DENTE ENGINEERING

ALBANY AREA
594 Broadway
Watervliet, NY 12189
Voice 518-266-0310
Fax 518-266-9238

BUFFALO AREA
PO Box 482
Orchard Park, NY 14127
Voice 716-649-9474
Fax 716-648-3521

November 23, 2004

Ms. Kim Williams
United Development Corp.
80 State Street
Albany, NY 12201

Re: Geotechnical Evaluation for
Proposed Carriage Hill Development
Brunswick, New York
File No. FDE-04-217

Dear Ms. Williams:

This report presents the results of a Geotechnical Evaluation completed for a new development planned between NYS Route 2 and Pinewoods Avenue, just east of the Troy Country Club, in the Town of Brunswick, Rensselaer County, New York. Our scope of services was outlined in a proposal dated October 15, 2004, which was authorized by United Development Corp. on October 20, 2004.

In general, our scope of services included:

- A reconnaissance of the site and the completion of six test borings and nine test pits across the area of proposed development.
- The completion of laboratory grain size and moisture testing.
- Evaluation of the results of the field and laboratory investigation and the preparation of this report, which presents our preliminary recommendations for the design and construction of the geotechnical aspects of the structures and associated earthworks.

It should be understood that this report was prepared early in the site design process, before proposed grading plans were developed, and, as such, must be considered preliminary at this time. As the design of this project progresses and building plans, grades and loading criteria become finalized, we must be afforded an opportunity to review and evaluate these plans relative to the recommendations presented herein.

It should also be understood that this report was prepared on the basis of the information supplied to us and the results of a limited number of explorations performed for the field investigation. The test borings and pits were advanced at specific locations and the overburden soils were sampled through limited and specific depths. As such, the subsurface conditions are only known at the locations and through the depths investigated. The subsurface conditions at other locations and depths may be different and these differences may impact upon the conclusions reached and the recommendations offered.

This site comprises over 200 acres and was investigated through the completion of a total of 15 test borings and pits. Although these investigations provided insight into the general stratigraphy expected to exist across the site, variations in the subsurface conditions should be expected. For these reasons, we strongly recommend that we be retained to provide construction period observation and testing services.

This report was prepared on the basis of generally accepted Geotechnical Engineering Practices. No other warranty or assertion, either expressed or implied, is made. A sheet entitled "Important Information about your Geotechnical Engineering Report" prepared by the Association of Engineering Firms Practicing in the Geosciences is attached. The sheet should never be separated from the report and should be carefully reviewed as it sets the only context within which this report should be used.

SITE AND PROJECT DESCRIPTION

The site planned for development is situated in a residential area between NYS Route 2 and Pinewoods Avenue, just east of the Troy Country Club, in the Town of Brunswick, Rensselaer County, New York. The site is depicted on the attached portion of the 7.5' USGS Topographic Map of the Troy South Quadrangle. As shown, grades at the site vary somewhat significantly from about El. 350 at Route 2 to high points of about El. 550 at the top of a few of the hills. Overhead power lines and an underground gas line pass through the eastern portion of the site.

The project site is presently a mix of brush-covered fields and dense woodlands, although the majority of the site is believed to be wooded. We understand that an area near the southeast corner of the site was formerly used as a junk yard. In general, the site is comprised of a series of north south trending, oblong shaped hills, bordered to the north by the Poesten Kill and the south by an unnamed stream. The lower lying areas between hills at this site were wet in many areas and the surficial soils very soft.

As we understand it, the over 200 acre site is to be developed with seven, three story slab on grade apartment type buildings, 82 quarter acre residential lots and 19, three to four acre estate lots, along with associated asphalt paved driveways, roadways and parking areas. The proposed site grades were not known at the time of this reports preparation. However, we have assumed that extensive cuts and fills will be required to level the sites for development. To facilitate this study, we have assumed that cuts and fills will be as much as abut 15 feet and that column and wall loads for the new buildings will be less than about 90 kips and six kips per lineal foot, respectively. We have also assumed that ground floor live loads will typically be less than 150 pounds per square foot.

SUBSURFACE CONDITIONS

As a basis for this study, six conventional test borings and nine test pits were completed at the approximate locations depicted on the attached USGS Topographic Map. The explorations were located in the field using a handheld Garmin etrex Legend Global Positioning System (GPS), which had a reported accuracy of between 19 and 25 feet at this site. For reference, the GPS coordinates for each of the test boring and pit locations are also attached.

The test borings were advanced using a CME Model 55 all-terrain drill rig and employed hollow stem augers to advance and case the boreholes. Overburden soils were sampled and their relative density determined using split-spoon sampling techniques in general accord with ASTM D-1586 procedures. Subsurface Logs, which were prepared for the completed explorations by a Geotechnical Technician, are attached, along with sheets that explain the terms used in their preparation.

The test pits were excavated using a Kobelco SK160 LC excavator. The overburden conditions were observed by a Geotechnical Engineer in the field as the excavations progressed and the results were recorded on Test Pit Field Logs, which are also attached.

As stated previously, the site was mostly covered with relatively dense woodlands. A surficial topsoil/forest mat mantled most areas of the site, with scattered cobbles, boulders and miscellaneous debris, such as car parts and shingles, on the ground surface. Some shallow filling was evident across the site, primarily along trails where minor cuts and fills appear to have been made to level the grades. Shallow corrugated metal drainage pipes were noted to extend beneath the trails in a couple of areas. Bedrock outcrops were noted near the southeast corner of the site

Based on the completed investigations, the surficial forest mat was found to be underlain with shallow glacial till deposits and, in some areas, bedrock. The bidders must not, however, rely upon the topsoil depths shown on the subsurface logs for bidding purposes and are encouraged to perform their own site observations and testing to obtain representative topsoil thicknesses and its quality.

The borings and test pits encountered generally similar conditions at each of the investigated locations. The surficial 12- to 36-inches consisted of fine sand and silt with lesser amounts of coarser sand, gravel, roots and occasional trace clay, cobbles and boulders. Roots were particularly present within the upper 12- to 24-inches. These surficial soils were generally brown or gray, moist to wet and judged to be of a loose relative density.

With increasing depth, this stratum graded to a heterogeneous mixture of silt, sand and gravel, in varying relative proportions, with lesser amounts of cobbles and boulders. The soils below about 36-inches and extending through the depths explored were generally brown grading to gray, moist to wet and judged to be of a firm grading to very compact relative density. Saturated soil seams and layers were noted in a few of the test pit explorations, which produced seepage into the excavations.

Several of the recovered overburden samples were tested in our laboratory to determine their moisture content and grain size distribution. The results of these tests are attached.

Our experience in the area suggests that these glacial till deposits extend to bedrock, a thin bedded shale. Bedrock was encountered within the depths explored at a few of the investigated locations, particularly near the southeast corner of the site. Test pits TP-5 and -5A encountered steeply dipping, shale bedrock at depths of less than one foot and seven feet below grade, respectively. Bedrock outcrops were also evident in the area of these test pits. The probable top of bedrock was also noted at boring B-6 at a depth of about 11 feet below grade.

Groundwater was not generally noted within the auger casings upon the completion of the test borings. However, as noted in the test pit excavations, numerous perched water tables do exist across the site.

Shallow perched groundwater levels result from precipitation infiltrating the ground surface and collecting within the shallow overburden soils, upon less permeable soils. At this site, the surficial soils have been loosened through seasonal frost penetrations and moisture variations and these looser, and as a result more permeable, soils overlie undisturbed, fine grained and compact deposits. The surficial soils were found to be wet and loose or soft at many locations, particularly in the low lying areas.

Granular seams and layers within the glacial till soils were also found to be saturated and, as a result, were classified as perched water tables. Wet to saturated soil seams and layers were encountered in explorations completed for this study at varying depths and these seams and layers contained appreciable amounts of water. These saturated seams and layers would be expected to be generally unresponsive to seasonal variations in precipitation and runoff.

The individual subsurface and test pit field logs should be reviewed for more specific information related to the groundwater conditions encountered. However, it should be understood that these logs indicate the groundwater conditions observed at the time the explorations were performed and these levels may be influenced by the methods employed to advance these explorations, the time allowed for groundwater to accumulate following their completion and the season.

GEOTECHNICAL EVALUATION

On the basis of the information provided to us, the assumptions made concerning loads and grades and our evaluation of the subsurface conditions disclosed through the site investigation, it is our opinion that the structures planned for this site may be supported with conventional spread foundations with floor slabs bearing upon prepared subgrades. We anticipate, however, that construction will be complicated by the need to control and divert surface water runoff and groundwater away from work areas, excavate bedrock and very compact soils containing boulders.

Development of the site must be planned to provide positive drainage. Temporary and permanent swales and french type drains must be included in the site design. We recommend that the contractor develop a plan to work the site that provides drainage and minimizes the repeated tracking of equipment across unprotected subgrades. In addition, we recommend that the stripping of vegetation and topsoil be sequenced, so as not to expose the underlying overburden to disturbance from precipitation or construction activities for long periods of time before they will be filled or built upon.

Our study disclosed that the site is mantled with up to about one foot of variable quality topsoil, which overlies indigenous, glacially derived soils. In our opinion, the topsoils and surficial 12 to 18 inches of the overburden are unsuitable for the support of foundations, floor slabs and pavements in a satisfactory or predictable manner. These soils were found to be wet or saturated and very loose or soft. As such, they should be planned to be removed and replaced with structural fill in order to provide uniform subgrade response. These unsuitable soils will extend to greater depths in low lying, and other, areas.

The bidders should not rely solely upon the topsoil depths shown on the subsurface logs for bidding purposes and are encouraged to perform their own site observations and testing to obtain representative topsoil thicknesses and determine its quality.

In planning cuts at this site, the design inclination of the soil slopes less than about 15 feet in height should initially be planned no steeper than about 1 Vertical on 3 Horizontal (1V:3H). Fill slopes consisting of site soils should also be initially planned no steeper than 1V:3H. If higher slopes are planned or steeper grades are required, these conditions should be evaluated by the Geotechnical Engineer on a case-by case basis. Crest swales and french drains, excavated into the slope face, must be incorporated into the design of the slopes to collect runoff and seepage from slope faces and prevent it from traversing the slopes.

The excavated soils, once broken and moisture conditioned to near their optimum, may be used as a source of fill to elevate site grades. However, it should be understood that the site soils contain an appreciable quantity of silt, which will make their compaction especially sensitive to variations in moisture content. If these soils are, or become, wet of their optimum moisture content, they will be difficult to compact unless they are dried. As such, dependent upon the season planned for the work, it will be prudent to budget some volume of off site granular borrow to elevate site grades, especially in building areas. In general, we suggest that the use of site soils for structural fill be ended within about three feet of slab and pavement subgrades.

Areas where fill depths are required to exceed about six feet in height should be brought to grade and allowed to sit for a period of four to six weeks to allow consolidation and corresponding settlement of the fills to occur before structures or pavements are constructed. The surface of these fills should be monitored to establish when settlements are substantially complete.

Any sidewalks, pavements or exterior grade supported slabs planned about the buildings will experience heave with frost penetration and this heave may be differential in nature, particularly at curbs, walks, storm drains, manholes and at entrances to buildings. If these conditions are undesirable, a minimum 16-inch thick non-frost susceptible stone base course composed of ASTM, C33 Blend 57 Stone with underdrains should be placed beneath the base course to prevent saturation of the shallow soils and limit heave to generally tolerable magnitudes, for most winters.

In our opinion, the design of any site retaining walls should be performed by a licensed Professional Engineer and the design submitted for review. Contractor designs often fail to address critical elements, such as drainage and do not address potential global stability issues.

SITE DEVELOPMENT

Site development in building and roadway areas should commence with the removal of vegetation, topsoil and any saturated, soft surficial soils, which were encountered at several

locations. Excavations should then be made to establish the desired subgrade and these areas shaped and proof-compacted using a smooth drum vibratory compactor with a static weight of at least five tons. The compactor should complete at least four passes across the subgrades with the compactor operating in vibratory mode. Areas that fail to stabilize, or become unstable beneath the compactor, should be investigated to determine the cause and the soils undercut and replaced with structural fill, as required.

All excavations within the overburden at the site should be designed in accord with the provisions of OSHA 29 CFR Part 1926 for Type B Soils. Where cuts into rock are required, steeper inclinations are possible. However, these conditions should be evaluated on a case-by-case basis based on the rock type, its quality and orientation of the rock beds. It should be noted that the shale bedrock, at least surficially, can usually be ripped. However, if bedrock removal is required over large areas or to depths of more than a few feet, controlled blasting may be required to achieve its economical removal.

Controlled blasting, if required, should be performed in a manner that limits the maximum peak particle velocity (PPV) to less than two inches per second (ips) at the property limits. However, depending on the sensitivity of adjacent properties and their owners, more strict vibration criteria may be warranted. In addition, the peak airblast overpressure limit must also be limited to less than 0.014 psi at the nearest adjacent occupied structure.

We recommend that blast vibrations be monitored at property limits and pre condition surveys be performed on adjacent structures that may be affected by the work. If blasting will be required adjacent to recently placed concrete, we can provide specific limitations on allowable vibrations for these situations. The vibration limitations associated with blasting should be provided in the project specifications.

Perched groundwater will be encountered at multiple depths in excavations at this site. We caution that the silt rich soils which will form the subgrades are sensitive to construction activities, particularly if the site is allowed to pond precipitation and the soils saturate. All site grading, from initial stripping activities through final construction should be designed and constructed to assure that drainage is provided at all times and that all excavations are dewatered. Subgrade areas that become saturated and unstable, should be undercut and replaced with borrow or suitable on site soils placed and compacted as recommended subsequently. The Geotechnical Engineer should observe final subgrade conditions immediately prior to the placement of structural fills at this site.

All fill used at this site to backfill excavations or increase grades for support of foundations, floor slabs and pavements should consist of structural fill. Structural fill may consist of excavated site soils that are free of organics, screened of particles larger than about four inches in size and conditioned to within two percent of their optimum moisture content. If adequate volumes of suitable on site soils are not available to complete the required fills, imported, sound, durable Sand and Gravel meeting the limits of gradation for NYSDOT Section 304 for Type 1, 3 or 4 Material may be used.

Structural fill soils should be placed in uniform loose layers no more than about one foot thick, where heavy vibratory compaction equipment is used. Smaller lifts should be used where hand operated equipment is required for compaction. In either case, it is recommended that each lift be compacted to not less than 95% of the soil's maximum dry density established through the Modified Proctor Compaction Test, ASTM D-1557.

Foundation and basement wall backfills and backfill more than three feet below finished pavement grades may consist of the materials recommended previously. The backfill material should be placed as recommended above and be compacted to not less than 93% of the soil's maximum dry density established through the Modified Proctor Compaction Test, ASTM D-1557.

We caution that where on site soils are reused, they must be placed in a controlled manner, such that their moisture content is within 2% of optimum, and be compacted to the maximum dry density recommended above. Further, these soils must be graded and sloped at all times to promote their surface drainage, as should the soils in areas to receive fills. It must be understood that, given their relatively high fines content (percent by weight of material passing the number 200 sieve size), placement and compaction of these materials will be difficult, particularly during periods of wet weather. A synthetic fabric, such as Mirafi 500X, may be employed as necessary to reinforce unstable subgrades in deeper fill areas.

Excavated bedrock, once processed or broken, can be used as a source of fill to elevate site grades provided that they are placed and compacted within certain limitations, as follows:

- The selected rock material should be thoroughly broken, with any large plates or boulder sized pieces, exceeding about six inches in size removed.
- Rockfill material should be spread in maximum 12 inch thick lifts, measured prior to compaction. The material should be dumped and pushed forward to allow mixing and removal of oversized rock.
- Each lift of rock should be compacted with a minimum of five systematic passes of a self-propelled vibratory roller with a static weight of at least ten tons, where feasible.
- A five ton roller may be used where the larger roller cannot gain access, however, the maximum lift size in this case should be reduced to eight inches measured prior to compaction.
- Due to the nature of this material it is not possible to accurately determine a moisture-density relationship using Proctor Methods. Field density tests should be compared to the density of the rock fill determined in a test pad. Continuous observation of the compacting should also be performed to verify that the recommended procedure is followed.
- The rock fill should not be used as the base course beneath pavements. The use of the rockfill should be ended when within about 16" of the pavement surface. A synthetic fabric such as Mirafi 500X should isolate the granular base course materials, preferably NYSDOT Section 304 Type 2 crushed rock from the rockfill forming the fills.

Because even controlled fills can consolidate once the design subgrade is established, settlement of all fills in excess of about six feet deep should be monitored over an estimated period of four to six weeks before foundation or road construction should begin. The holding period will allow the newly constructed fills to settle and, thus, the post construction total and differential settlements will be controlled.

Fills to be constructed upon existing slopes should be benched into the slope in steps no greater than two feet in height and extend at least three feet into the existing grades. A crest swale should be incorporated into the design to collect runoff and prevent it from traversing the slopes. The need for additional drainage features, such as a blanket drain at the interface between the existing grades with the fill, should be evaluated during construction based on field observations by the Engineer.

SEISMIC DESIGN CONSIDERATIONS

Site Classification: Our evaluation of the subsurface conditions at the site has been conducted following the Building Code of New York State (Code). We have evaluated the site conditions encountered in accordance with Table 1615.1.1 and recommend that Seismic Site Class C be used in the design.

Liquefaction: As required by the Code, we have also evaluated the liquefaction potential of the soils encountered at this site. For soils to be considered susceptible to liquefaction, they must be predominantly granular and located beneath the water table. Considering the composition of the soils encountered at this site and their relative density, it is our opinion that there is no significant risk of liquefaction.

Lateral Forces: Where required by the Code, exterior foundation or retaining walls should be designed to resist superimposed effects of the total static lateral soil pressure, excluding any temporary surcharge, plus an earthquake force calculated with the equation $0.034\ Y_t\ H^2$, where Y_t is the total unit weight of the soils and H is the height of the wall (in feet) measured between the finished floor in front and behind the wall. A total unit weight equal to 130 pounds per cubic foot is recommended for use in the equation.

CONVENTIONAL SPREAD FOUNDATIONS

Spread foundations may be designed to bear upon structural fill, placed and compacted as recommended herein, or the undisturbed indigenous soils, provided that the recommendations provided herein regarding fill placement and holding period are followed. Where structural fill is used to establish bearing grades, it should extend beyond the foundation edges in all directions a distance at least equal to the depth of fill required to be placed beneath the foundation.

All wall foundations should have a minimum width of 18 inches and column foundations should have a minimum width of 24 inches. Exterior foundations should bear at least four feet beneath final adjacent exterior grades to afford frost penetration protection. Interior foundations, in heated areas, may bear two feet beneath the interior floor slabs.

Provided all preparatory earthwork is completed as recommended, soil supported continuous wall and isolated column foundations may be proportioned using an allowable net bearing pressure of 3,000 pounds per square foot. A coefficient of friction equal to 0.40 between the foundation and subgrade soil may be used in the design.

All foundations should bear upon near level, firm and stable subgrades composed of the indigenous soils or structural fill which extends to the indigenous soils or bedrock. To insure that differential settlements are within generally tolerable ranges, at least two feet of structural fill or overburden should exist between foundation grades and the bedrock surface within any building area. All bearing grades should be inspected by the Geotechnical Engineer prior to forming.

The foundations will settle in a semi-elastic manner as loads are applied. If the dead and live loads are roughly equal, then roughly half of the settlements will occur during construction with the balance as live loads are transmitted. The actual settlement of the building will be related to the care exercised during the foundation grade preparations. Where good workmanship and stable grades are provided, we estimate that total settlements will not exceed about one inch, with differential settlements of no more than about ½-inch. This estimate assumes that the recommended holding periods are provided for fill areas.

LATERAL EARTH PRESSURES AND FOUNDATION DRAINAGE

Foundation or site retaining walls that are backfilled on one side and restrained against rotation should be designed to resist At-Rest lateral earth loads calculated using an equivalent fluid weight for the select granular backfill equal to 56 pounds per cubic foot, where the retained grades are level. If the walls are not restrained, free to rotate and backfilled with the select granular soils recommended, they may be designed to resist Active lateral earth pressures calculated using an equivalent fluid weight of the select granular soil equal to 36 pounds per cubic foot (for level backfill). Seismic lateral earth pressures should also be included in the design, where required by the Code.

Applicable surcharges for adjacent floors, vehicles or sloping ground should be added as a uniform lateral pressure over the height of wall equal to 0.5 times the vertical surcharge load. Passive earth pressures may be included in the wall's stability calculations for that portion of the wall more than two feet beneath the toe grade using an equivalent fluid weight of 200 pounds per cubic foot. A Coefficient of Friction of 0.40 may be used between the foundation and granular soils. All foundation backfilling and site grading requiring fill placement should be accomplished in the controlled manner recommended.

A footing drain must be incorporated into retaining wall design to maintain perched waters below the lowest slab or grade level and prevent the build-up of hydrostatic pressures on below grade walls that are backfilled on one side. This drainage system should, at a minimum, consist of a perimeter footing drain around the entire building (or wall), with the top of the pipe set below the lowest level floor slab.

Below grade walls that are backfilled on one side should be constructed with a geocomposite drainage panel, such as Miradrain 6000, backfilled with a free draining granular soil such as ASTM C33 concrete gravel. A foundation level drain should be provided at the outside edge of perimeter footings adjacent to below grade foundation walls. We believe that a nominal four inch diameter perforated or slotted pipe sloped at 1% and bedded within at least two feet of ASTM C-33 Blend 57 stone, which is separated from the existing soils with a drainage fabric such as Mirafi 140N, should be suited to the conditions that may exist at this site. The drain pipe should connect to a sump equipped with a dual motor pump and power interruption warning to drain the system, if gravity drainage is not feasible. Underdrains should also be provided about elevators, stairwells or other slab areas, which may be planned beneath the general floor grade.

The foundation or retaining wall backfill surface should be sealed off with asphalt, concrete or in planting areas, silt or clay, to limit the infiltration of surface water to the basement backfills. The ground surface should slope away from the building or wall. The underdrain and utility pipes should have clean outs provided for their routine maintenance.

FLOOR SLAB DESIGN AND CONSTRUCTION

Where resilient tile floors are planned, the floor slabs should be cast above a four-inch thick stone vapor break layer composed of ASTM C-33 Blend 57 material. The stone vapor break layer should be placed upon a minimum four inch thick layer of structural fill meeting the gradation requirements of NYSDOT Section 304.0 for Type 2 material. Where resilient tile flooring is not planned, the floor slab may be cast directly upon a six inch thick Type 2 structural fill layer. In addition, a vapor retarder should be placed beneath the floor slabs in accordance with the latest revision of the ACI Guide for Concrete Floor and Slab Construction.

The slabs should be designed following the recommended procedures of the American Concrete Institute or Portland Cement Association using a Modulus of Subgrade Reaction equal to 175 pounds per cubic inch. We believe that post construction slab settlements should be negligible provided our recommendations concerning subgrade preparation, holding periods and slab design are followed.

PAVEMENTS

It should be understood that much of the existing site soils that will form pavement subgrades at this site are considered susceptible to volume changes when they are frozen and thawed. The pavement sections presented subsequently will not prevent frost heave from occurring, but rather were selected to provide support for the pavements when subgrades thaw and their strength is at a minimum.

All new pavement areas should be stripped of the existing topsoils and any soft, surficial soils and the resulting subgrade proof-compacted. Proof-compacting should be accomplished by completing five or more passes over the subgrades using a steel drum vibratory roller with a minimum static weight of ten tons. Areas that exhibit instability under the passing roller should be undercut and stability established through the placement of structural fill compacted as recommended. These filled areas should be carefully graded to prevent the ponding of waters upon subgrades. All base courses should be drained through sloping and/or crowning of subgrades to their periphery, where underdrains should be located to remove the water.

The following pavement sections are recommended for use at the site. The auto parking section was developed for a general 50,000 EAL and the service drives for a general 200,000 EAL with a saturated CBR value equal to 3.0.

FLEXIBLE PAVEMENT SECTION			
MATERIAL	NYSDOT ITEM	LAYER THICKNESS	
		AUTO PARKING	SERVICE DRIVES
Wearing Course	403.18 Type 6 or 7	1-½"	1½"
Binder Course	403.13 Type 3	2"	3"
Base Course	304.03 Type 2	10"	14"
Fabric	Mirafi 500X	Yes	Yes

All subgrades should be crowned and sloped to promote drainage of the base course. Failure to provide a drained base course will materially degrade future pavement performance.

All materials and construction should conform with the NYSDOT Standard Specifications, Construction and Materials. The base course materials may be placed in a single lift and should be compacted to the density criteria previously recommended.

ADDITIONAL STUDIES

Additional evaluations of this site's geotechnical considerations can only be completed after the proposed grading plan is developed. As such, we must be provided the opportunity to review the site grading plan, once it is developed, so that we can evaluate the areas of cut and fill being considered. Supplemental test borings or test pits may be warranted at that time to determine the overall stratigraphy, develop more detailed foundation recommendations and perform slope stability evaluations.

CONSTRUCTION OBSERVATION

The foundation, slab and pavement design recommendations provided in this report are premised on the Geotechnical Engineer being retained to monitor earthwork and bearing grade preparations. It should be understood that the actual subsurface conditions that exist will only be known when the site is excavated. The presence of the Geotechnical Engineer during the earthwork and foundation construction phases will allow validation of the subsurface conditions assumed to exist for this study and the design recommended in this report. We believe this construction sequence observation and testing should be provided by the Geotechnical Engineer of record as a consultant to the owner. We do not believe these services should be provided through the earthwork contractor.

CLOSURE

This report was prepared for specific application to the project site and construction planned. It was prepared on the basis of a limited number of investigation locations at the site. Subsurface conditions at other than the investigated locations may be different. The Geotechnical Engineer should be retained for construction period observation and testing. We should also be allowed the opportunity to review appropriate plans and specifications prior to their release for bidding. This report was prepared using methods and practices common to Geotechnical Engineering. No warranties expressed or implied are made.

We appreciate the opportunity to be of service. Should questions arise or if we may be of any other service, please contact us at your convenience.

Yours truly,
Dente Engineering, P.C.

Keith LaPlante, P.E.
Vice President

Fred A. Dente, P.E.
President

Attachments:

Important Information About Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, *do not rely on a geotechnical engineering report that was:*

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely on Your ASFE-Member Geotechnical Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you ASFE-member geotechnical engineer for more information.

ASFE
The Best People on Earth

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@asfe.org www.asfe.org

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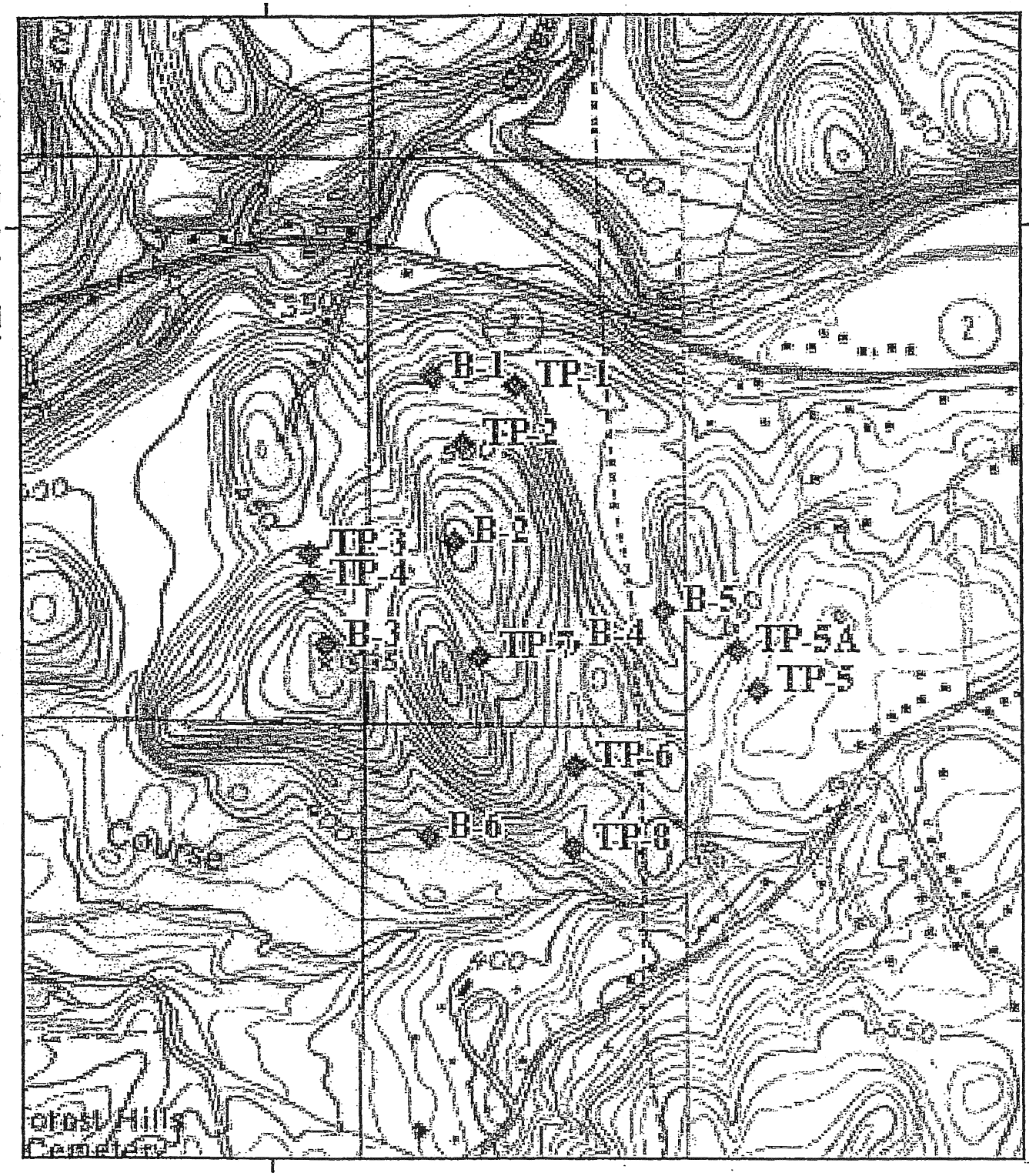
WGS84 73°38'00" W



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INTERPRETATION OF SUBSURFACE LOGS

The Subsurface Logs present observations and the results of tests performed in the field by the Driller, Technicians, Geologists and Geotechnical Engineers as noted. Soil/Rock Classifications are made visually, unless otherwise noted, on a portion of the materials recovered through the sampling process and may not necessarily be representative of the materials between sampling intervals or locations.

The following defines some of the terms utilized in the preparation of the Subsurface Logs.

SOIL CLASSIFICATIONS

Soil Classifications are visual descriptions on the basis of the Unified Soil Classification ASTM D-2487 and USBR, 1973 with additional comments by weight of constituents by BUHRMASTER. The soil density or consistency is based on the penetration resistance determined by ASTM METHOD D1586. Soil Moisture of the recovered materials is described as DRY, MOIST, WET or SATURATED.

SIZE DESCRIPTION		RELATIVE DENSITY/CONSISTENCY (basis ASTM D1586)			
SOIL TYPE	PARTICLE SIZE	GRANULAR SOIL		COHESIVE SOIL	
BOULDER	> 12	DENSITY	BLOWS/FT.	CONSISTENCY	BLOWS/FT.
COBBLE	3" - 12"	LOOSE	< 10	VERY SOFT	< 3
GRAVEL-COARSE	3" - 3/4"	FIRM	11 - 30	SOFT	4 - 5
GRAVEL - FINE	3/4" - #4	COMPACT	31 - 50	MEDIUM	6 - 15
SAND - COARSE	#4 - #10	VERY COMPACT	50 +	STIFF	16 - 25
SAND - MEDIUM	#10 - #40			HARD	25 +
SAND - FINE	#40 - #200				
SILT/NONPLASTIC	< #200				
CLAY/PLASTIC	< #200				

SOIL STRUCTURE		RELATIVE PROPORTION OF SOIL TYPES	
STRUCTURE	DESCRIPTION	DESCRIPTION	%. OF SAMPLE BY WEIGHT
LAYER	6" THICK OR GREATER	AND	35 - 50
SEAM	6" THICK OR LESS	SOME	20 - 35
PARTING	LESS THAN 1/4" THICK	LITTLE	10 - 20
VARVED	UNIFORM HORIZONTAL PARTINGS OR SEAMS	TRACE	LESS THAN 10

Note that the classification of soils or soil like materials is subject to the limitations imposed by the size of the sampler, the size of the sample and its degree of disturbance and moisture.

ROCK CLASSIFICATIONS

Rock Classifications are visual descriptions on the basis of the Driller's, Technician's, Geologist's or Geotechnical Engineer's observations of the coring activity and the recovered samples applying the following classifications.

CLASSIFICATION TERM	DESCRIPTION
VERY HARD	NOT SCRATCHED BY KNIFE
HARD	SCRATCHED WITH DIFFICULTY
MEDIUM HARD	SCRATCHED EASILY
SOFT	SCRATCHED WITH FINGERNAIL
VERY WEATHERED	DISINTEGRATED WITH NUMEROUS SOIL SEAM
WEATHERED	SLIGHT DISINTEGRATION, STAINING, NO SEAMS
SOUND	NO EVIDENCE OF ABOVE
MASSIVE	ROCK LAYER GREATER THAN 36" THICK
THICK BEDDED	ROCK LAYER 12" - 36"
BEDDED	ROCK LAYER 4" - 12"
THIN BEDDED	ROCK LAYER 1" - 4"
LAMINATED	ROCK LAYER LESS THAN 1"
FRACTURES	NATURAL BREAKS AT SOME ANGLE TO BEDS

Core sample recovery is expressed as percent recovered of total sampled. The ROCK QUALITY DESIGNATION (RQD) is the total length of core sample pieces exceeding 4" length divided by the total core sample length for N size cored.

GENERAL

- Soil and Rock classifications are made visually on samples recovered. The presence of Gravel, Cobbles and Boulders will influence sample recovery classification density/consistency determination.
- Groundwater, if encountered, was measured and its depth recorded at the time and under the conditions as noted.
- Topsoil or pavements, if present, were measured and recorded at the time and under the conditions as noted.
- Stratification Lines are approximate boundaries between soil types. These transitions may be gradual or distinct and are approximated.

LATITUDE / LONGITUDE COORDINATES
FOR SUBSURFACE EXPLORATIONS
CARRIAGE HILL ESTATES
BRUNSWICK, NEW YORK

Exploration Designation	Latitude	Longitude
B-1	N 042°43'51.6"	W 073°37'47.7"
B-2	N 042°43'41.9"	W 073°37'45.5"
B-3	N 042°43'35.6"	W 073°37'56.3"
B-4	N 042°43'35.7"	W 073°37'37.0"
B-5	N 042°43'38.3"	W 073°37'29.6"
B-6	N 042°43'24.8"	W 073°37'47.9"
TP-1	N 042°43'51.0"	W 073°37'41.2"
TP-2	N 042°43'47.6"	W 073°37'45.3"
TP-3	N 042°43'41.4"	W 073°37'57.2"
TP-4	N 042°43'39.6"	W 073°37'57.1"
TP-5	N 042°43'33.5"	W 073°37'22.6"
TP-5A	N 042°43'35.8"	W 073°37'24.1"
TP-6	N 042°43'29.1"	W 073°37'36.5"
TP-7	N 042°43'35.3"	W 073°37'44.0"
TP-8	N 042°43'24.3"	W 073°37'36.9"

Notes:

1. Coordinates were recorded using a Garmin etrex Legend handheld Global Positioning System (GPS) and are approximate. At the time of locating, the reported accuracy was between about 19 and 25 feet.

2. B-1 indicates test boring designation. TP-1 indicates test pit designation.

3. Approximate locations are mapped on the plan that precedes this page.

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-1

PROJECT: Carriage Hill Development	DATE	START: 11-4-04	FINISH: 11-4-04

LOCATION: Brunswick, New York	METHODS: 4 1/4" HSAC with
CLIENT: United Development	ASTM D 1586
JOB NUMBER: FDE-04-217	SURFACE ELEVATION:
DRILL TYPE: CME 55	CLASSIFICATION: G. Blackburn

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	TOPSOIL ± 4"
	1	1	1				Tan / Brown F-C SAND & SILT, Little F-M
				2	3	3	Gravel
5'							**(MOIST, LOOSE)**
	2	6	35				Mottled Brown / Orange / Gray / Olive F-C
				30	24	50+	SAND & SILT, Little Gravel
10'							
	3	8	16				Grades Gray / Brown F-C SAND & SILT,
				20	27	36	Some Gravel
15'							
	4	4	16				Grades Gray SILT & GRAVEL, Little F-C Sand
				20	24	36	**(MOIST, V. COMPACT TO COMPACT)**
							End of boring at 17.0' depth.
							No measurable groundwater observed inside
20'							augers upon completion.
25'							
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-2

PROJECT: Carriage Hill Development	DATE	START: 11-4-04	FINISH: 11-4-04

LOCATION: Brunswick, New York	METHODS: 4 1/4" HSAC with
CLIENT: United Development	ASTM D 1586
JOB NUMBER: FDE-04-217	SURFACE ELEVATION:
DRILL TYPE: CME 55	CLASSIFICATION: G. Blackburn

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	TOPSOIL ± 6"
	1	1	1				Tan / Brown F-C SAND & SILT, trace gravel
				2	3	3	root
							Driller Note: Boulder from 3.0' - 4.0'
5'							(MOIST, LOOSE)
	2	8	16				Brown F-C SAND & SILT, Little Gravel
				24	48	40	
10'							
	3	8	16				Grades Brown / Gray SILT, F-C SAND &
				32	41	48	GRAVEL
15'							Grades Gray SILT & GRAVEL, Some F-C
	4	45	60				Sand
				50/.4		50+	(MOIST, COMPACT TO V. COMPACT)
							End of boring at 16.4' depth.
							No measurable groundwater observed inside
20'							augers upon completion.
25'							
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-3

PROJECT: Carriage Hill Development	DATE	START: 11-5-04	FINISH: 11-5-04

LOCATION: Brunswick, New York	METHODS: 4 1/4" HSAC with
CLIENT: United Development	ASTM D 1586
JOB NUMBER: FDE-04-217	SURFACE ELEVATION:
DRILL TYPE: CME 55	CLASSIFICATION: G. Blackburn

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	1	1				TOPSOIL & Brown SILT, trace gravel
				2	4	3	
5'							(MOIST, LOOSE)
	2	8	9				Brown F-C SAND & SILT, Little Gravel
				12	15	21	
10'							
	3	10	24				Grades Brown / Gray F-C SAND & GRAVEL,
				35	45	50+	Little Silt
15'							Grades Brown / Gray F-C SAND & GRAVEL,
	4	18	36				Some Silt
				55	50/.4	50+	(MOIST, FIRM TO V. COMPACT)
							End of boring at 17.0' depth.
20'							No measurable groundwater observed inside augers upon completion
25'							
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-4

PROJECT: Carriage Hill Development	DATE	START: 11-5-04	FINISH: 11-5-04

LOCATION: Brunswick, New York	METHODS: 4 1/4" HSAC with
CLIENT: United Development	ASTM D 1586
JOB NUMBER: FDE-04-217	SURFACE ELEVATION:
DRILL TYPE: CME 55	CLASSIFICATION: G. Blackburn

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	1	2				TOPSOIL ± 8"
				1	2	3	Brown / Tan F-C SAND & SILT, Little to trace gravel with roots
5'							**(MOIST, LOOSE)**
	2	6	8				Brown / Gray F-C SAND & SILT, Little Gravel,
				10	4	18	trace clay
10'							
	3	5	12				Grades Brown / Gray F-C SAND, SILT and
				18	20	30	GRAVEL
							Driller Notes: Coarse Sand Seam at 15.0'.
15'							Grades Brown F-C SAND, SILT & GRAVEL,
	4	5	15				trace clay
				32	40	47	**(MOIST, FIRM TO COMPACT)**
							End of boring at 17.0' depth.
							Groundwater measured at 13.2' inside augers
20'							upon completion.
25'							
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-5

PROJECT: Carriage Hill Development	DATE	START: 11-3-04	FINISH: 11-3-04

LOCATION: Brunswick, New York	METHODS: 4 1/4" HSAC with
CLIENT: United Development	ASTM D 1586
JOB NUMBER: FDE-04-217	SURFACE ELEVATION:
DRILL TYPE: CME 55	CLASSIFICATION: G. Blackburn

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	1	2				TOPSOIL ± 6"
				2	8	4	Brown SILT, Some F-C Sand, Little Gravel
5'							(MOIST, LOOSE)
	2	6	11				Brown / Gray F-C GRAVEL & SILT, Some
				17	24	28	F-M Sand
10'							
	3	6	15				Grades Gray SILT, Some F-C Sand & Gravel
				20	24	35	
15'							
	4	6	20				
				17	22	37	(MOIST, FIRM TO COMPACT)
							End of boring at 17.0' depth.
							No measurable groundwater observed inside
20'							augers upon completion.
25'							
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-6

PROJECT: Carriage Hill Development	DATE	START: 11-4-04	FINISH: 11-4-04

LOCATION: Brunswick, New York	METHODS: 4 1/4" HSAC with
CLIENT: United Development	ASTM D 1586
JOB NUMBER: FDE-04-217	SURFACE ELEVATION:
DRILL TYPE: CME 55	CLASSIFICATION: G. Blackburn

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	TOPSOIL ± 10"
	1	1	1				Brown / Tan F-C SAND & SILT, Little Gravel,
				2	4	3	trace clay, root
5'							(MOIST, LOOSE)
	2	16	22				Gray GRAVEL & F-C SAND, Some Silt
				24	41	45	
10'							
	3	15	50				Grades Gray / Brown F-C SAND, SILT and
				50/.1		50+	GRAVEL
	4	50/.3					No Recovery
							(MOIST, COMPACT TO V. COMPACT)
15'							End of boring at 13.3' depth.
							No measurable groundwater observed inside
							augers upon completion.
							Driller Notes: Shale Fragments from
							auger cuttings.
20'							
25'							
30'							

DENTE ENGINEERING

TEST PIT FIELD LOG		
PROJECT: Carriage Hill Development		**NUMBER:** TP-1
LOCATION: Brunswick, New York		**FILE NO.** FDE-04-217
CONTRACTOR: Jenkins Excavating		**DATE:** 11-16-04
MAKE: Kobbelco	**MODEL:** SK 160 LC	**ENGINEER:** K. LaPlante
WEATHER: Cloudy	**CAPACITY:**	**REACH:** ft.
GROUND LEVEL:	**TIME START:** 0825	**TIME STOP:** 0850

DEPTH	SOIL DESCRIPTION	EXCAVATION EFFORT	BOULDER COUNT
1'	Mottled Dark Brown / Gray SILT, Little to Fine Sand, Gravel,	E	
2'	Roots with Boulders **(VERY WET)**	E	
3'	Brown SILT, Little F-C Sand & Gravel with Occasional Cobbles	M	
4'	Rock Fragments **(WET, MOIST)**	M	
5'	Slight Seepage of Groundwater	D	
6'	Grades Occasional Boulders, Grayish / Brown	D	
7'	Hard Digging at 7.0' **(MOIST)**	D	
8'		D	
9'		D	
10'	Bottom of Test Pit at 8' 6" (Slow Progress)		
11'			
12'			
13'			
14'			
15'			

REMARKS: Surficial 8 - 20" soft and wet

LEGENDS: BOULDER COUNT		ABBREVIATIONS	EXCAVATION EFFORT	GROUNDWATER OBSERVATIONS
SIZE RANGE CLASSIFICATION	LETTER DESIGNATION	F = FINE M = MEDIUM C = COARSE F/M = FINE TO MEDIUM F/C = FINE TO COARSE V = VERY GR = GRAY BN = BROWN YEL = YELLOW	EASY.....E MODERATE.....M DIFFICULT.....D	SEEPAGE BETWEEN 8-20" AND 48"
6" - 18"	A			
18" - 36"	B			
36" & OVER	C			

DENTE ENGINEERING

TEST PIT FIELD LOG

PROJECT: Carriage Hill Development		**NUMBER:** TP-2
LOCATION: Brunswick, New York		**FILE NO.** FDE-04-217
CONTRACTOR: Jenkins Excavating		**DATE:** 11-16-04
MAKE: Kobbelco	**MODEL:** SK 160 LC	**ENGINEER:** K. LaPlante
WEATHER: Cloudy	**CAPACITY:**	**REACH:** ft.
GROUND LEVEL:	**TIME START:** 0910	**TIME STOP:** 0930

DEPTH	SOIL DESCRIPTION	EXCAVATION EFFORT	BOULDER COUNT
1'	± 12" Brown SILT & Fine SAND, TOPSOIL with Roots	E	
2'	Brown SILT, Little F-C Sand, trace clay, gravel, rootlets	E	
3'		M	
4'	Brown SILT, Little to Some F-C SAND & GRAVEL with	M	
5'	Occasional Cobbles, Boulders, trace clay	D	
6'		D	
7'	(MOIST TO WET)		
8'	Harder at 7.0', with Cobbles, Boulders, Rock Fragments		
9'			
10'	Bottom of Test Pit at 9.0' Very Hard Digging		
11'			
12'			
13'			
14'			
15'			

REMARKS: Numerous Rock Fragments - Slight Water Seepage Locally at Boulders

LEGENDS: BOULDER COUNT		ABBREVIATIONS	EXCAVATION EFFORT	GROUNDWATER OBSERVATIONS
SIZE RANGE CLASSIFICATION	LETTER DESIGNATION	F = FINE M = MEDIUM C = COARSE F/M = FINE TO MEDIUM F/C = FINE TO COARSE V = VERY GR = GRAY BN = BROWN YEL = YELLOW	EASY.....E MODERATE.....M DIFFICULT.....D	
6" - 18"	A			
18" - 36"	B			
36" & OVER	C			

DENTE ENGINEERING

TEST PIT FIELD LOG

PROJECT: Carriage Hill Development		**NUMBER:** TP-3
LOCATION: Brunswick, New York		**FILE NO.** FDE-04-217
CONTRACTOR: Jenkins Excavating		**DATE:** 11-16-04
MAKE: Kobbelco	**MODEL:** SK 160 LC	**ENGINEER:** K. LaPlante
WEATHER: Cloudy	**CAPACITY:**	**REACH:** ft.
GROUND LEVEL:	**TIME START:** 1230	**TIME STOP:** 1245

DEPTH	SOIL DESCRIPTION	EXCAVATION EFFORT	BOULDER COUNT
1'	**SATURATED** Gray SILT, Little Fine Sand with Organics	E	
2'		E	
3'	Brown SILT & Fine SAND **(WET)**	M	
4'	Brown SILT, Little F-C Sand & Gravel **(MOIST)** with Occasional	M	
5'	Boulders	D	A/B
6'			
7'	Bottom of Test Pit at 5.5'		
8'			
9'			
10'			
11'			
12'			
13'			
14'			
15'			

REMARKS: Surficial 2', Very Soft

LEGENDS: BOULDER COUNT		ABBREVIATIONS	EXCAVATION EFFORT	GROUNDWATER OBSERVATIONS
SIZE RANGE CLASSIFICATION	LETTER DESIGNATION	F = FINE M = MEDIUM C = COARSE F/M = FINE TO MEDIUM F/C = FINE TO COARSE V = VERY GR = GRAY BN = BROWN YEL = YELLOW	EASY.....E MODERATE.....M DIFFICULT.....D	WATER SEEPAGE IN SURFICIAL ± 2'. WATER PONDED ON GROUND SURFACE.
6" - 18"	A			
18" - 36"	B			
36" & OVER	C			

DENTE ENGINEERING

TEST PIT FIELD LOG

PROJECT: Carriage Hill Development		**NUMBER:** TP-4
LOCATION: Brunswick, New York		**FILE NO.** FDE-04-217
CONTRACTOR: Jenkins Excavating		**DATE:** 11-16-04
MAKE: Kobbelco	**MODEL:** SK 160 LC	**ENGINEER:** K. LaPlante
WEATHER: Cloudy	**CAPACITY:**	**REACH:** ft.
GROUND LEVEL:	**TIME START:** 1300	**TIME STOP:** 1315

DEPTH	SOIL DESCRIPTION	EXCAVATION EFFORT	BOULDER COUNT
1'	Brown SILT & F-M SAND with Roots to Rootlets **(VERY MOIST)**	E	
2'	trace coarse sand and gravel	E	
3'		E	
4'	Brown SILT & F-C SAND, trace to Little Gravel, Clay	M	
5'	**(WET)**	M	
6'	Grades with Occasional Boulders	M	A
7'	Brown to Mottled Gray / Brown SILT, Little Fine Sand with	M-D	
8'	Occasional Embedded Gravel	M-D	
9'	**(VERY MOIST)**	M-D	
10'			
11'	Bottom of Test Pit at 9.5'.		
12'	**SATURATED** Seepage at 5' to 5.5'.		
13'			
14'			
15'			

REMARKS:

LEGENDS: BOULDER COUNT

SIZE RANGE CLASSIFICATION	LETTER DESIGNATION
6" - 18"	A
18" - 36"	B
36" & OVER	C

ABBREVIATIONS

F = FINE
M = MEDIUM
C = COARSE
F/M = FINE TO MEDIUM
F/C = FINE TO COARSE
V = VERY
GR = GRAY
BN = BROWN
YEL = YELLOW

EXCAVATION EFFORT

EASY.....E
MODERATE.....M
DIFFICULT.....D

GROUNDWATER OBSERVATIONS

WATER COLLECTING AT BASE FROM SEEPAGE BETWEEN 5.0' - 5.5'.

DENTE ENGINEERING

TEST PIT FIELD LOG

PROJECT: Carriage Hill Development		**NUMBER:** TP-5
LOCATION: Brunswick, New York		**FILE NO.** FDE-04-217
CONTRACTOR: Jenkins Excavating		**DATE:** 11-16-04
MAKE: Kobbelco	**MODEL:** SK 160 LC	**ENGINEER:** K. LaPlante
WEATHER: Cloudy	**CAPACITY:**	**REACH:** ft.
GROUND LEVEL:	**TIME START:** 1040	**TIME STOP:** 1040

DEPTH	SOIL DESCRIPTION	EXCAVATION EFFORT	BOULDER COUNT
1'	± 12" Dark Brown TOPSOIL	E	
2'	Bedrock, Steeply Dipping SHALE	D	
3'	Bottom of Test Pit 12" - 18" at practical refusal.		
4'			
5'			
6'			
7'			
8'			
9'			
10'			
11'			
12'			
13'			
14'			
15'			

REMARKS: Outcrops of bedrock around test pit location.

LEGENDS: BOULDER COUNT		ABBREVIATIONS	EXCAVATION EFFORT	GROUNDWATER OBSERVATIONS
SIZE RANGE CLASSIFICATION	LETTER DESIGNATION	F = FINE M = MEDIUM C = COARSE F/M = FINE TO MEDIUM F/C = FINE TO COARSE V = VERY GR = GRAY BN = BROWN YEL = YELLOW	EASY.....E MODERATE.....M DIFFICULT.....D	
6" - 18"	A			
18" - 36"	B			
36" & OVER	C			

DENTE ENGINEERING

TEST PIT FIELD LOG		
PROJECT: Carriage Hill Development		**NUMBER:** TP-5A
LOCATION: Brunswick, New York		**FILE NO.** FDE-04-217
CONTRACTOR: Jenkins Excavating		**DATE:** 11-16-04
MAKE: Kobbelco	**MODEL:** SK 160 LC	**ENGINEER:** K. LaPlante
WEATHER: Cloudy	**CAPACITY:**	**REACH:** ft.
GROUND LEVEL:	**TIME START:** 1020	**TIME STOP:** 1030

DEPTH	SOIL DESCRIPTION	EXCAVATION EFFORT	BOULDER COUNT
1'	± 12" - 18" SILT & Fine SAND, Roots **(MOIST)**	E	
2'	Light Brown Fine SAND & SILT, trace m-c sand, gravel	E	
3'		E	
4'	Brown SILT, Little F-C Sand, Gravel with Occasional Cobbles,	M	
5'	Rock Fragments **(WET TO MOST)**	M	
6'		M	
7'	SHALE BEDROCK	M	
8'		D	
9'	Bottom of Test Pit at 7' 6" at Top of Rock, Practical Refusal.		
10'			
11'			
12'			
13'			
14'			
15'			

REMARKS:

LEGENDS: BOULDER COUNT		ABBREVIATIONS	EXCAVATION EFFORT	GROUNDWATER OBSERVATIONS
SIZE RANGE CLASSIFICATION	LETTER DESIGNATION	F = FINE M = MEDIUM C = COARSE F/M = FINE TO MEDIUM F/C = FINE TO COARSE V = VERY GR = GRAY BN = BROWN YEL = YELLOW	EASY.....E MODERATE.....M DIFFICULT.....D	NONE IN THE TIME ALLOTTED.
6" - 18"	A			
18" - 36"	B			
36" & OVER	C			

DENTE ENGINEERING

TEST PIT FIELD LOG

PROJECT: Carriage Hill Development		**NUMBER:** TP-6
LOCATION: Brunswick, New York		**FILE NO.** FDE-04-217
CONTRACTOR: Jenkins Excavating		**DATE:** 11-16-04
MAKE: Kobbelco	**MODEL:** SK 160 LC	**ENGINEER:** K. LaPlante
WEATHER: Cloudy	**CAPACITY:**	**REACH:** ft.
GROUND LEVEL:	**TIME START:** 1053	**TIME STOP:** 1110

DEPTH	SOIL DESCRIPTION	EXCAVATION EFFORT	BOULDER COUNT
1'	± 12" SILT & Fine SAND with Roots	E	
2'	Light Brown SILT, Little Fine Sand	E	
3'	(MOIST)	E	
4'	Brown SILT, Little F-C Sand, Gravel	M	
5'	(WET TO MOIST)	M	
6'		D	
7'	Rugged, Large Boulders at 7.0'.	D	B/C
8'		D	
9'		D	
10'		D	
11'	Bottom of Test Pit at 10.0' depth.		
12'			
13'			
14'			
15'			

REMARKS:

LEGENDS: BOULDER COUNT

SIZE RANGE CLASSIFICATION	LETTER DESIGNATION
6" - 18"	A
18" - 36"	B
36" & OVER	C

ABBREVIATIONS

F = FINE
M = MEDIUM
C = COARSE
F/M = FINE TO MEDIUM
F/C = FINE TO COARSE
V = VERY
GR = GRAY
BN = BROWN
YEL = YELLOW

EXCAVATION EFFORT

EASY.....E
MODERATE.....M
DIFFICULT.....D

GROUNDWATER OBSERVATIONS

SIGNIFICANT SEEPAGE AT WEST END OF PIT 4' 6"

DENTE ENGINEERING

TEST PIT FIELD LOG

PROJECT: Carriage Hill Development		**NUMBER:** TP-7
LOCATION: Brunswick, New York		**FILE NO.** FDE-04-217
CONTRACTOR: Jenkins Excavating		**DATE:** 11-16-04
MAKE: Kobbelco	**MODEL:** SK 160 LC	**ENGINEER:** K. LaPlante
WEATHER: Cloudy	**CAPACITY:**	**REACH:** ft.
GROUND LEVEL:	**TIME START:** 1130	**TIME STOP:** 1148

DEPTH	SOIL DESCRIPTION	EXCAVATION EFFORT	BOULDER COUNT
1'	8-12" TOPSOIL / ROOT, FOREST MAT	E	
2'	SILT, F-C SAND & GRAVEL with Cobbles, Occasional	M	
3'	Boulders, trace clay	D	
4'		D	
5'		D	
6'		D	
7'		D	
8'		D	
9'		D	
10'	Bottom of Test Pit at 9.0', Hard Digging		
11'			
12'			
13'			
14'			
15'			

REMARKS: Soils generally moist with occasional wet seams

LEGENDS: BOULDER COUNT

SIZE RANGE CLASSIFICATION	LETTER DESIGNATION
6" - 18"	A
18" - 36"	B
36" & OVER	C

ABBREVIATIONS

F = FINE
M = MEDIUM
C = COARSE
F/M = FINE TO MEDIUM
F/C = FINE TO COARSE
V = VERY
GR = GRAY
BN = BROWN
YEL = YELLOW

EXCAVATION EFFORT

EASY.....E
MODERATE.....M
DIFFICULT.....D

GROUNDWATER OBSERVATIONS

SLIGHT SEEPAGE AT 6.0'.

DENTE ENGINEERING

TEST PIT FIELD LOG

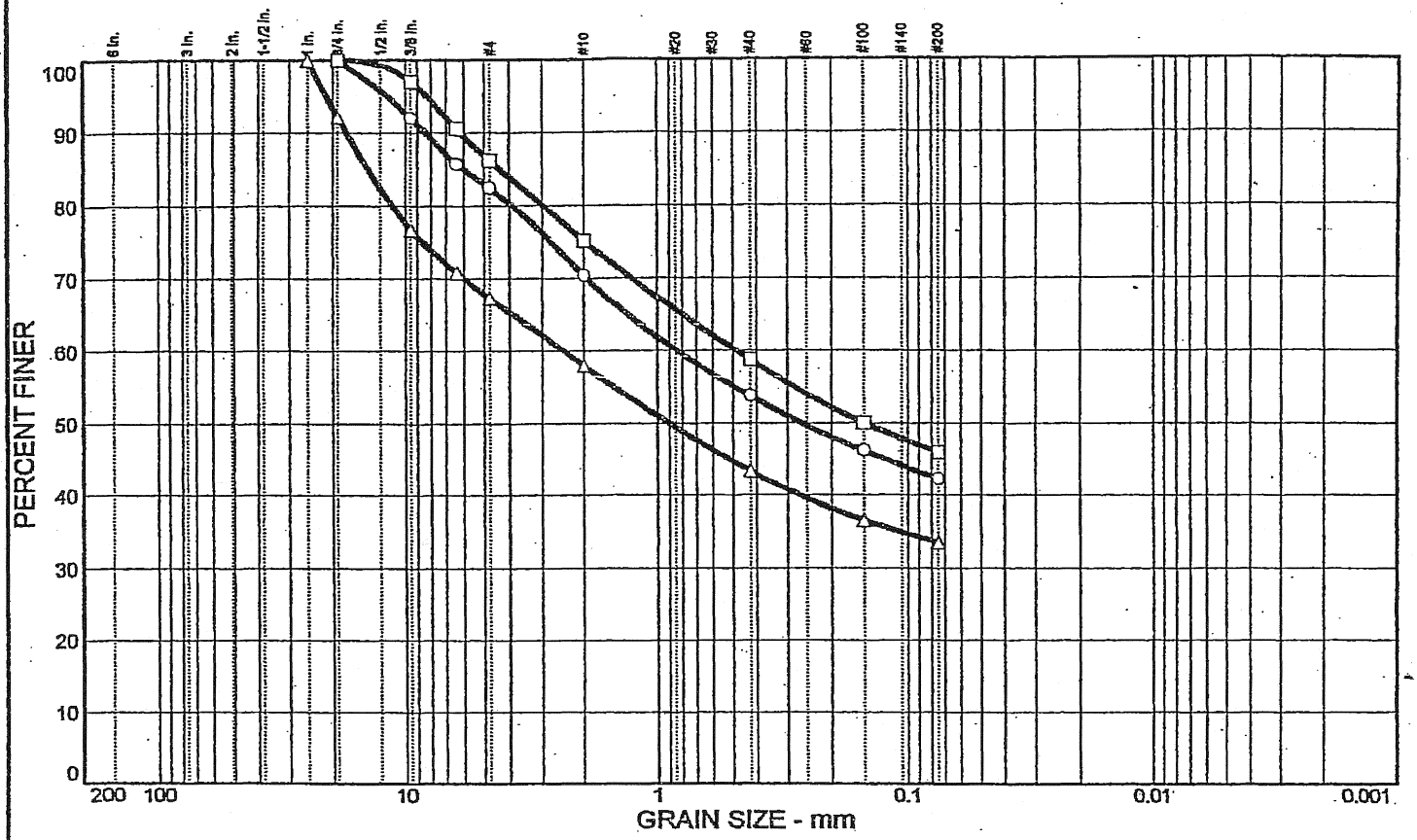
PROJECT: Carriage Hill Development		**NUMBER:** TP-8
LOCATION: Brunswick, New York		**FILE NO.** FDE-04-217
CONTRACTOR: Jenkins Excavating		**DATE:** 11-16-04
MAKE: Kobbelco	**MODEL:** SK 160 LC	**ENGINEER:** K. LaPlante
WEATHER: Cloudy	**CAPACITY:**	**REACH:** ft.
GROUND LEVEL:	**TIME START:** 1350	**TIME STOP:** 1400

DEPTH	SOIL DESCRIPTION	EXCAVATION EFFORT	BOULDER COUNT
1'	10 - 12" SILT, Little Fine Sand with Roots **(VERY MOIST)**	E	
2'	Mottled SILT, Little Sand, trace clay **(MOIST)**	M	
3'	Brown SILT, SAND & GRAVEL with Occasional Cobbles	D	
4'	**(MOIST, HARD)**	D	
5'		D	
6'	Bottom of Test Pit at 5.0' depth.		
7'			
8'			
9'			
10'			
11'			
12'			
13'			
14'			
15'			

REMARKS:

LEGENDS: BOULDER COUNT		ABBREVIATIONS	EXCAVATION EFFORT	GROUNDWATER OBSERVATIONS
SIZE RANGE CLASSIFICATION	LETTER DESIGNATION	F = FINE M = MEDIUM C = COARSE F/M = FINE TO MEDIUM F/C = FINE TO COARSE V = VERY GR = GRAY BN = BROWN YEL = YELLOW	EASY.....E MODERATE.....M DIFFICULT.....D	NO SEEPAGE IN THE TIME ALLOTTED
6" - 18"	A			
18" - 36"	B			
36" & OVER	C			

Particle Size Distribution Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○		17.6	40.1	42.3		SM	A-4(0)	NP	NP
□		13.8	40.2	46.0		SM	A-4(0)	NP	NP
△		32.7	33.8	33.5		SM	A-2-4(0)	NP	NP

SIEVE inches size	PERCENT FINER ○	□	△
1			100.0
.75	100.0	100.0	92.2
.375	92.0	97.0	76.7
.25	85.7	90.5	70.8
	GRAIN SIZE		
D_{60}	0.836	0.482	2.43
D_{30}			
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	82.4	86.2	67.3
#10	70.4	75.2	58.0
#40	53.8	58.8	43.4
#100	46.2	50.1	36.6
#200	42.3	46.0	33.5

SOIL DESCRIPTION

○ med to fine Sand, and Silt, some coarse to fine Gravel
Moisture = 14.2%

□ med to fine Sand, and Silt, some coarse to fine Gravel
Moisture = 10.9%

△ med to fine Sand, some Silt, and coarse to fine Gravel
Moisture = 6.6%

REMARKS:

○ Tested By: MA Checked By: KL
Per ASTM D422 washed

□ Tested By: MA Checked By: KL
Per ASTM D422 washed

△ Tested By: MA Checked By: KL
Per ASTM D422 washed

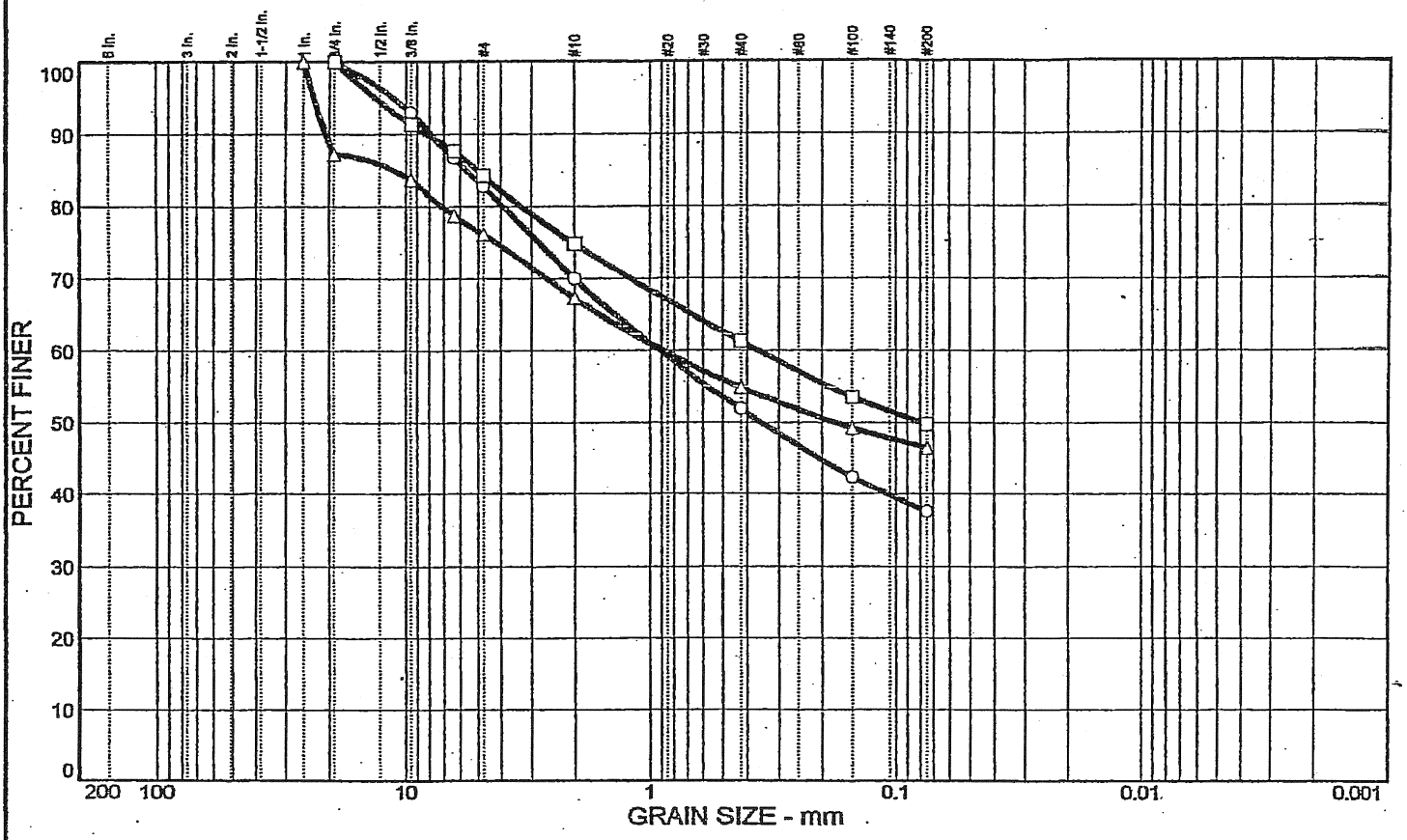
○ Source: Soil Borings	Sample No.: 878	Elev./Depth: B-1, S1 0'-2'
□ Source: Soil Borings	Sample No.: 879	Elev./Depth: B-1, S2 5'-7'
△ Source: Soil Borings	Sample No.: 880	Elev./Depth: B-2, S3 10'-12'

EVERGREEN TESTING, INC.

Client: United Development
Project: Carriage Hill Estates
Brunswick, NY
Project No.: FDE-04-217

Figure 878, 879, 880

Particle Size Distribution Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○		17.3	45.1	37.6		SM	A-4(0)	NP	NP
□		15.8	34.4	49.8		SM	A-4(0)	NP	NP
△		23.9	29.6	46.5		SM	A-4(0)	NP	NP

SIEVE inches size	PERCENT FINER ○	□	△
1			100.0
.75	100.0	100.0	87.2
.375	92.9	91.3	83.6
.25	86.6	87.6	78.7
GRAIN SIZE			
D_{60}	0.912	0.361	0.882
D_{30}			
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	82.7	84.2	76.1
#10	70.0	74.8	67.3
#40	51.9	61.3	54.9
#100	42.4	53.6	49.3
#200	37.6	49.8	46.5

SOIL DESCRIPTION

○ med to fine Sand, and Silt, some coarse to fine Gravel
Moisture = 10.8%

□ med to fine Sand, and Silt, some coarse to fine Gravel
Moisture = 13.4%

△ med to fine Sand, and Silt, some coarse to fine Gravel
Moisture = 8.2%

REMARKS:

○ Tested By: MA Checked By: KL
Per ASTM D422 Washed

□ Tested By: MA Checked By: KL
Per ASTM D422 washed

△ Tested By: MA Checked By: KL
Per ASTM D422

○ Source: Soil Borings — Sample No.: 881 — Elev./Depth: B-3, S2 5'-7'

□ Source: Soil Borings — Sample No.: 882 — Elev./Depth: B-5, S1 0'-2'

△ Source: Soil Borings — Sample No.: 883 — Elev./Depth: B-5, S3 10'-12'

EVERGREEN TESTING, INC.

Client: United Development
Project: Carriage Hill Estates
Brunswick, NY
Project No.: FDE-04-217

Figure 881, 882, 883

DENTE ENGINEERING

ALBANY AREA
594 Broadway
Watervliet, NY 12189
Voice 518-266-0310
Fax 518-266-9238

BUFFALO AREA
PO Box 482
Orchard Park, NY 14127
Voice 716-649-9474
Fax 716-648-3521

June 29, 2005

Ms. Tim Haskins
United Development Corp.
80 State Street
Albany, NY 12201

Re: Preliminary Geotechnical Evaluation for
Orchard Village at Carriage Hill
Brunswick, New York
File No. FDE-04-217

Dear Mr. Haskins:

This report presents the results of a Preliminary Geotechnical Evaluation completed for new independent living senior apartments being planned for a site located to the south of NYS Route 2, between Shippey Road and Shyne Lane, in the Town of Brunswick, Rensselaer County, New York. Our scope of services was outlined in a proposal dated October 15, 2004, which was authorized by United Development Corp. on October 20, 2004.

In general, our scope of services included:

- A reconnaissance of the site and the completion of one test boring and two test pits across the area of proposed senior apartments development.
- The completion of laboratory grain size and moisture testing upon select soil samples recovered from the borings and test pits.
- Evaluation of the results of the field and laboratory investigation and the preparation of this report, which presents our preliminary recommendations for the design and construction of the geotechnical aspects of the structures and associated earthworks.

It should be understood that this report was prepared early in the site design process, before proposed grading plans were developed, and, as such, must be considered

preliminary at this time. As the design of this project progresses and building plans, grades and loading criteria become finalized, we must be afforded the opportunity to review and evaluate these plans, complete additional explorations and modify our recommendations, as necessary.

This report was prepared on the basis of the information supplied to us and the results of a limited number of explorations performed for the field investigation. The test borings and pits were advanced at specific locations and the overburden soils were sampled through limited and specific depths. As such, the subsurface conditions are only known at the locations and through the depths investigated. The subsurface conditions at other locations and depths may be different and these differences may impact upon the conclusions reached and the recommendations offered.

A sheet entitled "Important Information about your Geotechnical Engineering Report" prepared by the Association of Engineering Firms Practicing in the Geosciences is attached. The sheet should never be separated from the report and should be carefully reviewed as it sets the only context within which this report should be used.

The Contractor's bidding the work must review and understand this report. The report should be made available for information on factual data only and must not be interpreted as a warranty of subsurface conditions, whether interpreted from written text, subsurface logs or other data. Should the data contained in the report not be adequate for the Contractor's purposes, the Contractor's may make their own investigations, tests and analyses for use in bid preparation.

SITE AND PROJECT DESCRIPTION

The site planned for development with independent living senior apartments is situated in a residential area, between Shippey Road and Shyne Lane, about 500 to 1000 feet south of NYS Route 2 in the Town of Brunswick, Rensselaer County, New York. The site is depicted on the attached portion of the 7.5' USGS Topographic Map of the Troy South Quadrangle. As shown, grades at the site vary somewhat significantly from about El. 350 at Route 2 to a high point of about El. 500 at the southern site limits. The project site is presently wooded and consists of a series of north south trending, oblong shaped hills.

As we understand it, the site is to be developed with nine, three-story slab on grade apartment type buildings, eight townhouses, a club house and associated asphalt paved driveways, roadways and parking areas. The proposed site grades range from about El. 350 at the entrance off of Route 2 to about El. 510, or so, along the loop road on the south side of the site. We have estimated that cuts and fills on the order of about ten to 12 feet will be required to level the site for development.

To facilitate this study, we have assumed that column and wall loads for the new buildings will be less than about 200 kips and six kips per lineal foot, respectively. We have also assumed that ground floor live loads will typically be less than 150 pounds per square foot.

SUBSURFACE CONDITIONS

As a basis for this preliminary study, one conventional test borings and two test pits were completed at the approximate locations depicted on the attached subsurface investigation plan. The explorations were located in the field using a handheld Garmin etrex Legend Global Positioning System (GPS), which had a reported accuracy of between 19 and 25 feet at this site.

The test boring was advanced using a CME Model 55 all-terrain drill rig and employed hollow stem augers to advance and case the boreholes. Overburden soils were sampled and their relative density determined using split-spoon sampling techniques in general accord with ASTM D-1586 procedures. A subsurface log, which was prepared for the completed exploration by a Geotechnical Technician, is attached, along with sheets that explain the terms used in its preparation.

The test pits were excavated using a Kobelco SK160 LC excavator. The overburden conditions were observed by a geotechnical engineer in the field as the excavations progressed and the results were recorded on Test Pit Field Logs, which are also attached.

As stated previously, the site was mostly covered with relatively dense woodlands. A surficial topsoil/forest mat mantled most areas of the site, with scattered cobbles, boulders and miscellaneous debris on the ground surface. Based on the completed investigations, the surficial forest mat was found to be underlain with shallow glacial till deposits. The bidders must not, however, rely upon the topsoil depths shown on the subsurface logs for bidding purposes and are encouraged to perform their own site observations and testing to obtain representative topsoil thicknesses and assess its quality.

The borings and test pits encountered generally similar conditions at each of the investigated locations. The surficial 12- to 30-inches consisted of fine to coarse sand and silt with lesser amounts of gravel, roots and occasional trace clay, cobbles and boulders. Roots were particularly present within the upper 12- to 24-inches. These surficial soils were generally brown or gray, moist to wet and judged to be of a loose relative density.

With increasing depth, this stratum was classified as silt and fine to coarse sand, little to some gravel with occasional cobbles and boulders. The soils below about 30-inches and extending through the depths explored were generally brownish grading to gray, moist to wet with occasional saturated seams and judged to be of a firm grading to very compact relative density. The saturated soil seams noted in the test pits produced seepage into the excavation.

A couple of the overburden soil samples recovered from B-1 between the ground surface and about seven feet below grade were tested in our laboratory to determine their moisture content and grain size distribution. The results of these tests are attached.

Although not encountered through the depths explored at the Orchard Village Site, our experience in the area suggests that the glacial till deposit extends to bedrock, a thin bedded shale.

Groundwater was not generally noted within the auger casing upon the completion of the test boring. However, as noted in the test pit excavations, numerous perched water tables do exist across the site.

Shallow perched groundwater levels result from precipitation infiltrating the ground surface and collecting within the shallow overburden soils, upon less permeable soils. At this site, the surficial soils have been loosened through seasonal frost penetrations and moisture variations and these looser, and as a result more permeable, soils overlie undisturbed, fine grained and compact deposits. The surficial soils were found to be wet and loose or soft.

Granular seams and layers within the glacial till soils were also found to be saturated and, as a result, were classified as perched water tables. Wet to saturated soil seams and layers were encountered in explorations completed for this study at varying depths and these seams and layers may contain appreciable amounts of water. These saturated seams and layers would be expected to be generally unresponsive to seasonal variations in precipitation and runoff.

The individual subsurface and test pit field logs should be reviewed for more specific information related to the soil and groundwater conditions encountered. However, it should be understood that these logs indicate the groundwater conditions observed at the time the explorations were performed and these levels may be influenced by the methods employed to advance these explorations, the time allowed for groundwater to accumulate following their completion and the season.

PRELIMINARY GEOTECHNICAL EVALUATION

On the basis of the information provided to us, the assumptions made concerning loads and grades and our evaluation of the subsurface conditions disclosed through the site investigation, it is our opinion that the structures planned for this site may be supported with conventional spread foundations with floor slabs bearing upon prepared subgrades. Construction will, however, be complicated by the need to control and divert surface water runoff and groundwater away from work areas, excavate very compact soils containing boulders and complete fills using the on site silty soils.

Areas where fill depths are required to exceed about seven feet in height should be brought to grade and allowed to sit for a period of four to six weeks to allow consolidation and corresponding settlement of the fills to occur before structures or pavements are constructed above. The surface of these fills should be monitored to establish when consolidations, or settlements, are substantially complete.

Development of the site must be planned to provide positive drainage. Temporary and permanent swales and french type drains must be included in the site design. We recommend that the contractor develop a plan to work the site that provides drainage and minimizes the repeated tracking of equipment across unprotected subgrades. In addition, we recommend that the stripping of vegetation and topsoil be sequenced, so as not to expose the underlying overburden to disturbance from precipitation or construction activities for long periods of time before they will be filled or built upon.

Our study disclosed that the site is mantled with up to about one foot of variable quality topsoil, which overlies indigenous, glacially derived soils. In our opinion, the topsoils and surficial 12 to 18 inches of the overburden are unsuitable for the direct support of foundations, floor slabs and pavements in a satisfactory or predictable manner. These soils were found to be wet or saturated and very loose or soft. As such, they should be planned to be removed and replaced with structural fill in order to provide uniform subgrade response. These unsuitable soils will extend to greater depths in low lying, and possibly other, areas.

The bidders should not rely solely upon the topsoil depths shown on the subsurface logs for bidding purposes and are encouraged to perform their own site observations and testing to obtain representative topsoil thicknesses and determine its quality.

In planning cuts at this site, the design inclination of the soil slopes less than about 15 feet in height should initially be planned no steeper than about 1 Vertical on 3 Horizontal (1V:3H). Fill slopes consisting of site soils should also be initially planned no steeper than 1V:3H. If higher slopes are planned or steeper grades are required, these conditions should be evaluated by the Geotechnical Engineer on a case-by case basis. Crest swales and french drains, excavated into the slope face, must be incorporated into the design of the slopes to collect runoff and seepage from slope faces and prevent it from traversing the slopes.

The excavated soils, once broken and moisture conditioned to near their optimum, may be used as a source of fill to elevate site grades. However, it should be understood that the site soils contain an appreciable quantity of silt, which will make their compaction especially sensitive to variations in moisture content. If these soils are, or become, wet of their optimum moisture content, they will be difficult to compact unless they are dried. As such, it will be prudent to budget some volume of off site granular borrow to elevate site grades, especially in building areas. In general, we suggest that the use of site soils for structural fill be ended within about three feet of slab and pavement subgrades.

Any sidewalks, pavements or exterior grade supported slabs planned about the buildings will experience heave with frost penetration and this heave may be differential in nature, particularly at curbs, walks, storm drains, manholes and at entrances to buildings. If these conditions are undesirable, a minimum 16-inch thick non-frost susceptible stone base course composed of ASTM, C33 Blend 57 Stone with

underdrains should be placed beneath the base course to prevent saturation of the shallow soils and limit heave to generally tolerable magnitudes, for most winters. In our opinion, the design of any site retaining walls should be performed by a licensed Professional Engineer and the design submitted for review. Contractor designs often fail to address critical elements, such as drainage and do not address potential global stability issues.

SITE DEVELOPMENT RECOMMENDATIONS

Site development in building and roadway areas should commence with the removal of vegetation, topsoil, forest mat and any saturated, soft surficial soils. Excavations should then be made to establish the desired subgrade and these areas shaped and sealed using a smooth drum vibratory compactor with a static weight of at least five tons. The compactor should complete at least four passes across the subgrades with the compactor operating in vibratory mode. Areas that fail to stabilize, or become unstable beneath the compactor, should be investigated to determine the cause and the soils undercut and replaced with structural fill, as required.

All excavations within the overburden at the site should be designed in accord with the provisions of OSHA 29 CFR Part 1926 for Type B Soils. Where cuts into rock are required, steeper inclinations are possible. However, these conditions should be evaluated on a case-by-case basis based on the rock type, its quality and orientation of the rock beds. It should be noted that the shale bedrock, at least surficially, can usually be ripped. However, if bedrock removal is required over large areas or to depths of more than a few feet, controlled blasting may be required to achieve its economical removal.

Perched groundwater will be encountered at multiple depths in excavations at this site. We caution that the silt rich soils which will form the subgrades are sensitive to construction activities, particularly if the site is allowed to pond water and the soils saturate. All site grading, from initial stripping activities through final construction must be designed and constructed to assure that drainage is provided at all times and that all excavations are dewatered. Subgrade areas that become saturated and unstable, should be undercut and replaced with borrow or suitable on site soils placed and compacted as recommended subsequently. The Geotechnical Engineer should observe final subgrade conditions immediately prior to the placement of fills.

All fill used at this site to backfill excavations or increase grades for support of foundations, floor slabs and pavements should consist of structural fill. Structural fill may consist of excavated site soils that are free of organics, screened of particles larger than about four inches in size and conditioned to within two percent of their optimum moisture content. The use of these materials should, however, be terminated at about three feet below the finished slab and pavement grades.

Within about three feet of finished slab and pavement grades, or if adequate volumes of suitable on site soils are not available to complete the required fills, imported,

sound, durable Sand and Gravel meeting the limits of gradation for NYSDOT Section 304 for Type 1, 3 or 4 Material may be used.

Structural fill soils should be placed in uniform loose layers no more than about one foot thick, where heavy vibratory compaction equipment is used. Smaller lifts should be used where hand operated equipment is required for compaction. In either case, it is recommended that each lift be compacted to not less than 95% of the soil's maximum dry density established through the Modified Proctor Compaction Test, ASTM D-1557.

Foundation and basement wall backfills and backfill more than three feet below finished pavement grades may consist of the materials recommended previously. The backfill material should be placed as recommended above and be compacted to not less than 93% of the soil's maximum dry density established through the Modified Proctor Compaction Test, ASTM D-1557.

We caution that where on site soils are reused, they must be placed in a controlled manner, such that their moisture content is within 2% of optimum, and be compacted to the maximum dry density recommended above. Further, these soils must be graded and sloped at all times to promote their surface drainage, as should the soils in areas to receive fills. It must be understood that, given their relatively high fines content (percent by weight of material passing the number 200 sieve size), placement and compaction of these materials will be difficult, particularly during periods of wet weather. A synthetic fabric, such as Mirafi 500X, may be employed as necessary to reinforce unstable subgrades in deeper fill areas.

Because even controlled fills can consolidate once the design subgrade is established, settlement of all fills in excess of about seven feet deep should be monitored over an estimated period of four to six weeks before foundation or road construction should begin. The holding period will allow the newly constructed fills to settle and, thus, the post construction total and differential settlements will be controlled.

Fills to be constructed upon existing slopes should be benched into the slope in steps no greater than two feet in height and extend at least three feet into the existing grades. A crest swale should be incorporated into the design to collect runoff and prevent it from traversing the slopes. The need for additional drainage features, such as a blanket drain at the interface between the existing grades with the fill, should be evaluated during construction based on field observations by the Engineer.

SEISMIC DESIGN CONSIDERATIONS

Site Classification: Our evaluation of the subsurface conditions at the site has been conducted following the Building Code of New York State (Code). We have evaluated the site conditions encountered in accordance with Table 1615.1.1 and recommend that Seismic Site Class C be used in the design.

Liquefaction: As required by the Code, we have also evaluated the liquefaction potential of the soils encountered at this site. For soils to be considered susceptible to liquefaction, they must be predominantly granular and located beneath the water table. Considering the composition of the soils encountered at this site and their relative density, it is our opinion that there is no significant risk of liquefaction.

Lateral Forces: Where required by the Code, exterior foundation or retaining walls should be designed to resist superimposed effects of the total static lateral soil pressure, excluding any temporary surcharge, plus an earthquake force calculated with the equation $0.034\ Y_t\ H^2$, where Y_t is the total unit weight of the soils and H is the height of the wall (in feet) measured between the finished floor in front and behind the wall. A total unit weight equal to 130 pounds per cubic foot is recommended for use in the equation.

CONVENTIONAL SPREAD FOUNDATIONS

Spread foundations may be designed to bear upon structural fill or the undisturbed indigenous soils, provided that the recommendations provided herein regarding subgrade preparation, fill placement and holding period are followed. Where structural fill is used to establish bearing grades, it should extend beyond the foundation edges in all directions a distance at least equal to the depth of fill required to be placed beneath the foundation.

All wall foundations should have a minimum width of 18 inches and column foundations should have a minimum width of 24 inches. Exterior foundations should bear at least four feet beneath final adjacent exterior grades to afford frost penetration protection. Interior foundations, in heated areas, may bear two feet beneath the interior floor slabs.

Provided all preparatory earthwork is completed as recommended, soil supported continuous wall and isolated column foundations may be proportioned using an allowable net bearing pressure of 3,000 pounds per square foot. A coefficient of friction equal to 0.35 between the foundation and subgrade soil may be used in the design. All foundations should bear upon near level, firm and stable subgrades composed of the undisturbed, indigenous soils or structural fill which extends to the undisturbed, indigenous soils. All bearing grades should be inspected by the Geotechnical Engineer prior to forming.

The foundations will settle in a semi-elastic manner as loads are applied. If the dead and live loads are roughly equal, then roughly half of the settlements will occur during construction with the balance as live loads are transmitted. The actual settlement of the building will be related to the care exercised during the foundation grade preparations. Where good workmanship and stable grades are provided, we estimate that total settlements will not exceed about one inch, with differential settlements of no more than about ½-inch. This estimate assumes that the recommended holding periods are provided for fill areas, where required.

We recommend that a perimeter footing drain be constructed about each of these buildings, with the pipe set adjacent to the footing. We believe that a nominal four inch diameter perforated or slotted pipe sloped at 1% and bedded within at least two feet of ASTM C-33 Blend 57 stone should be suited to the conditions expected to exist at this site. The stone must be separated from the existing soils with a drainage fabric, such as Mirafi 140N. The system should drain by gravity. Underdrains should also be provided about elevators, stairwells or other slab areas, which may be planned beneath the general floor grade.

Backfill placed within two feet of the foundation wall should consist of the imported sand and gravel materials recommended above. The backfill surface should, however, be sealed off with asphalt, concrete or in planting areas, silt or clay, to promote runoff and limit the infiltration of surface water to the backfills. The ground surface should slope away from the building or wall. The underdrain and utility pipes should have clean outs provided for their routine maintenance.

If the foundation wall will also serve as a retaining wall, the drains should be constructed as recommended below.

LATERAL EARTH PRESSURES AND FOUNDATION DRAINAGE

Foundation or site retaining walls that are backfilled on one side and restrained against rotation should be designed to resist At-Rest lateral earth loads calculated using an equivalent fluid weight for the select granular backfill equal to 56 pounds per cubic foot, where the retained grades are level. If the walls are not restrained, free to rotate and backfilled with the select granular soils recommended, they may be designed to resist Active lateral earth pressures calculated using an equivalent fluid weight of the select granular soil equal to 36 pounds per cubic foot (for level backfill). Seismic lateral earth pressures should also be included in the design, where required by the Code.

Applicable surcharges for adjacent floors, vehicles or sloping ground should be added as a uniform lateral pressure over the height of wall equal to 0.5 times the vertical surcharge load. Passive earth pressures may be included in the wall's stability calculations for that portion of the wall more than two feet beneath the toe grade using an equivalent fluid weight of 200 pounds per cubic foot. A Coefficient of Friction of 0.40 may be used between the foundation and granular soils. All foundation backfilling and site grading requiring fill placement should be accomplished in the controlled manner recommended.

A footing drain must be incorporated into retaining wall design to maintain perched waters below the lowest slab or grade level and prevent the build-up of hydrostatic pressures on below grade walls that are backfilled on one side. This drainage system should, at a minimum, consist of a perimeter footing drain around the entire building (or wall), with the top of the pipe set below the lowest level floor slab.

Below grade walls that are backfilled on one side should be constructed with a geocomposite drainage panel, such as Miradrain 6000, backfilled with a free draining granular soil such as ASTM C33 concrete gravel. A foundation level drain should be provided at the outside edge of perimeter footings adjacent to below grade foundation walls. We believe that a nominal four inch diameter perforated or slotted pipe sloped at 1% and bedded within at least two feet of ASTM C-33 Blend 57 stone, which is separated from the existing soils with a drainage fabric such as Mirafi 140N, should be suited to the conditions that may exist at this site. The drain pipe should connect to a sump equipped with a dual motor pump and power interruption warning to drain the system, if gravity drainage is not feasible. Underdrains should also be provided about elevators, stairwells or other slab areas, which may be planned beneath the general floor grade.

The foundation or retaining wall backfill surface should be sealed off with asphalt, concrete or in planting areas, silt or clay, to limit the infiltration of surface water to the basement backfills. The ground surface should slope away from the building or wall. The underdrain and utility pipes should have clean outs provided for their routine maintenance.

FLOOR SLAB DESIGN AND CONSTRUCTION

Where resilient tile floors are planned, the floor slabs should be cast above a four-inch thick stone vapor break layer composed of ASTM C-33 Blend 57 material. The stone vapor break layer should be placed upon a minimum four inch thick layer of structural fill meeting the gradation requirements of NYSDOT Section 304.0 for Type 2 material. Where resilient tile or other moisture sensitive flooring is not planned, the floor slab may be cast directly upon a six-inch thick Type 2 structural fill layer. A vapor retarder should be placed beneath the floor slabs in accordance with the latest revision of the ACI Guide for Concrete Floor and Slab Construction.

The slabs should be designed following the recommended procedures of the American Concrete Institute or Portland Cement Association using a Modulus of Subgrade Reaction equal to 175 pounds per cubic inch. We believe that post construction slab settlements should be negligible provided our recommendations concerning subgrade preparation, holding periods and slab design are followed.

PAVEMENTS

It should be understood that much of the existing site soils that will form pavement subgrades at this site are considered susceptible to volume changes when they are frozen and thawed. The pavement sections presented subsequently will not prevent frost heave from occurring, but rather were selected to provide support for the pavements when subgrades thaw and their strength is at a minimum.

All new pavement areas should be stripped of the existing topsoils and any soft, surficial soils and the resulting subgrade proof-compacted. Proof-compacting should be accomplished by completing five or more passes over the subgrades using a steel

drum vibratory roller with a minimum static weight of ten tons. Areas that exhibit instability under the passing roller should be undercut and stability established through the placement of structural fill compacted as recommended. These filled areas should be carefully graded to prevent the ponding of waters upon subgrades. All base courses should be drained through sloping and/or crowning of subgrades to their periphery, where underdrains should be located to remove the water.

The following pavement sections are recommended for use at the site. The auto parking section was developed for a general 50,000 EAL and the service drives for a general 200,000 EAL with a saturated CBR value equal to 3.0.

FLEXIBLE PAVEMENT SECTION			
MATERIAL	NYSDOT ITEM	LAYER THICKNESS	
		AUTO PARKING	SERVICE DRIVES
Wearing Course	403.18 Type 6 or 7	1-½"	1½"
Binder Course	403.13 Type 3	2"	3"
Base Course	304.03 Type 2	10"	14"
Fabric	Mirafi 500X	Yes	Yes

All subgrades should be crowned and sloped to promote drainage of the base course. Failure to provide a drained base course will materially degrade future pavement performance.

All materials and construction should conform with the NYSDOT Standard Specifications, Construction and Materials. The base course materials may be placed in a single lift and should be compacted to the density criteria previously recommended.

ADDITIONAL STUDIES

As the design of this project progresses and building plans, grades and loading criteria become finalized, we must be afforded the opportunity to review and evaluate these plans and modify the recommendations presented herein, as necessary. Supplemental test borings and test pits are recommended to determine the overall stratigraphy and develop more detailed foundation recommendations. A proposal for this supplemental work has already been provided to United Development.

CONSTRUCTION OBSERVATION

The foundation, slab and pavement design recommendations provided in this report are premised on the Geotechnical Engineer being retained to monitor earthwork and

bearing grade preparations. It should be understood that the actual subsurface conditions that exist will only be known when the site is excavated. The presence of the Geotechnical Engineer during the earthwork and foundation construction phases will allow validation of the subsurface conditions assumed to exist for this study and the design recommended in this report.

We believe that construction sequence observation and testing should be provided by the Geotechnical Engineer of record as a consultant to the owner. We do not believe these services should be provided through the earthwork contractor.

CLOSURE

This report was prepared for specific application to the project site and construction planned. It was prepared on the basis of a limited number of investigation locations at the site. Subsurface conditions at other than the investigated locations may be different. The Geotechnical Engineer should be retained for construction period observation and testing. We should also be allowed the opportunity to review appropriate plans and specifications prior to their release for bidding. This report was prepared using methods and practices common to Geotechnical Engineering. No warranties expressed or implied are made.

We appreciate the opportunity to be of service. Should questions arise or if we may be of any other service, please contact us at your convenience.

Yours truly,
Dente Engineering, P.C.

Keith LaPlante, P.E.
Vice President

Fred A. Dente, P.E.
President

Attachments:

Important Information About Your Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you —* should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

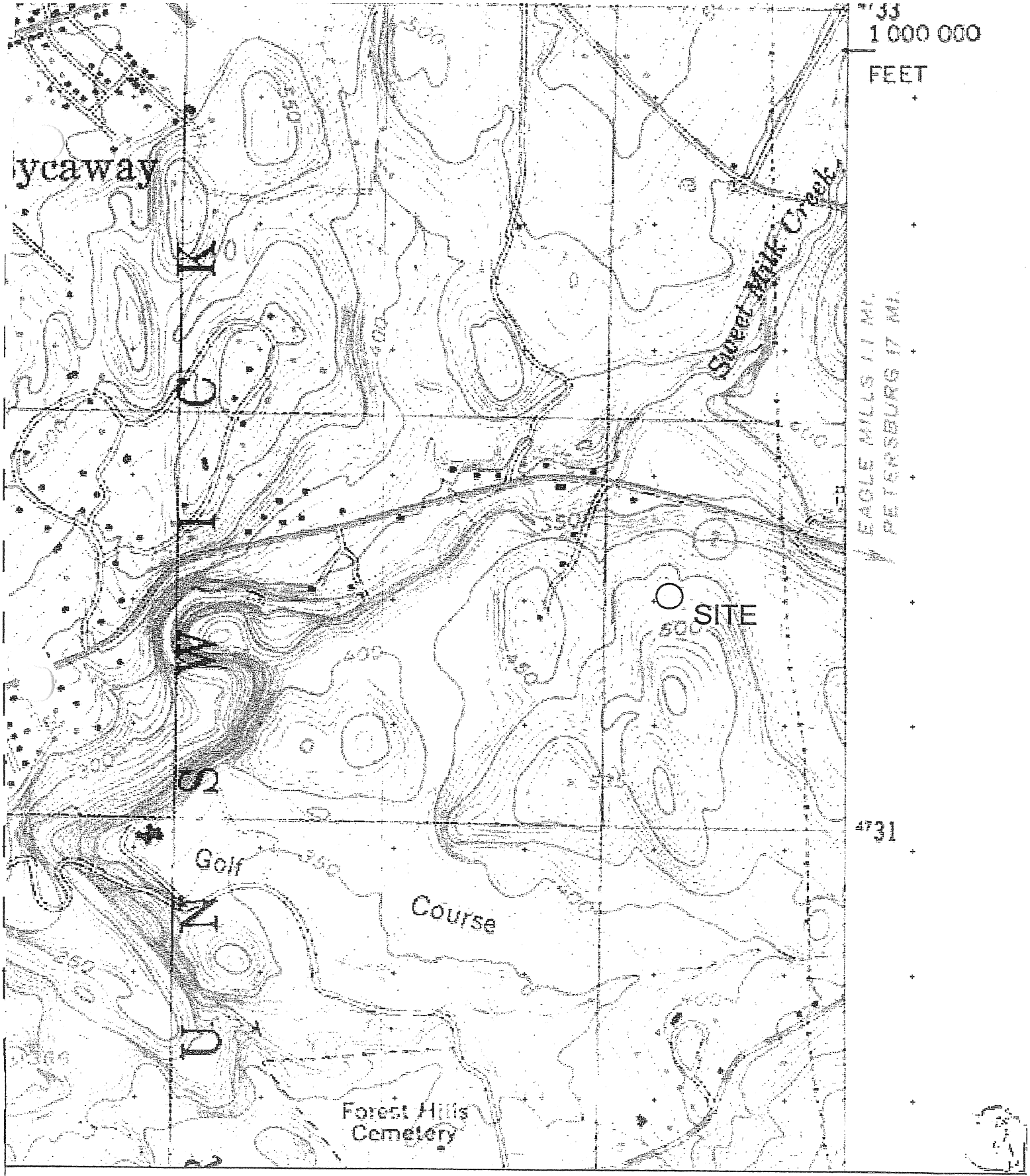
A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

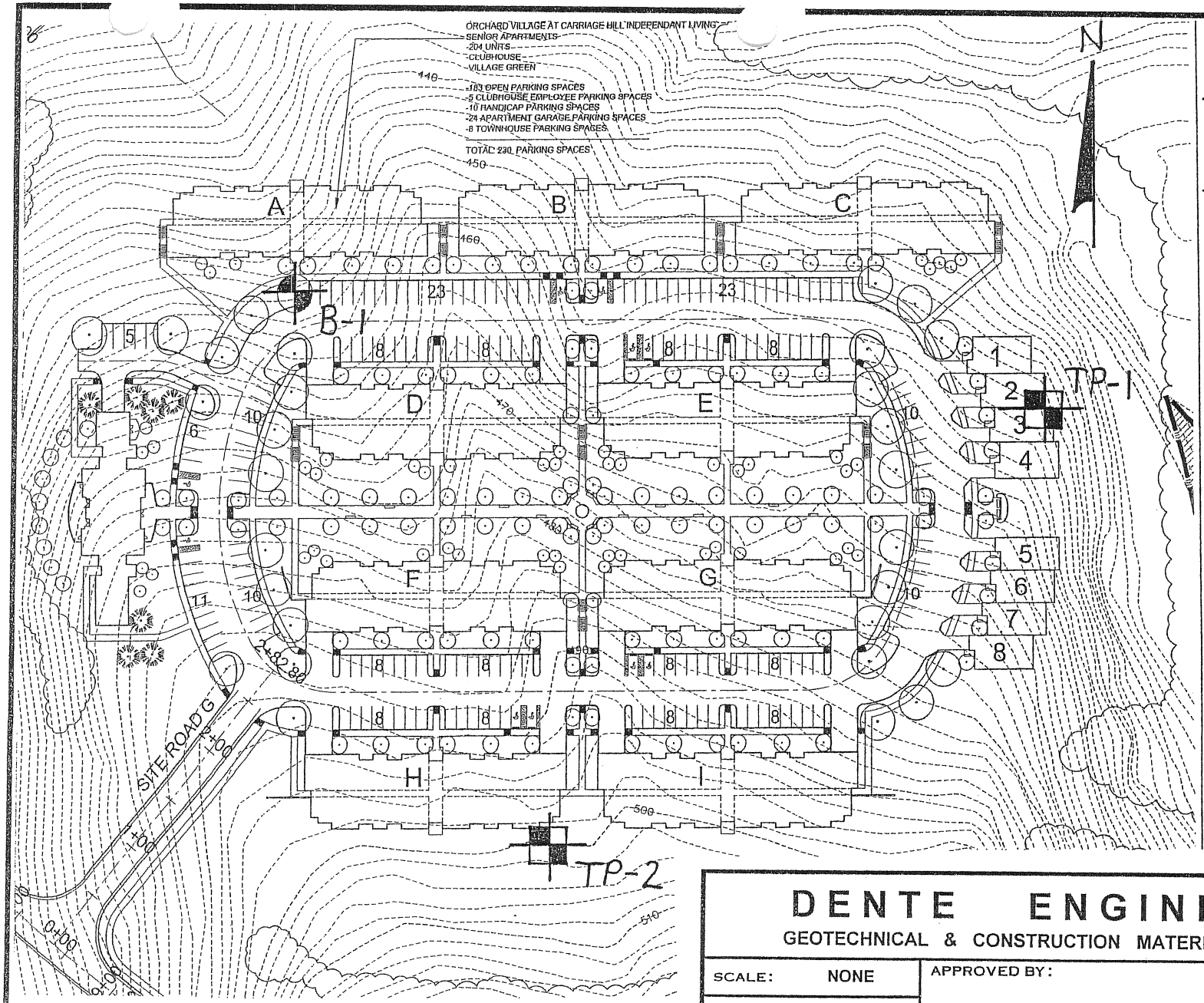
A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual



Name: TROY SOUTH
Date: 6/29/105
Scale: 1 inch equals 1000 feet

Location: 042° 43' 51.3" N 073° 38' 03.7" W
Caption: Orchard Village at Carriage Hill
Brunswick, New York



BASE PLAN BY SARATOGA ASSOCIATES

DENTE ENGINEERING

GEOTECHNICAL & CONSTRUCTION MATERIALS CONSULTING

SCALE: NONE	APPROVED BY:	DRAWN BY	KEL
DATE: 6/29/2005		REVISED	

ORCHARD VILLAGE AT CARRIAGE HILL
BRUNSWICK, NEW YORK

SUBSURFACE EXPLORATION PLAN

DRAWING NUMBER
1

INTERPRETATION OF SUBSURFACE LOGS

The Subsurface Logs present observations and the results of tests performed in the field by the Driller, Technicians, Geologists and Geotechnical Engineers as noted. Soil/Rock Classifications are made visually, unless otherwise noted, on a portion of the materials recovered through the sampling process and may not necessarily be representative of the materials between sampling intervals or locations.

The following defines some of the terms utilized in the preparation of the Subsurface Logs.

SOIL CLASSIFICATIONS

Soil Classifications are visual descriptions on the basis of the Unified Soil Classification ASTM D-2487 and USBR, 1973 with additional comments by weight of constituents by BUHRMASTER. The soil density or consistency is based on the penetration resistance determined by ASTM METHOD D1586. Soil Moisture of the recovered materials is described as DRY, MOIST, WET or SATURATED.

SIZE DESCRIPTION	
SOIL TYPE	PARTICLE SIZE
BOULDER	> 12
COBBLE	3" - 12"
GRAVEL-COARSE	3" - 3/4"
GRAVEL - FINE	3/4" - #4
SAND - COARSE	#4 - #10
SAND - MEDIUM	#10 - #40
SAND - FINE	#40 - #200
SILT/NONPLASTIC	< #200
CLAY/PLASTIC	< #200

RELATIVE DENSITY/CONSISTENCY (basis ASTM D1586)			
GRANULAR SOIL		COHESIVE SOIL	
DENSITY	BLOWS/FT.	CONSISTENCY	BLOWS/FT.
LOOSE	< 10	VERY SOFT	< 3
FIRM	11 - 30	SOFT	4 - 5
COMPACT	31 - 50	MEDIUM	6 - 15
VERY COMPACT	50 +	STIFF	16 - 25
		HARD	25 +

SOIL STRUCTURE	
STRUCTURE	DESCRIPTION
LAYER	6" THICK OR GREATER
SEAM	6" THICK OR LESS
PARTING	LESS THAN 1/4" THICK
VARVED	UNIFORM HORIZONTAL PARTINGS OR SEAMS

RELATIVE PROPORTION OF SOIL TYPES	
DESCRIPTION	% OF SAMPLE BY WEIGHT
AND	35 - 50
SOME	20 - 35
LITTLE	10 - 20
TRACE	LESS THAN 10

Note that the classification of soils or soil like materials is subject to the limitations imposed by the size of the sampler, the size of the sample and its degree of disturbance and moisture.

ROCK CLASSIFICATIONS

Rock Classifications are visual descriptions on the basis of the Driller's, Technician's, Geologist's or Geotechnical Engineer's observations of the coring activity and the recovered samples applying the following classifications.

CLASSIFICATION TERM	DESCRIPTION
VERY HARD	NOT SCRATCHED BY KNIFE
HARD	SCRATCHED WITH DIFFICULTY
MEDIUM HARD	SCRATCHED EASILY
SOFT	SCRATCHED WITH FINGERNAIL
VERY WEATHERED	DISINTEGRATED WITH NUMEROUS SOIL SEAM
WEATHERED	SLIGHT DISINTEGRATION, STAINING, NO SEAMS
SOUND	NO EVIDENCE OF ABOVE
MASSIVE	ROCK LAYER GREATER THAN 36" THICK
THICK BEDDED	ROCK LAYER 12" - 36"
BEDDED	ROCK LAYER 4" - 12"
THIN BEDDED	ROCK LAYER 1" - 4"
LAMINATED	ROCK LAYER LESS THAN 1"
FRACTURES	NATURAL BREAKS AT SOME ANGLE TO BEDS

Core sample recovery is expressed as percent recovered of total sampled. The ROCK QUALITY DESIGNATION (RQD) is the total length of core sample pieces exceeding 4" length divided by the total core sample length for N size cored.

GENERAL

- Soil and Rock classifications are made visually on samples recovered. The presence of Gravel, Cobbles and Boulders will influence sample recovery classification density/consistency determination.
- Groundwater, if encountered, was measured and its depth recorded at the time and under the conditions as noted.
- Topsoil or pavements, if present, were measured and recorded at the time and under the conditions as noted.
- Stratification Lines are approximate boundaries between soil types. These transitions may be gradual or distinct and are approximated.

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-1

PROJECT: Carriage Hill Development	DATE	START: 11-4-04	FINISH: 11-4-04

LOCATION: Brunswick, New York	METHODS: 4 1/4" HSAC with
CLIENT: United Development	ASTM D 1586
JOB NUMBER: FDE-04-217	SURFACE ELEVATION:
DRILL TYPE: CME 55	CLASSIFICATION: G. Blackburn

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	TOPSOIL ± 4"
	1	1	1				Tan / Brown F-C SAND & SILT, Little F-M
				2	3	3	Gravel
5'							(MOIST, LOOSE)
	2	6	35				Mottled Brown / Orange / Gray / Olive F-C
				30	24	50+	SAND & SILT, Little Gravel
10'							
	3	8	16				Grades Gray / Brown F-C SAND & SILT,
				20	27	36	Some Gravel
15'							
	4	4	16				Grades Gray SILT & GRAVEL, Little F-C Sand
				20	24	36	(MOIST, V. COMPACT TO COMPACT)
							End of boring at 17.0' depth.
							No measurable groundwater observed inside
20'							augers upon completion.
25'							
30'							

DENTE ENGINEERING

TEST PIT FIELD LOG

PROJECT: Carriage Hill Development		**NUMBER:** TP-1
LOCATION: Brunswick, New York		**FILE NO.** FDE-04-217
CONTRACTOR: Jenkins Excavating		**DATE:** 11-16-04
MAKE: Kobbelco	**MODEL:** SK 160 LC	**ENGINEER:** K. LaPlante
WEATHER: Cloudy	**CAPACITY:**	**REACH:** ft.
GROUND LEVEL:	**TIME START:** 0825	**TIME STOP:** 0850

DEPTH	SOIL DESCRIPTION	EXCAVATION EFFORT	BOULDER COUNT
1'	Mottled Dark Brown / Gray SILT, Little to Fine Sand, Gravel,	E	
2'	Roots with Boulders **(VERY WET)**	E	
3'	Brown SILT, Little F-C Sand & Gravel with Occasional Cobbles	M	
4'	Rock Fragments **(WET, MOIST)**	M	
5'	Slight Seepage of Groundwater	D	
6'	Grades Occasional Boulders, Grayish / Brown	D	
7'	Hard Digging at 7.0' **(MOIST)**	D	
8'		D	
9'		D	
10'	Bottom of Test Pit at 8' 6" (Slow Progress)		
11'			
12'			
13'			
14'			
15'			

REMARKS: Surficial 8 - 20" soft and wet

LEGENDS: BOULDER COUNT		ABBREVIATIONS	EXCAVATION EFFORT	GROUNDWATER OBSERVATIONS
SIZE RANGE CLASSIFICATION	LETTER DESIGNATION	F = FINE M = MEDIUM C = COARSE F/M = FINE TO MEDIUM F/C = FINE TO COARSE V = VERY GR = GRAY BN = BROWN YEL = YELLOW	EASY.....E MODERATE.....M DIFFICULT.....D	SEEPAGE BETWEEN 8-20" AND 48"
6" - 18"	A			
18" - 36"	B			
36" & OVER	C			

DENTE ENGINEERING

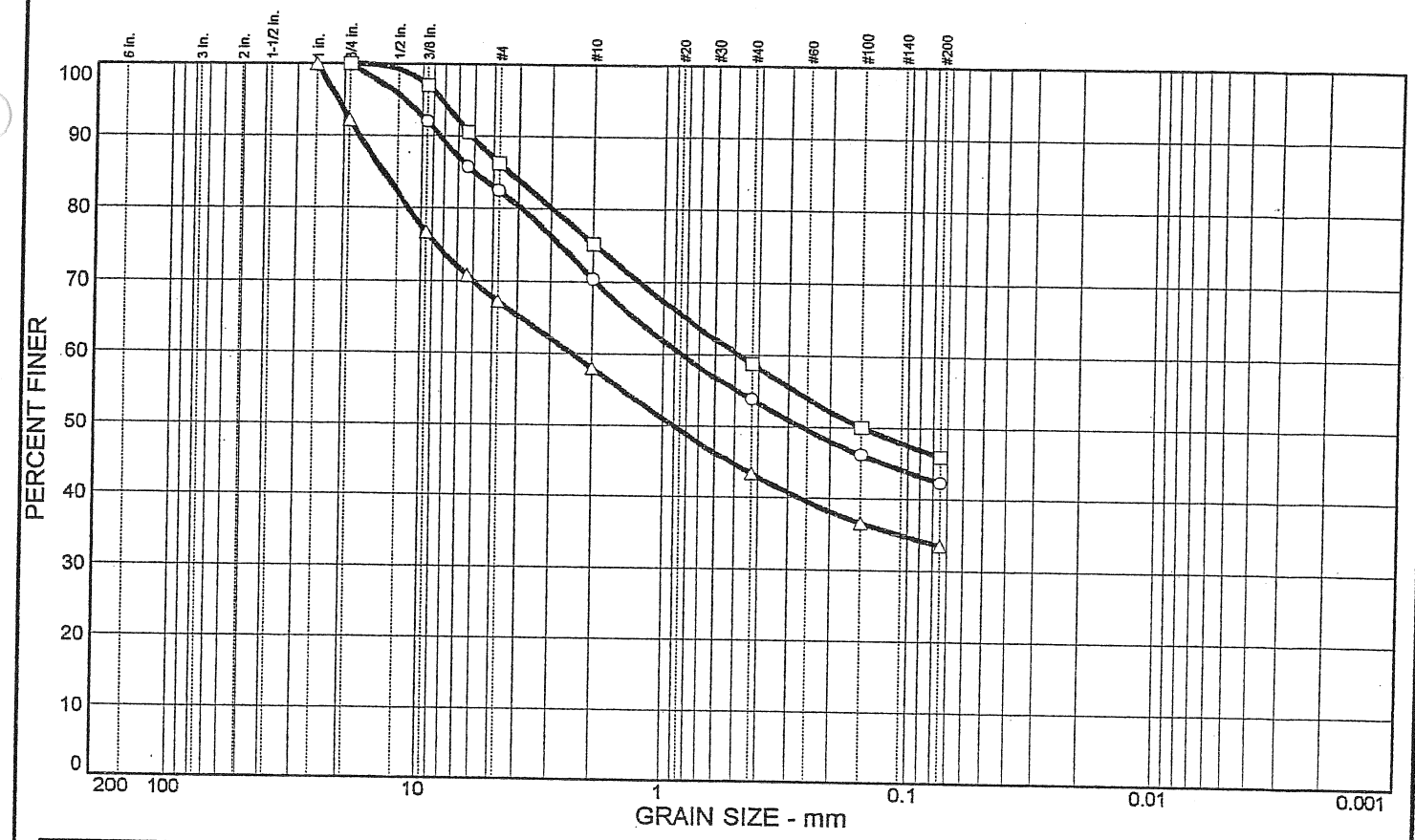
TEST PIT FIELD LOG		
PROJECT: Carriage Hill Development		**NUMBER:** TP-2
LOCATION: Brunswick, New York		**FILE NO.** FDE-04-217
CONTRACTOR: Jenkins Excavating		**DATE:** 11-16-04
MAKE: Kobbelco	**MODEL:** SK 160 LC	**ENGINEER:** K. LaPlante
WEATHER: Cloudy	**CAPACITY:**	**REACH:** ft.
GROUND LEVEL:	**TIME START:** 0910	**TIME STOP:** 0930

DEPTH	SOIL DESCRIPTION	EXCAVATION EFFORT	BOULDER COUNT
1'	± 12" Brown SILT & Fine SAND, TOPSOIL with Roots	E	
2'	Brown SILT, Little F-C Sand, trace clay, gravel, rootlets	E	
3'		M	
4'	Brown SILT, Little to Some F-C SAND & GRAVEL with	M	
5'	Occasional Cobbles, Boulders, trace clay	D	
6'		D	
7'	(MOIST TO WET)		
8'	Harder at 7.0', with Cobbles, Boulders, Rock Fragments		
9'			
10'	Bottom of Test Pit at 9.0' Very Hard Digging		
11'			
12'			
13'			
14'			
15'			

REMARKS: Numerous Rock Fragments - Slight Water Seepage Locally at Boulders

LEGENDS: BOULDER COUNT		ABBREVIATIONS	EXCAVATION EFFORT	GROUNDWATER OBSERVATIONS
SIZE RANGE CLASSIFICATION	LETTER DESIGNATION	F = FINE M = MEDIUM C = COARSE F/M = FINE TO MEDIUM F/C = FINE TO COARSE V = VERY GR = GRAY BN = BROWN YEL = YELLOW	EASY.....E MODERATE.....M DIFFICULT.....D	
6" - 18"	A			
18" - 36"	B			
36" & OVER	C			

Particle Size Distribution Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○		17.6	40.1	42.3		SM	A-4(0)	NP	NP
□		13.8	40.2	46.0		SM	A-4(0)	NP	NP
△		32.7	33.8	33.5		SM	A-2-4(0)	NP	NP

SIEVE inches size	PERCENT FINER ○	□	△
1			100.0
.75	100.0	100.0	92.2
.375	92.0	97.0	76.7
.25	85.7	90.5	70.8
	GRAIN SIZE		
D_{60}	0.836	0.482	2.43
D_{30}			
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	82.4	86.2	67.3
#10	70.4	75.2	58.0
#40	53.8	58.8	43.4
#100	46.2	50.1	36.6
#200	42.3	46.0	33.5

SOIL DESCRIPTION

○ med to fine Sand, and Silt, some coarse to fine Gravel
Moisture = 14.2%

□ med to fine Sand, and Silt, some coarse to fine Gravel
Moisture = 10.9%

△ med to fine Sand, some Silt, and coarse to fine Gravel
Moisture = 6.6%

REMARKS:

○ Tested By: MA Checked By: KL
Per ASTM D422 washed

□ Tested By: MA Checked By: KL
Per ASTM D422 washed

△ Tested By: MA Checked By: KL
Per ASTM D422 washed

○ Source: Soil Borings — Sample No.: 878 — Elev./Depth: B-1, S1 0'-2'

□ Source: Soil Borings — Sample No.: 879 — Elev./Depth: B-1, S2 5'-7'

△ Source: Soil Borings — Sample No.: 880 — Elev./Depth: B-2, S3 10'-12'

EVERGREEN TESTING, INC.

Client: United Development

Project: Carriage Hill Estates
Brunswick, NY

Project No.: FDE-04-217

Figure 878, 879, 880

DENTE ENGINEERING

ALBANY AREA
594 Broadway
Watervliet, NY 12189
Voice 518-266-0310
Fax 518-266-9238

BUFFALO AREA
PO Box 482
Orchard Park, NY 14127
Voice 716-649-9474
Fax 716-648-3521

August 23, 2005

Mr. Tim Haskins
United Development Corp.
80 State Street
Albany, NY 12201

Re: Supplemental Geotechnical Evaluation for
Carriage Hill Development
Brunswick, New York
File No. FDE-04-217

Gentlemen:

This report presents the results of our supplemental geotechnical study which was completed to evaluate the deep excavations planned for roadways and building lots at the referenced site, which is located between NYS Route 2 and Pinewoods Avenue, just east of the Troy Country Club, in the Town of Brunswick, Rensselaer County, New York. In general, our scope of services included:

- The review of progress site grading plans.
- Completing five exploratory test borings at the approximate locations selected by Saratoga Associates and located in the field by Hershberg & Hershberg.
- The preparation of this report, which presents our recommendations concerning the design and construction of cut and fill geometry and earthworks at the site.

Our understanding of the project was generated through a review of the plans provided to us and discussions with our Client. As the design of this project progresses and plans and grades become finalized, we should be afforded an opportunity to review and evaluate the effects that any changes made during the design may have upon the recommendations presented in this report. This report was prepared as a supplement our November 23, 2004 geotechnical report for the project, and not as a stand alone document.

A sheet entitled "Important Information about your Geotechnical Engineering Report" prepared by the Association of Engineering Firms Practicing in the Geosciences is

attached to this report. This sheet should never be separated from the report and be carefully reviewed as it sets the only context within which this report should be used.

It should be understood that this report was prepared on the basis of the results of a limited number of test borings. The test borings were advanced at specific locations and the overburden soils were sampled at limited and specific depths. As such, the subsurface conditions at other locations and depths may be different and these differences may impact upon the conclusions reached and recommendations offered. For this reason, we strongly recommend that we be retained to provide construction period observation and testing services.

The Contractor's bidding work at this site must review and understand this report, as well as our earlier reports prepared for the project. Our reports should be made available for information on factual data only and must not be interpreted as a warranty of subsurface conditions whether interpreted from written text, subsurface logs or other data. Should the data contained in the reports not be adequate for the Contractor's purposes, the Contractor's may make their own investigations, tests and analyses for use in bid preparation.

SITE AND PROJECT DESCRIPTION

The site planned for development is situated in a residential area between NYS Route 2 and Pinewoods Avenue, just east of the Troy Country Club, in the Town of Brunswick, Rensselaer County, New York. The site is depicted on the attached portion of the 7.5' USGS Topographic Map of the Troy South Quadrangle. As shown, grades at the site vary somewhat significantly from about El. 350 at Route 2 to high points of about El. 550 at the top of a few of the hills. Overhead power lines and an underground gas line pass through the eastern portion of the site.

The project site is presently a mix of brush-covered fields and dense woodlands, although the majority of the site is believed to be wooded. We understand that an area near the southeast corner of the site was formerly used as a junk yard. In general, the site consists of a series of north south trending, oblong shaped hills, bordered to the north by the Poesten Kill and the south by an unnamed stream. The lower lying areas between hills at this site were wet in many areas and the surficial soils very soft.

The purpose of this supplemental study was to evaluate the subsurface conditions in four areas of the site where cuts are estimated to be on the order of about 25 to 50 feet in depth. The following sections of this report will present a discussion of the subsurface conditions encountered during these recent investigations, as well as preliminary site design considerations in these deep cut areas. Additional subsurface investigations and recommendations concerning earthwork, pavements and foundations at this site were summarized in our November 23, 2004 Geotechnical Report, which should also be reviewed.

SUMMARY OF SUBSURFACE CONDITIONS

The subsurface conditions were explored through the completion of five exploratory test borings performed at the *approximate* locations depicted on the attached Subsurface Investigation Plan. The borings were advanced through the overburden using a rotary drill rig and the soils were sampled through the procedures of ASTM D-1586. Subsurface logs, which were prepared for each of the test borings by a geotechnical engineer, are attached together with a sheet explaining the terms used in their preparation.

In summary, the recent test borings determined that the overburden extended through the depths explored, about 22 to 51.5 feet below grade, and bedrock was not encountered. The overburden soils consisted of surficially weathered, and as a result loosened, glacial till which graded to sound till at depths ranging from about two to three feet below grade at the locations investigated. The till consisted of a mixture of moist to wet silt, sand, gravel, cobbles and boulders with lesser amounts of clay. The soils were soft and loose, where surficially weathered, and graded with increasing depth to a very compact relative density. Seams and layers of sandier soils, possibly saturated, should be expected within the till soils.

Several of the samples collected for this study were tested to determine their moisture content and particle size distribution, the results of which are attached.

The groundwater measurements attempted by the drill crew within the hollow stem auger casing and core holes advanced for the test borings did not measure stabilized water levels within the allotted time. It should be understood that groundwater enters drilled bores at different rates dependent upon a number of factors and that the levels or absence of recorded measurements may or may not represent stabilized groundwater levels. It should also be understood that seasonal and climatic changes can affect the groundwater level in an area and cause it to either rise or fall several feet in any year.

In our opinion, multiple perched water zones exist at this site. The zones should be expected within the surficially weathered till soils, at the overburden and within the more granular seams and layers expected within the till soils. Test pits completed as part of our 2004 study encountered saturated soil seams and layers within the overburden which produced seepage into the excavations.

The subsurface logs should be reviewed for the specific conditions encountered at each investigated location. It must be noted that the subsurface conditions are only known at the investigated locations and at the depths sampled and that conditions at locations and depths other than those investigated may or may not be similar.

GEOTECHNICAL RECOMMENDATIONS

In our opinion, the deep cuts planned at the locations investigated through this study may be made with large excavators and, where necessary, rock hammers. We

caution, however, that very compact soil conditions and large boulders will be encountered throughout the excavation depths, which will make excavation difficult and, in some cases, a slow process. Some boulders may require breaking up to achieve their removal and, although not encountered at the locations and through the depths explored for this study, bedrock may also be encountered.

We noted in our review of the most recent site grading plan that the slopes are planned to be graded at 1V:2H, which is steeper than the inclination of 1V:3H originally recommended in our report for these soils. As such, shallow failures may result on these slopes over the long term. Considering the composition of the soils that will form the slopes, however, global slope instability is not expected to be a concern. As such, if the slopes are located such that the consequences of a shallow failure would not impact upon any structures, the steeper slopes may be constructed provided the Owner understands the risks discussed subsequently.

In our opinion, the following should be considered in planning excavated slopes steeper than about 1V:3H in the soil types encountered at this site:

- *The slopes may be cut as currently planned, 1V:2H, and any failures that occur in the future repaired.* The repairs should be evaluated on a case by case basis, but would likely consist of the removal of the failed soil mass and the placement of rip rap or stone and/or the addition of supplemental drainage measures. The Owner should plan and budget for such maintenance and repairs for the life of the facility.

- *French type drains may be excavated into the slope face on 50 foot centers to reduce the risk of, but not eliminate the potential for, shallow slope failures.* The drains should collect and carry water to a stormwater detention system. The trenches should be at least 18-inches wide by 30-inches deep, lined with filter fabric, such as Mirafi 140N, and backfilled with ASTM C33 Blend 57 Stone, or similar. The filter fabric should also wrap the top of the stone. The surface may be capped with larger rip rap, or similar rock.

Swales must be provided along the crest and toe of all slopes, regardless of their inclination, to intercept, collect and dispose of runoff and groundwater before it can traverse the slope faces and saturate the shallow soils. The swales, or french type drains, should extend to a depth of at least 30-inches below grade. Further, dependent upon the quantity of groundwater exfiltrating from intercepted saturated zones within the overburden, it may be necessary to construct fabric lined and stone filled drainage trenches upon the slopes.

Establishing vegetation will also be critical in controlling, or minimizing, erosion impacts upon slopes of the planned height and inclination.

If the slopes planned to be graded steeper than 1V:3H are considered critical, in that

even shallow failures would present a risk to adjacent structures or roadways, we should be contacted to provide specific recommendations for their treatment. In general, any structures located within a zone defined by a line extending up from the slope toe at an inclination of 1V:2.5H should be evaluated further. Those located outside this zone should not generally be impacted by the shallow failures that could occur.

All roadway and building pad subgrades and structural fill surfaces must be crowned and sloped to direct precipitation, runoff and perched groundwater that enters the excavations to the periphery. We caution that the subgrade soils will be extremely sensitive to construction activities if perched waters are not eliminated or the subgrades are allowed to pond water and saturate. Areas of the subgrades that become saturated and unstable should be undercut to reestablish stable soil subgrade conditions. The Geotechnical Engineer should observe subgrade conditions immediately prior to the placement of structural fill.

All site grading, from initial stripping activities through final construction, should be designed and performed to assure that drainage is provided at all times. Areas of the subgrade that become saturated and/or are unstable, should be undercut and replaced with structural fill material, placed and compacted as previously recommended.

CONSTRUCTION OBSERVATION

We recommend that the Geotechnical Engineer be retained to monitor proof-compacting and earthwork for pavements and site work for buildings. In our opinion, these services should *not* be made a part of the contractor's scope of services, but rather they *should* be provided by the Geotechnical Engineer responsible for the design report as a consultant to the Owner or his Principle Engineer. It should be understood that the actual subsurface conditions at the site will only be known when they are excavated.

The presence of the Geotechnical Engineer who prepared the design report and made the assumptions concerning the conditions disclosed during the investigation will allow validation of the conditions assumed to exist and the design recommended in this report.

CLOSURE

It must be understood that this report was prepared as a supplement to our November 23, 2004 Geotechnical Report for the overall project, and not as a stand alone document. As such, the recommendations contained herein must only be used following a complete review of our earlier, more comprehensive, report for the site.

This report was prepared for specific application to the project site and construction planned. It was prepared on the basis of a limited number of investigation locations at the site. Subsurface conditions at other than the investigated locations may be

Important Information About Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you —* should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

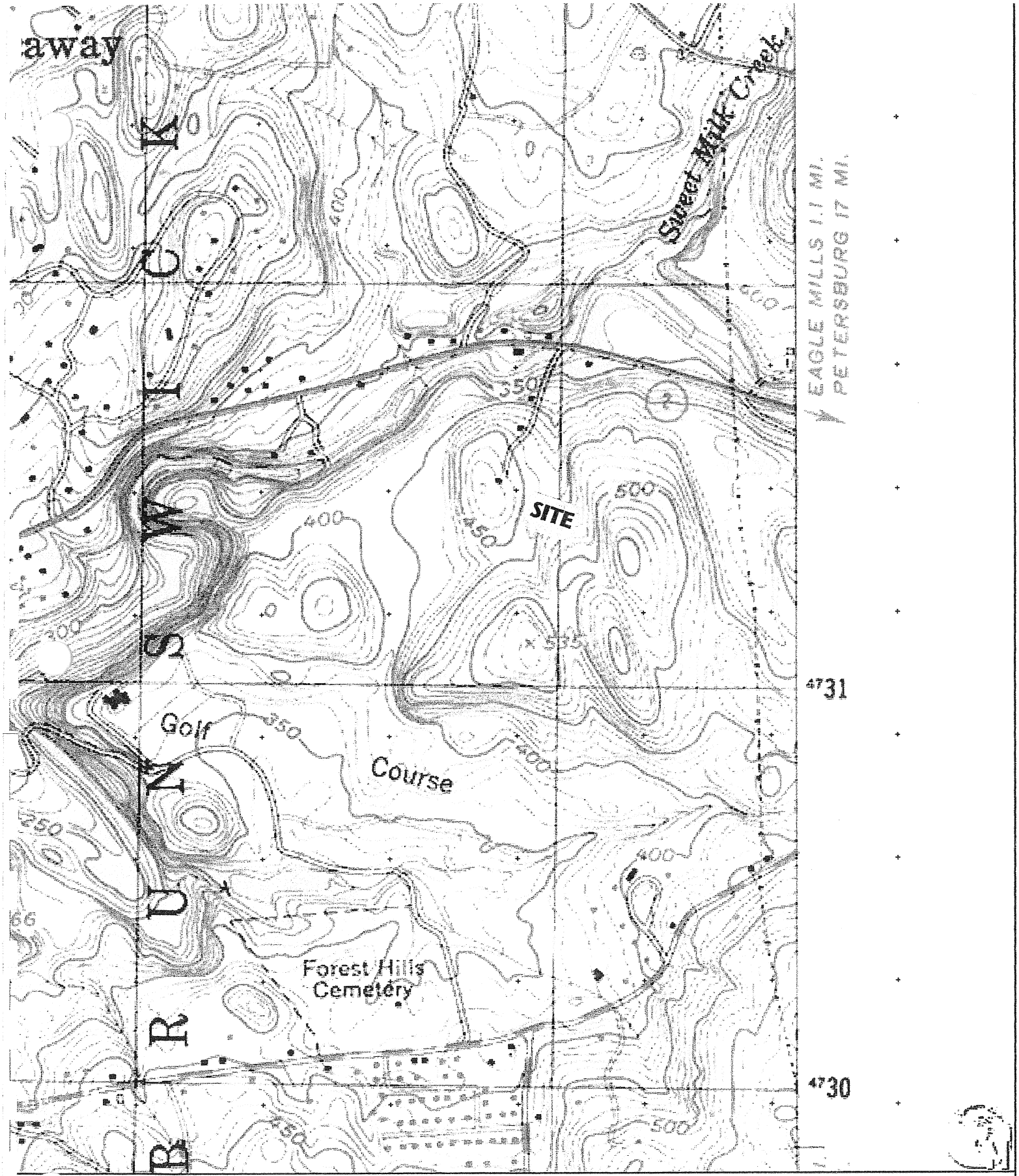
A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

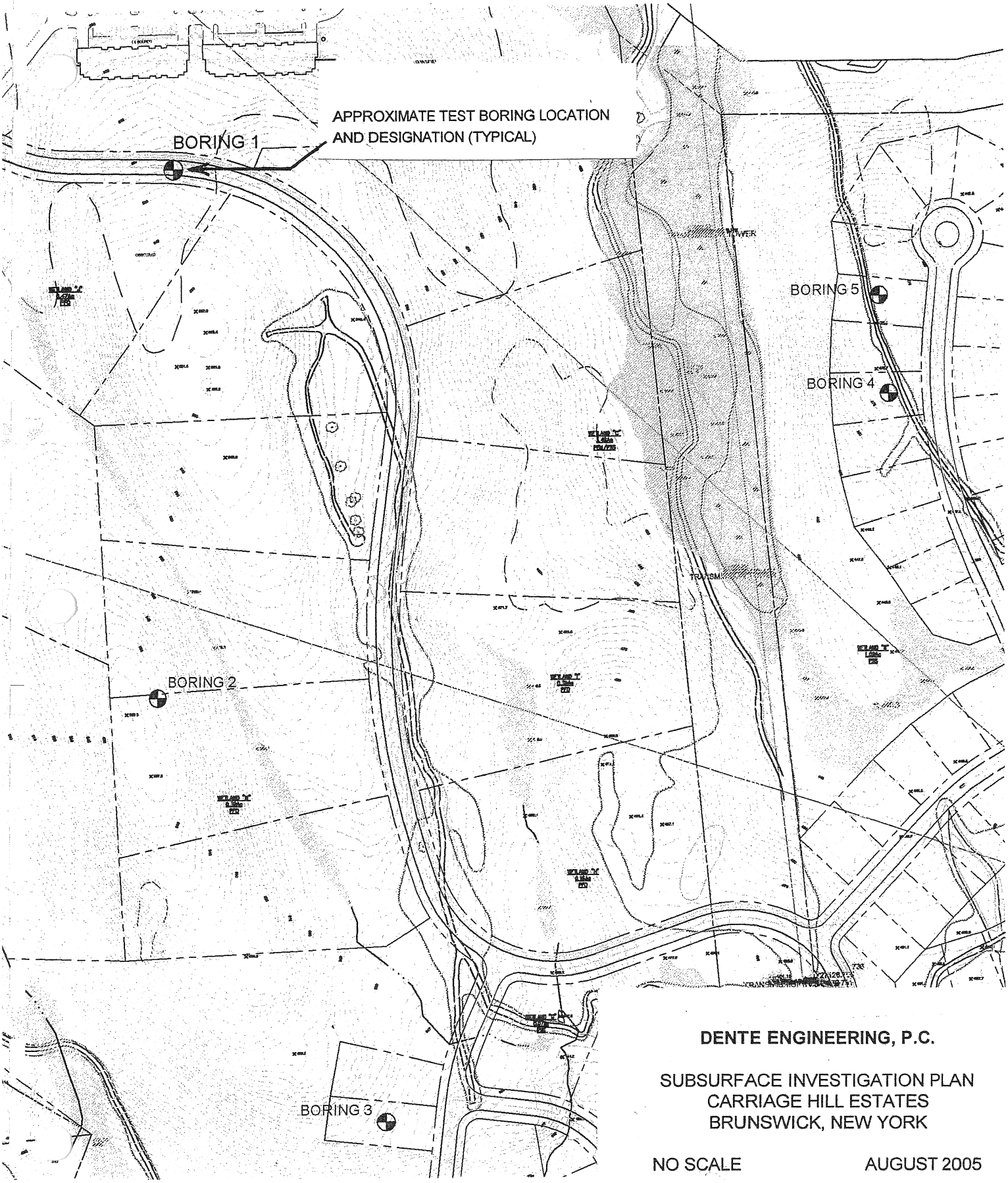
A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual



ne: TROY SOUTH
Date: 8/23/105
Scale: 1 inch equals 1000 feet

Location: 042° 43' 39.3" N 073° 38' 00.1" W
Caption: Carriage Hill Estates
Brunswick, New York



DENTE ENGINEERING, P.C.

SUBSURFACE INVESTIGATION PLAN
CARRIAGE HILL ESTATES
BRUNSWICK, NEW YORK

NO SCALE AUGUST 2005

INTERPRETATION OF SUBSURFACE LOGS

The Subsurface Logs present observations and the results of tests performed in the field by the Driller, Technicians, Geologists and Geotechnical Engineers as noted. Soil/Rock Classifications are made visually, unless otherwise noted, on a portion of the materials recovered through the sampling process and may not necessarily be representative of the materials between sampling intervals or locations.

The following defines some of the terms utilized in the preparation of the Subsurface Logs.

SOIL CLASSIFICATIONS

Soil Classifications are visual descriptions on the basis of the Unified Soil Classification ASTM D-2487 and USBR, 1973 with additional comments by weight of constituents by BUHRMASTER. The soil density or consistency is based on the penetration resistance determined by ASTM METHOD D1586. Soil Moisture of the recovered materials is described as DRY, MOIST, WET or SATURATED.

SIZE DESCRIPTION		RELATIVE DENSITY/CONSISTENCY (basis ASTM D1586)			
SOIL TYPE	PARTICLE SIZE	GRANULAR SOIL		COHESIVE SOIL	
BOULDER	> 12	DENSITY	BLOWS/FT.	CONSISTENCY	BLOWS/FT.
COBBLE	3" - 12"	LOOSE	< 10	VERY SOFT	< 3
GRAVEL-COARSE	3" - 3/4"	FIRM	11 - 30	SOFT	4 - 5
GRAVEL - FINE	3/4" - #4	COMPACT	31 - 50	MEDIUM	6 - 15
SAND - COARSE	#4 - #10	VERY COMPACT	50 +	STIFF	16 - 25
SAND - MEDIUM	#10 - #40			HARD	25 +
SAND - FINE	#40 - #200				
SILT/NONPLASTIC	< #200				
CLAY/PLASTIC	< #200				

SOIL STRUCTURE		RELATIVE PROPORTION OF SOIL TYPES	
STRUCTURE	DESCRIPTION	DESCRIPTION	% OF SAMPLE BY WEIGHT
LAYER	6" THICK OR GREATER	AND	35 - 50
SEAM	6" THICK OR LESS	SOME	20 - 35
PARTING	LESS THAN 1/4" THICK	LITTLE	10 - 20
VARVED	UNIFORM HORIZONTAL PARTINGS OR SEAMS	TRACE	LESS THAN 10

Note that the classification of soils or soil like materials is subject to the limitations imposed by the size of the sampler, the size of the sample and its degree of disturbance and moisture.

ROCK CLASSIFICATIONS

Rock Classifications are visual descriptions on the basis of the Driller's, Technician's, Geologist's or Geotechnical Engineer's observations of the coring activity and the recovered samples applying the following classifications.

CLASSIFICATION TERM	DESCRIPTION
VERY HARD	NOT SCRATCHED BY KNIFE
HARD	SCRATCHED WITH DIFFICULTY
MEDIUM HARD	SCRATCHED EASILY
SOFT	SCRATCHED WITH FINGERNAIL
VERY WEATHERED	DISINTEGRATED WITH NUMEROUS SOIL SEAM
WEATHERED	SLIGHT DISINTEGRATION, STAINING, NO SEAMS
SOUND	NO EVIDENCE OF ABOVE
MASSIVE	ROCK LAYER GREATER THAN 36" THICK
THICK BEDDED	ROCK LAYER 12" - 36"
BEDDED	ROCK LAYER 4" - 12"
THIN BEDDED	ROCK LAYER 1" - 4"
LAMINATED	ROCK LAYER LESS THAN 1"
FRACTURES	NATURAL BREAKS AT SOME ANGLE TO BEDS

Core sample recovery is expressed as percent recovered of total sampled. The ROCK QUALITY DESIGNATION (RQD) is the total length of core sample pieces exceeding 4" length divided by the total core sample length for N size cored.

GENERAL

- Soil and Rock classifications are made visually on samples recovered. The presence of Gravel, Cobbles and Boulders will influence sample recovery classification density/consistency determination.
- Groundwater, if encountered, was measured and its depth recorded at the time and under the conditions as noted.
- Topsoil or pavements, if present, were measured and recorded at the time and under the conditions as noted.
- Stratification Lines are approximate boundaries between soil types. These transitions may be gradual or distinct and are approximated.

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B -1

PROJECT: Carriage Hill Estates	**DATE**	START: 7-22-05	FINISH: 7-22-05
LOCATION: Brunswick, NY	**METHODS:** 2 1/4" HSAC with ASTM D 1586		
CLIENT: United Development			
JOB NUMBER: FDE-04-217	**SURFACE ELEVATION:**		
DRILL TYPE: CME- 55	**CLASSIFICATION:** K, LaPlante		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	TOPSOIL + / - 5"
	1	2	3				Brown SILT, little fine to coarse sand and gravel
				5	5	8	with cobbles and boulders **(MOIST)**
5'							
	2	12	15				Light Brown SILT, Some Fine to Coarse Sand,
				17	-	32	Gravel
10'							
	3	38	20				Greyish Brown SILT, Fine to Coarse SAND and
				25	-	45	GRAVEL **(DRY TO MOIST)**
15'							
	4	13	15				Grades Grey
				21		36	
20'							
	5	12	21				
				23	-	44	
25'							
	6	17	21				
				22	-	43	
30'							End of Boring at 26.5' depth No groundwater inside augers 7-25-05 at 9 a.m.

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B - 2.1

PROJECT: Carriage Hill Estates	**DATE**	START: 7-25-05	FINISH: 7-26-05

LOCATION: Brunswick, NY	**METHODS:** 3" FJC to 4' Open Hole Mud
CLIENT: United Development	with ASTM D 1586
JOB NUMBER: FDE-04-217	**SURFACE ELEVATION:**
DRILL TYPE: CME- 55	**CLASSIFICATION:** K, LaPlante

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	TOPSOIL + / - 2"
	1	4	7				Brown SILT and Fine SAND, little fine to coarse
				12	17	19	sand, gravel with cobbles **(DRY TO MOIST)**
5'							
	2	17	23				Brown SILT, Some Fine to Coarse Sand and
				22	-	45	Gravel
10'							
	3	19	28				Brown SILT and Fine to Coarse SAND, little
				40	-	68	gravel
15'							
	4	21	38				grades Some Gravel with cobbles and boulders
				53	-	91	
20'							
	5	15	30				grades with Seam of Brown SILT, trace to little
				38	-	68	fine sand
25'							
	6	19	52				Brown Fine to Coarse SAND, Some Silt, Gravel
				50/.4	-	102	
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B - 2.2

PROJECT: Carriage Hill Estates	**DATE**	START: 7-25-05	FINISH: 7-26-05
LOCATION: Brunswick, NY	**METHODS:** 3" FJC to 4' Open Hole Mud		
CLIENT: United Development	with ASTM D 1586		
JOB NUMBER: FDE-04-217	**SURFACE ELEVATION:**		
DRILL TYPE: CME- 55	**CLASSIFICATION:** K, LaPlante		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	TOPSOIL + / - 2"
	7	17	35				Brown SILT, Fine to Coarse SAND and
				55	-	90	GRAVEL, trace clay with cobbles
35'							
	8	33	50				Brown SILT and Fine to Coarse SAND, little
				60	-	110	gravel, trace clay
40'							
	9	20	50				
				100	-	150	
45'							
50'							
	10	11	19				Grades Grey
				36	-	55	
							End of Boring at 51.5' depth
							Groundwater did not accumulate inside augers
55'							
60'							

DENTE ENGINEERING, P.C. | SUBSURFACE LOG B - 3

PROJECT: Carriage Hill Estates	**DATE** START: 7-26-05	FINISH: 7-26-05
LOCATION: Brunswick, NY	**METHODS:** 2 1/4" HSAC	
CLIENT: United Development	with ASTM D 1586	
JOB NUMBER: FDE-04-217	**SURFACE ELEVATION:**	
DRILL TYPE: CME- 55	**CLASSIFICATION:** K, LaPlante	

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	TOPSOIL + / - 2"
5'	1	17	20	17	-	37	Brown SILT, Fine to Coarse SAND and GRAVEL **(MOIST)**
10'	2	10	8	8	-	16	Brown SILT, Some Fine to Coarse Sand, trace gravel **(WET)**
15'	3	18	16	20	-	36	grades little gravel
20'	4	14	16	20	-	36	Grey SILT and Fine to Coarse SAND, trace gravel, clay
25'							End of Boring at 21.5' Groundwater did not accumulate inside augers
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B - 4

PROJECT: Carriage Hill Estates	**DATE**	START: 8-22-05	FINISH: 8-22-05

LOCATION: Brunswick, NY	**METHODS:** 2 1/4" HSAC
CLIENT: United Development	with ASTM D 1586
JOB NUMBER: FDE-04-217	**SURFACE ELEVATION:**
DRILL TYPE: CME- 55	**CLASSIFICATION:** K, LaPlante

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	TOPSOIL + / - 3"
	1	2	3				Light Brown SILT, little fine sand with rock
				9	9	12	fragments **(MOIST)**
5'							
	2	17	13				Brown SILT, little fine to coarse sand, gravel
				20	-	33	
10'							
	3	20	20				grades Some Fine to Coarse Sand
				19	-	39	
15'							
	4	30	43				Grey SILT and Fine to Coarse SAND, little
				30	-	73	gravel with cobbles and boulders
20'							
	5	16	16				
				20	-	36	
25'							
	6	9	15				
				20	-	35	
30'							End of Boring at 26.5' depth Groundwater did not accumulate inside augers

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B - 5.1

PROJECT: Carriage Hill Estates	**DATE**	START: 7-22-05	FINISH: 7-22-05
LOCATION: Brunswick, NY	**METHODS:** 2 1/4" HSAC		
CLIENT: United Development	with ASTM D 1586		
JOB NUMBER: FDE-04-217	**SURFACE ELEVATION:**		
DRILL TYPE: CME- 55	**CLASSIFICATION:** K, LaPlante		

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	TOPSOIL + / - 3"
	1	3	5				Light Brown Fine SAND, Some Silt, trace
				8	12	13	medium to coarse sand **(DRY)**
5'							
	2	11	12				Brown SILT, Some Fine to Coarse Sand, little
				17	-	29	gravel **(MOIST)**
10'							
	3	25	34				Brown SILT and Fine to Coarse SAND, little
				38	-	72	gravel
15'							
	4	31	50				Brown Fine to Coarse SAND, Some Silt, Gravel
				50/.4	-	100 +	
20'							
	5	20	40				Grey Fine to Coarse SAND and SILT, little
				40	-	80	trace clay
25'							
	6	25	25				
				38		63	
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B - 5.2

PROJECT: Carriage Hill Estates	**DATE**	START: 7-22-05	FINISH: 7-22-05

LOCATION: Brunswick, NY	**METHODS:** 2 1/4" HSAC
CLIENT: United Development	with ASTM D 1586
JOB NUMBER: FDE-04-217	**SURFACE ELEVATION:**
DRILL TYPE: CME- 55	**CLASSIFICATION:** K, LaPlante

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	TOPSOIL + / - 3"
	7	16	25				Grey SILT and Fine to Coarse SAND, little gravel
				30	-	55	**(MOIST)**
							End of Boring at 31.5' depth
							Groundwater did not accumulate in augers
35'							
40'							
45'							
50'							
55'							
60'							

Carriage Hill Development

Moisture Content Results-ASTM D2216

Boring No.	B1/S2	B1/S5	B3/S2	B3/S6	B3/S9	B5/S3
Sample No.	690	691	692	693	694	695
Sample Depth	5'-6.5'	20'-21.5	5'-6.5'	25'-26.5'	40'-41.5	10'-11.5'
Tare Weight	186.72	185.13	190.06	184.18	189.09	367.78
W_S + Tare	407.20	435.50	451.90	451.10	454.90	613.80
W_D + Tare	388.20	419.50	427.60	430.70	432.40	586.00
W_{WATER}	19.00	16.00	24.30	20.40	22.50	27.80
$W_{DRY\ SOIL}$	201.48	234.37	237.54	246.52	243.31	218.22
% Moisture (W_W / W_D)	9.4	6.8	10.2	8.3	9.2	12.7

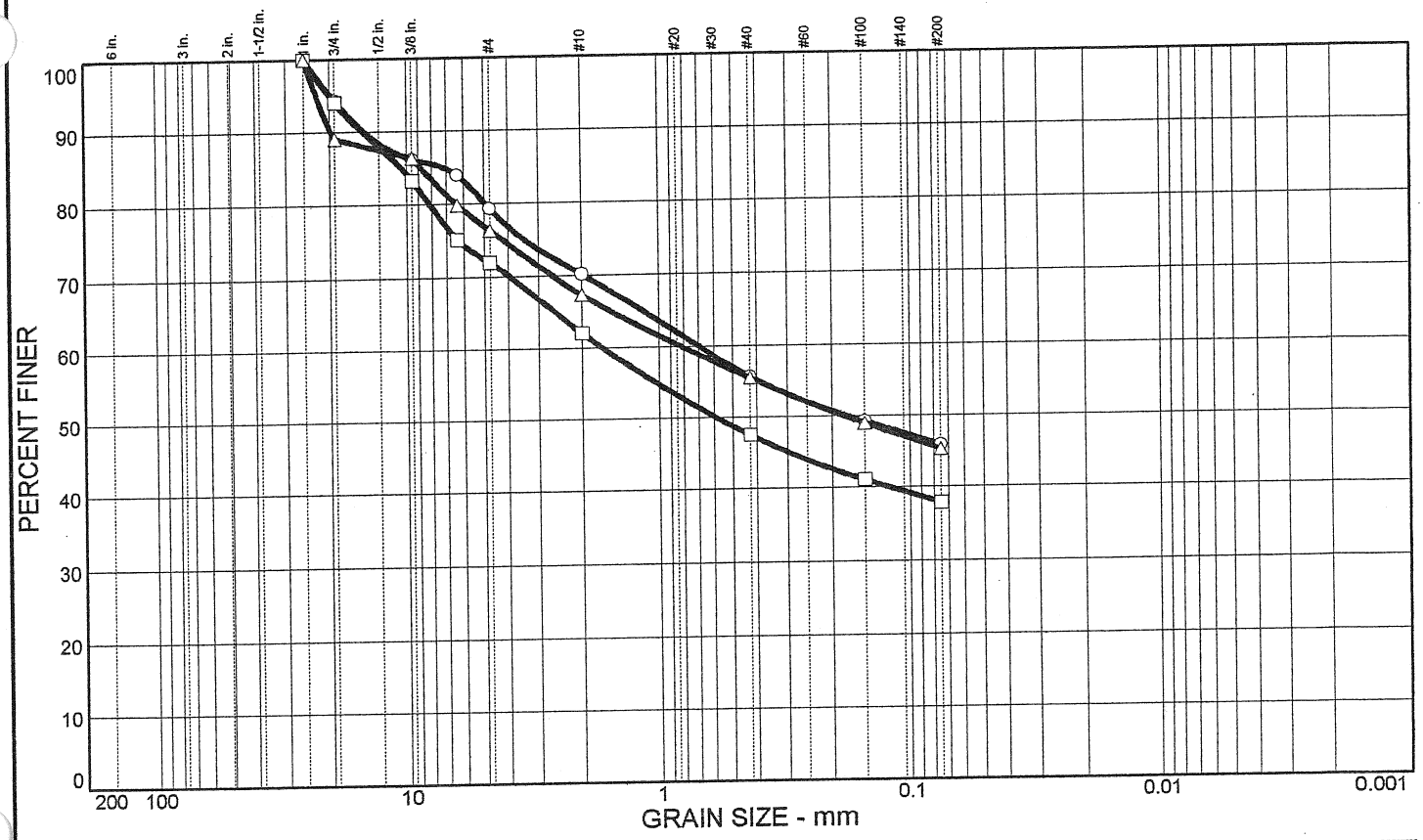
Boring No.						
Sample No.						
Sample Depth						
Tare Weight						
W_S + Tare						
W_D + Tare						
W_{WATER}						
$W_{DRY\ SOIL}$						
% Moisture (W_W / W_D)						

Boring No.						
Sample No.						
Sample Depth						
Tare Weight						
W_S + Tare						
W_D + Tare						
W_{WATER}						
$W_{DRY\ SOIL}$						
% Moisture (W_W / W_D)						

DENTE ENGINEERING
594 Broadway
Watervliet, NY 12189
Ph. 518-266-0310
Fax 518-266-9238

Client: United Development
File No. FDE 04-217
Date: 08-22-05

Particle Size Distribution Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○		20.7	33.4	45.9		SM	A-4(0)		
□		28.1	34.0	37.9		SM	A-4(0)		
△		23.7	31.0	45.3		SM	A-4(0)		

SIEVE inches size	PERCENT FINER ○	□	△
1	100.0	100.0	100.0
.75	94.3	94.0	89.0
.375	86.1	83.2	86.3
.25	83.9	75.1	79.8
	GRAIN SIZE		
D_{60}	0.690	1.66	0.812
D_{30}			
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	79.3	71.9	76.3
#10	70.2	62.1	67.4
#40	55.7	47.5	55.5
#100	49.3	41.1	49.0
#200	45.9	37.9	45.3

SOIL DESCRIPTION

○ med to fine Sand, and Silt, some coarse to fine Gravel

□ med to fine Sand, and Silt, and coarse to fine Gravel

△ med to fine Sand, and Silt, some coarse to fine Gravel

REMARKS:

○ Tested By: SAR Checked By: KL Per ASTM D422 Washed

□ Tested By GB Checked By: KL Per ASTM D422 Washed

△ Tested By: GB Checked By: KL Per ASTM D422 Washed

○ Source: Borings Sample No.: 690 B1/S2 Elev./Depth: 5'-6.5'

□ Source: Borings Sample No.: 691 B1/S5 Elev./Depth: 20'-21.5'

△ Source: Borings Sample No.: 692 B3/S2 Elev./Depth: 5'-6.5'

EVERGREEN TESTING, INC.

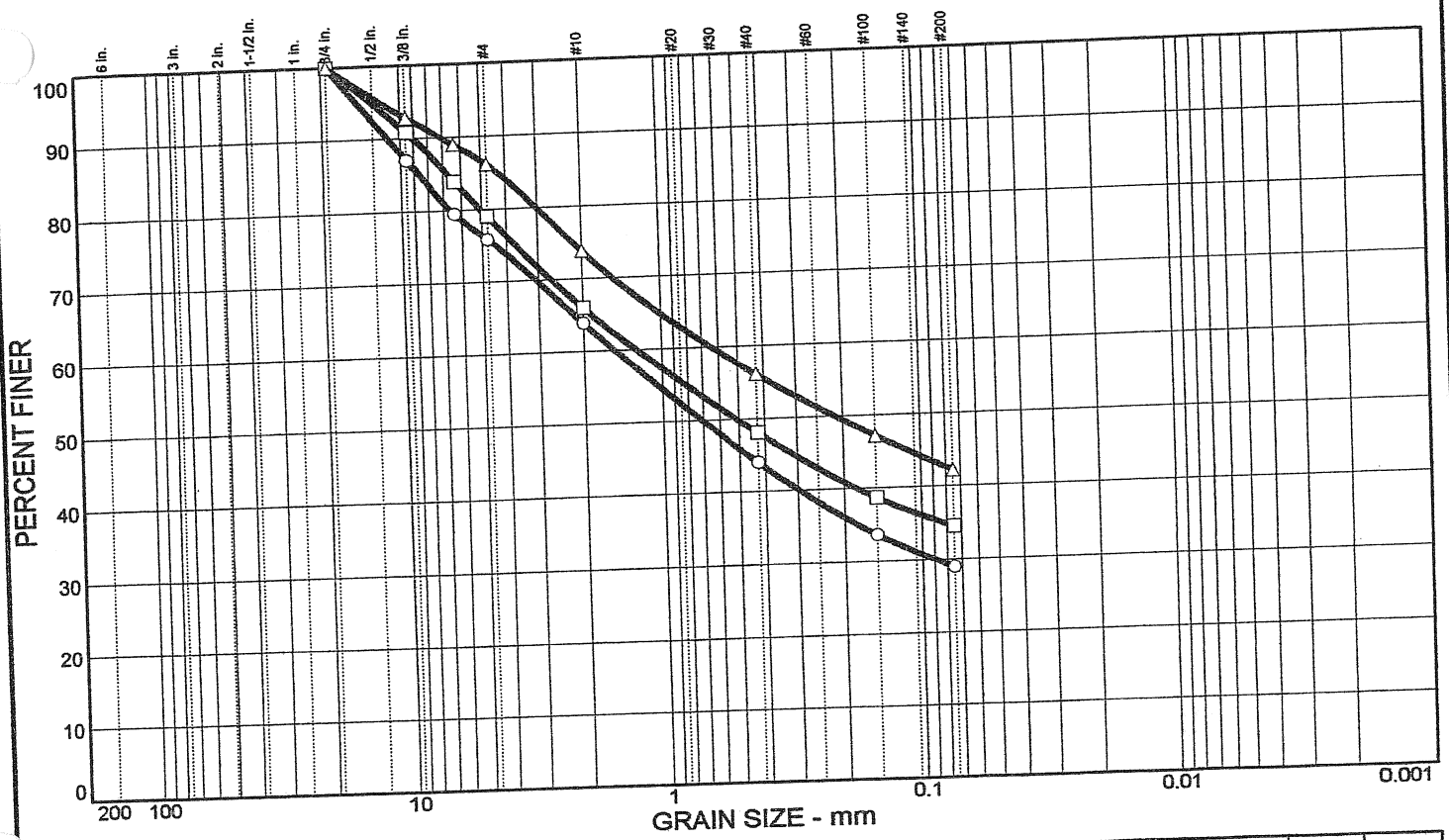
Client: United Development

Project: Carriage Hill Development

Project No.: FDE 04-217

Figure 690 - 692

Particle Size Distribution Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○		24.2	46.9	28.9		SM	A-2-4(0)		
□		21.0	44.5	34.5		SM	A-2-4(0)		
△		13.9	43.9	42.2		SM	A-4(0)		

SIEVE inches size	PERCENT FINER ○	□	△
.75	100.0	100.0	100.0
.375	86.9	90.8	92.8
.25	79.4	83.9	88.9
	GRAIN SIZE		
D_{60}	1.52	1.25	0.637
D_{30}	0.0895		
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	75.8	79.0	86.1
#10	63.9	66.0	73.8
#40	44.0	48.1	56.1
#100	33.6	38.7	47.2
#200	28.9	34.5	42.2

SOIL DESCRIPTION

○ med to fine Sand, some Silt, and coarse to fine Gravel

□ med to fine Sand, some Silt, some coarse to fine Gravel

△ med to fine Sand, and Silt, some coarse to fine Gravel

REMARKS:

○ Tested By: GB Checked By: KL
Per ASTM D422 Washed

□ Tested By: GB Checked By: KL
Per ASTM D422 Washed

△ Tested by: GB Checked By: KL
Per ASTM D422 Washed

○ Source: Borings — Sample No.: 693 B3/S6 — Elev./Depth: 25'-26.5'

□ Source: Borings — Sample No.: 694 B3/S9 — Elev./Depth: 40'-41.5'

△ Source: Borings — Sample No.: 695 B5/S3 — Elev./Depth: 10'-11.5'

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Figure 693 - 695