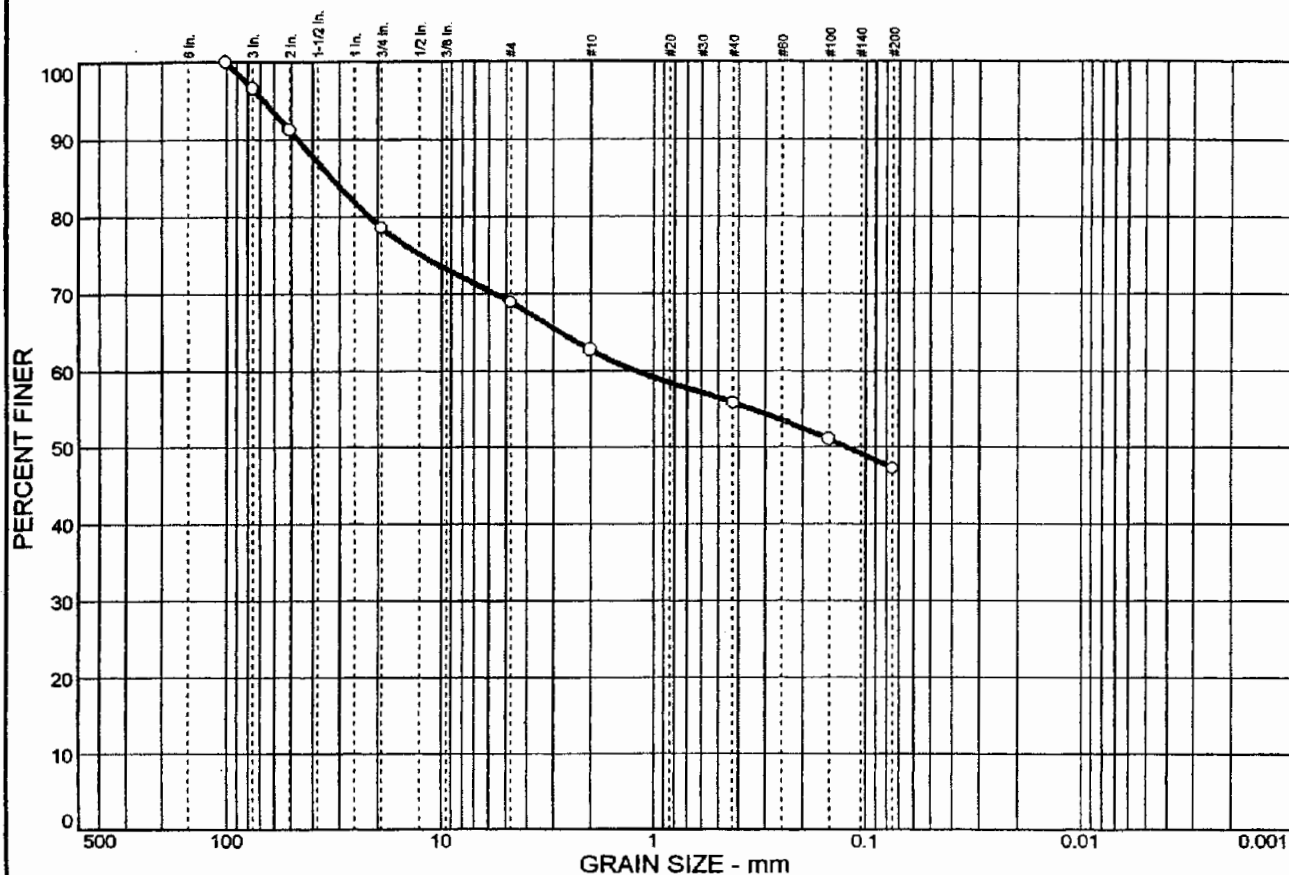
Remarks:

●
■

LIQUID AND PLASTIC LIMITS TEST REPORT

SJB SERVICES, INC.

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
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		
1.5 in.	88.6		
#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
D₈₅= 32.4 D₆₀= 1.22 D₅₀= 0.124
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification
USCS= GC-GM AASHTO=

Remarks

Sample No.: 439 Source of Sample: Common Fill
Location: Common Fill, 75K Sample, N10 E84

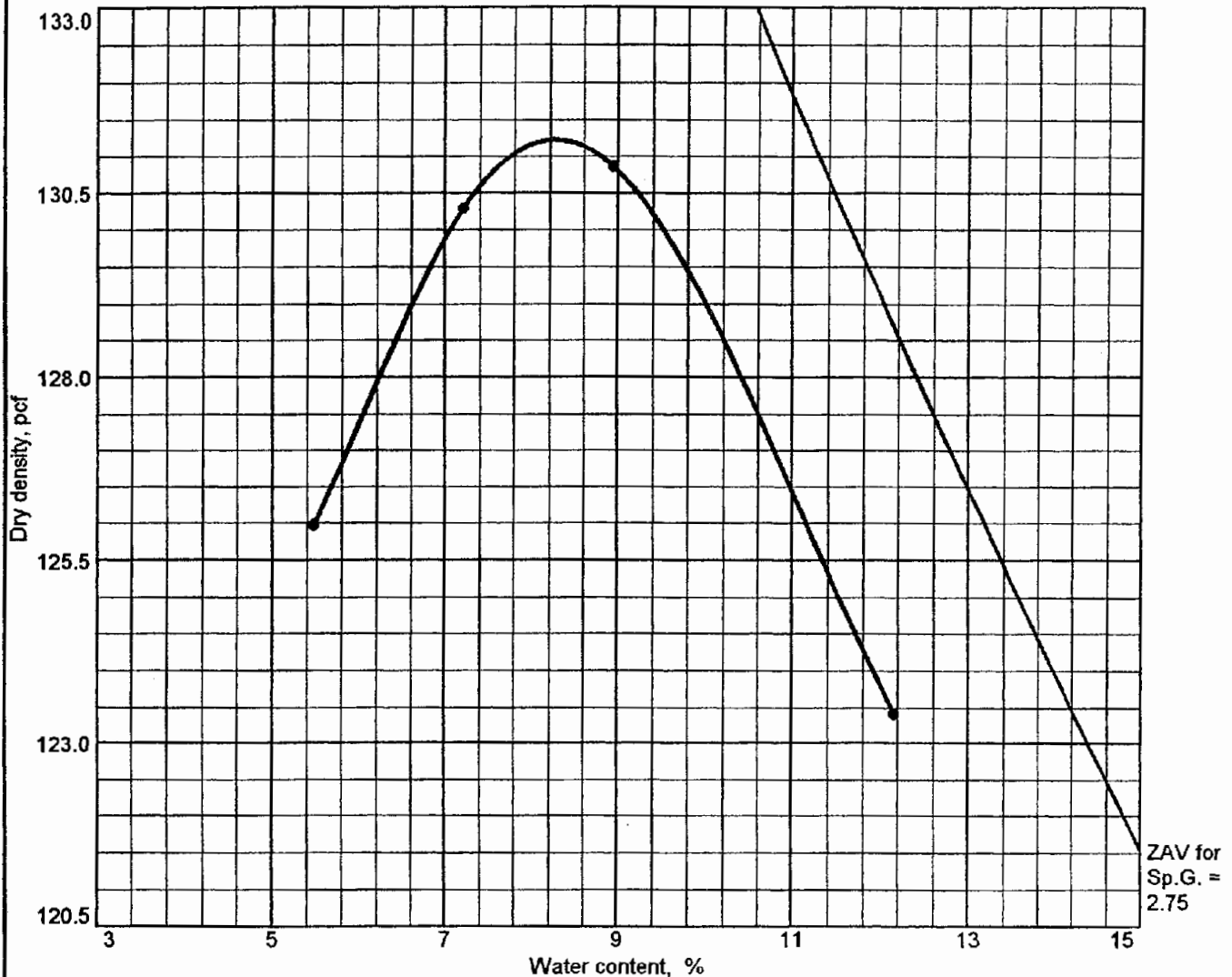
Date: 8/29/01
Elev./Depth:

**SJB
SERVICES, INC.**

Client: Marcy Excavation
Project: Cortland Landfill Cover

Project No: 2009053

COMPACTION TEST REPORT

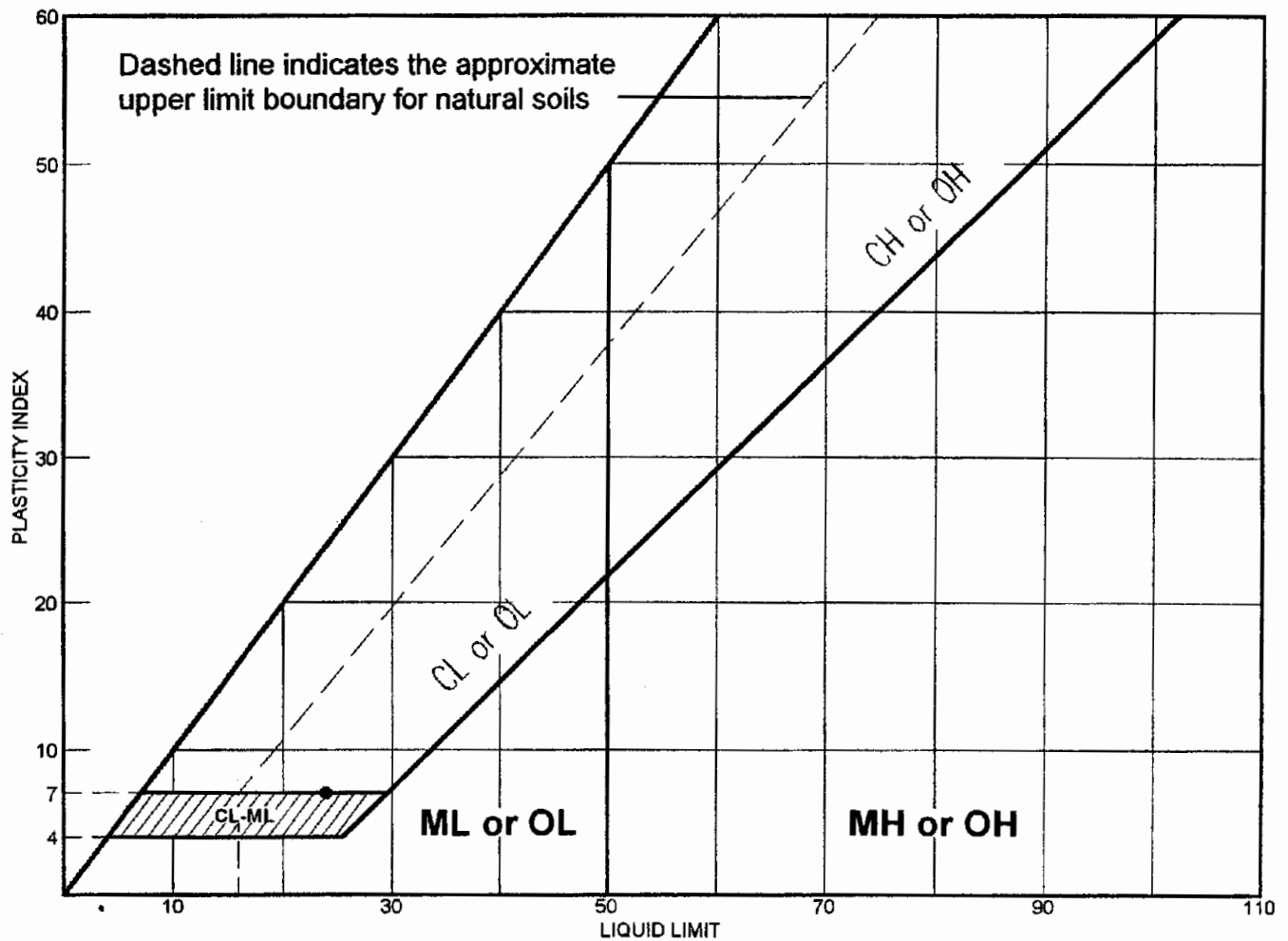


Test specification: ASTM D 1557-78 Method D Modified

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		Silty clayey gravel with sand
Optimum moisture = 8.3 %		
Project No. 2009053 Client: Marcy Excavation Project: Cortland Landfill Cover		Remarks:
● Location: Common Fill, 75K Sample, N10 E84		
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

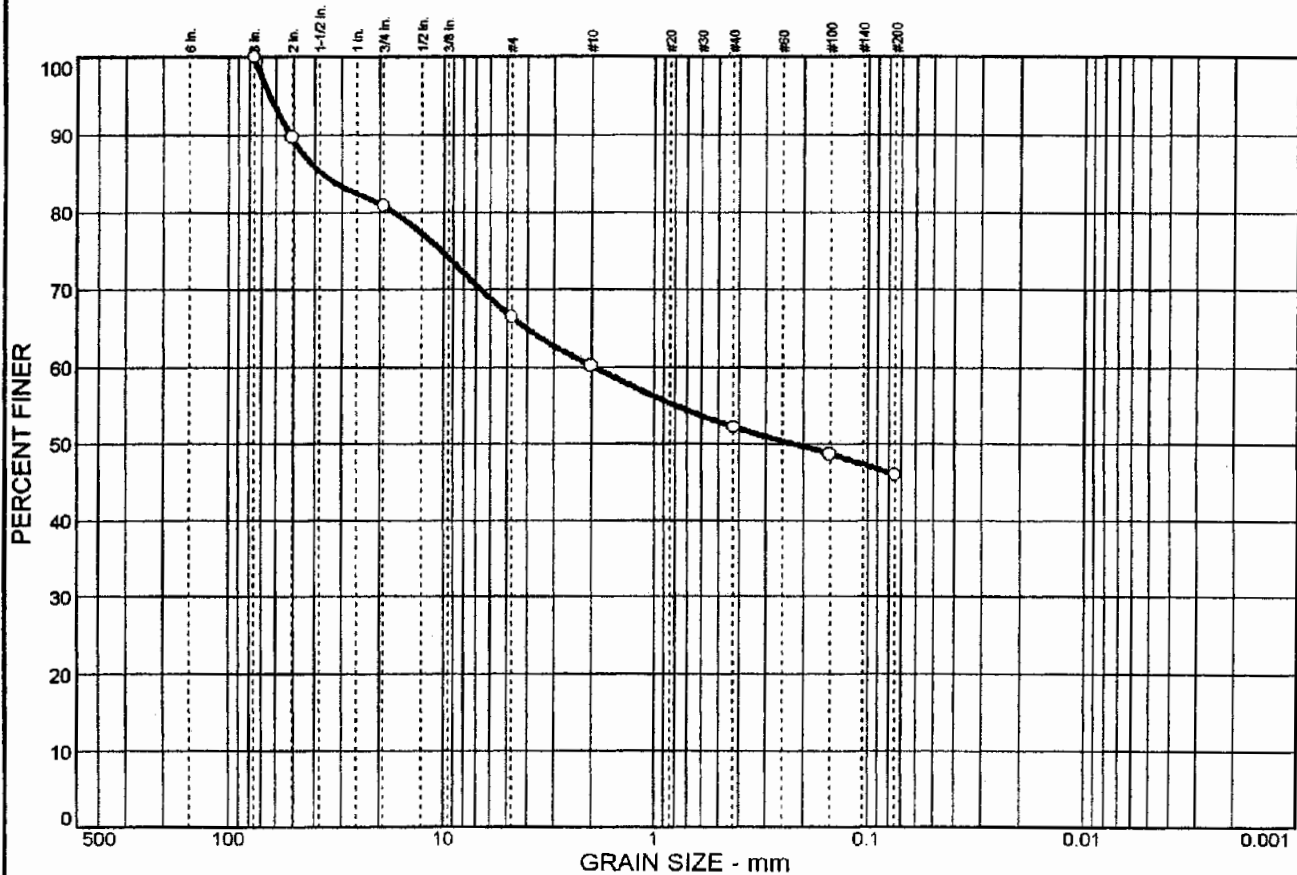
Remarks:

•

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		
1.5 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

D₈₅ = 36.8 D₆₀ = 1.93 D₅₀ = 0.222
D₃₀ = D₁₅ = D₁₀ =
C_u = C_c =

Classification

USCS = GC-GM AASHTO =

Remarks

Sample No.: 452

Location:

Source of Sample: Common Fill

Date: Sept. 7, 2001

Elev./Depth:

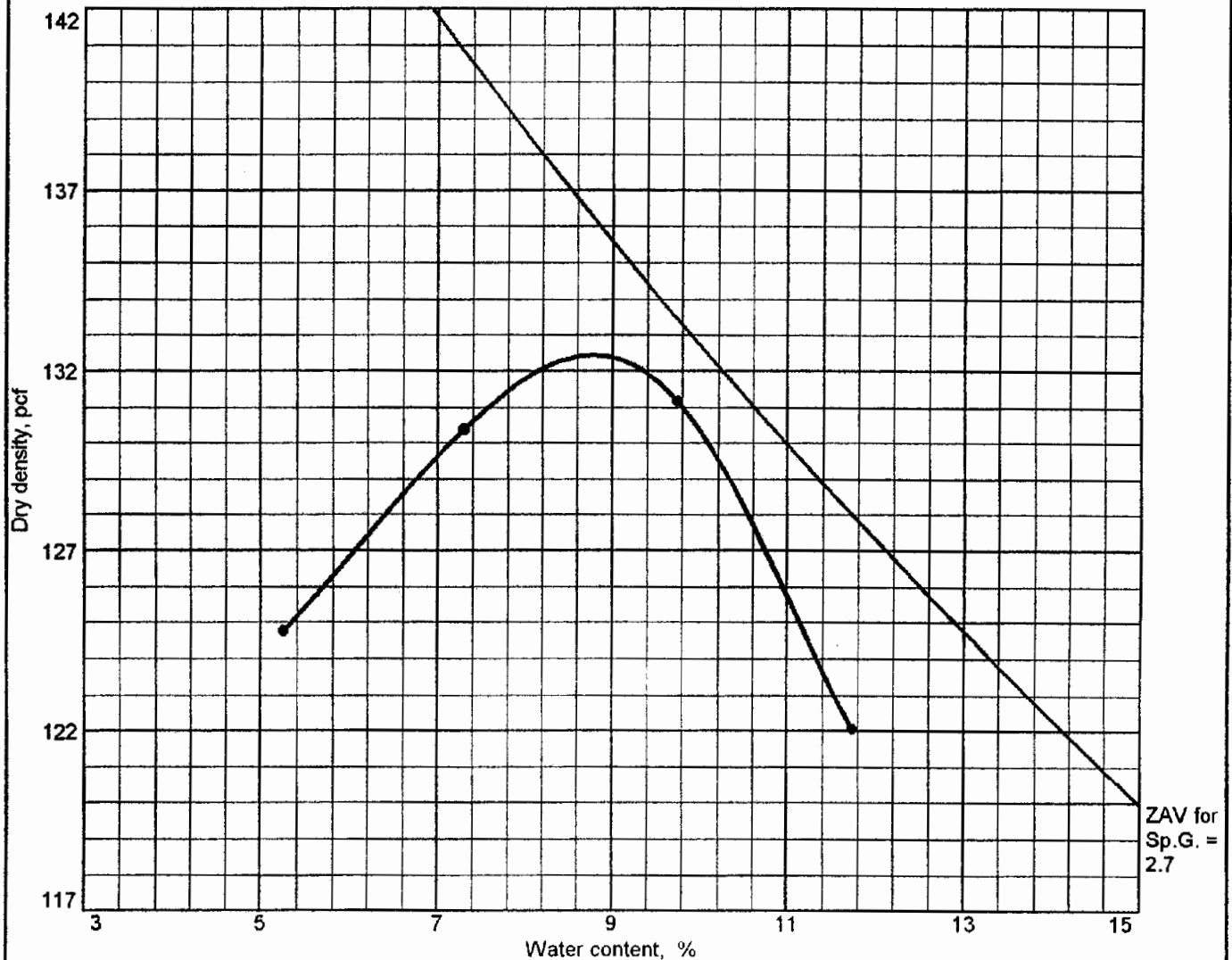
**SJB
SERVICES, INC.**

Client: Marcy Excavation
Project: Cortland Landfill Cover

Project No: 2009053

452

COMPACTION TEST REPORT

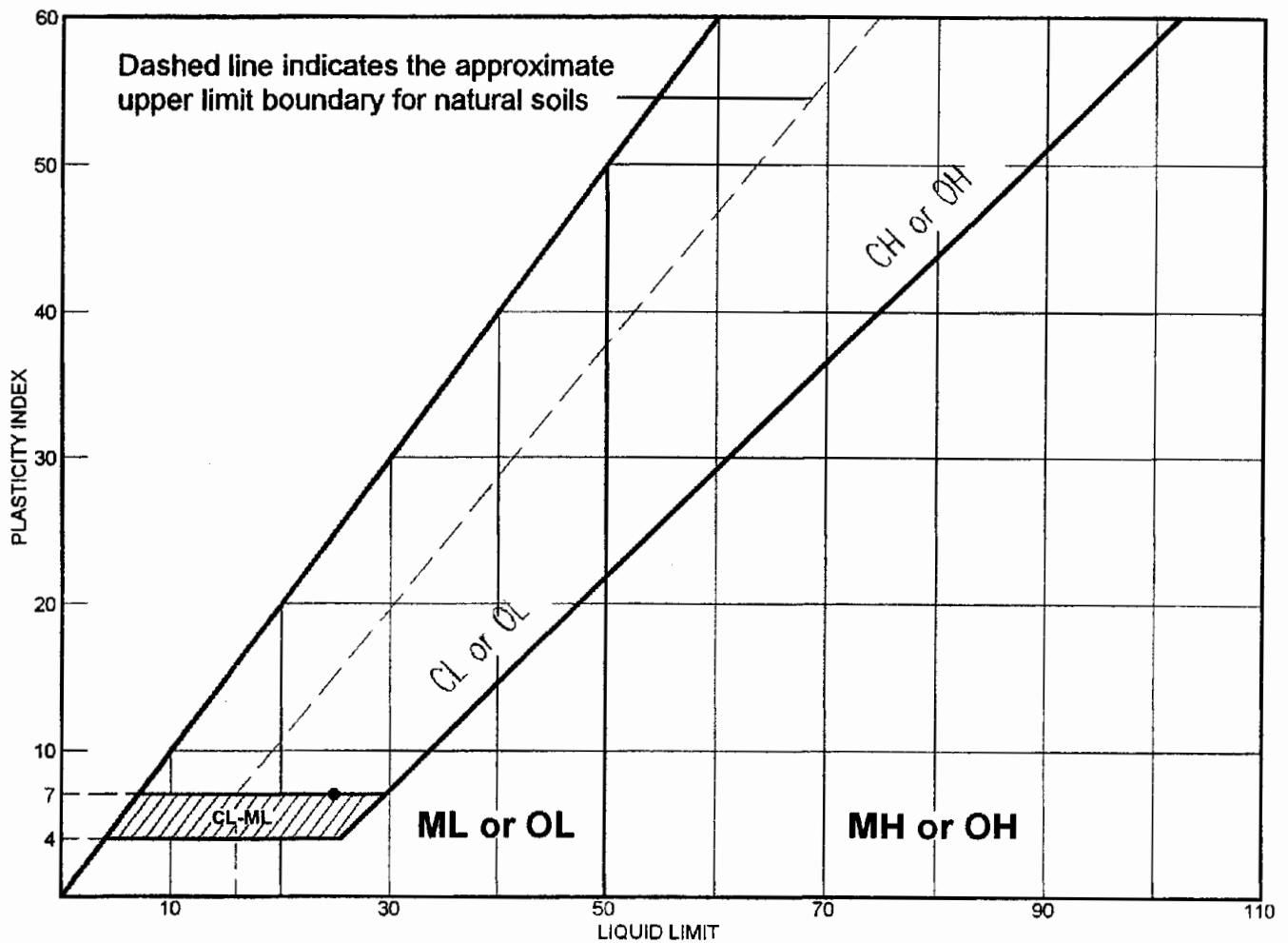


Test specification: ASTM D 1557-78 Method D Modified

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 Optimum moisture = 8.8 %		80K N98 E 8 2 Silty clayey gravel with sand
Project No. 2009053 Client: Marey Excavation Project: Cortland Landfill Cover ● Source: Common Fill		

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

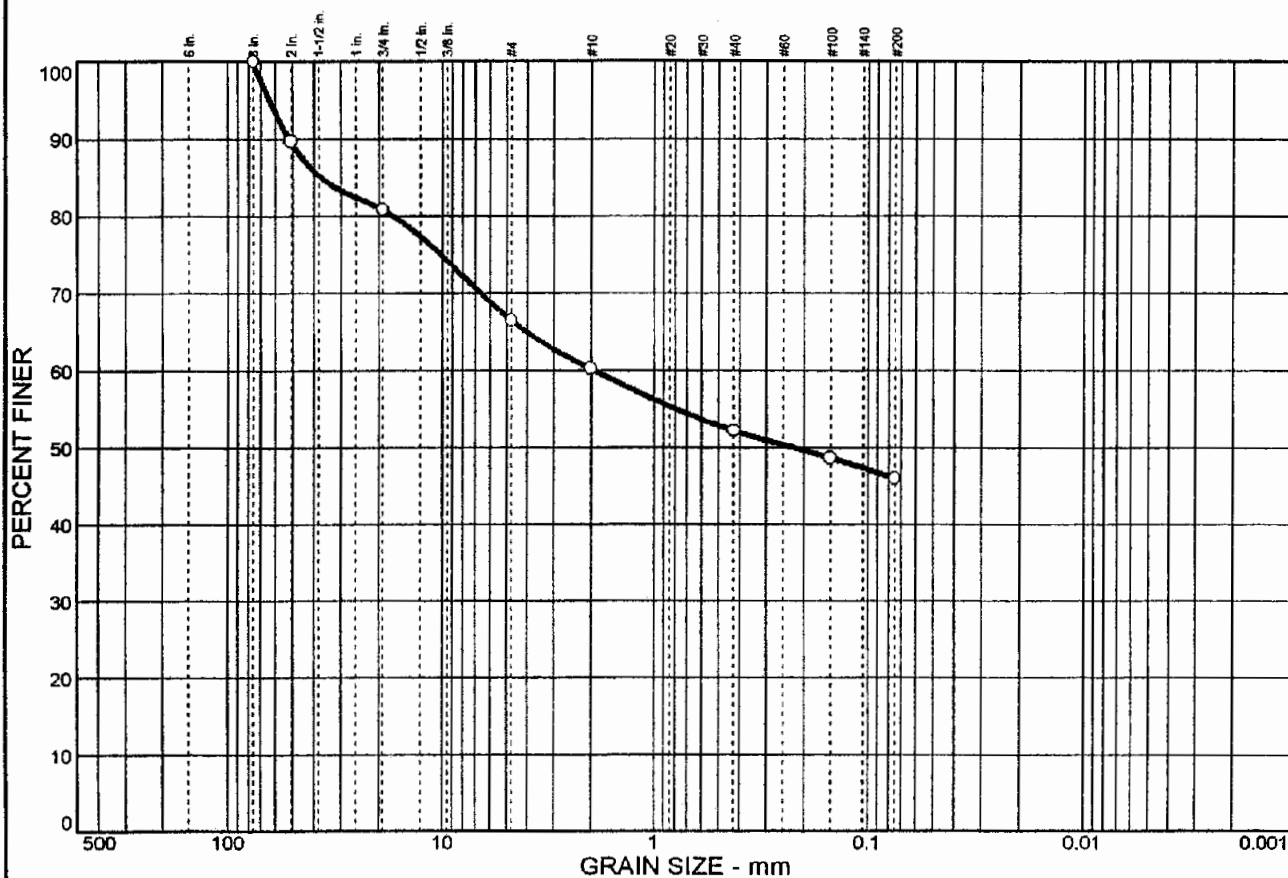
Remarks:

•

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
 D₈₅= 36.8 D₆₀= 1.93 D₅₀= 0.222
 D₃₀= D₁₅= D₁₀=
 C_u= C_c=

Classification
 USCS= GC-GM AASHTO=

Remarks

Sample No.: 452

Location:

Source of Sample: Common Fill

Date: Sept. 7, 2001

Elev./Depth:

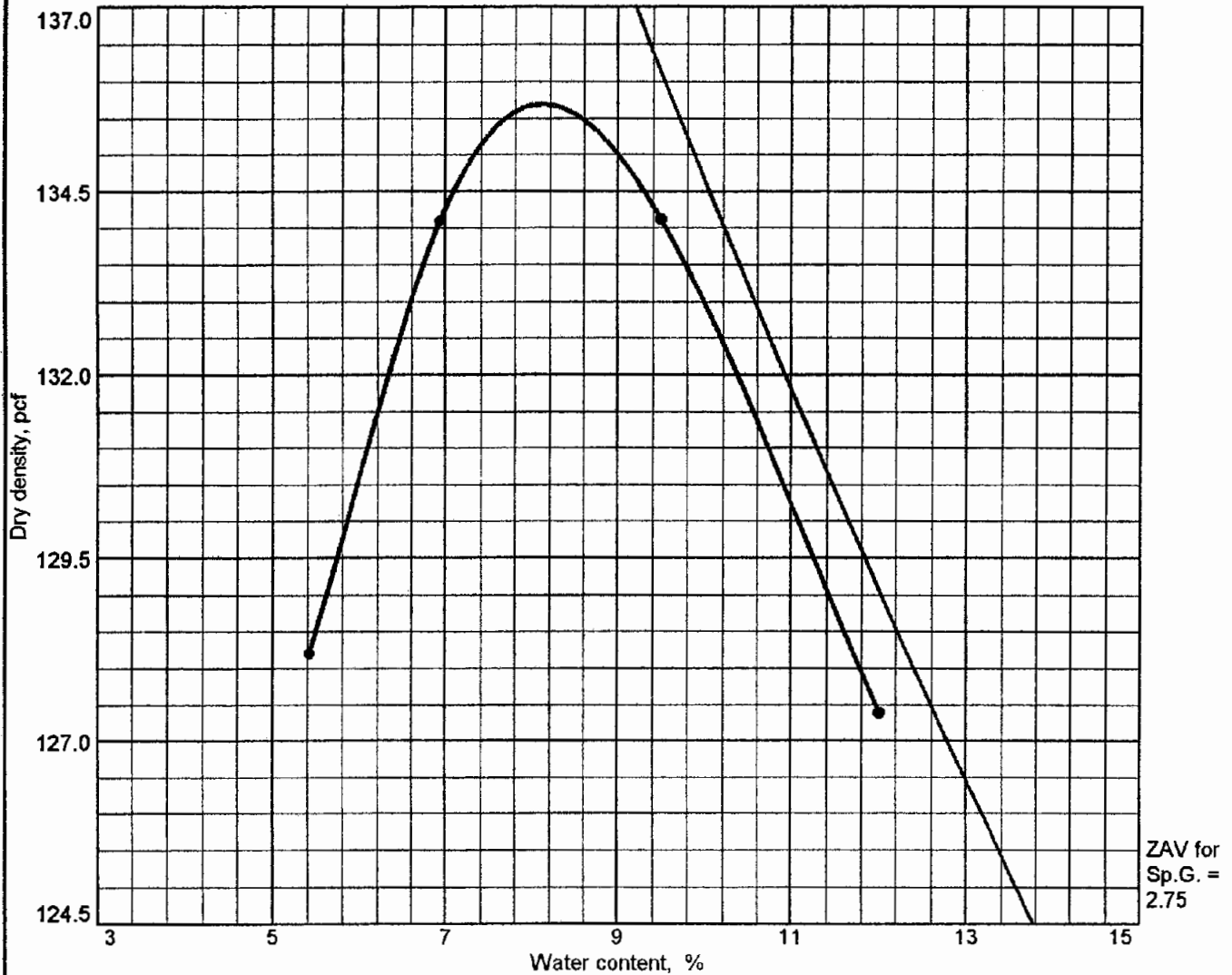
**SJB
SERVICES, INC.**

Client: Marey Excavation
Project: Cortland Landfill Cover

Project No: 2009053

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COMPACTION TEST REPORT

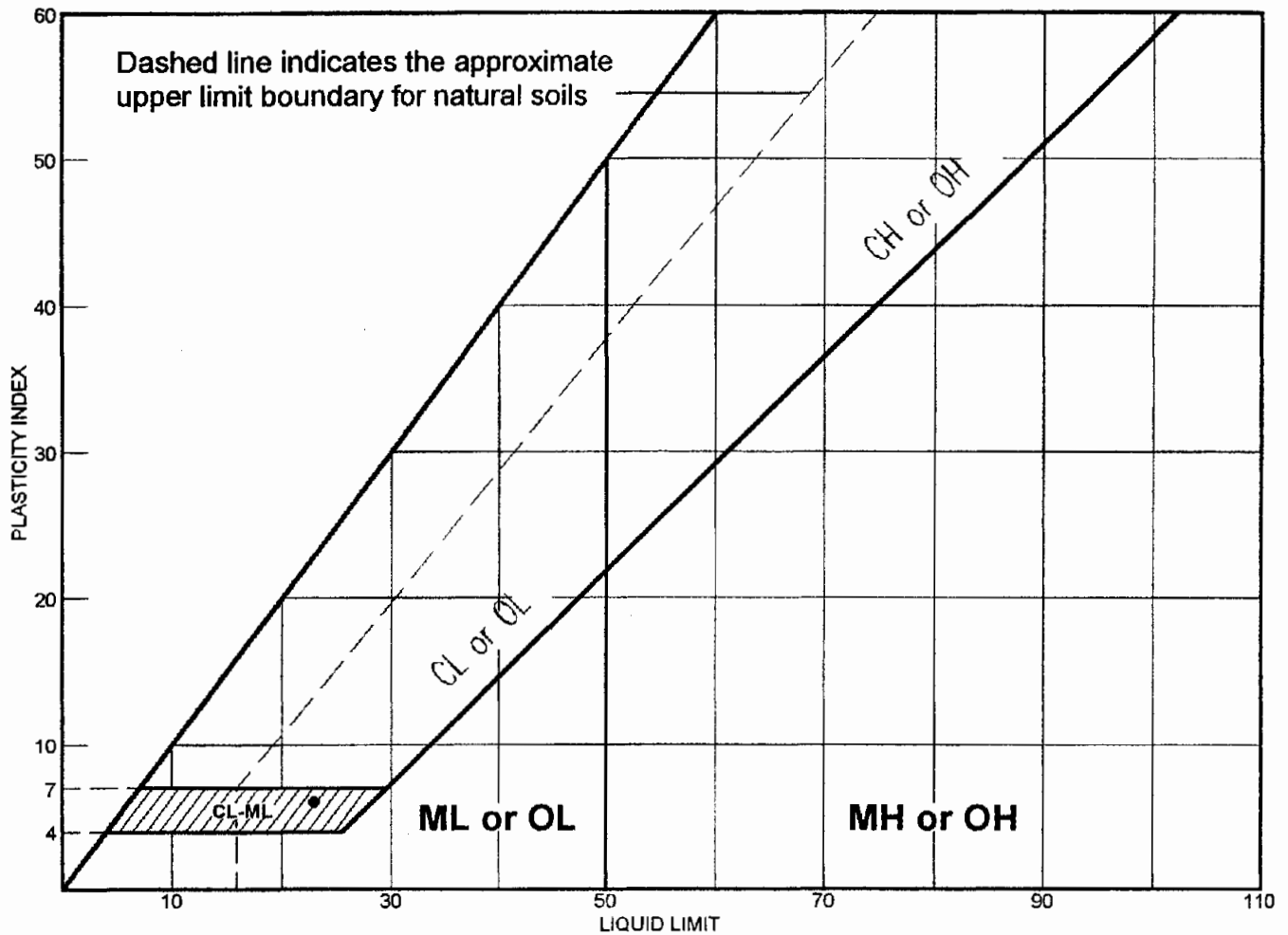


Test specification: ASTM D 1557-78 Method D Modified

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		85K N96 E 82 Silty clayey gravel with sand
Optimum moisture = 8.1 %		
Project No. 2009053 Client: Marey Excavation Project: Cortland Landfill Cover		Remarks:
● Source: Common Fill		

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
•	90K N95 E84 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

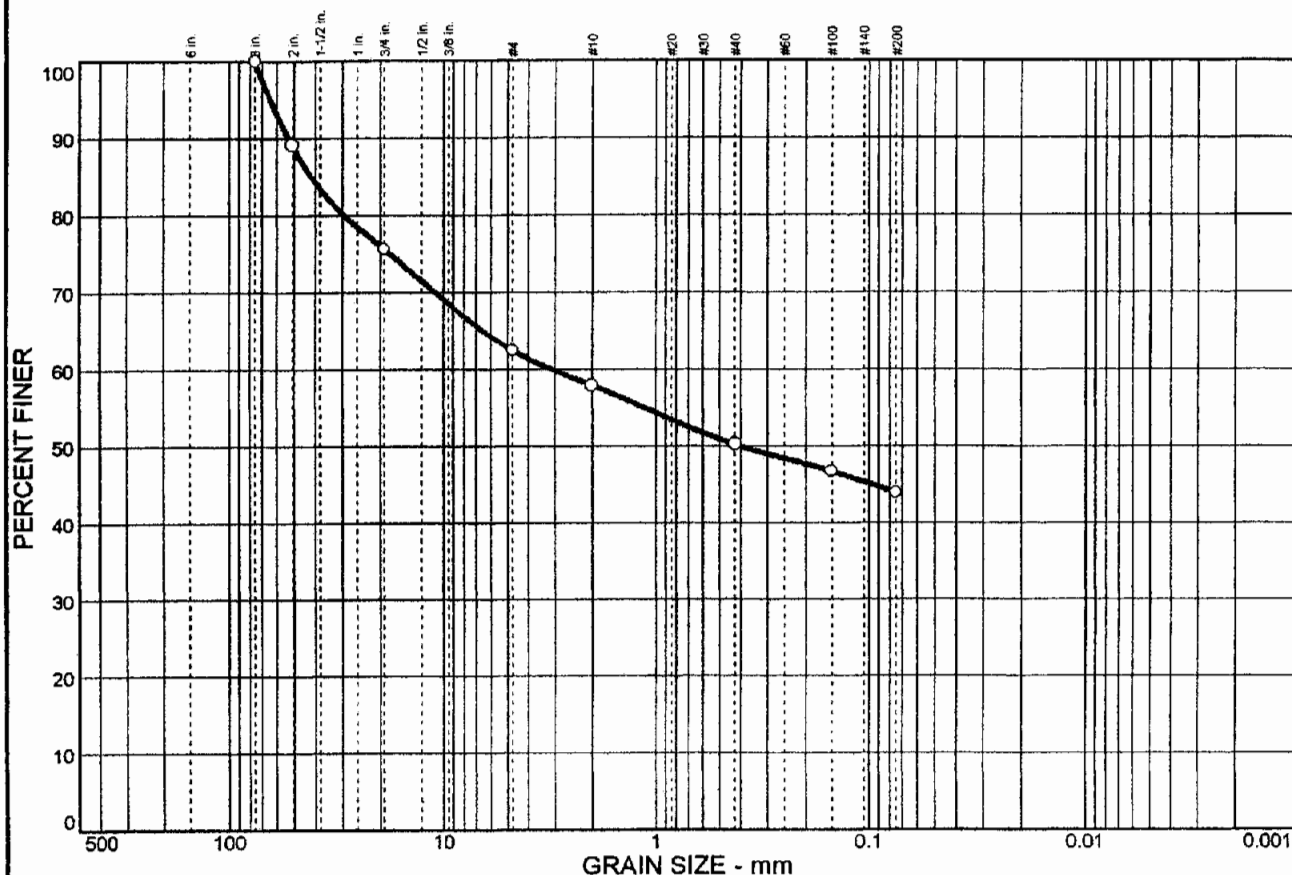
Remarks:

•

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		
1.5 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

D₈₅= 41.5 D₆₀= 3.10 D₅₀= 0.404
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= GC-GM AASHTO=

Remarks

Sample No.: 454

Location:

Source of Sample: Common Fill

Date: Sept. 7, 2001

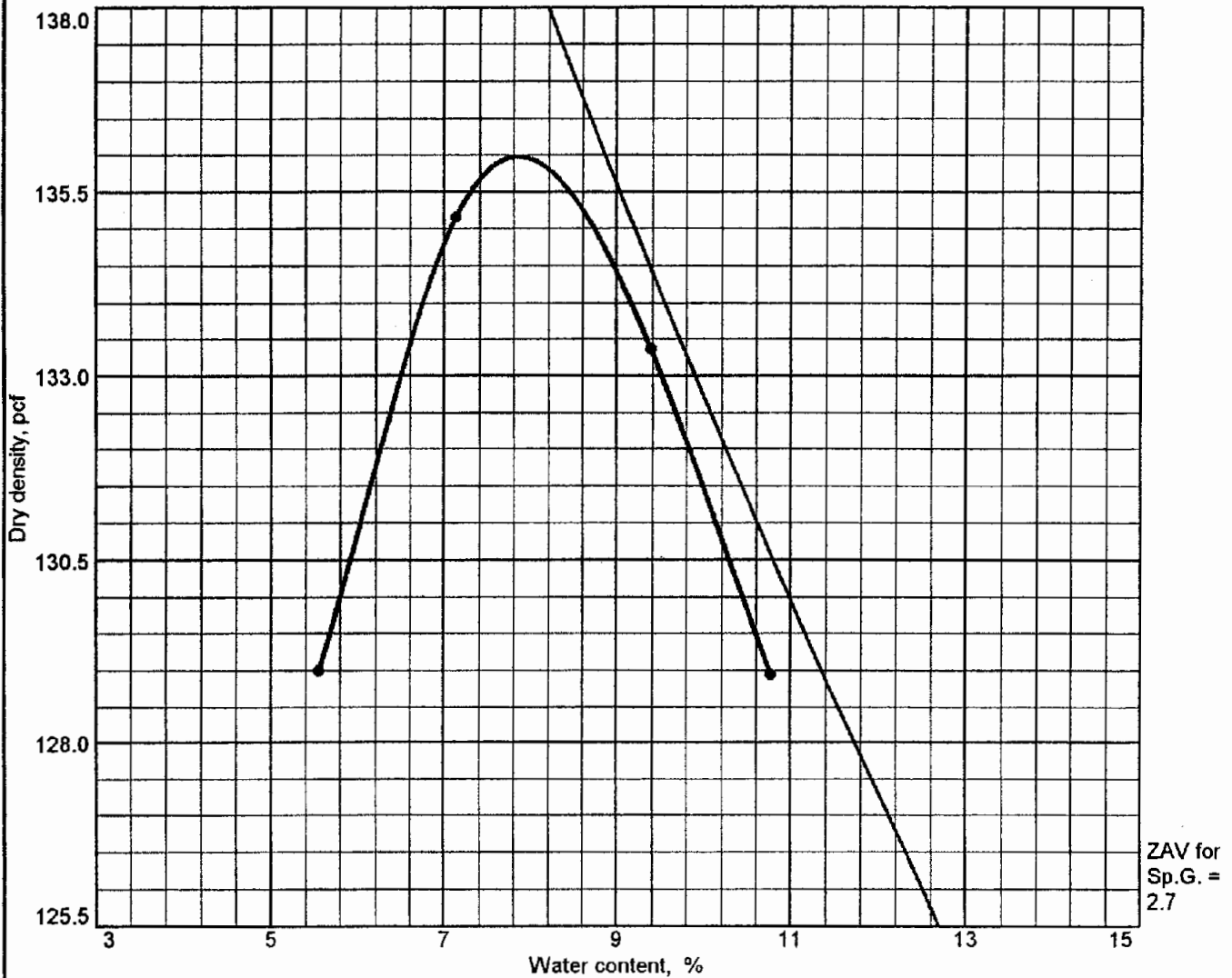
Elev./Depth:

SJB
SERVICES, INC.

Client: Macey 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 Optimum moisture = 7.9 %		90K N95 E84 Silty clayey gravel with sand
Project No. 2009053 Client: Marey Excavation Project: Cortland Landfill Cover ● Source: Common Fill Sample No.: 454		Remarks:
COMPACTION TEST REPORT SJB SERVICES, INC.		

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Appendix A
Section: 1.B
Common Fill Material
Quality Assurance Testing

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

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		

[illegible]

Max Density	Optimum Moisture	Material Type and Source	Method
139.7	6.8	Screened On Site Material	ASTM D 1557

REMARKS:

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°		

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%

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

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		

[illegible]

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%

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

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%

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

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%

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 : 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
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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%

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: 2751-810
Technician: D. Jennings

Respectfully submitted,
SJB Services, Inc.

T. Hamilton
Thomas A. Hamilton
Central Region Manager

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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		

[illegible]

Max Density	Optimum Moisture	Material Type and Source	Method
139.3	7.5	Existing On Site Material	ASTM D 1557

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

Respectfully submitted,
SJB Services, Inc.

T. Hamilton

Thomas A. Hamilton
Central Region Manager

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Fax: (607) 266-6409

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		

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

T. Hamilton
Thomas A. Hamilton
Central Region Manager

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		

[illegible]

Max Density	Optimum Moisture	Material Type and Source	Method
145.6	4.6	Granular Fill	ASTM D 1557

REMARKS:

Respectfully submitted,
SJB Services, Inc.

T. Hamilton
Thomas A. Hamilton
Central Region Manager

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: Troxter 3440
Serial Number: 14656
Std. Counts : 2696-521
Technician: R. TerwilligerRespectfully submitted,
SJB Services, Inc.Mike Warner
Testing Manager

SJB Services, Inc.

2415 N. Triphammer Rd., Suite 3
Ithaca, New York 14850
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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

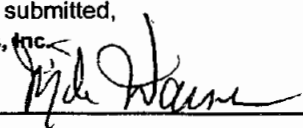
Test No.	Elevation	Locations and Comments	In-place moisture	Density			% compact
				Wet (pcf)	Dry (pcf)	maxim (pcf)	
21	FG	11850, 8850 #21	4.8%	129.8	123.8	135.7	91.2%
22	FG	11850, 8850 #22	4.4%	139.4	133.5	135.7	98.4%
23	FG	11850, 8850 #23	4.9%	129.9	123.8	135.7	91.2%
24	FG	11850, 8850 #24	4.4%	139.1	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%

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. Terwilligar

Respectfully submitted,
SJB Services, Inc.


Mike Warner
Testing Manager

2415 N. Triphammer Rd., Suite 3
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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		

[illegible]

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

REMARKS: FG: Finish Grade

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. S091401
Client: Marcy Excavation Co. Inc. Date: 09-14-01
Contractor: Marcy Excavation Co. Inc. Project No. 2009053
Weather

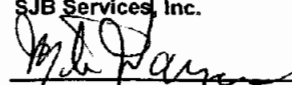
Test No.	Elevation	Locations and Comments	In-place moisture	Density			% compact
				Wet (pcf)	Dry (pcf)	maxim (pcf)	
41		50' North & 30' East of Station N10300 E8200	6.6%	136.5	128.0	140.2	91.3%
42		4' North & 30' East of Station N10300 E8400	7.4%	134.6	125.3	135.7	92.3%
43		27' North & 38' East of Station 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

SJB Services, Inc.

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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

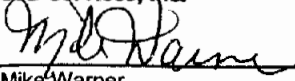
Test No.	Elevation	Locations and Comments	In-place moisture	Density			% compact
				Wet (pcf)	Dry (pcf)	maxim (pcf)	
61		51' North & 33' East of Station N10000 E8400	6.0%	145.8	137.6	140.2	98.1%
62		60' North & 27' East of Station N9900 E8400	5.4%	142.6	135.4	140.2	96.6%
63		63' North & 26' West of Station 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%

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.

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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°		

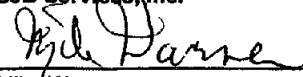
Test No.	Elevation	Locations and Comments	In-place moisture	Density			% compact
				Wet (pcf)	Dry (pcf)	maxim (pcf)	
1	FL	# 67	9.3%	134.3	122.9	135.7	90.6%
2	FL	# 68	7.6%	132.9	123.6	135.7	91.1%
3	FL	# 69	8.6%	140.0	128.9	140.2	91.9%
4	FL	# 70	8.5%	136.4	125.7	135.7	92.6%
5	FL	# 71	7.3%	142.3	132.6	140.2	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

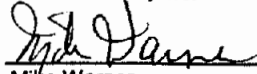
FIELD IN-PLACE DENSITY TEST REPORT

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°		

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. TerwillegarRespectfully submitted,
SJB Services, Inc.
Mike Warner
Testing Manager

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°

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%

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. Terwilliger

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. S100301
Client: Marcy Excavation Co. Inc. Date: 10-03-01
Contractor: Marcy Excavation Co. Inc. Project No. 2009053
Weather:

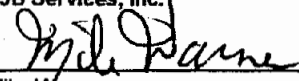
Test No.	Elevation	Locations and Comments	In-place moisture	Density			% compact
				Wet (pcf)	Dry (pcf)	maxim (pcf)	
118		#118	7.7%	144.2	133.9	140.2	95.5%
119		#119	8.2%	141.6	130.8	140.2	93.3%
120		#120	7.1%	139.5	130.2	140.2	92.9%
121		#121	8.1%	137.6	127.3	140.2	90.8%
122		#122	8.1%	131.3	126.1	135.7	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 Varnar
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.	S101901
Client:	Marcy Excavation Co. Inc.	Date:	10-19-01
Contractor	Marcy Excavation Co. Inc.	Project No.	2009053
Weather	Cloudy		

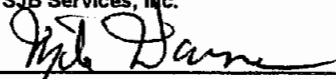
Test No.	Elevation	Locations and Comments	In-place moisture	Density			% compact
				Wet (pcf)	Dry (pcf)	maxim (pcf)	
1	FL	#136	9.3%	144.8	132.5	135.7	97.6%
2	FL	#137	9.0%	143.9	132.0	135.7	97.3%
3	FL	#138	8.0%	135.7	125.6	135.7	92.6%
4	FL	#139	9.2%	140.4	128.6	135.7	94.8%
5	FL	#140	8.9%	138.6	127.2	135.7	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

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

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		

[illegible]

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.

2415 N. Trihammer 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. 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

**Cortland County Landfill
Remedial Action Landfill Closure**

REL. DEN = 90%

[illegible]

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	
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	48.3	48.7		
1/2	4.202	46.4	2.2	0-15	
3/8	0.13	1.4	0.8		
1/4	0.016	0.2	0.6		
pan	0.056	0.6	0.0		
total	9.048	100.0			
CRUSH COUNT		ONE FACE		88 TWO FACE	
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	11.8	0-15	
#4	0.648	7.8	4.0		
1/8	0.196	2.4	1.6		
pan	0.196	1.6	0.0		
total	8.256	100			
CRUSH COUNT		ONE FACE		87 TWO FACE	
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	0.096	0.5	0.0		
total	10.954	100			
CRUSH COUNT		ONE FACE		88 TWO FACE	
5	Round wt	1 Face wt	9.7	2 Face wt	298.3

Page 1

Grain size distribution curve showing Percent Finer versus Grain Size (mm). The curve indicates a soil sample with a high percentage of fine material, dropping sharply between 10 mm and 0.075 mm.

Grain Size (mm)	Percent Finer (%)
500	100
100	100
60	100
47.5	100
37.5	100
30	100
25	100
20	100
15	100
12.5	100
10	100
7.5	100
6	100
4.75	100
3.75	100
3	100
2.5	100
2	100
1.5	100
1.18	100
0.85	100
0.75	100
0.6	100
0.425	100
0.3	100
0.25	100
0.2	100
0.15	100
0.106	100
0.075	100
0.06	100
0.05	100
0.0425	100
0.0375	100
0.03	100
0.025	100
0.02	100
0.015	100
0.0106	100
0.0075	100
0.006	100
0.005	100
0.00425	100
0.00375	100
0.003	100
0.0025	100
0.002	100
0.0015	100
0.00106	100
0.00075	100
0.0006	100
0.0005	100
0.000425	100
0.000375	100
0.0003	100
0.00025	100
0.0002	100
0.00015	100
0.000106	100
0.000075	100
0.00006	100
0.00005	100
0.0000425	100
0.0000375	100
0.00003	100
0.000025	100
0.00002	100
0.000015	100
0.0000106	100
0.0000075	100
0.000006	100
0.000005	100
0.00000425	100
0.00000375	100
0.000003	100
0.0000025	100
0.000002	100
0.0000015	100
0.00000106	100
0.00000075	100
0.0000006	100
0.0000005	100
0.000000425	100
0.000000375	100
0.0000003	100
0.00000025	100
0.0000002	100
0.00000015	100
0.000000106	100
0.000000075	100
0.00000006	100
0.00000005	100
0.0000000425	100
0.0000000375	100
0.00000003	100
0.000000025	100
0.00000002	100
0.000000015	100
0.0000000106	100
0.0000000075	100
0.000000006	100
0.000000005	100
0.00000000425	100
0.00000000375	100
0.000000003	100
0.0000000025	100
0.000000002	100
0.0000000015	100
0.00000000106	100
0.00000000075	100
0.0000000006	100
0.0000000005	100
0.000000000425	100
0.000000000375	100
0.0000000003	100
0.00000000025	100
0.0000000002	100
0.00000000015	100
0.000000000106	100
0.000000000075	100
0.00000000006	100
0.00000000005	100
0.0000000000425	100
0.0000000000375	100
0.00000000003	100
0.000000000025	100
0.00000000002	100
0.000000000015	100
0.0000000000106	100
0.0000000000075	100

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

#200 Wash: 0.7%

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

30	254.3		254.3
60		281	535.3
90	266.6		801.9
120		272	1073.9
150	267.6		1341.5
180		269.1	1610.6
210	268.3		1878.9
240		270.2	2149.1
270	267.2		2416.3
300		271.8	2688.1
330	268.6		2956.7
360		271.8	3228.5

#1

#2

Total

670.9		670.9
	645.9	1316.8
659.5		1976.3
	638.7	2615
644.9		3259.9
	675.7	3935.6
633.7		4569.3
	676	5245.3
635.6		5880.9
	675.2	6556.1
636.5		7192.6
	675.5	7868.1

Tare:

Permeability: 9.6 cm./sec.

9.4 cm./sec.

Tested by: A. Marks

Calculations by: T. Hamilton

Appendix A

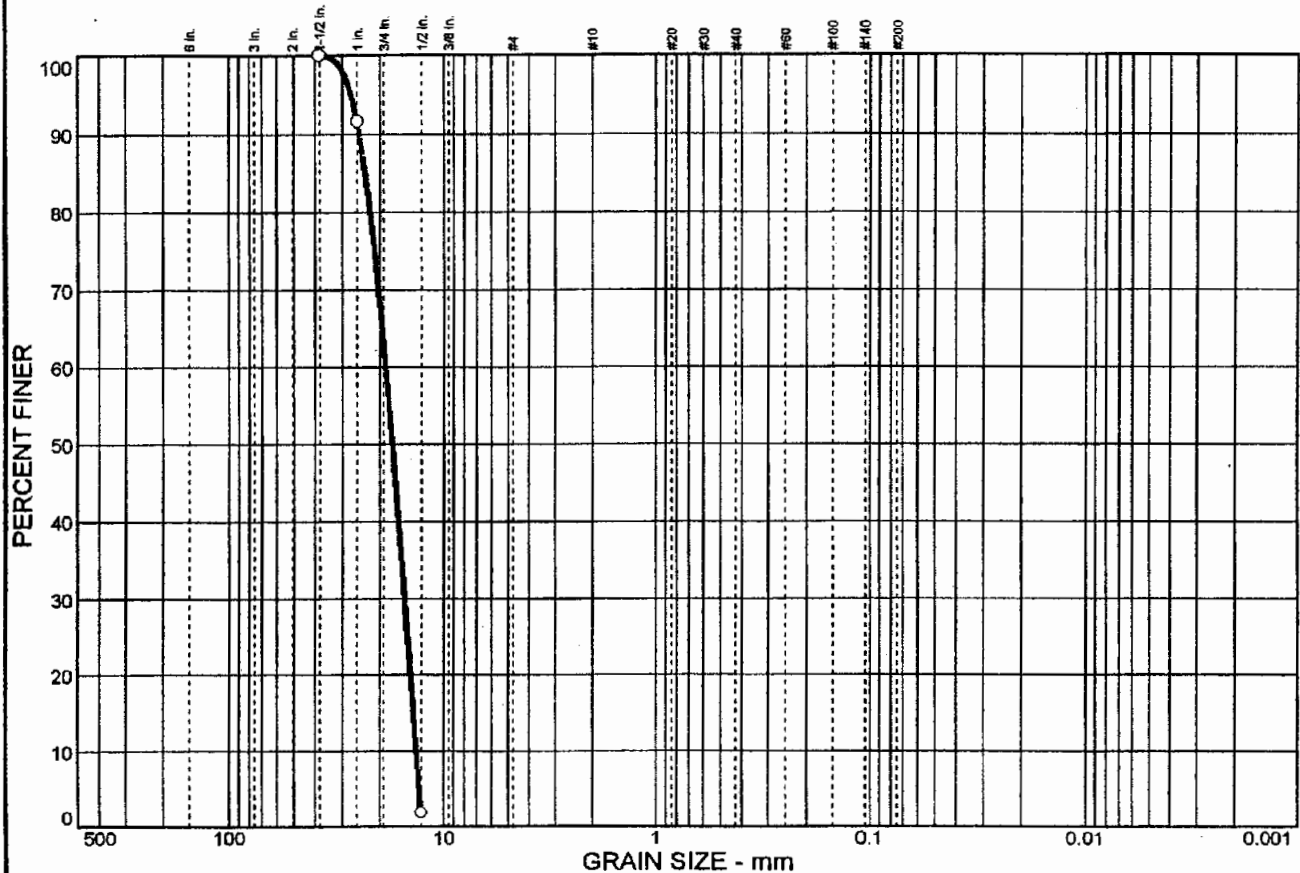
Section: 2.B

Type D Select Fill Test Results

**Cortland County Landfill
Remedial Action Landfill Closure**

[illegible]

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

D₈₅= 23.2 D₆₀= 18.5 D₅₀= 17.3
D₃₀= 15.1 D₁₅= 13.8 D₁₀= 13.3
C_u= 1.39 C_c= 0.92

Classification

USCS= GP AASHTO=

Remarks

#200 Wash: 0.3%

Sample No.: 216, D-1

Location: 1st 1,000 cy

Source of Sample: Type D Select Fill

Date: 5/11/01

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
Area,
A, sq.cm.: 412.23
Length of
sample, cm.: 27.26
Sample
Weight, g: 17,622

Height of cylinder, cm.: 29.8
Height of Void, cm.: 2.54
Sample Vol., cc: 11,237
Manometer, L, cm.: 23.5

Moisture Content:

Before After

Wet Wt. _____
Dry Wt. _____
Tare Wt. _____

Moisture %

Dry Unit Wt 97.9

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

Test Run No.

1

$k=QL/Ath$

2

Head, h, cm.

0.27

0.44

Flow, t @

#1

#2

Q

30	386		386
60		408	794
90	386		1180
120		408	1588
150	386		1974
180		408	2382
210	386		2768
240		408	3176
270	386		3562
300		408	3970
330	386		4356
360		408	4764

#1

#2

Q

658		658
	680	1338
658		1996
	680	2676
658		3334
	680	4014
658		4672
	680	5352
658		6010
	680	6690
658		7348
	680	8028

Tare:

Permeability: 2.8 cm./sec.

Permeability: 2.9 cm./sec.

Tested by: A. Marks

Calculations by:

T. Hamilton

AUG-26-1999 THU 08:26 AM MAXIM TECHNOLOGIES, INC. FAX NO. 6072688409

P. 05



AUGUST 26, 1999

Empire Soils Investigations, Inc., Division
2419 W. Triphammer Rd., Suite 3
Ithaca, New York 14850
Telephone: (607) 266-0147
Fax: (607) 266-0408

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.

	<u>Trial #1</u>	<u>Trial #2</u>	<u>Trial #3</u>	<u>Average</u>
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,

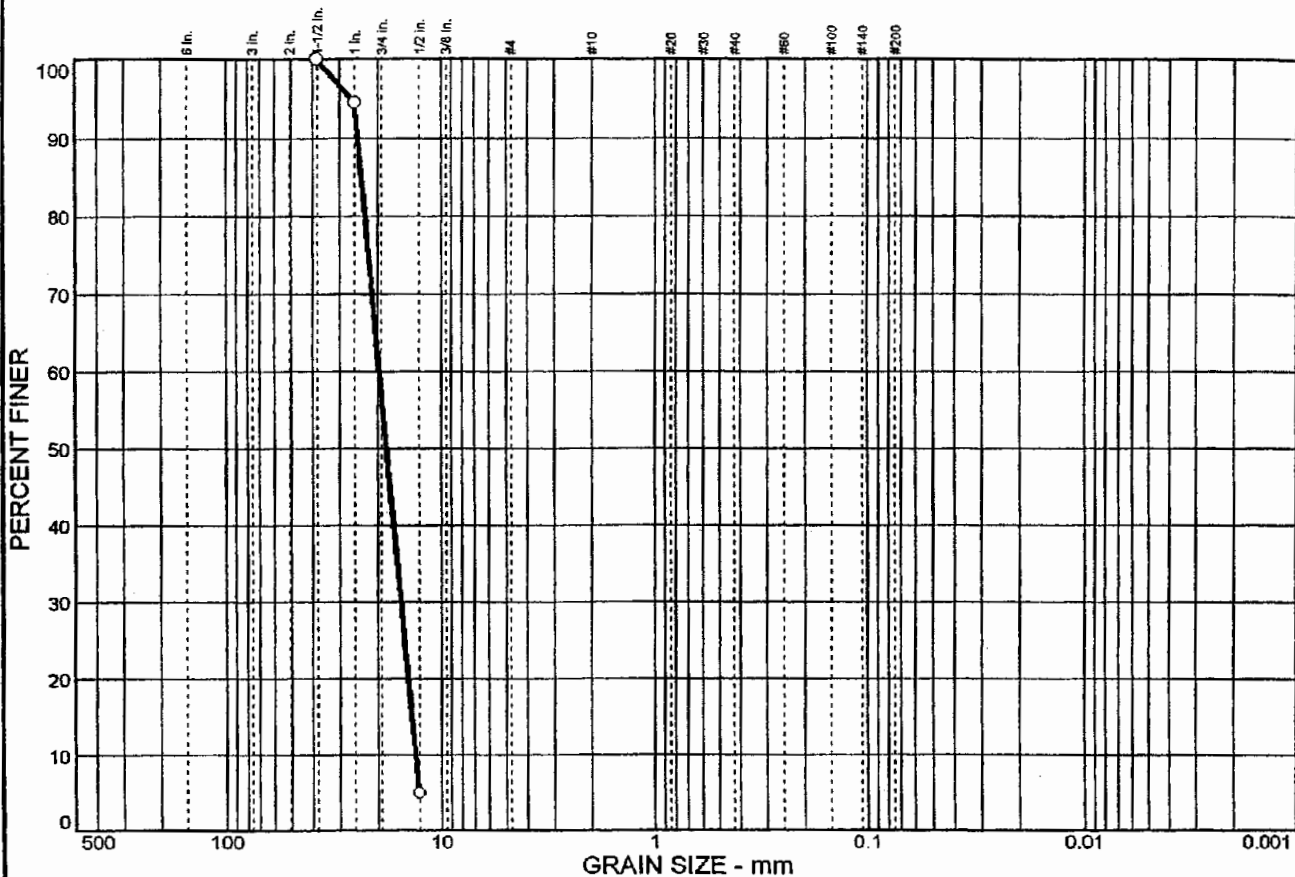
MAXIM TECHNOLOGIES OF NEW YORK, INC.

Jeffrey Truax
Jeffrey Truax
Construction Services Manager

F:\Public\Data\Carbonate

"Providing Cost-Effective Solutions to Clients Nationwide"

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
 D₈₅= 23.6 D₆₀= 19.4 D₅₀= 18.0
 D₃₀= 15.4 D₁₅= 13.7 D₁₀= 13.2
 C_u= 1.47 C_c= 0.93

Classification
 USCS= AASHTO=

Remarks

Sample No.: 466
 Location:

Source of Sample: Type D Select Fill

Date: 9/12/2001
 Elev./Depth:

**SJB
 SERVICES, INC.**

Client: Marcy Excavation
 Project: Cortland Landfill Cover

Project No: 2009053

466



PERMEABILITY TEST REPORT

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 ($\Delta V/t$) (cm³/sec) : ● 9.8 ▲

Permeability (cm/sec) : ● 2.47 ▲

SAMPLE DATA:

Sample Identification : 466, Select Fill

Type D

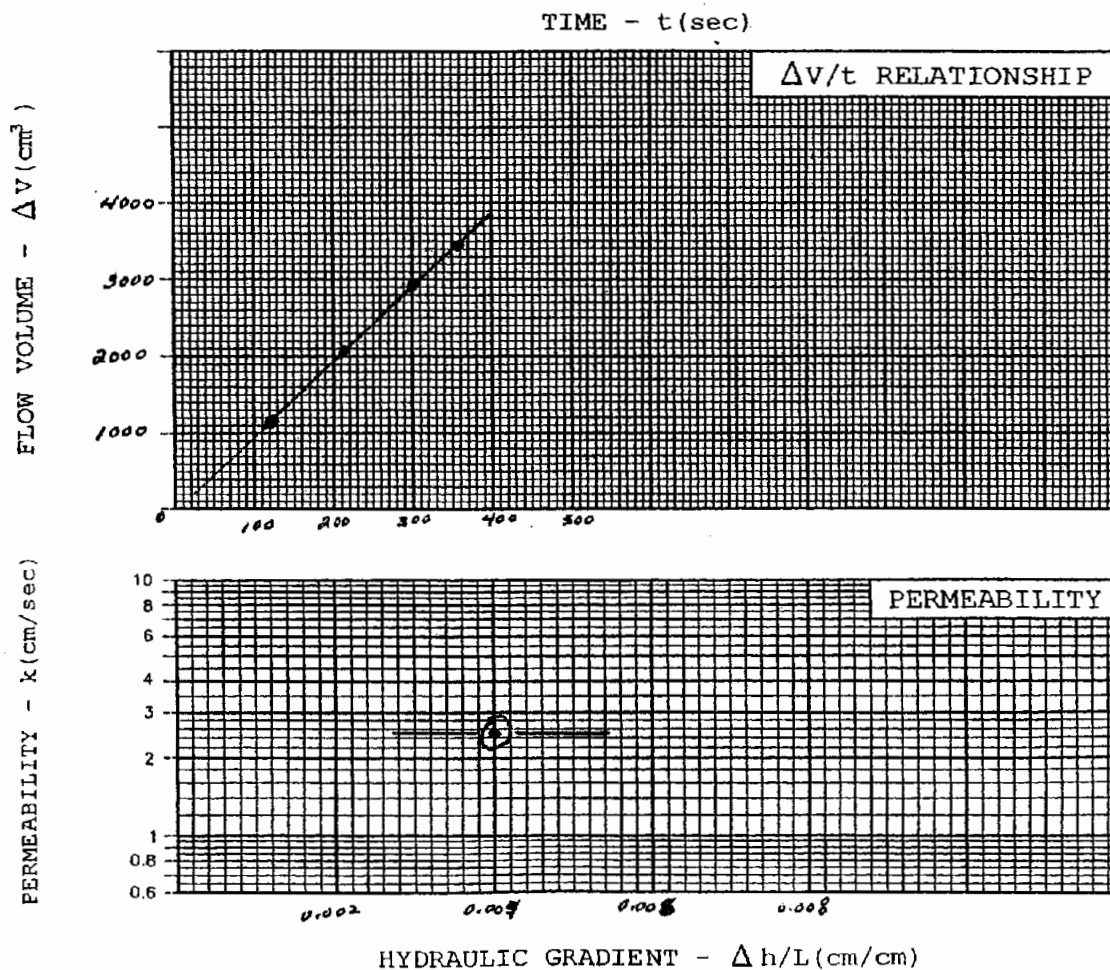
Visual Description : Crushed Stone #2

Remarks :

Maximum Dry Density : 94.3

Optimum Moisture Content (%) :

Percent Compaction : 95

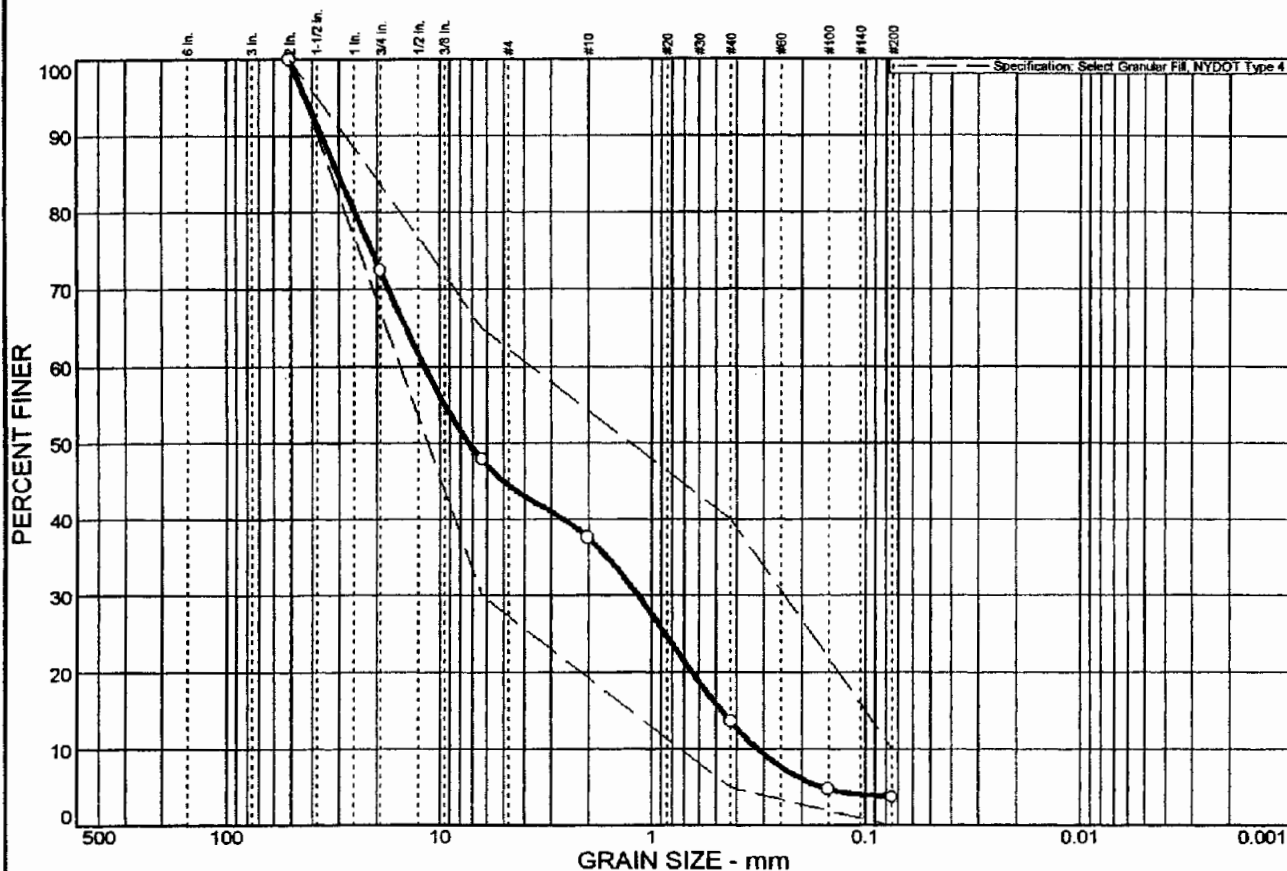


Appendix A

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	

Soil Description

Granular Fill
Poorly graded gravel with sand

Atterberg Limits

PL= LL= PI=

Coefficients

D₈₅= 30.0 D₆₀= 11.8 D₅₀= 7.27
D₃₀= 1.16 D₁₅= 0.469 D₁₀= 0.316
C_u= 37.31 C_c= 0.36

Classification

USCS= GP AASHTO=

Remarks

Granular Fill

* Select Granular Fill, NYDOT Type 4

Sample No.: 244
Location: Suite Kote

Source of Sample: Granular Fill

Date:
Elev./Depth:

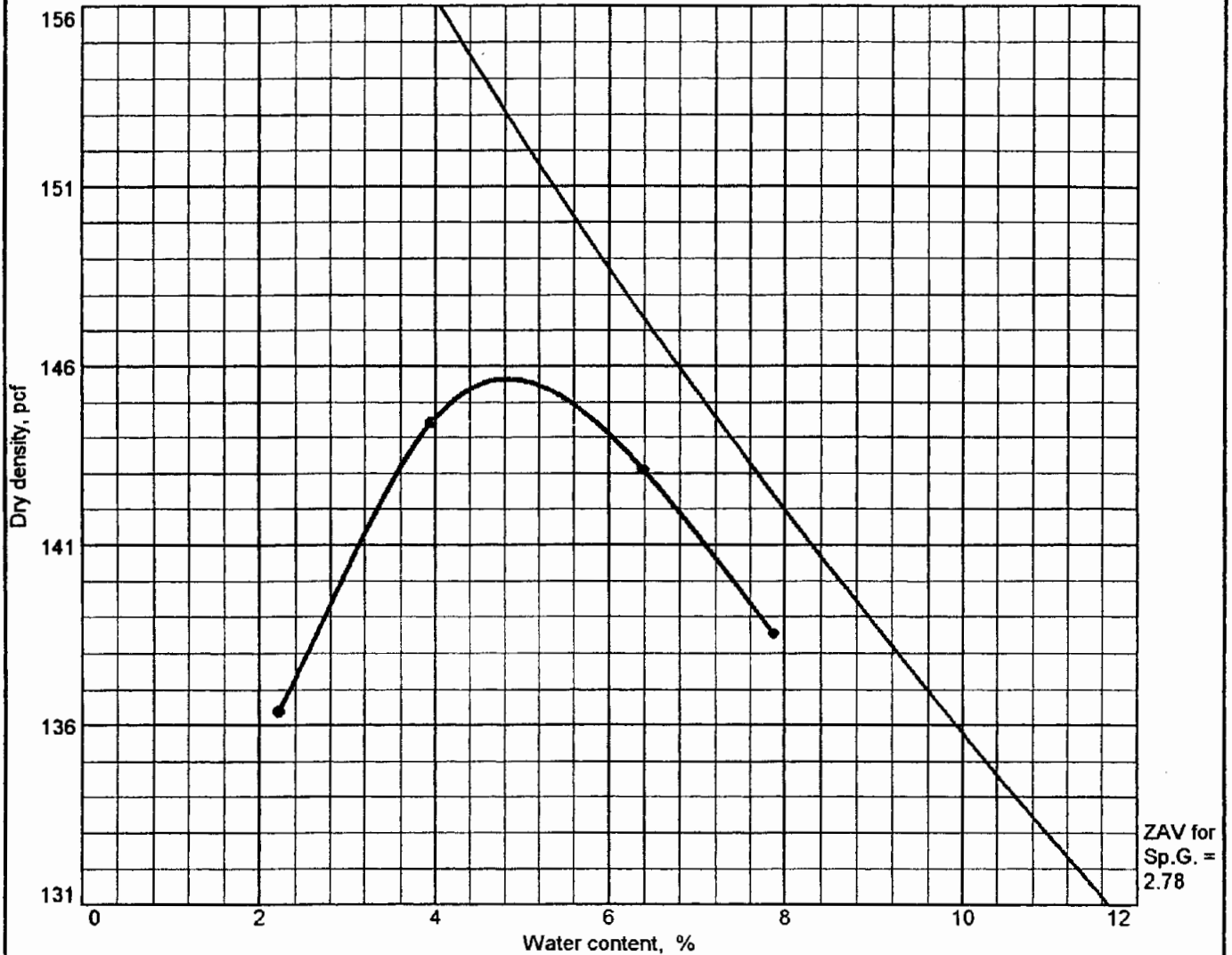
SJB
SERVICES, INC.

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		Granular Fill Poorly graded gravel with sand
Optimum moisture = 4.8 %		
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



**Contract
Drilling
and
Testing**

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(518) 899-7491

Falconer, NY

(716) 487-1481

Gilbert, PA

(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).

<u>Test Performed</u>	<u>Pile #1, East Side</u>		<u>County Pile #1</u>
	<u>S-1</u>	<u>S-2</u>	<u>South End</u>
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



"QUALITY & SERVICE THE WAY IT USED TO BE"





**Contract
Drilling
and
Testing**

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(610) 681-8500

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.

<u>Test Performed</u>	<u>S-1</u>	<u>S-2</u>
Ph	7.9	8.4
Loss on Ignition	5.2 %	6.0%

Respectfully submitted,

SJB Services, Inc.

T. Hamilton

Thomas A. Hamilton
Regional Manager



"QUALITY & SERVICE THE WAY IT USED TO BE"

