Appendix R

CARLIN-SIMPSON GEOTECHNICAL REPORT

CARLIN • SIMPSON & ASSOCIATES

Consulting Geotechnical and Environmental Engineers

Robert B. Simpson, P.E.
Principal

Robert J. Carlin, P.E.
Principal Emeritus:

61 Main Street, Sayreville, New Jersey 08872
Tel. (732) 432-5757
Fax. (732) 432-5717

Associates:
Meredith R. Anke, P.E.
Robert H. Barnes, P.E.
Kurt W. Anke
Eric J. Shaw

23 April 2008

P.L.I., LLC
1699 Route 6, Suite 1
Carmel, New York 10512

Att: Mr. Paul Camarda

Re: Report on Supplemental Geotechnical Subsurface Exploration
Proposed Stateline Retail Center– Southern Cut Area
U.S. Route 6
Town of Southeast, NY (07-90)

Dear Mr. Camarda:

In accordance with our proposal dated 9 November 2007, we have completed a supplemental subsurface exploration and geotechnical engineering evaluation for the proposed cut area at the referenced site. The purpose of this supplemental study was to further determine the nature and engineering properties of the subsurface soil, rock and groundwater conditions in the planned slope cut area and to confirm the rock elevation and rock quality in the planned the rock slope cut area.

The current site plans indicate that a portion of the proposed cut situated between Interstate Highway Route 84 and the southern side of the proposed retail center will consist of an exposed rock slope with a tiered retaining wall system constructed on top of the rock slope. To guide us in the preparation of this proposal, Insite Engineering, Surveying & Landscape Architecture, P.C. has provided us with a copy of the most recent grading plan that indicates the location of the planned walls and slopes.

Our scope of work for this project included the following:

1. Reviewed the proposed slope cut location, the existing site conditions, the data from our preliminary subsurface exploration and planned this study.

2. Retained General Borings, Inc. to advance six (6) supplemental test borings (Borings B-4 through B-9) at selected locations along the proposed slope cut. Performed rock coring at three of the boring locations.

3. Laid out the boring locations in the field, provided full time inspection of the borings, obtained soil samples and rock

cores, prepared detailed boring logs and a Boring Location Plan.

4. Performed grain size analyses on selected soil samples in our laboratory.

5. Analyzed the field and laboratory test data and prepared this report containing the results of this study.

SITE DESCRIPTION

The project site is the proposed Stateline Retail Center located on the southern side of U.S. Route 6 in the Town of Southeast, New York. Interstate Highway Route 84 borders the site to the south. The area of interest for this study is the proposed slope cut situated between Interstate Highway Route 84 and the southern side of the proposed retail center.

The study area is currently undeveloped and heavily wooded with large trees. During our field exploration, numerous large boulders were observed on the surface. Evidence of significant stormwater runoff and erosion was observed during our site work. Several deep erosion gullies were observed. Evidence of heavy runoff was also noted along the southern property line flowing in an easterly direction towards the wetlands drainage channel.

Site grades generally slope moderately to steeply downward in all directions from the high point, elevation +534 feet, located near the southern property line directly south of the southwestern corner of Proposed Anchor Building A. According to the topography information provided on the proposed site grading plan, the existing surface grades within the study area vary from about elevation +496 feet at the eastern end of the proposed slope to about elevation +534 feet at the high point.

SUBSURFACE CONDITIONS

To further determine the subsurface soil, rock and groundwater conditions within the proposed cut slope area, we advanced 6 supplemental test borings (Borings B-4 through B-9) in December 2007 at the locations shown on the enclosed Boring Location Plan. Three previous test borings (Borings B-1 through B-3) were performed in July 2007 as part of the preliminary subsurface exploration.

The proposed cut slope area is currently heavily wooded and moderately to steeply sloping. ATV drilling equipment was used to access the boring locations. Detailed boring logs have been prepared and are included in this report. Our field geologist visually identified all soil and rock core samples and selected soil samples were tested in our laboratory. The results of these tests are included in this report.

Soil and Rock Conditions

The soil descriptions shown on the boring logs are based on the Burmister Classification System. In this system, the soil is divided into three components: Sand (S), Silt ($) and Gravel (G). The major component is indicated in all capital letters, the lesser in lower case letters. The following modifiers indicate the quantity of each lesser component:

Modifier	Quantity
trace (t)	0 – 10%
little (l)	10% - 20%
some (s)	20% - 35%
and (a)	35% - 50%

The subsurface soil and rock conditions observed in the borings can be summarized as follows:

Stratum 1
Topsoil

The surface layer in each of the borings is brown silty topsoil, ranging from 7 to 10 inches in thickness.

Stratum 2A
Sandy Silt or
Sandy Silt with Gravel

Beneath the topsoil in Borings B-2 and Borings B-4 through B-8 is medium stiff to hard brown SILT some to and (+), coarse to fine Sand, trace (+) to some coarse to fine Gravel with rock fragments. Sandy silt or sandy silt with gravel was observed to depths ranging from 2'0" to 16'0" beneath the existing ground surface.

Stratum 2B
Very Silty Sand or
Very Silty Sand with
Gravel

Below the topsoil in Borings B-3 and B-9 and underlying the sandy silt in Borings B-5 through B-8 is dense to very dense brown coarse to fine SAND, and Silt, trace to and coarse to fine Gravel. Very silty sand or very silty sand with gravel was to observed depths ranging from 12'6" to 31'1" beneath the existing ground surface.

Borings B-5 and B-7 were terminated upon "auger refusal' at final depths of 31'1" and 15'0", respectively. At these locations, the drilling augers could not be advanced deeper. Auger refusal is sometimes an indicator of harder weathered rock, bedrock, or a large boulder.

In Boring B-6, very loose to loose silty sand was observed between the depths of 10'0" and 12'6".

Stratum 3
Silty Sand

Underlying the topsoil layer in Boring B-1 and the very silty sand in Boring B-3 is loose to medium dense brown coarse to fine SAND, trace to little Silt, trace to little coarse to fine Gravel. In Boring B-3, the silty sand was observed to be very micaeous and in a loose state of density between the depths of 10 to 15 feet below the surface. The silty Sand extends to depths of 4'0" and 18'0" below the existing ground surface in Borings B-1 and B-3, respectively.

Stratum 4
Silty Sand
with Gravel

Beneath the Stratum 3 silty sand in Boring B-1, dense to very dense brown, or gray brown coarse to fine SAND, some Silt, some (+) to and coarse to fine Gravel was observed to a depth of 8'0" below the existing ground surface.

Stratum 5
Silty Sandy Gravel
(Completely to Highly
Weathered Gneiss)

Very dense brown, gray coarse to fine GRAVEL some to and, coarse to fine Sand, little Silt (Completely to Highly Weathered Gneiss in a soil-like state) was observed underlying the silty sand with gravel in Borings B-1, B-7, and B-8; below the sandy silt with gravel in Boring B-2, and beneath the silty sand in Boring B-3.

Borings B-2 and B-3 were terminated upon "auger refusal" at final depths of 26'0" and 19'0" below the ground surface. At these locations, the drilling augers could not be advanced deeper. Auger refusal is sometimes an indicator of harder weathered rock, bedrock, or a large boulder.

Auger refusal was also noted in Borings B-1, B-7, and B-8 at depths of 14'0", 15'0", and 30'0", respectively. Boulders were observed within the completely to highly weathered gneiss between the depths of 20'0" and 30'0".

Stratum 6
Gneiss

The gneiss bedrock was cored at Borings B-1, B-6, B-7 and B-9 beginning at depths of 14'0", 15'0", 15'0", and 30'0" below the existing ground surface, respectively. The rock core recoveries ranged from 32 to 100 percent. The rock quality designation (RQD) of the recovered cores varied from 32 to 100 percent.

Based on the rock core recoveries and RQD values, the gneiss bedrock rock ranges from poor to excellent in quality. At Boring B-6, the condition of the bedrock was intact and fresh. However, at Borings B-1, B-6, and B-7 the gneiss bedrock can be described as being in a shattered, very blocky to blocky and seamy condition.

Groundwater Conditions

Observations for groundwater were made during sampling and upon completion of the drilling operations at each boring location. In auger drilling operations, water is not introduced into the boreholes, and the groundwater position can often be determined by observing water flowing into or out of the boreholes. Furthermore, visual observation of the soil samples retrieved during the auger drilling exploration can often be used in evaluating the groundwater conditions. In rock coring operations, drill water is used during the coring process; the interpretation of the groundwater therefore becomes more difficult without long term monitoring, i.e. through the use of observation wells.

Groundwater was observed in Boring B-5 at a depth of 27'0". This corresponds to an elevation of about +500.0 feet. Groundwater not observed in any of the other borings at the time of drilling. Very moist soil was observed in some of the soil samples obtained from Boring B-1 between the depths of 12 and 14 feet. The very moist soil condition may be due to a local spring or perched water condition. Groundwater levels at this site will be influenced by the underlying rock surface. As surface water infiltrates the ground, the water will travel along the soil/rock interface and through fractures in the bedrock.

The highest groundwater observations are normally encountered in late winter and spring and our current groundwater observations are expected to be slightly lower than the seasonal maximum water table. Variations in the location of the long-term water table may occur as a result of changes in precipitation, evaporation, surface water runoff, and other factors not immediately apparent at the time of this exploration.

EVALUATION

We understand that the planned construction will consist of a large retail center and associated parking. The purpose of this study was to evaluate the stability and feasibility of constructing soil and rock slopes and retaining walls in the planned cut area situated between Interstate Highway Route 84 and the southern side of the proposed retail center.

According to the topography information provided on the proposed grading plan, the existing surface grades within the study area vary from about elevation +497 feet at the eastern end of the proposed slope to about elevation +534 feet at the high point. Site grades generally slope moderately to steeply downward in all directions from the high point, elevation +534 feet, located near the southern property line directly south of the southwestern corner of Proposed Building B. Based on the existing and proposed grades, a maximum cut of about 39 feet will be required to achieve the proposed elevations.

The most recent grading plan indicates that the grades on the southern side of the proposed retail center will be cut in order to achieve the new grades for the building. The new slope will be designed with a series of tiered retaining walls with soil and rock slopes. Throughout most of the cut area, the base of the cut will be a rock slope. Retaining walls will be required in some areas of the base of the cut at the western and eastern ends of the cut area, where rock is not present. The western section of the slope cut will be designed with a triple-tiered wall system. Above the rock slope or lower retaining wall, one or two additional walls will be constructed, depending on the proposed site grades. Each of the walls will be a maximum of 10 feet in height. A minimum six-foot wide bench will be provided at the top of the rock slope. Benches at least five feet in width will be provided between the tiered walls. Above the upper wall the soil slope will be graded on a 2 horizontal to one vertical (2H:1V) or flatter slope. At the eastern end of the cut a swale will be constructed behind the upper wall to direct surface runoff towards the east.

The proposed new rock slope will be constructed on an approximate one horizontal to five vertical (1H:5V) angle at it steepest point. The maximum height of the proposed rock slope will be about 23.4 feet near the middle of the cut area.

A total of nine test borings were performed to determine the subsurface soil, rock and groundwater conditions in the vicinity of the planned cut. Test Borings B-1, B-2, and B-3 were performed in July 2007. Supplemental Borings B-4 through B-9 were performed in December 2007.

The boring data indicates that the surface layer in each of the borings is brown silty topsoil, ranging from 7 to 10 inches in thickness. Beneath the topsoil in Borings B-2 and Borings B-4 through B-8 is medium stiff to hard brown sandy silt or sandy silt with gravel (Stratum 2A), which was observed to depths ranging from 2'0" to 16'0" beneath the existing ground surface. Below the topsoil in Borings B-3 and B-9 and underlying the sandy silt in Borings B-5 through B-8 is dense to very dense very silty sand or very silty sand with gravel (Stratum 2B), which was to observed depths ranging from 12'6" to 31'1" beneath the existing ground surface.

Underlying the topsoil layer in Boring B-1 and the very silty sand in Boring B-3 is loose to medium dense brown silty sand (Stratum 3) was observed to be very micaeous and in a loose state of density between the depths of 10 to 15 feet below the surface. The silty sand extends to depths of 4'0" and 18'0" below the existing ground surface in Borings B-1 and B-3, respectively. Beneath the Stratum 3 silty sand in Boring B-1, is dense to very dense brown, or gray brown silty sand with gravel (Stratum 4), which was observed to a depth of 8'0" below the existing ground surface.

Very dense brown, gray coarse to fine silty sandy gravel, completely to Highly Weathered Gneiss in a soil-like state (Stratum 5), was observed underlying the silty sand with gravel in Borings B-1, B-7, and B-8; below the sandy silt with gravel in Boring B-2, and beneath the silty sand in Boring B-3. Borings B-2 and B-3 were terminated upon "auger refusal" at final depths of 26'0" and 19'0" below the ground surface. At these locations, the drilling augers could not be advanced deeper. Auger refusal is sometimes an indicator of harder weathered rock, bedrock, or a large boulder. Auger refusal was also noted in Borings B-1, B-7, and B-8 at depths of 14'0", 15'0", and 30'0", respectively. Boulders were observed within the completely to highly weathered gneiss between the depths of 20'0" and 30'0".

Gneiss bedrock (Stratum 6) was cored at Borings B-1, B-6, B-7 and B-9 beginning at depths of 14'0", 15'0", 15'0", and 30'0" below the existing ground surface, respectively. At Boring B-1, the gneiss bedrock was cored beginning at a depth of 14'0" below the existing ground surface for a vertical distance of 30 feet. Based on the rock core recoveries and RQD values, the gneiss bedrock rock ranges from poor to excellent in quality. At Boring B-6, the condition of the bedrock was intact and fresh. However, at

Borings B-1, B-6, and B-7 the gneiss bedrock can be described as being in a shattered, very blocky to blocky and seamy condition.

The elevation of the rock surface will vary throughout the planned slope area. Rock excavation, possibly including blasting, will be required in portions of the proposed slope and retail buildings. Rock removal is discussed in a separate section below. The rock conditions observed in the borings are summarized in Table 1.

TABLE 1

Boring No.	Approximate Ground Surface Elevation (Feet)	Observed Depth to Completely or Highly Weathered Gneiss (Elevation)	Observed Depth to Bedrock or Auger Refusal* (Elevation)
B-1	+530.5	8'0" (+522.5)	14'0" (+516.5)
B-2	+512.0	16'0" (+496.0)	26'0" (+486.0)
B-3	+525.0	18'0" (+507.0)	19'0" (+506.0)
B-4	+526.0	-	12'6" (+513.5)
B-5	+527.0	-	31'1" (+495.9)
B-6	+525.0	-	15'0" (+510.0)
B-7	+533.0	13'6" (+519.5)	15'0" (+518.0)
B-8	+530.0	-	15'0" (+515.0)
B-9	+522.0	20'0" (+502.0)	30'0" (+492.0)

* Auger refusal may be an indicator of bedrock or harder weathered rock.

Impact of Groundwater on the Proposed Construction

Groundwater was not observed in the borings at the time of drilling. Very moist soil was observed in one of the soil samples obtained from Boring B-1 between the depths of 12 and 14 feet. The very moist soil condition may be due to a nearby underground spring or local perched water conditions. Groundwater levels at this site will be influenced by the underlying rock surface. As surface water infiltrates the ground, the water will travel along the soil/rock interface and through fractures in the bedrock.

In the deeper slope cuts, underground springs or pockets of perched water may be exposed during excavation. Areas with water seepage, if encountered, will have to be evaluated by Carlin-Simpson & Associates at the time of construction as the conditions are exposed. Since water seepage can weaken the slope, areas where water seepage or wet soils are exposed may require special treatment to collect or redirect the water, to improve the slope soil and rock conditions, or to retain the slope. Special treatment methods may include the installation of slope drains or diversion trenches; excavating and replacing weak, wet or soft soils with rip-rap or reinforced earth; re-grading the slope on a flatter angle; installing soil nails and rock anchors; or constructing retaining walls.

Proposed Slope Configuration

The most recent grading plan indicates that the grades on the southern side of the proposed retail center will be cut in order to achieve the new grades for the building. The new cut slope will be designed with a series of tiered retaining walls with soil and rock slopes. In order to evaluate the proposed slope geometry, we have generated three cross-sections from the existing topography and proposed grading information shown on the proposed grading plan. The cross-sections were taken perpendicular to the slope through Borings B-1, B-2 and B-3. A discussion of each of the cross-sections is provided below. The cross-sections have been included in the Appendix of this report.

Cross-Section A-A

Cross-Section A-A is perpendicular to the slope through Boring B-3, which was performed in the planned pavement area approximately 9 feet north of the curb line, about 25 feet southeast of the southeastern corner of the proposed Building C. As shown on the cross-section, the existing surface elevations in the area of the proposed cut vary from elevation +524 feet to elevation +531 feet. The proposed toe of slope at this location is elevation +495.5 feet. A cut of about 34 feet is anticipated at this section.

According to the proposed grading plan the new slope configuration will consist of a rock slope at the base. In this area, the rock slope will be designed as a one horizontal to five vertical (1H:5V) slope, extending from the toe of slope up to elevation +505 feet. A bench, approximately nine feet wide, will be provided at elevation +505 feet. A double-tiered retaining wall is planned above the rock slope. The top of the lower and upper retaining walls will be at about elevation +515 feet and elevation +524 feet, respectively. The walls will be 10 feet and 9 feet high, respectively, with a bench, approximately five feet wide, between the retaining walls. Behind the upper wall, grades will slope up to the existing grade at about elevation +530 feet on about a 3 horizontal to 1 vertical (3H:1V) slope.

The subsurface conditions observed in Boring B-3 consist of a surface layer of topsoil underlain by very dense, very silty sand (Stratum 2) to a depth of 8'6" (elevation +516.5 feet). Below the very silty sand is loose to medium dense micaeous silty sand (Stratum 3), which extends to a depth of 18'0" (elevation +507 feet). Highly weathered gneiss was encountered between elevations +507 feet and +506 feet. The boring was terminated at elevation +506 feet upon auger refusal. This is approximately 1 foot above the planned elevation at the top of rock slope elevation +505 feet.

Auger refusal, indicating possible bedrock, was encountered at about elevation +506 feet in Boring B-3. Boring B-3 was performed approximately 22 feet north of the proposed top of the rock slope. As indicated on the enclosed profile section (FIG-3), we have estimated the top of rock to be about elevation +507 feet at the proposed top of rock slope. Conceptually, the proposed rock slope, tiered retaining wall system, and soil slope configuration shown on the grading plan appears feasible.

Recommendations on design parameters and drainage for the retaining walls are provided in a separate section of this report. Our recommendations on the design and construction of soil and rock slopes are also provided below.

Cross-Section B-B

Cross-Section B-B is perpendicular to the slope through Boring B-1, which was performed approximately 33 feet east and approximately 37 feet north of the southwestern building corner of proposed Anchor Building A. As shown on the cross-section, the existing surface elevations in the area of the proposed cut vary from elevation +532 feet to elevation +533 feet. The proposed toe of the rock slope at this location is elevation +494.8 feet. Based on the proposed grades a cut of about 38.3 feet is anticipated.

According to the proposed grading plan, the proposed slope geometry in this area consists of a rock slope of approximately one horizontal to five vertical (1H:5V) extending from the toe of slope at elevation +494.8 feet up to elevation +516.5 feet. A bench, approximately 5.7-feet wide, will be provided at elevation +516.5 feet. A double-tiered retaining wall is planned above the rock slope. The lower wall will be 10 feet high, extending up to elevation +526.5 feet. A bench, approximately six feet wide, will be provided between the retaining walls. The upper retaining wall will be about 5.5 feet in height at this section, extending up to about elevation +532 feet. Behind the upper wall, the new grade will be the same as the existing grade, elevation +532 feet.

The subsurface conditions observed in Boring B-1 consist of a surface layer of topsoil underlain by medium dense silty sand (Stratum 3), which extends to a depth of 4'0" (elevation +526.5 feet). Below the silty sand is dense to very dense silty sand with gravel (Stratum 4), extending to about elevation +522.5 feet. Very dense silty sandy gravel (completely weathered gneiss) was encountered between elevations +522.5 feet and +516.5 feet.

Gneiss bedrock was observed at elevation +516.5 feet. The gneiss bedrock was cored at Boring B-1 beginning at about elevation +516.5 feet for a vertical distance of 30 feet. Based on the recovered rock cores, the quality of the upper 30 feet of rock ranges from poor to fair in quality and is in a shattered, very blocky to blocky and seamy condition.

Gneiss bedrock was encountered at about elevation +516.5 feet in Boring B-1. Boring B-1 was performed approximately 94 feet north of the proposed toe of slope. As indicated on the profile section, we have estimated the top of rock to be about elevation +516.5 feet at the proposed top of rock slope. Conceptually, the proposed rock slope, tiered retaining wall system, and soil slope configuration shown on the grading plan appears feasible.

Recommendations on design parameters and drainage for the retaining walls are provided in a separate section of this report. Our recommendations on the design and construction of soil and rock slopes are also provided below.

Cross-Section C-C

Cross-Section C-C is perpendicular to the slope through Boring B-2, which was performed approximately 275 feet east and 12 feet south of the southwestern building corner. As shown on the cross-section, the existing surface elevations in the area of the proposed cut vary from elevation +515 feet to elevation +517 feet. The proposed grade at the top of curb is elevation +495 feet. A cut of about 22 feet is anticipated at this section.

According to the proposed grading plan, the configuration in this cut section will consist of a double-tiered wall. The base of the lower wall at this location will be 11 feet behind the curb and will be at elevation +495.0 feet. Each wall will be 10 feet high with a bench, approximately eight feet wide, between the retaining walls. The top of the upper retaining wall will be at elevation +515.0 feet. Behind the upper wall, grades will slope up to the existing grade at about elevation +518 feet. A swale will be constructed behind the upper wall to divert stormwater runoff to the east.

The subsurface conditions observed in Boring B-2 consist of a surface layer of topsoil underlain by stiff sandy silt (Stratum 2A), which extends to a depth of 5'0" (elevation +507.0 feet). Below the sandy silt is dense to very dense silty sand with gravel (Stratum 4), extending to about elevation +496.0 feet. Beneath the silty sand with gravel is very dense silty sandy gravel (completely weathered gneiss) that was observed to about elevation +486.0 feet.

Conceptually, the proposed tiered retaining wall configuration at this section appears feasible based on the existing soil conditions encountered in Boring B-2. Recommendations on design parameters and drainage for the retaining walls are provided in a separate section of this report.

Rock Slope Area

Where rock is encountered in the cut area, we recommend that the rock slope be constructed on a near vertical slope of approximately 1 horizontal to 5 vertical (1H:5V). Provided that the slope can be properly designed with a landing zone and containment fence located along the base of the slope to contain fallen rock debris, we anticipate that most of the new rock slope can be constructed without the need for anchoring and wire mesh.

A significant amount of rock excavation is anticipated. We anticipate that the "rippability" of the bedrock with large excavation equipment will be variable and very limited. Blasting and the use of hydraulic hammers will be required to excavate the harder rock. Additional issues related to blasting are discussed below.

Based on the rock core data obtained from Borings B-1, B-6, B-7 and B-9, the gneiss bedrock rock ranges from poor to excellent in quality. At Boring B-6, the condition of the bedrock was intact and fresh. However, at Borings B-1, B-6, and B-7 the gneiss bedrock can be described as being in a shattered, very blocky to blocky and seamy condition. Depending upon the rock conditions exposed at the time of construction, isolated areas of the rock excavation may need to be stabilized as the excavation progresses. The need for a rock fall containment system (wire netting) and rock anchors or rock bolts will have to be evaluated at the time of construction as the rock conditions are exposed.

The rock surface on this site is covered with soil and completely weathered rock in a soil-like state; the amount of soil and weathered rock coverage varies throughout the planned cut area. Depending upon the rock conditions exposed at the time of construction, adjustments may be required to the proposed top of slope elevations. This will have to be evaluated at the time of construction as the rock conditions are exposed.

We recommend that a bench be provided at the soil/rock interface. The bench should be a minimum of 5 feet wide. The proposed benches above the rock slope shown on the grading plan are acceptable. The bench should be sloped to direct water away from the exposed rock face. Above the rock cut the overburden soil must be graded to a stable slope. A 2.0 horizontal to 1.0 vertical (2.0H:1.0V) or flatter angle is recommended. Alternatively, retaining walls, as proposed, can be constructed.

Soil and Rock Slopes in Cut Areas

Soil Slopes

In our opinion, slopes constructed in soil and soil-like completely weathered rock should be constructed on a 2.0 horizontal to 1.0 vertical (2.0H:1.0V) or flatter angle. Behind the proposed retaining walls, the slope should be graded on a 2.0 horizontal to 1.0 vertical (2.0H:1.0V) or flatter slope.

Once the new soil slope has been constructed, the slope surface shall be seeded so that a root mass develops on the slope. The root mass will protect the slope from erosional forces. A landscape architect should be consulted for recommendations regarding the best type of vegetation for this slope.

Rock Slopes

In rock, the stability of slope is dependent upon the quality of the rock, the jointing and shear zones in the rock, the strike and dip of the rock, and groundwater seepage. We recommend that the lower slope, where rock is encountered, be constructed on a near vertical slope of approximately 1 horizontal to 5 vertical (1H:5V). Provided that the slope can be properly designed with a landing zone and containment fence located at the base of the slope to contain fallen rock debris, we anticipate that most the new slope can be constructed without the need for anchoring and wire mesh. This is discussed in more detail below.

Typically, the upper 10 to 20 feet of the exposed (cut) rock slope may be very blocky and seamy. This portion of the slope may not be stable. Isolated unstable blocks of rock may exist on the face of the new rock slope. Rock anchors may be required to stabilize the rock blocks. We are unable to predict the extent of the rock anchors based on the available data. During the excavation of the new slope, Carlin-Simpson & Associates will evaluate the rock blocks. A determination will then be made as to the location, type and extent of the rock anchors. The rock anchors will be used to retain potentially unstable blocks of rock, resulting in a stable slope face.

We anticipate that the "rippability" of the bedrock with large excavation equipment will be variable and very limited. Blasting and the use of hydraulic hammers will be required to excavate the harder rock. Additional issues related to blasting are discussed below.

Landing Zone and Rock Impact Fence

Portions of the exposed rock face will consist of weathered, fractured gneiss. The nature of the rock is such that loose spalling rock or slope raveling will occur throughout the life of the slope. Slope raveling is a condition described when small pieces of rock become detached from a rock mass and fall as individual pieces to the toe of the slope. The principal cause of this condition is due to the cyclical expansion and contraction associated with the freezing and thawing of water in the cracks and fissures of the rock mass. A secondary cause is related to the gradual deterioration (weathering) of the minerals within the rock matrix.

We recommend that a landing zone and a chain link rock impact fence be provided at the toe of the slope to provide rockfall containment. The landing zone should be pitched slightly towards the toe of the slope. The width of the landing zone should be increased with the rock slope height. Listed below are our recommendations on minimum landing zone widths. Wire mesh netting should be used on the face of the rock slope where an adequate landing zone width cannot be provided.

Rock Slope Height	**Minimum Landing Zone Width**
0 – 5'	1'-2'
5' – 10'	3'
10' – 20'	8'
20' – 30'	12'
30' – 60'	15'

The current plan indicates that the toe of slope will be approximately 12 feet behind the curb line. The proposed rock slope is expected to be less than 24 feet in height. As indicated in the table above, the 12-foot toe of slope setback will provide an adequate landing zone distance for the expected rock slope. A chain link rock impact fence must also be provided at the toe of the slope to provide rockfall containment. The areas requiring fencing and the type of fence (i.e. a low energy impact fence or security fence) will be determined at the time of construction.

Horizontal Drains

Water may seep out of the joints and fracture zones on the new rock face. Water seepage, if encountered, will need to be evaluated by Carlin-Simpson & Associates during construction. Horizontal rock drains may be required to facilitate drainage and to prevent the buildup of water pressure behind the rock slope, which could destabilize the slope. The need for rock drains will be determined during construction.

Horizontal drains consist of drilling a 3 to 4 inch diameter hole, 15 to 20 feet into the rock slope on a slight incline. A small section of PVC pipe is inserted into the hole to keep it open at the rock face. The purpose of the drains is to intercept water flowing through the rock joints. Swales and drainage inlets should be provided along the base of the slope to collect the water seepage.

Excavation Procedures and Recommendations

We recommend that the excavation of all rock slopes be carefully advanced in stages. Depending upon the orientation of the joint planes with respect to each other and the face of the rock cut, unstable blocks of rock may be present. Rock anchors and protective wire mesh netting may be required to secure the new slope in areas where unstable blocks of rock, weak rock, or fracture zones are encountered. The extent and design of the rock anchors and slope stabilization will be determined as the slope is excavated.

Conceptually, the general procedure for excavating the required soil and rock slopes will be as follows:

1. The top of the rock surface should be established along the slope/wall alignment. A bench shall be constructed at the top of the new rock slope first. The bench shall be designed and constructed so that stormwater drains away from the top of the new rock slope.

2. In areas where retaining walls will be constructed above the rock slope, the upper soil slope shall be temporarily benched or graded in accordance with OSHA guidelines for temporary excavations. Where retaining walls are to be constructed behind the rock slope cuts, the walls should be constructed after all blasting has been performed to prevent damage to the new walls.

3. A pre-split line shall be drilled along the proposed rock slopes to the slope lines and inclinations shown on the construction plans. The rock slope should be constructed on a 1.0 horizontal to 5.0 vertical (1.0H:5.0V) or flatter angle as required by the grading plan. The spacing shall be determined by the blasting contractor and reviewed by Carlin-Simpson & Associates. In general, the pre-splitting holes shall have a spacing of three feet, center to center, and a diameter not greater than 3 inches. The pre-splitting shall be drilled and detonated prior to the drilling and blasting of the general pattern holes.

4. The rock at the planned slope face shall be removed in stages, ranging from 10 to 15 feet in height. The first stage shall be no greater than 10 feet. Scaling must be performed at each stage to remove loose rock blocks

from the cut face. Scaling is often performed by excavation equipment and by laborers using heavy steel pry bars.

5. Carlin-Simpson & Associates will then inspect the exposed rock face of each stage as it is exposed and a rock-anchoring plan, if required, will be prepared. The plan will outline anchor locations, inclinations, and lengths as needed to stabilize the slope.

6. Where required, rock anchors will be installed prior to removing the next stage of rock.

7. The rock excavation shall continue in controlled stages, with each stage being evaluated by Carlin-Simpson & Associates, and the rock anchors, being installed as required.

8. Where wire mesh netting is required on the rock slope to contain spalling rock, the netting may be either installed simultaneously with the rock anchors or after all the anchors have been installed.

Blasting Issues

In order to develop the site, rock blasting will be required to achieve the proposed grades in the proposed cut slope on the southern side of the proposed retail center. A rock cut of about 24 feet or more may be required. Blasting is also expected to be required for the slope area on the southern side of proposed Anchor Building A, the adjacent pavement area, and any underground utility trenches in this area.

The bedrock encountered in the borings consists of gneiss. Based on our experience, the in-situ bedrock will range from highly weathered, fractured rock to massive, intact rock. To excavate the rock, the top 1 to 5 feet of rock may be "rippable" by using large construction equipment. Blasting and the use of hydraulic hammers will be required in order to achieve deeper excavations. Zones of weathered rock may exist deeper than 5 feet but conditions are expected to be variable. Hard rock will be encountered.

The blasting contractor should avoid over-blasting the rock. Over-blasting will disturb the integrity of the finished rock slope. Pre-splitting along the slope of the rock excavation will be required in the deeper rock cut areas.

Prior to any blasting work being done, a licensed professional engineer shall be retained to perform a detailed pre-blast survey of any existing structures located within 500 feet of the blast area. In addition, a blasting plan should be prepared by the blasting contractor and submitted to Carlin-Simpson & Associates for review. A copy of all reports prepared by the licensed professional engineer shall be submitted to the Southeast Engineer and the Owner's representative in a timely manner.

The blasting operation will be monitored by a seismologist using a seismograph. Each blast must be monitored independently to insure that the following criterion is not exceeded. Multiple monitoring points are recommended. The maximum peak particle velocity on any one component of an instrument measuring three-component motion shall not exceed the limits of the following table.

TABLE 2– Distance Versus Peak Particle Velocity Method

Distance in Feet	**Peak Particle Velocity of any One Component* (inches per second)**
0 to 100	1.50
100 to 200	1.25
200 to 500	1.00
500 to 1,000	0.50
Over 1,000	0.25

Perimeter Cut-Off Drain

To redirect subsurface water around southern side of the proposed buildings, a perimeter cut-off trench drain system should be installed at the base of the cut slope around the perimeter of the pavement area. The system would consist of a 2-foot wide gravel filled trench that is excavated along the perimeter of the new pavement area on the southern side of the buildings. The trench should be excavated approximately 3 feet below the planned pavement elevation. An 8-inch diameter perforated PVC pipe, surrounded with ¾" clean crushed stone and wrapped in a geotextile fabric should be installed at the bottom of the trench to collect the water. The system should be connected into the site stormwater system. A perimeter cut-off drain is shown on the current grading and utilities plan.

Site Retaining Walls

Site retaining walls will be required in the proposed cut area on the southern side of the retail buildings and elsewhere on site as part of the site development. The southern cut area will be designed with a tiered wall system. The following recommendations may be used to design the retaining walls in the southern cut area. The wall designer must include a global stability analysis of the whole tiered wall system as part of their design.

Retaining Wall Foundations or Bases

The retaining wall base or foundation may be placed on the virgin soil, weathered rock, rock, or new structural fill. New structural fill shall be either the on-site soil or clean sand and gravel containing less than 20 percent silt, and compacted to 95 percent Maximum Modified Density. The foundation or base of the wall can be designed using a net design bearing pressure of 2.0 TSF. In the event soft or wet soils are encountered at the wall base or footing bearing elevation, selective undercutting, typically about 6 to 12 inches, will be required. The removed soils should be replaced with 3/4-inch crushed stone.

Earth Pressures on Site Retaining Walls

The soil adjacent to the site retaining walls will exert a horizontal pressure against the wall. This pressure is based on the soil density and the Coefficient of Active Earth Pressure (k_a). Preliminarily, we estimate that the backfill material will have an in-place (moist) density of about 130 pcf and an angle of internal friction, $\phi = 30^o$. For design, soil cohesion is assumed to be zero for the foundation soil, retained soil, and reinforced backfill. Preliminarily, the active earth pressure coefficient, k_a, is 0.333 provided the grade behind the wall is level. Based on these properties, the retained soil will produce an Equivalent Fluid Pressure of 43.3 pcf against the retaining wall.

If a sloping grade exists behind the new wall, k_a and the Equivalent Fluid Pressure must be adjusted accordingly. In addition, any surcharge loads from structures or other retaining walls (i.e. tiered walls) must be considered in the wall design.

For sliding, the friction coefficient between mass concrete and the virgin site soils or new compacted fill is 0.45. For clean sound rock, a friction coefficient of 0.55 can be used. Where passive lateral earth pressure is to be included in the design of the wall, a maximum design value of 210 psf/ft may be used. This is based on a Coefficient of Passive Earth Pressure, k_p = 3.255, an in-place soil backfill density of 130 pcf and a reduction factor of 0.5. For design, the cohesion (c) of the retained soils and foundation soil should be assumed to be zero. In addition, the interface angle between the backfill material and wall blocks should also be zero.

Special Design Considerations for Tiered Retaining Walls

We understand that a tiered gravity wall system is proposed for this project. When a tiered wall system is designed, the lateral loads from the retained soil behind each individual wall tier plus the surcharge loads associated with the retained soil and other wall loads above the wall must be included in the design of that particular tier section. Typically the greater the distance between the individual wall tiers, the lower the surcharge loading on the lower wall.

For this project, the walls are a maximum of 10 feet in height. The distance between wall tiers is typically less than the wall height. As such, the lower walls of the tiered wall system must be designed for the full height of the retained slope behind the wall including the surcharge loads associated with the retained soil and other wall loads above the wall. Likewise, each tier above the lower wall would also need to be designed in a similar manner.

The above design requirement is critical when sizing the gravity wall units for the lower wall tiers. When designing tiered walls, the sizes of the gravity wall units in the lower walls need to be increased to account for the additional surcharge loading on that particular wall tier resulting from the wall and soil loads above the wall. As with any retaining wall design, the wall designer must perform a global slope stability analysis not only on the individual wall tiers but also on the tiered wall system as a whole.

Site Retaining Wall Drainage

We recommend that a footing drain be placed behind the new retaining walls to prevent water from accumulating against the walls. The footing drain should consist of a 6-inch diameter perforated PVC pipe, surrounded with ¾" clean crushed stone and wrapped in a geotextile fabric, Mirafi 140N or equivalent. The drain should be installed behind the base or foundation of the retaining wall to collect the water behind the wall and be connected into the site stormwater system.

Site retaining walls should be backfilled with suitable soil placed in layers up to one foot in thickness. The new fill shall be compacted with small hand guided vibratory compactors to a minimum density of 92 percent Maximum Modified Dry Density (ASTM D1557). Heavy equipment should not be operated near the wall as damage to the wall could occur.

Behind the wall, the backfill placed adjacent to the wall and above the footing drain shall consist of either clean crushed stone or imported sand and gravel containing less than 10 percent by weight passing a No. 200 sieve and placed in layers not exceeding one foot in thickness. This clean sand and gravel or crushed stone backfill shall extend a minimum of one foot horizontally from the back face of the walls, and shall extend vertically up the wall face to two feet below the finished ground surface elevation. Beyond this point approved material excavated from the cut areas may be used as compacted fill provided it conforms to the wall design gradation requirements, is relatively dry enough to be adequately compacted to the required density, and does not contain any debris or organic material (i.e. topsoil and roots).

Temporary Construction Excavations

Temporary construction excavations should be conducted in accordance with the most recent OSHA guidelines or applicable federal, state or local codes. Based on the results of the borings, we believe the site soils and rock would have the following classifications as defined by OSHA guidelines.

Soil/Rock Type	Possible Classification
Virgin Silty Sandy Soils	Type "B" or "C"
Weathered or Intact Bedrock	Type "A" or Stable Rock

Further evaluation of the site soil deposits will be required in the field by a qualified person at the time of the excavation to determine the proper OSHA classification. Temporary support (i.e. sheeting and shoring) should be used for any excavation that cannot be sloped or benched in accordance with the applicable regulations.

Placement of New Compacted Fill

New compacted fill required to replace the excavated topsoil and unsuitable materials in the slope area or to raise grades to the planned subgrade elevation shall consist of either suitable on-site soil approved by Carlin-Simpson & Associates or imported sand and gravel containing less than 20 percent by weight passing a No. 200 sieve. Maximum particle size shall be 3 inches. The new fill shall be placed in one foot layers and compacted to the required Maximum Modified Dry Density (ASTM D1557) percentage outlined in the table below. Each layer shall be tested and approved before placing subsequent layers.

TABLE 3 - Recommended Minimum Compaction Requirements

Area	Maximum Modified Dry Density, % (ASTM D1557)
Building (below foundations)	95
Building Slab (above foundations)	92
Pavement	92
Exterior Slabs, Sidewalks	92
Utility Trenches	92
Landscape Areas (slopes)	92
Landscape Areas (non-slope)	88
Retaining Walls (below foundations)	95
Retaining Walls (above foundations)	92

The material removed from the cut areas will be evaluated by the representative from Carlin-Simpson & Associates to determine its suitability for reuse as structural fill in the building and pavement areas. Fill material that is wet or contains debris, topsoil, organic material or deleterious material is unsuitable for reuse. The suitability of the on-site soil and excavated rock for use as compacted fill is discussed in a separate section below.

Where new fill is to be placed on existing slopes, all topsoil, vegetation, and surface materials must first be removed from the area receiving new fill. Slopes shall be constructed from the base of the slope upward with the fill material placed in compacted horizontal layers. Each layer of new fill shall be benched into the existing slope to prevent weak planes from developing in the new slope. Constructing slopes by end dumping, filling from the top of the slope, or by placing material in an uncontrolled or loose manner shall not be permitted.

Suitability of the In-Situ Soils and Rock for Use as Compacted Fill

The site soils contain varying amounts of sand, silt and gravel. Most of this material can be used as structural fill for the building, pavement and slope areas provided the soil does not become too wet prior to its placement and does not contain organic material, topsoil, or debris.

Our laboratory test results indicate that the on-site soils contain a minor to moderate percentage of silt and clay, 8 to 53 percent by weight passing a No. 200 sieve. If the soil becomes too wet, it will pump when compacted and the Contractor will not be able to achieve the required maximum density. The natural moisture content in the soil, at the time the field exploration was performed, was at or slightly below the optimum moisture content. In the event that the fill material becomes wet and cannot be adequately compacted, a drier clean fill will be needed.

The in-situ soils that exist throughout the site will become soft and unstable if exposed to excessive construction traffic and moisture. The instability will occur quickly when exposed to these elements and it will be difficult to stabilize the subgrade. We recommend that adequate site drainage be implemented early in the construction schedule and if the subgrade becomes wet, the Contractor should limit construction activity until the soil has dried.

Excavated rock may also be used as fill material provided that the material conforms to the required gradation. All rock fill must be well blended with smaller rock fragments and/or soil. Open voids within the rock fill matrix must be avoided. Small boulders up to 24 inches in diameter may be placed in parking lot fills deeper than 10 feet below the finished pavement. Boulders must not be clustered and must be sufficiently surrounded with soil fill. We recommend that a crusher be used to process the boulders and excavated rock and provide suitable fill material for the building and pavement areas.

Rock fill shall be placed in 12-inch loose layers and compacted with multiple passes of a large vibratory roller to a firm and non-yielding state as determined by the on-site representative from Carlin-Simpson & Associates. Rock fill should not be used where it will interfere with the installation of foundations or utilities. Also, it shall not be used as backfill directly against concrete structures, walls or utilities.

The use of rock fill within the planned building and pavement areas shall be limited to the following gradations, unless more restrictive gradations are required by the construction documents.

TABLE 4
Gradation Limitations

	Location	**Maximum Particle Size**
Building Area	Within 4 feet of Finished Floor	3 inches
	More than 4 feet below Finished Floor	12 inches
Pavement Area	Within 4 feet of Finished Grade	6 inches
	More than 4 feet below Finished Grade	18 inches
	More than 10 feet below Finished Grade	24 inches

Limitations of the Supplemental Subsurface Exploration

The scope of this study did not include an evaluation of the proposed buildings, pavement, and underground utilities. We recommend that a subsurface exploration be performed to evaluate the subsurface soil, rock, and groundwater conditions in the proposed building, pavement, and underground utility areas.

Loose, highly micaeous silty sand was observed in Boring B-3, performed just south of proposed Retail Building C. An additional exploration is recommended in proposed Retail Building C, north of Boring B-3, to determine if the loose soils extend into the planned building area. The exploration should include the area around the erosional gully located north of Boring B-1.

General

The most recent grading plan indicates that the grades on the southern side of the proposed retail center will be cut in order to achieve the new grades for the building. The new cut slope will be designed with a series of tiered retaining walls with soil and rock slopes.

The proposed rock slope, tiered retaining wall system, and soil slope configuration as shown the most recent grading plan appears to be feasible. The elevation of the rock surface along the proposed rock cut slope will be variable. As such slope and wall adjustments may be required during construction.

We anticipate that the "rippability" of the bedrock with large excavation equipment will be variable and very limited. Blasting and the use of hydraulic hammers will be required to excavate the harder rock. Additional issues related to blasting are discussed in the text above.

Where rock is encountered in the proposed southern cut area, we recommend that the lower slope be constructed on a near vertical slope of approximately 1 horizontal to 5 vertical (1H:5V). Provided that the slope is properly designed with a landing zone and containment fence located at the base of the slope to contain fallen rock debris, we anticipate that most of the new rock slope can be constructed without the need for anchoring and stabilization.

Carlin-Simpson & Associates must perform a stability evaluation on all of the exposed rock slopes. Rockfall protection (netting) and rock stabilization (rock bolting) may be required to secure unstable rock blocks and zones of weak or fractured rock.

To control subsurface groundwater flow at the base of the cut slope, a perimeter cut-off drain is recommended around the perimeter of the pavement area on the southern side of the buildings.

The findings, conclusions and recommendations presented in this report represent our professional opinions concerning subsurface conditions at the site. The opinions presented are relative to the dates of our site work and should not be relied on to represent conditions at later dates or at locations not explored. The opinions included herein are based on information provided to us, the data obtained at specific locations during the study and our past experience. If additional information becomes available that might impact our geotechnical opinions, it will be necessary for Carlin-Simpson &

Associates to review the information, reassess the potential concerns, and re-evaluate our conclusions and recommendations.

Regardless of the thoroughness of a geotechnical exploration, there is the possibility that conditions between borings will differ from those encountered at specific boring locations, that conditions are not as anticipated by the designers and/or the contractors, or that either natural events or the construction process have altered the subsurface conditions. These variations are in inherent risk associated with subsurface conditions in this region and the approximate methods used to obtain the data. These variations may not be apparent until construction.

The professional opinions presented in this geotechnical report are not final. Field observations and slope construction monitoring by the geotechnical engineer, as well as soil density testing and other quality assurance functions associated with site earthwork and slope construction, are an extension of this report. Therefore, Carlin-Simpson & Associates should be retained by the Owner to observe all earthwork and geotechnical related construction to document that the conditions anticipated in this study actually exist, and to finalize or amend our conclusions and recommendations. Carlin-Simpson & Associates is not responsible or liable for the conclusions and recommendations presented in this report if Carlin-Simpson & Associates does not perform these observation and testing services.

Therefore, in order to preserve continuity in this project, the Owner must retain the services of Carlin-Simpson & Associates to provide full time Geotechnical related monitoring and testing during construction. This shall include the inspection of 1) the proofrolling of the subgrade soil prior to the placement of new compacted fill; 2) the removal of unsuitable soil from within the planned slope areas; 3) the placement and compaction of controlled fill, 4) the monitoring of the excavation of rock in the cut areas and the installation of rock stabilization/containment systems, 5) the monitoring of the retaining wall construction and backfilling behind the walls.

This report has been prepared in accordance with generally accepted geotechnical engineering practice. No other warranty is expressed or implied. The evaluations and recommendations presented in this report are based on the available project information, as well as on the results of the exploration. Carlin-Simpson & Associates should be given the opportunity to review the final drawings and site plans for this project to determine if changes to the recommendations outlined in this report are needed. Should the nature of the project change, these recommendations should be reevaluated.

This report is provided for the exclusive use of Insite Engineering, Surveying & Landscape Architecture, P.C., P.L.I., LLC, and its project specific design team and may not be used or relied upon in connection with other projects or by other third parties. Carlin-Simpson & Associates disclaims liability for any such third party use or reliance without express written permission. Use of this report or the findings, conclusions or recommendations by others will be at the sole risk of the user. Carlin-Simpson & Associates is not responsible or liable for the interpretation by others of the data in this report, nor their conclusions, recommendations or opinions.

If the conditions encountered during construction vary significantly from those stated in this report, this office should be notified immediately so that additional recommendations can be made.

Thank you for allowing us to assist you with this project. Should you have any questions or comments, please contact this office.

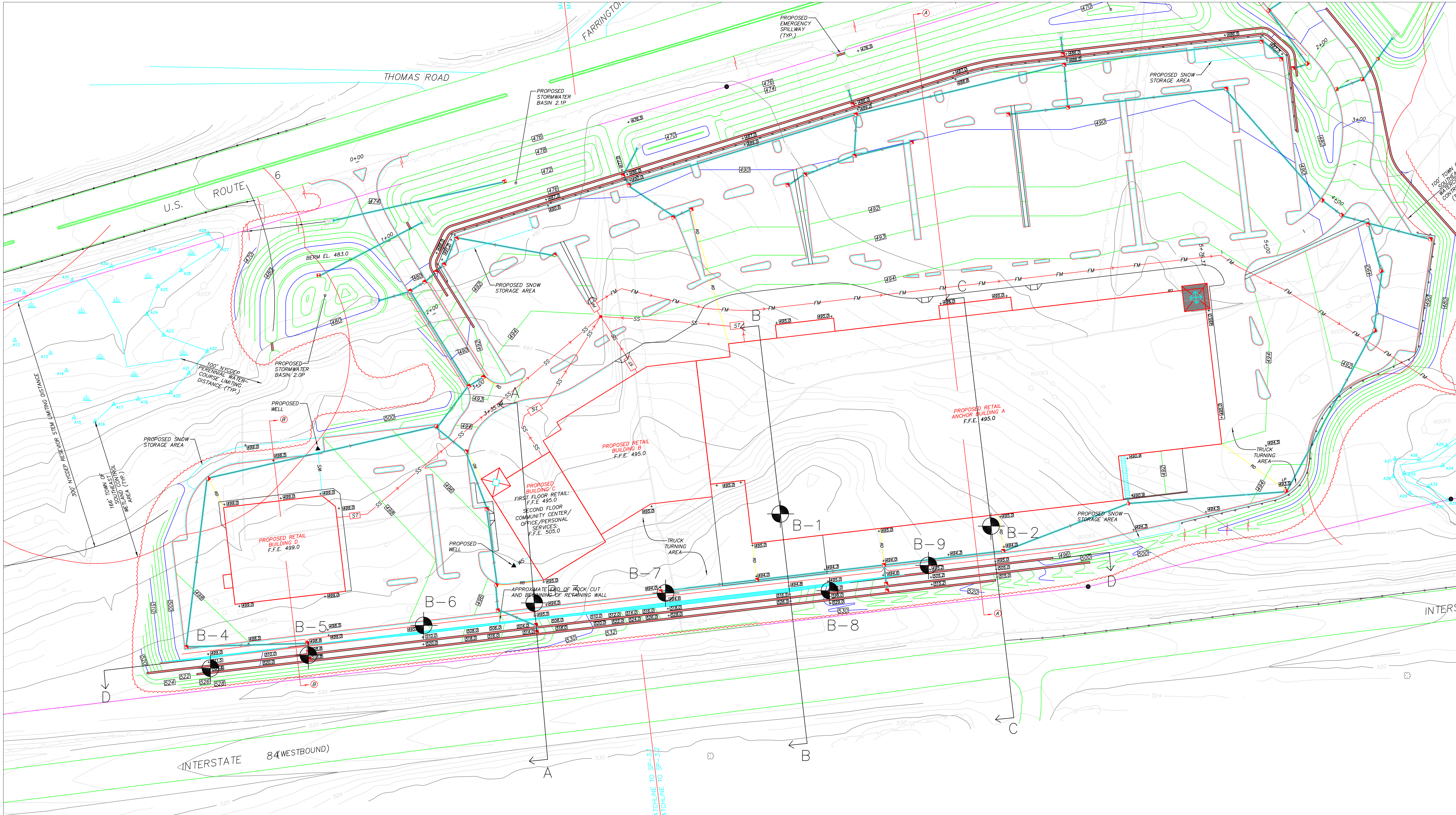
Very truly yours,

CARLIN-SIMPSON & ASSOCIATES represented by:

ROBERT H. BARNES, P.E.
Senior Project Engineer

ROBERT B. SIMPSON, P.E.

File No. 07-90



LEGEND:

- ⊕ – BORING LOCATION
- CROSS–SECTION (SEE FIGURE 2)

GENERAL NOTES:

1. GENERAL LAYOUT WAS OBTAINED FROM A DRAWING PREPARED BY INSITE ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C., ENTITLED "GRADING & UTILITIES PLAN", DATED 30 MARCH 2006, REVISED 20 NOVEMBER 2007.
2. BORING LOCATIONS WERE LAID OUT IN THE FIELD BY CARLIN–SIMPSON & ASSOCIATES (CSA).
3. BORINGS WERE PERFORMED BY GENERAL BORINGS INC. UNDER THE FULL TIME INSPECTION OF CSA. BORINGS B–1 THROUGH B–3 WERE PERFORMED ON 16 JULY 2007. BORINGS B–4 THROUGH B–9 WERE PERFORMED IN DECEMBER 2007.
4. LOCATIONS ARE APPROXIMATE.

ROBERT B. SIMPSON, P.E.
PROFESSIONAL ENGINEER

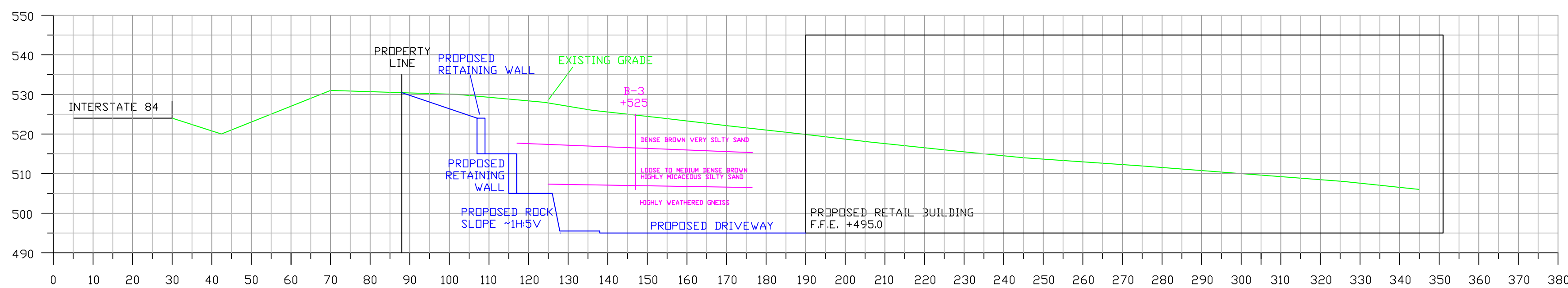
LICENSE NO. | SIGNATURE | DATE

BORING LOCATION PLAN WITH CROSS-SECTIONS

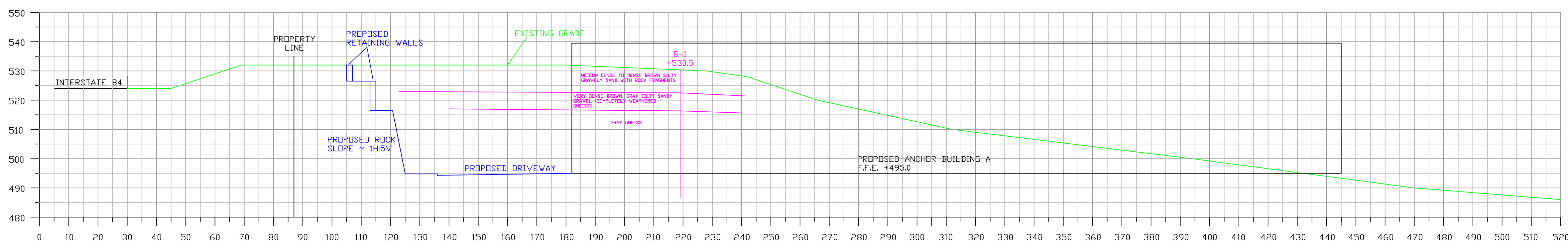
STATELINE RETAIL CENTER
U.S. ROUTE 6
TOWN OF SOUTHEAST, NEW YORK

DRAWN	SCALE
MRA	1" = 50'
CHECKED RHB	DATE 17 APR 08
PROJECT NO. 07-90	DWG NO. FIG -1
APPROVED	

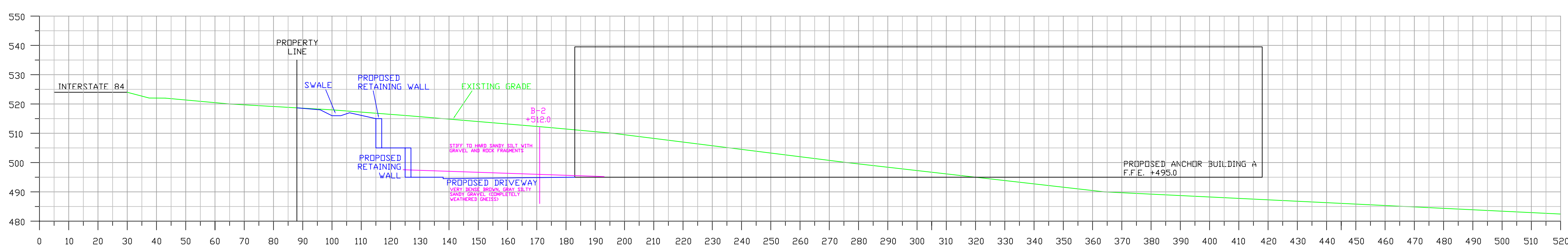
CARLIN-SIMPSON AND ASSOCIATES
61 Main Street
Sayreville, NJ 08872
Consulting Geotechnical and Environmental Engineers



CROSS-SECTION A-A



CROSS-SECTION B-B



CROSS-SECTION C-C

ROBERT B. SIMPSON, P.E.
PROFESSIONAL ENGINEER

LICENSE NO. | SIGNATURE | DATE

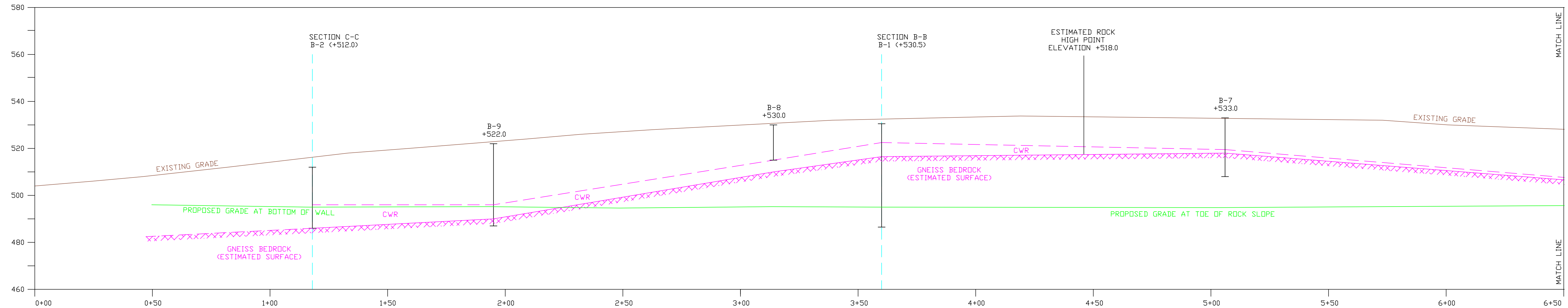
CROSS-SECTIONS A-A, B-B, AND C-C

STATELINE RETAIL CENTER
U.S. ROUTE 6
TOWN OF SOUTHEAST, NEW YORK

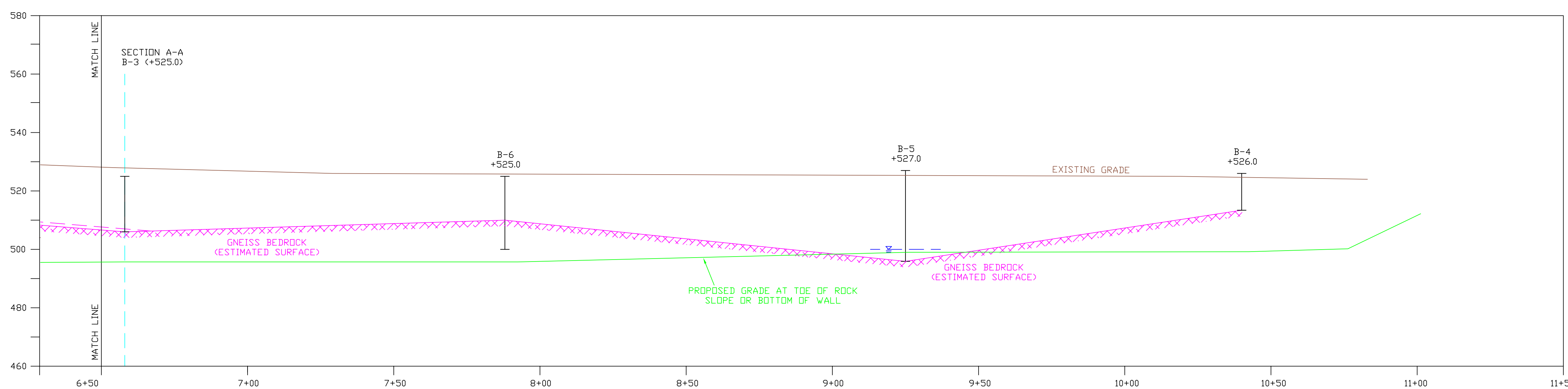
DRAWN: MRA	SCALE: 1" = 20'
CHECKED: RHB	DATE: 17 APR 08
PROJECT NO.: 07-90	DWG NO.: FIG -2
APPROVED:	

CARLIN-SIMPSON AND ASSOCIATES
61 Main Street
Sayreville, NJ 08872

Consulting Geotechnical and Environmental Engineers



ROCK PROFILE SECTION D-D



ROCK PROFILE SECTION D-D (CONT.)

ROBERT B. SIMPSON, P.E.
PROFESSIONAL ENGINEER

LICENSE NO. | SIGNATURE | DATE

ROCK PROFILE SECTION D-D

STATELINE RETAIL CENTER
U.S. ROUTE 6
TOWN OF SOUTHEAST, NEW YORK

DRAWN: MRA	SCALE: 1" = 20'	CARLIN-SIMPSON AND ASSOCIATES 61 Main Street Sayreville, NJ 08872
CHECKED: RHB	DATE: 17 APR 08	
PROJECT NO.: 07-90	DWG NO.: FIG -3	Consulting Geotechnical and Environmental Engineers
APPROVED		

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-1
Project: Proposed Retail Center, U.S. Route 6, Southeast, NY		**SHEET NO.:** 1 of 2
Client: Insite Engineering		**JOB NUMBER:** 07-90
Drilling Contractor: General Borings Inc.		**ELEVATION:** +530.5

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			**DATUM:** Topo
				DIA.	3 1/4"	1 3/8"			**START DATE:** 16 Jul 07
No water encountered				WGHT		140#			**FINISH DATE:** 16 Jul 07
				FALL		30"			**DRILLER:** Jim
									INSPECTOR: EJS

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			1		**Brown Silty Topsoil**	
1		**S-1**	2		0'10"	Rec = 14"
			3		Br cf S, l (+) $, t (+) f G	moist
2			4			many roots
3					**Brown coarse to fine SAND, little (+) Silt, trace (+) fine Gravel**	
4					4"0"	
5						
			19		Br cf S, s $, a cf G, w/decomposed rock fragments	
6		**S-2**	45			Rec = 10"
			40/3"		**Brown, gray brown coarse to fine Sand, some Silt, and coarse to fine Gravel with decomposed rock fragments**	moist
7						
8					8'0"	
9						
10					**Brown, gray coarse to fine GRAVEL and, coarse to fine Sand, little Silt (Completely Weathered Rock - Gneiss)**	
11		**S-3**	38			Rec = 7"
			45/3"			moist-dry
12						
13						
14					14'0"	auger refusal @ 14'0"
15						
16		**Run #1**				Run #1 14'0"-19'0" Run = 60"
17					**Gray GNEISS**	Rec = 57", 95% RQD = 40%
18						shattered, very blocky and seamy
19					same	
20		**Run #2**				Run #2 19'0"-24'0" Run = 60"
21						Rec = 60", 100% RQD = 58%
22						blocky and seamy

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-1
Project: Proposed Retail Center, U.S. Route 6, Southeast, NY		**SHEET NO.:** 2 of 2
Client: Insite Engineering		**JOB NUMBER:** 07-90

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
23		**Run #2 cont'd**			Gray Gneiss	blocky and seamy
24						
25						
26		**Run # 3**			same	Run #3
						24'0"-29'0"
27						Run = 60"
						Rec = 60", 100%
28						RQD = 45%
						shattered, very blocky and
29						seamy
30						
31		**Run #4**				Run #4
						29'0"-34'0"
32						Run = 60"
						Rec = 60", 100%
33						RQD = 37%
					Gray GNEISS	shattered, very blocky and
34						seamy
35						
36		**Run #5**			same	Run #5
						34'0"-39'0"
37						Run = 60"
						Rec = 54", 90%
38						RQD = 57%
						blocky and seamy
39						
40						
41		**Run #6**			same	Run #6
						39'0"-44'0"
42						Run = 60"
						Rec = 58", 97%
43						RQD = 57%
						blocky and seamy
44					44'0"	
					End of Boring @ 44'0"	
45						
46						
47						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-2

Project:	**Proposed Retail Center, U.S. Route 6, Southeast, NY**	**SHEET NO.:**	1 of 2
Client:	**Insite Engineering**	**JOB NUMBER:**	07-90
Drilling Contractor:	**General Borings Inc.**	**ELEVATION:**	+512.0

GROUNDWATER					**CASING**	**SAMPLE**	**CORE**	**TUBE**	**DATUM:**	Topo
DATE	**TIME**	**DEPTH**	**CASING**	**TYPE**	**HSA**	**SS**			**START DATE:**	16 Jul 07
				DIA.	**3 1/4"**	**1 3/8"**			**FINISH DATE:**	16 Jul 07
No water encountered				**WGHT**		**140#**			**DRILLER:**	Jim
				FALL		**30"**			**INSPECTOR:**	EJS

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			1		**Brown Silty Topsoil with many roots**	
1		**S-1**	4		0'10"	Rec = 20"
			6		Br $ s (+), cf S, t (+) cf G	moist
2			9			
					Brown SILT some (+), coarse to fine Sand, trace (+) coarse to fine Gravel	
3						
4						
5					5'0"	
			27		Br $ a (+), cf S, s (+) cf G w/decomposed rock fgmts	
6		**S-2**	20			Rec = 20"
			32			moist
7			27			hard @ 5'0"
					Brown SILT and (+), coarse to fine Sand, some coarse to fine Gravel with decomposed rock fragments	
8						
9						
10						
			16		Br, gr br $ a (+), cf S, l mf G w/weathered rock fgmts	
11		**S-3**	26			Rec = 20"
			31			moist
12			32			
13						
14						
15						
			29		same	
16		**S-4**	32		16'0"	Rec = 10"
						moist
17						
18					**Brown, gray coarse to fine GRAVEL some, coarse to fine Sand, little Silt (Completely Weathered Gneiss)**	
19						
20						
		S-5	55		Weathered Gneiss	Rec = 6"
21						moist
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-2
Project: Proposed Retail Center, U.S. Route 6, Southeast, NY		SHEET NO.: 2 of 2
Client: Insite Engineering		JOB NUMBER: 07-90

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
23						
24					Brown, gray brown coarse to fine GRAVEL some, coarse to fine Sand, little Silt (Completely Weathered Gneiss)	
25						
26					26'0"	Auger refusal @ 26'0"
27					End of Boring @ 26'0"	
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-3
Project: Proposed Retail Center, U.S. Route 6, Southeast, NY		**SHEET NO.:** 1 of 1
Client: Insite Engineering		**JOB NUMBER:** 07-90
Drilling Contractor: General Borings Inc.		**ELEVATION:** +525.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE		
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			DATUM:	Topo
				DIA.	3 1/4"	1 3/8"			START DATE:	16 Jul 07
No water encountered				WGHT		140#			FINISH DATE:	16 Jul 07
				FALL		30"			DRILLER:	Jim
									INSPECTOR:	EJS

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
1					**Brown Silty Topsoil** 0'10"	
2						
3						
4						
5			18		Br cf S, a $, t (+) mf G	
6		S-1	23			Rec = 22"
			24		**Brown coarse to fine Sand, and Silt, trace (+) medium to fine Gravel**	moist
7			27			
8					8'6"	
9						
10			4		Br cf S, l $, t (-) f G, highly micaceous	
11		S-2	3			Rec = 24"
			2			moist
12			3			
			2		Br cf S, t (+) $, t (-) f G	
13		S-3	3			Rec = 22"
			2		**Brown coarse to fine SAND, trace (+) Silt, trace (-) fine Gravel, highly micaceous**	very moist
14			3			
15			3		same, w l (+) cf G	
16		S-4	4			Rec = 6"
			5			moist
17			8			
18					18'0"	
					Highly Weathered GNEISS	
19					19'0"	auger refusal @ 19'0"
					End of Boring @ 19'0"	
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-4
Project: Proposed Retail Center, U.S. Route 6, Southeast, NY		**SHEET NO.:** 1 of 1
Client: Insite Engineering		**JOB NUMBER:** 07-90
Drilling Contractor: General Borings Inc.		**ELEVATION:** +526.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	
DATE	**TIME**	**DEPTH**	**CASING**	**TYPE**	HSA	SS			**DATUM:** Topo
				DIA.	3 1/4"	1 3/8"			**START DATE:** 12 Dec 07
No water encountered				**WGHT**		140#			**FINISH DATE:** 12 Dec 07
				FALL		30"			**DRILLER:** Jim
									INSPECTOR: EJS

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			1		**Brown Silty Topsoil, with many roots** 0'7"	
1		**S-1**	2		Br $ a (+), cf S, l (-) cf G	Rec = 19"
			4			moist
2			5			
			14		same, t f G	
3		**S-2**	14			Rec = 16"
			24		**Brown SILT and (+), coarse to fine**	moist
4			36		**Sand, little (-) coarse to fine Gravel**	
5						
			47		same	
6		**S-3**	29			Rec = 17"
			19			moist
7			21			
8						
9						
10						
			32		same	
11		**S-4**	50/4"			Rec = 7"
						moist
12					12'6"	Auger refusal @ 12'6"
13					**End of Boring @ 12'6"**	
14						
15						
16						
17						
18						
19						
20						
21						
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-5

Project:	**Proposed Retail Center, U.S. Route 6, Southeast, NY**	**SHEET NO.:**	1 of 2
Client:	**Insite Engineering**	**JOB NUMBER:**	07-90
Drilling Contractor:	**General Borings Inc.**	**ELEVATION:**	+527.0

GROUNDWATER					**CASING**	**SAMPLE**	**CORE**	**TUBE**	**DATUM:**	Topo
DATE	**TIME**	**DEPTH**	**CASING**	**TYPE**	**HSA**	**SS**			**START DATE:**	12 Dec 07
12 Dec 07	**1400**	**27'0"**		**DIA.**	**3 1/4"**	**1 3/8"**			**FINISH DATE:**	12 Dec 07
				WGHT		**140#**			**DRILLER:**	Jim
				FALL		**30"**			**INSPECTOR:**	EJS

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	IDENTIFICATION	REMARKS
			2	**TOPSOIL** 0'7"	
1		**S-1**	3	Br $ s (-), cf S, l (+) cf G	Rec = 17"
			3		very moist
2			8		
			25	same, s (+) cf G	
3		**S-2**	34		Rec = 15"
			38	**Brown SILT some (-), coarse to fine**	moist
4			41	**Sand, little (+) coarse to fine Gravel**	
5				5'0"	
			30	Br cf S, a (+) $, t mf G	
6		**S-3**	36		Rec = 10"
			50/3"		moist
7					
8					
9					
10					
			11	same, t f G	
11		**S-4**	15		Rec = 16"
			17		moist
12			19	**Brown coarse to fine Sand, and (+)**	
				Silt, trace medium to fine Gravel	
13					
14					
15					
			23	Br cf S, s $, l f G	
16		**S-5**	22		Rec = 16"
			19		moist
17			19		Weathered Gneiss in tip
18					
19					
20					
			12	same	Residual Soil
21		**S-6**	16		Rec = 17"
			24		moist
22			34		

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-5
Project: Proposed Retail Center, U.S. Route 6, Southeast, NY		**SHEET NO.:** 2 of 2
Client: Insite Engineering		**JOB NUMBER:** 07-90

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
23						
24						
25						Residual Soil-
			17		Br cf S, a $, l mf G	Completely Weathered Gneiss
26		S-7	19			Rec = 18"
			26			moist
27			23			
					Brown coarse to fine Sand, and	
28					**Silt, little medium to fine Gravel**	
29						
30						
			14		same	
31		S-8	50/5"			Rec = 15"
			50/1"			wet
32					**End of Boring @ 31'1"**	Auger refusal @ 31'1"
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-6
Project: Proposed Retail Center, U.S. Route 6, Southeast, NY		SHEET NO.: 1 of 2
Client: Insite Engineering		JOB NUMBER: 07-90
Drilling Contractor: General Borings Inc.		ELEVATION: +525.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE		
DATE	TIME	DEPTH	CASING	TYPE	FJ	SS	NX		DATUM:	Topo
				DIA.	5"	1 3/8"	2 1/8"		START DATE:	12 Dec 07
No water encountered				WGHT		140#			FINISH DATE:	13 Dec 07
				FALL		30"			DRILLER:	Jim
									INSPECTOR:	EJS

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			1		**Brown Silty Topsoil with many roots** 0'7"	
1		**S-1**	3		Br $ s (+), cf S, t (+) f G	Rec = 10"
			3		**Brown SILT some (+), coarse to fine**	very moist
2			4		**Sand, trace (+) fine Gravel** 2'0"	
			15		Br cf S, a $, l cf G	
3		**S-2**	22			Rec = 14"
			26			moist
4			57			
5						
			35			
6		**S-3**	50/3"		same	Rec = 3"
					Brown coarse to fine Sand, and	moist
7					**Silt, little coarse to fine Gravel**	
8						
9						
10						
			3		Br cf S, s (+) $, t (+) cf G	
11		**S-4**	2			no recovery
			2			
12			2			
			4			hard at 12' 6"
13		**S-5**	50/3"			Rec = 5"
						moist
14						
15					15'0"	
16						Run #1
						15'-20'
17						Run = 60"
		Run #1			**Light gray GNEISS, intact, fresh**	Rec = 60", 100%
18						RQD = 100%
19						
20						Run #2
						20'-25'
21		**Run #2**				Run = 60"
						Rec = 60", 100%
22						RQD = 100%

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-6
Project: Proposed Retail Center, U.S. Route 6, Southeast, NY		SHEET NO.: 2 of 2
Client: Insite Engineering		JOB NUMBER: 07-90

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
23						Run #2
		Run #2			Light gray GNEISS	20'-25'
24						Run = 60"
						Rec = 60", 100%
25					25'0"	RQD = 100%
					End of Boring @ 25'0"	
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-7

Project:	**Proposed Retail Center, U.S. Route 6, Southeast, NY**	**SHEET NO.:**	1 of 2
Client:	**Insite Engineering**	**JOB NUMBER:**	07-90
Drilling Contractor:	**General Borings Inc.**	**ELEVATION:**	+533.0

GROUNDWATER					**CASING**	**SAMPLE**	**CORE**	**TUBE**	**DATUM:**	Topo
DATE	**TIME**	**DEPTH**	**CASING**	**TYPE**	**FJ**	**SS**	**NX**		**START DATE:**	13 Dec 07
				DIA.	**5"**	**1 3/8"**	**2 1/8"**		**FINISH DATE:**	14 Dec 07
No water encountered				**WGHT**		**140#**			**DRILLER:**	Jim
				FALL		**30"**			**INSPECTOR:**	EJS

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	IDENTIFICATION	REMARKS
			3		
1		**S-1**	5	**Topsoil with many roots** 0'8"	Rec = 4"
			5	Br $ s (+), cf S, t (+) cf G w/cobbles	very moist-wet
2			8	**Brown SILT some (+) coarse to fine Sand, trace (+) coarse to fine Gravel, with cobbles** 2'0"	
			27		
3		**S-2**	48		Rec = 4"
			50/2"	Br cf S, a (-) $, l mf G	moist
4					
5					
			27	same	
6		**S-3**	33		Rec = 12"
			50/5"	**Brown coarse to fine Sand, and (+) Silt, little coarse to fine Gravel**	moist
7					
8					
9					
10					
			18	Br cf S, a (+) $, l cf G	
11		**S-4**	20		Rec = 24"
			20		moist
12			25		
13					
14				13'6"	
15				**Completely weathered GNEISS** 15'0"	
16					Run #1
					15'-20'
17					Run = 60"
					Rec = 59", 98%
18		**Run #1**			RQD = 32%
19				**Gray brown GNEISS, shattered, very blocky and seamy**	
20					Run #2
					20'-25'
21					Run = 60"
		Run #2			Rec = 53", 88%
22					RQD = 40%

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-7
Project: Proposed Retail Center, U.S. Route 6, Southeast, NY		**SHEET NO.:** 2 of 2
Client: Insite Engineering		**JOB NUMBER:** 07-90

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
23						
24		Run #2			**Gray brown GNEISS, shattered, very blocky and seamy**	Run #2 20'-25' Run = 60"
25					25'0"	Rec = 53", 88%
					End of Boring @ 25'0"	RQD = 40%
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-8

Project:	**Proposed Retail Center, U.S. Route 6, Southeast, NY**	**SHEET NO.:**	1 of 1
Client:	**Insite Engineering**	**JOB NUMBER:**	07-90
Drilling Contractor:	**General Borings Inc.**	**ELEVATION:**	+530.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE		
									DATUM:	Topo
DATE	**TIME**	**DEPTH**	**CASING**	**TYPE**	**HSA**	**SS**			**START DATE:**	14 Dec 07
				DIA.	**3 1/4"**	**1 3/8"**			**FINISH DATE:**	14 Dec 07
No water encountered				**WGHT**		**140#**			**DRILLER:**	Jim
				FALL		**30"**			**INSPECTOR:**	EJS

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION		REMARKS
			1				
1		**S-1**	5		**Silty TOPSOIL**	0'8"	Rec = 12"
			4		Br $ s (+), cf S, l (-) cf G		very moist
2			4		**Brown SILT and, coarse to fine**		
			7		**Sand, little (-) coarse to fine Gravel**		
3		**S-2**	13			3'0"	Rec = 15"
			50/4"				moist
4							
5							
			25				
6		**S-3**	27		Br cf S, a $, l cf G		Rec = 18"
			29				moist
7			31				
					Brown coarse to fine Sand, and		
8					**Silt, little coarse to fine Gravel**		
9							
10							
			12				
11		**S-4**	49		same		Rec = 10"
			50/2"				moist
12							
13							
14							
15						15'0"	auger refusal at 15'0"
					End of Boring @ 15'0"		
16							
17							
18							
19							
20							
21							
22							

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-9
Project: Proposed Retail Center, U.S. Route 6, Southeast, NY		**SHEET NO.:** 1 of 2
Client: Insite Engineering		**JOB NUMBER:** 07-90
Drilling Contractor: General Borings Inc.		**ELEVATION:** +522.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			**DATUM:** Topo
				DIA.	3 1/4"	1 3/8"			**START DATE:** 17 Dec 07
No water encountered				WGHT		140#			**FINISH DATE:** 17 Dec 07
				FALL		30"			**DRILLER:** Jim
									INSPECTOR: EJS

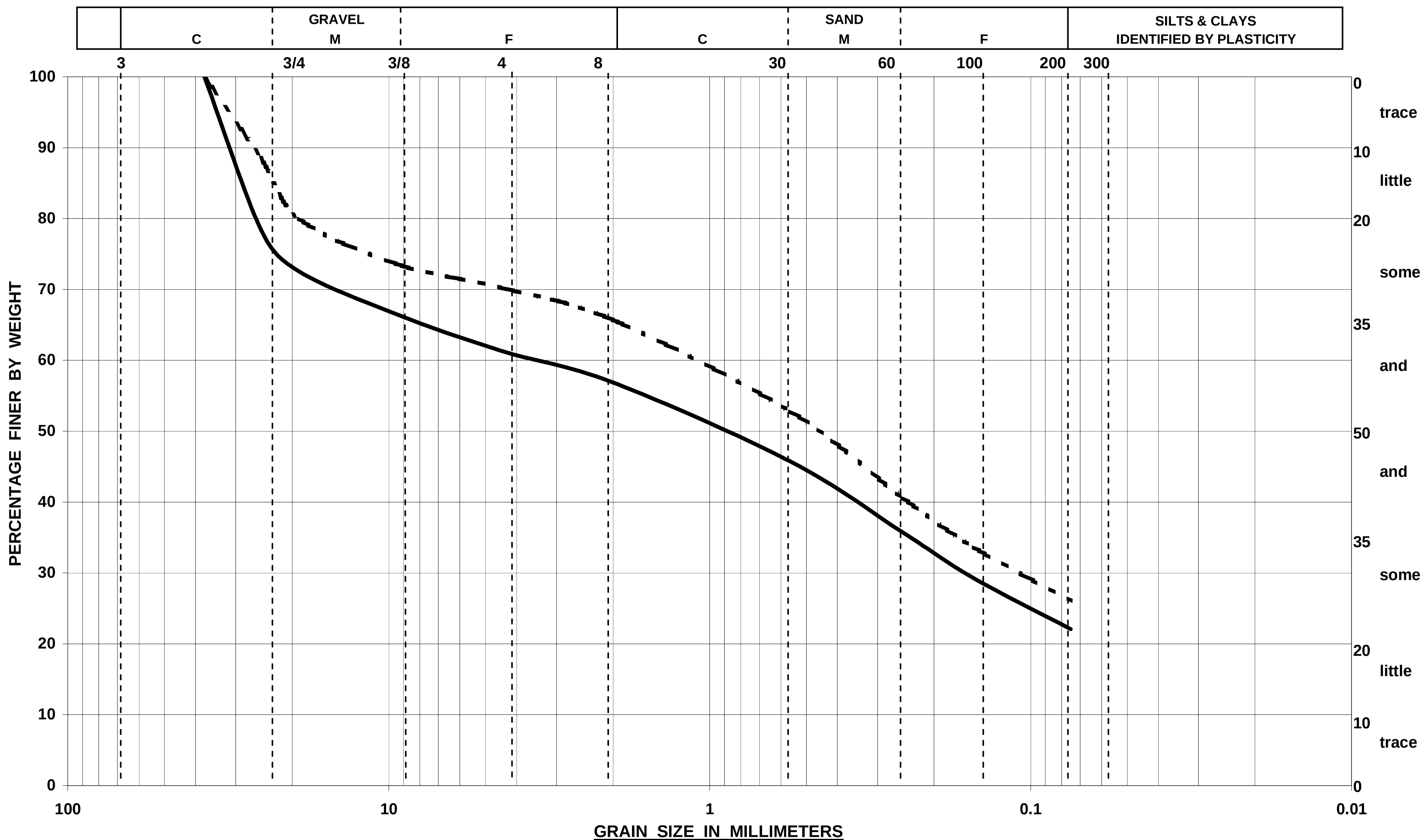
Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	IDENTIFICATION		REMARKS
			3			
1		S-1	5	**Brown Silty TOPSOIL**	0'8"	Rec = 3"
			5	Br cf S, s (-) $, a (+) cf G		moist
2			6			
			13			
3		S-2	27	same		Rec = 14"
			47			moist
4			50/1"			boulder at 3'8"
						cored 3'6" to 4'6" - boulder
5						
			37			
6		S-3	30	same		Rec = 1"
			20			moist
7			17	**Brown coarse to fine Sand, some (-) Silt, and (+) coarse to fine Gravel**		
8						
9						
10						
			19			
11		S-4	14	same, a (-) cf S, l cf G		Rec = 12"
			5			moist-very moist
12			7			
13						
14						
15						
		S-5	60/6"	same		Rec = 2"
16						moist
17						
18						
19						
20					20'0"	
			57	Gr cf S, s $, a (-) cf G		completely weathered gneiss
21		S-6	70	**Gray coarse to fine Sand, some Silt, and (-) coarse to fine Gravel**		Rec = 8"
						very moist
22						

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-9
Project: Proposed Retail Center, U.S. Route 6, Southeast, NY		**SHEET NO.:** 2 of 2
Client: Insite Engineering		**JOB NUMBER:** 07-90

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
23						augered to 25'
24					**Completely weathered GNEISS (Gray coarse to fine Sand, some Silt, and coarse to fine Gravel)**	cored 25'-26'
25					25'0"	
26					**GNEISS - boulder** 26'0"	partially weathered gneiss
27						
28						
29					**Completely weathered GNEISS (Gray coarse to fine Sand, some Silt, and coarse to fine Gravel)**	Augered to 30'
30					30'0"	
31					**Highly weathered GNEISS**	
32					32'0"	Run #1
33		Run #1				30'-35' Run = 60"
34					**Gray GNEISS, shattered, very blocky and seamy**	Rec = 24", 40% RQD = 33%
35					35'0"	
36					**End of Boring @ 35'0"**	
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS

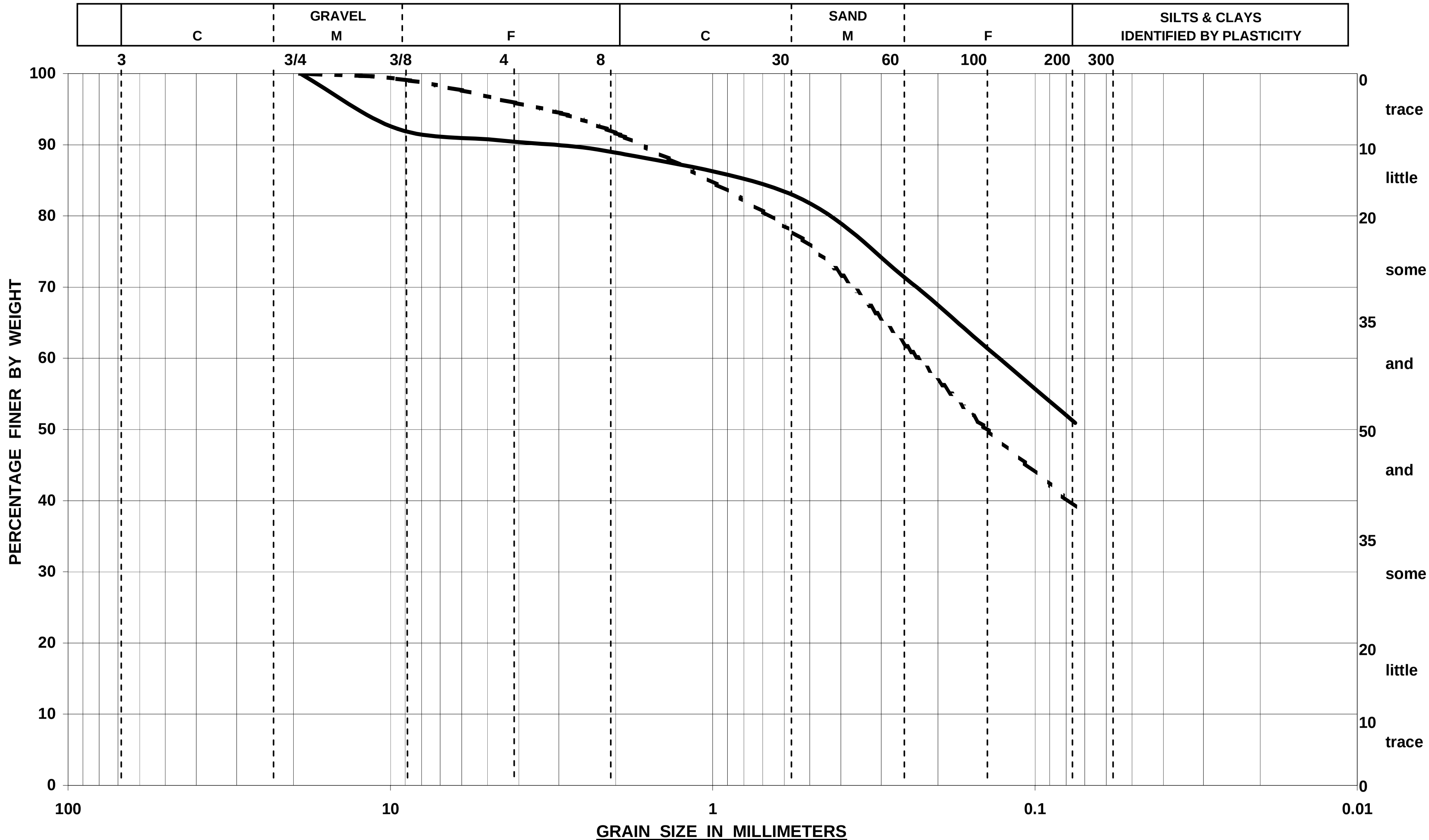


SYMBOL	BORING	SAMPLE	DEPTH	DESCRIPTION
———	B-1	S-2	5'0"-6'3"	Brown coarse to fine Sand, some (-) Silt, and coarse to fine Gravel
— -	B-2	S-2	5'0"-7'0"	Brown coarse to fine Sand, some Silt, some (+) coarse to fine Gravel

PROJECT Stateline Retail Center, Southeast, NY **BY** LYD **DATE** 23-Jul-07 **JOB NO** 07-90

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS

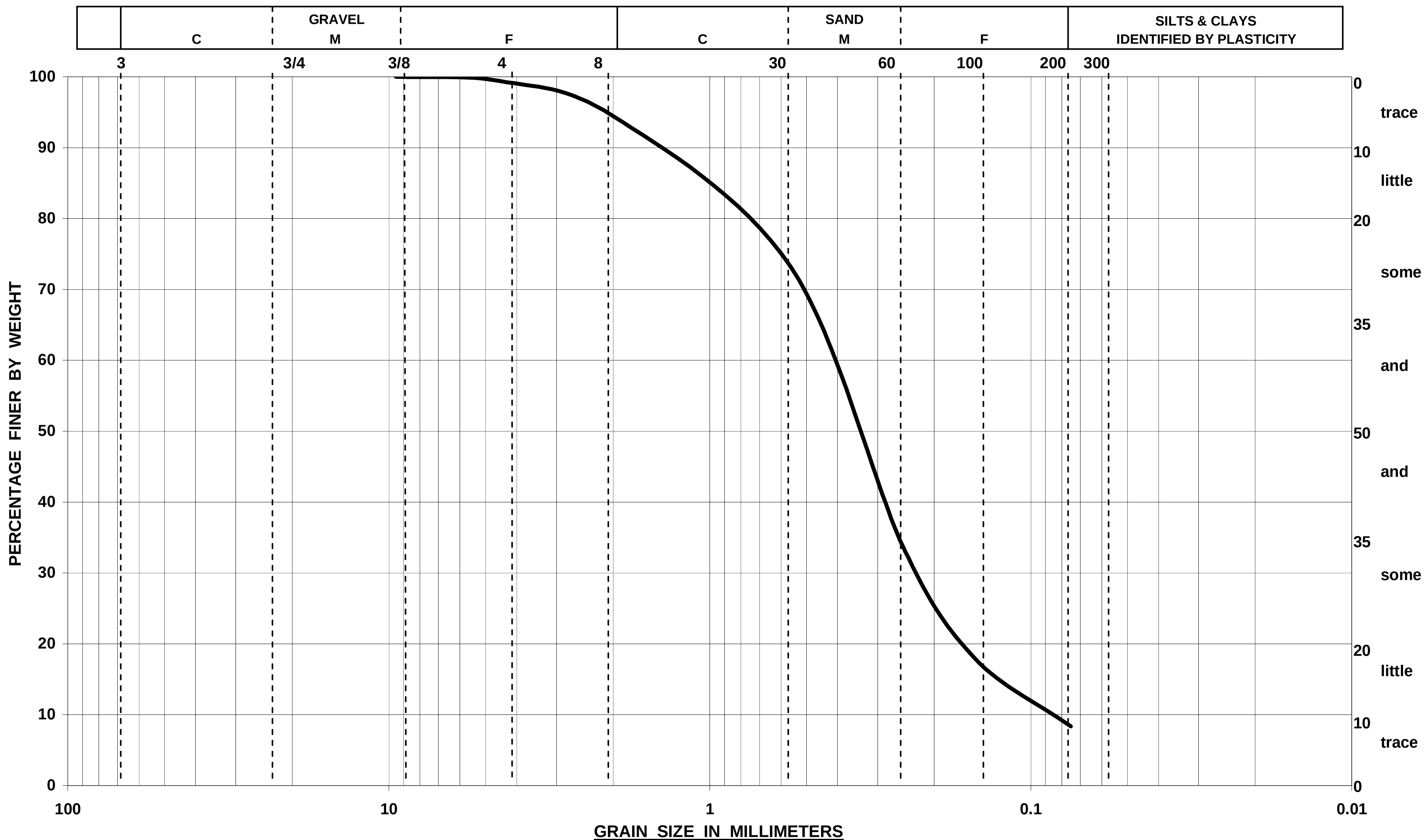


SYMBOL	BORING	SAMPLE	DEPTH	DESCRIPTION
———	B-2	S-3	10'0"-12'0"	Brown SILT and (+), coarse to fine Sand, little (-) medium to fine Gravel
— -	B-3	S-1	5'0"-7'0"	Brown coarse to fine SAND, and (-) Silt, trace (+) medium to fine Gravel

PROJECT Stateline Retail Center, Southeast, NY **BY** LYD **DATE** 23-Jul-07 **JOB NO** 07-90

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS

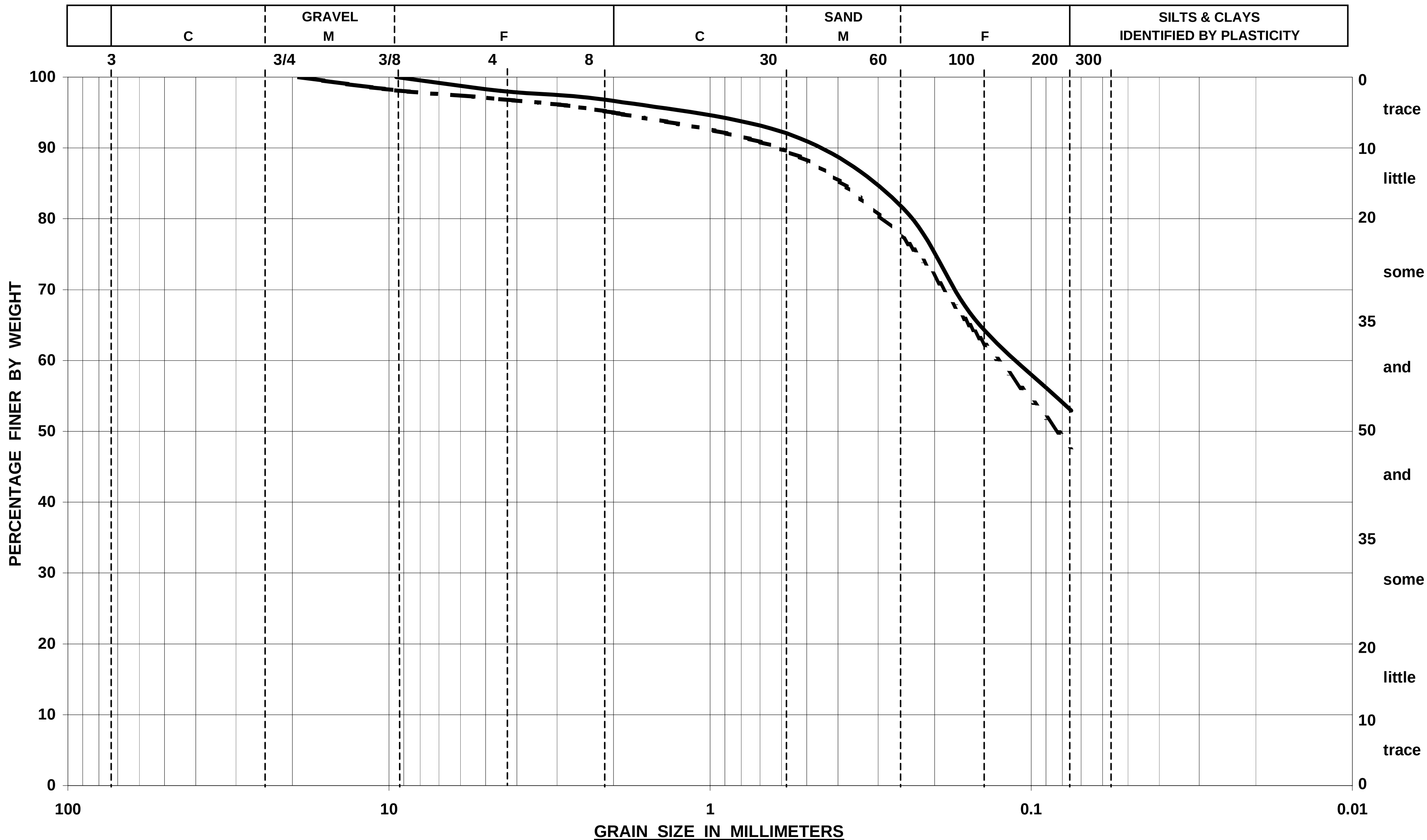


SYMBOL	BORING	SAMPLE	DEPTH	DESCRIPTION
——	B-3	S-3	12'0"-14'0"	Brown coarse to fine SAND, trace (+) Silt, trace (-) fine Gravel

PROJECT Stateline Retail Center, Southeast, NY **BY** LYD **DATE** 23-Jul-07 **JOB NO** 07-90

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS

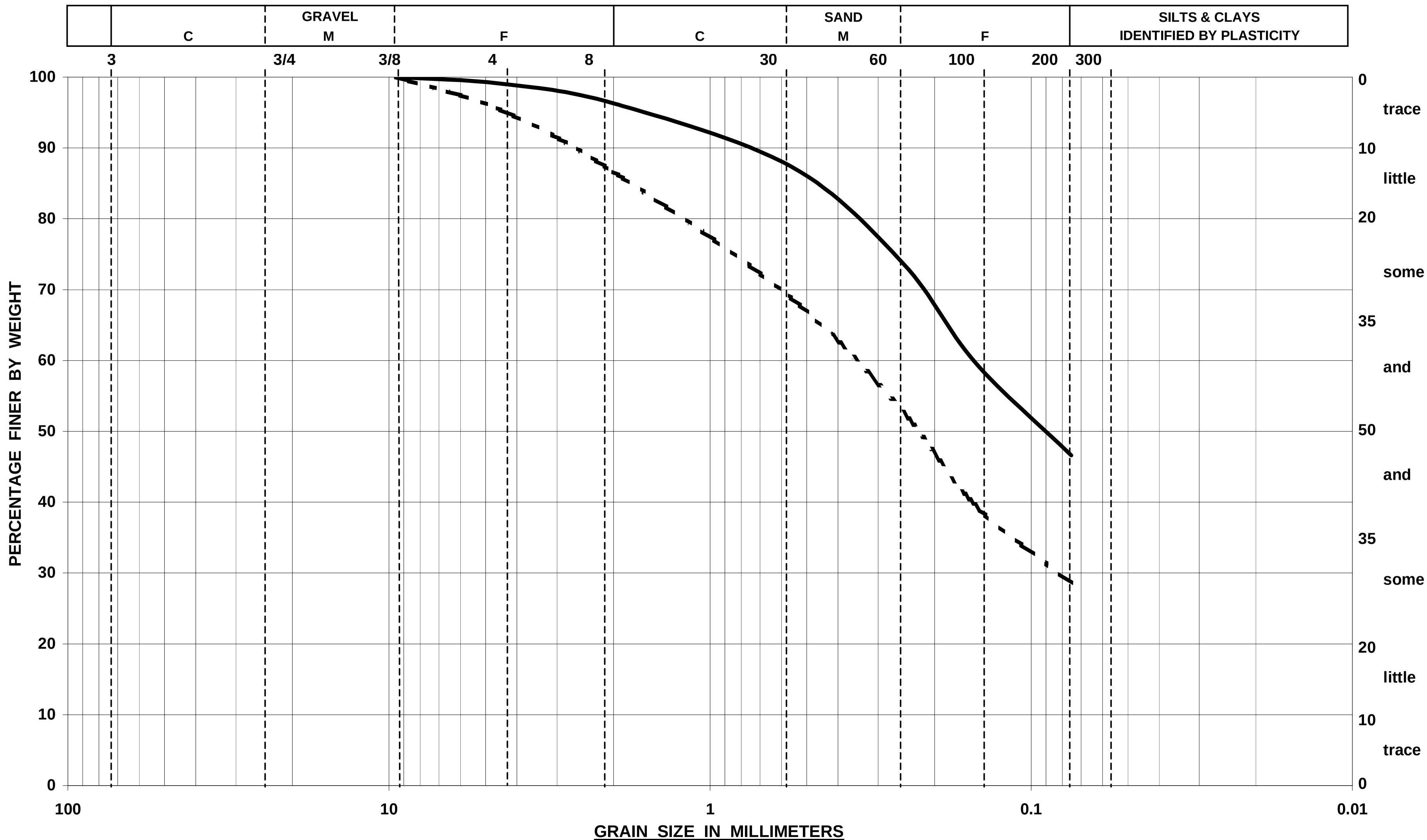


SYMBOL	BORING	SAMPLE	DEPTH	DESCRIPTION
———	B-4	S-2	2' 0" - 4' 0"	Brown SILT and (+), coarse to fine Sand, trace fine Gravel
— -	B-5	S-3	5' 0"- 6' 3"	Brown coarse to fine Sand, and (+) Silt, trace medium to fine Gravel

PROJECT Proposed Retail Center, Southeast, NY **BY** LYD **DATE** 20-Dec-07 **JOB NO** 07-90

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS

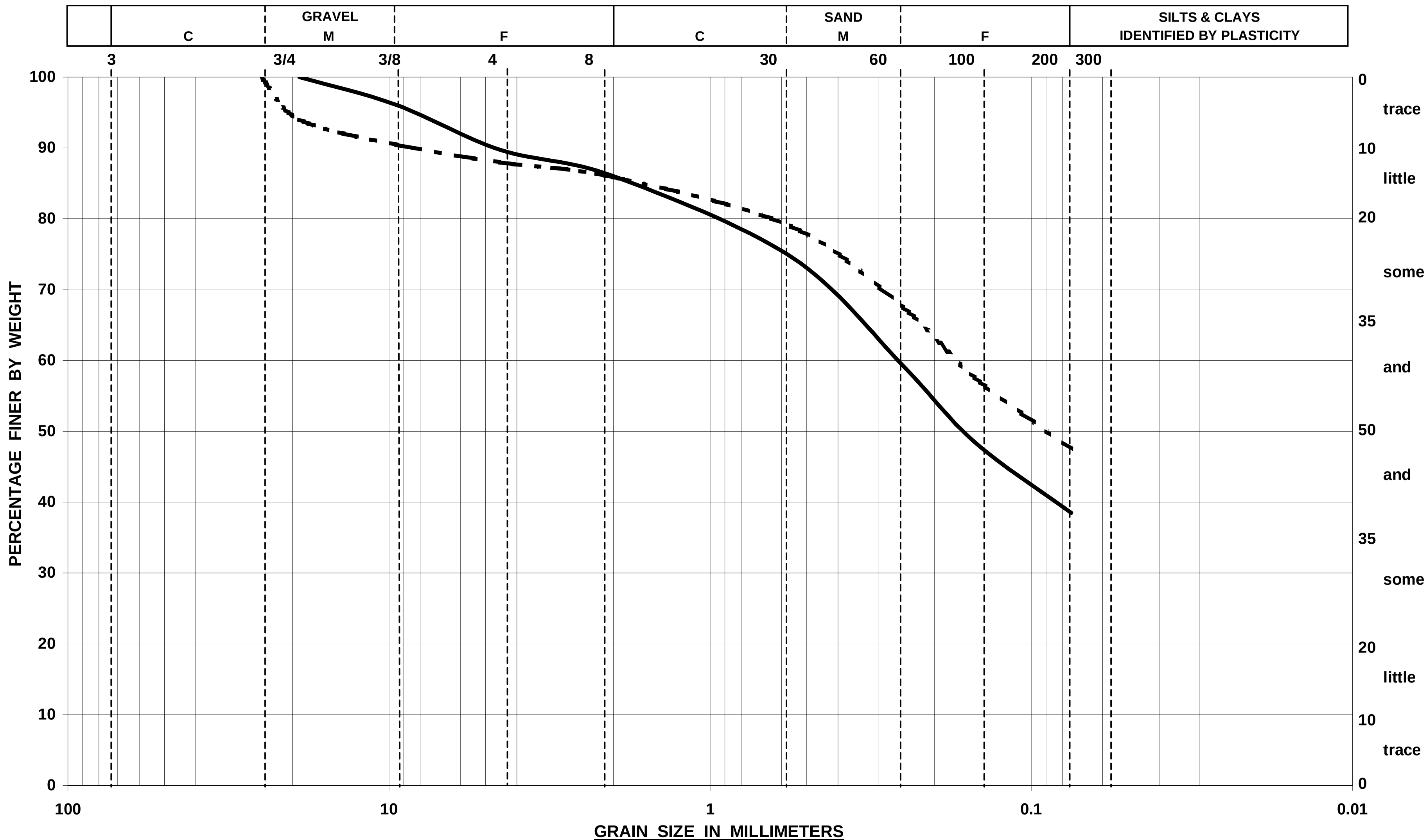


SYMBOL	BORING	SAMPLE	DEPTH	DESCRIPTION
———	B-5	S-4	10' 0" - 12' 0"	Brown coarse to fine Sand, and (+) Silt, trace fine Gravel
— -	B-5	S-5	15' 0" - 17' 0"	Brown coarse to fine SAND, some Silt, little fine Gravel

PROJECT Proposed Retail Center, Southeast, NY **BY** LYD **DATE** 20-Dec-07 **JOB NO** 07-90

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS

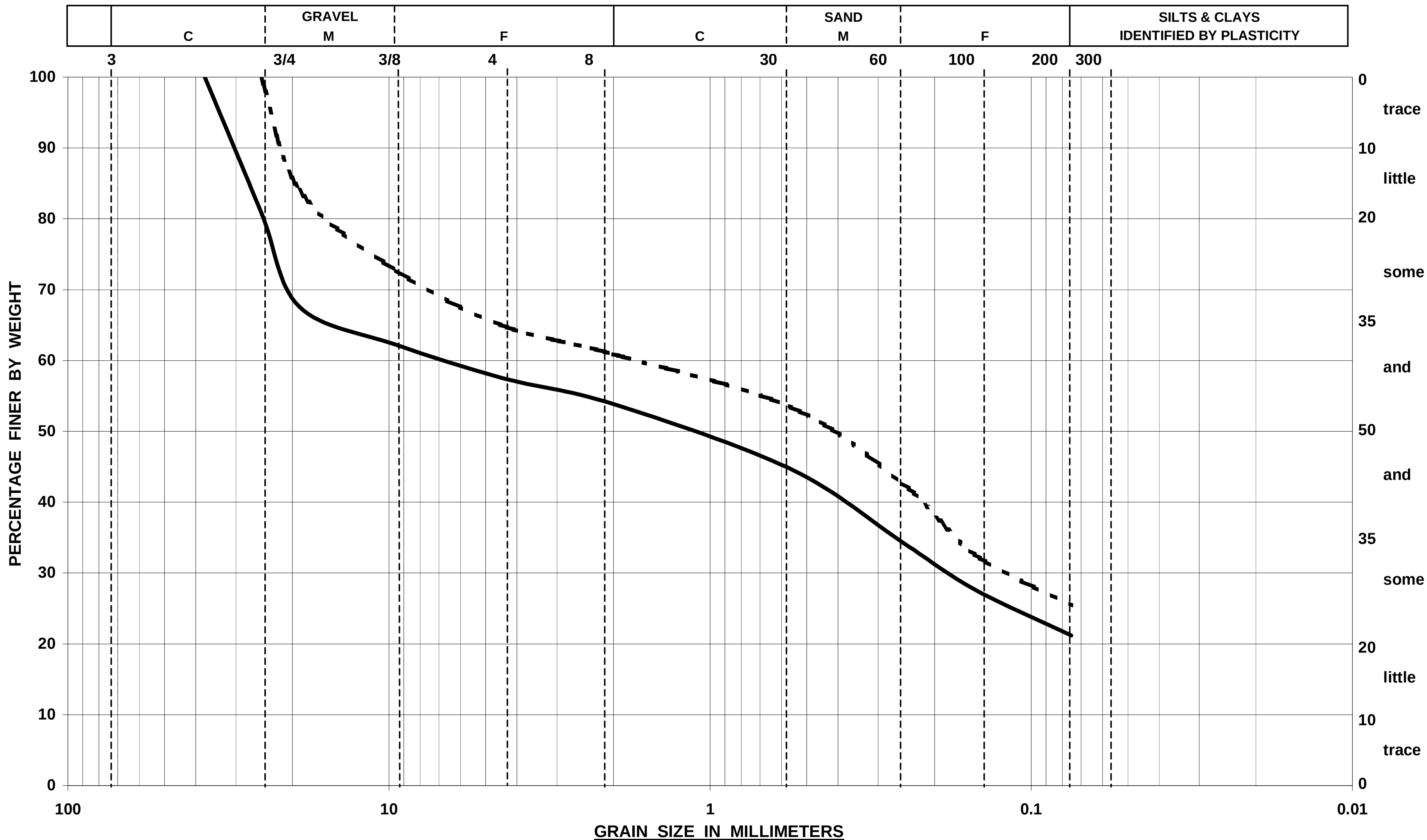


SYMBOL	BORING	SAMPLE	DEPTH	DESCRIPTION
———	B-7	S-3	5' 0" - 6' 5"	Brown coarse to fine Sand, and (-) Silt, little medium to fine Gravel
— -	B-7	S-4	10' 0" - 12' 0"	Brown coarse to fine Sand, and (+) Silt, little coarse to fine Gravel

PROJECT Proposed Retail Center, Southeast, NY **BY** LYD **DATE** 20-Dec-07 **JOB NO** 07-90

CARLIN-SIMPSON & ASSOCIATES
SAYREVILLE, NJ 08872

SIEVE ANALYSIS



SYMBOL	BORING	SAMPLE	DEPTH	DESCRIPTION
———	B-9	S-2	2' 0" - 4' 0"	Brown coarse to fine Sand, some (-) Silt, and (+) coarse to fine Gravel
— -	B-9	S-6	20' 0"- 22' 0"	Brown coarse to fine Sand, some Silt, and (-) coarse to fine Gravel

PROJECT Proposed Retail Center, Southeast, NY **BY** LYD **DATE** 20-Dec-07 **JOB NO** 07-90