CGC, Inc.

Construction • Geotechnical
Consulting Engineering/Testing

January 21, 2009
CM07107-2

Mr. Jeff Hosler
TEMCO
2088 Washington Avenue
P.O. Box 856
Cedarburg, WI 53012

Re: Supplemental Subsurface Exploration
Novak Site Redevelopment Project
1960 S. 67th Place
West Allis, Wisconsin

Dear Mr. Hosler:

Construction • Geotechnical Consultants, Inc. (CGC) has completed the supplemental subsurface exploration for the above-noted site in West Allis, Wisconsin. The supplemental exploration was completed in two separate phases which included additional soil borings and a test pit exploration program. The primary purpose of supplemental soil borings was to confirm preliminary findings and to provide further delineation of the subsurface conditions within the northwest quadrant of the site to aid in the siting of a future building on the parcel, along with providing geotechnical-related recommendations for general site development and preliminary foundation and floor slab design/construction. An exploratory test pit program was performed to assist in evaluating the characteristics of the near surface fills on the site, with the focus placed on the areas surrounding the northwest quadrant of the site being considered for future pavement construction, etc. One copy of this report is provided for your use. Additional copies of this report are being forwarded to Messrs. John Stibal of the City of West Allis and Donald Gallo of Reinhart Boerner Van Deuren s.c.

PROJECT DESCRIPTION

It is our understanding that the parcel referred to as the Novak Site is being considered for redevelopment of a light industrial-type of facility. The parcel, measuring approximately 11.6 acres, had previously been occupied by five separate one- to two-story masonry buildings, with slab-on-grade construction. The balance of the site was used more recently for temporary storage of dumpsters, etc. for a local waste hauler. The reader is referred to the "Preliminary Subsurface Exploration" report (CGC Ref. No.: CM04151; dated December 29, 2005) for additional information on the site's past historical usage and subsurface conditions.

Current development plans are focused on the possible construction of a light industrial-type facility within the northwest quadrant of the site. It is anticipated that the facility planned for the site will

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consist of a single-story, steel frame and/or masonry building supported by a combination of columns and bearing walls utilizing conventional spread footings. The structure is expected to be slab-on-grade construction. Asphalt-paved surface parking and related access/service drives, along with possible stormwater retention features, etc., are also proposed for any future development.

Based on the findings from the preliminary exploration conducted on the site, the northwest quadrant of the parcel exhibited the most favorable subsoil conditions for use of conventional spread footings. Building development elsewhere on the site would be impacted by the need for an alternate foundation system (i.e., deep foundations, etc.) to address the relatively thick non-engineered fill, lime and/or buried organic soil deposits encountered.

It is our understanding that minor adjustments to the site grades that existed at the time of this supplemental exploration are being considered. It is anticipated that additional site filling on the order of 1 to 4± ft may occur across the site to essentially establish a targeted finished site grade of approximately Elevation 726.9 ft (Mean Sea Level datum) or about Elevation 146.0 ft (MMSD datum).

SITE CONDITIONS

A generalized description of the overall site conditions is included in the Preliminary Subsurface Exploration report and will not be repeated. However, some modifications to the site have occurred since the time of CGC's 2004/2005 exploration and include the following:

- The five masonry structures that once occupied the site have been razed. Reportedly, the substructural elements (i.e., foundation walls, footings, etc.) were removed and the resulting excavations were backfilled. The specific means and methods followed by the demolition contractor during the placement of backfill was not available.

- According to our review of site topographic information prepared by Arcadis (Site Layout-Drawing Nos. 1 and 2; undated), we understand that between 2 and 3 ft of new fill was spread and placed across portions of the site between the performance of the preliminary and supplemental subsurface explorations. The surface of the fills appeared to have been subjected to compaction and possibly back-dragged with the aid of a dozer to seal the surface of the fills.

- A recent reconnaissance made of the site to aid in the preparation of this report revealed that the site has received additional fill. An estimated 100 to 150 end-dumped stockpiles of

miscellaneous materials have been placed throughout the parcel. Based on our cursory review, the stockpiles appear to be comprised of predominantly a mixture of granular and clayey textured soils. However, scattered piles throughout the site contain topsoil-like materials and miscellaneous demolition debris including concrete and asphalt pieces of variable size, concrete masonry block, etc. Miscellaneous materials including tires, metal, etc. were also noted more sporadically.

EXPLORATION PROGRAM

A. Additional Soil Borings

Fourteen additional standard penetration test (SPT) borings were performed on the site for this supplemental phase of the exploration program. The specific purpose of these additional borings was to further assist in delineating the vertical and lateral extent of the existing fill soils within the northwest quadrant of the site, thereby, better defining the most desirable limits for future building construction. The borings were drilled between October 4 and 9, 2007 at locations selected by CGC, Inc. after consultation with TEMCO. The borings were drilled by J&J Soil Testing, Ltd. (under subcontract to CGC) using a truck-mounted rotary drill rig equipped with hollow-stem augers. The borings were extended to depths of 15 to 20 ft below existing site grades, with the deeper borings (i.e., 20 ft) drilled along the perimeter of the anticipated building limits of the northwest quadrant area of the site. Specific procedures used for drilling and sampling during the field exploration are described in Appendix A. The approximate boring locations are shown in plan on the Soil Boring & Test Pit Location Map presented in Appendix B. Ground surface elevations at the boring locations were determined using conventional leveling techniques. Monitoring Well #13 (designated as MW-13) was used as a temporary benchmark with a known elevation for the top of PVC casing of EL 727.44 ft (Mean Sea Level datum) used as a reference.

B. Exploratory Test Pit Program

An exploratory test pit program was completed on the site on July 27, 2007 for the purpose of evaluating the characteristics of the more recently placed near surface fills. According to topographical mappings of the site prepared by Arcadis, an estimated 1 to 3 ft of fill was placed on the parcel since performance of the Preliminary Subsurface Exploration in 2004/2005, with the majority of the fills being placed along the south and eastern portions of the site -- generally lying east and south of the former building footprints. A series of fourteen (14) test pits were excavated on the site at the approximate locations shown on the Soil Boring & Test Pit Location Map attached in Appendix B. The test pits were typically extended to a depth of 3 to 5 ft below the existing site grades at that time.

Specific details regarding the scope of the test pit program are presented in Appendix A. The final logs prepared by the engineer, along with the results of the field density tests performed, are presented in Appendix B.

C. Previous Investigations

Previous investigations have been completed on the site including the earlier referred to "Preliminary Subsurface Exploration" completed by CGC, along with environmental-related investigations completed on the site by TEMCO. We understand that any on-going environmental-related issues and/or determinations made regarding the need for site remediation, if any, is being addressed by others.

SUBSURFACE CONDITIONS

A. Additional Soil Borings

Subsurface conditions as revealed by the supplemental borings drilled within the northwest quadrant of the site are fairly consistent to the findings of the preliminary borings completed within this area in 2004, as anticipated. The generalized subsurface profile as revealed by the supplemental borings within this area consist of (in descending order):

- 1 to 18 ft of surficial ***fills***, comprised of layered strata of gray to brown lean clay, sandy silt, crushed stone/tunnel spoils and sand and gravel. Scattered occurrences of cinders and/or foundry sand materials and miscellaneous demolition debris (i.e., wood, brick/concrete, asphalt, crushed stone, etc.) were also encountered, along with scattered seams/layers of organic soils and/or buried topsoil. Such occurrences were noted in Borings 1A, 8A, 9A, 11A and 14A.

- Underlain by natural, stiff to hard brown to gray brown ***lean clay*** with recorded pocket penetrometer readings typically ranging between 1.25 and 4.5+ tsf, to the maximum depths explored.

As noted during the preliminary subsurface exploration completed on the site, the thickness of the surficial fills vary significantly depending upon the location of the borings on the property. The borings along the southern and eastern edges of the area explored (i.e., Borings 7A, 11A, 12A, 13A and 14A) revealed fills that extended between 5.5 to 18 ft below the existing ground surface, with remnants of the former lime pit/lagoon fills noted within the profile. Lime deposits were observed

within three of the supplemental borings (Nos. 12A, 13A and 14A) at depths ranging between 8 and 15 ft. Based upon blow count data (i.e., N-values), the lime deposits are in a very loose to loose condition with N-values ranging between 1 and 9. The surficial fills observed within the remainder of the northwest quadrant area ranged in thickness in the more typical range of 1 to 5.5 ft.

B. Exploratory Test Pits

The relatively shallow test pits performed on the site revealed that the near surface fills are fairly similar in character and texture to that revealed by both the previous and recent borings, as anticipated. The one possible exception is that scattered demolition debris appears to be more prevalent within the fills in areas surrounding the northwest quadrant of the site. The results of the field testing program performed to aid in evaluating the condition of the near surface fills are as follows:

- Where the fills were comprised of predominantly clayey soils, pocket penetrometer tests were performed on the cohesive soils to provide an indication of the soil's unconfined compressive strength. Pocket penetrometer readings typically ranged between 1.5 and 4.5+ tsf, indicating the clayey soils were stiff to hard. One exception was noted in Test Pit No. 5 where the clays were very soft to stiff (i.e., q_p values ranged between 0.25 to 1.5 tsf).

  To evaluate the uniformity of the layered fill conditions, hand probes were also conducted on the fills with a ⅝-in. diameter steel rod under full body weight at multiple depths within each test pit. Hand probe penetrations were somewhat variable ranging between 0 and 8 in.

  Pocket penetrometer readings and hand probe penetration results are recorded on the final test pit logs presented in Appendix B.

- A series of thirty-nine field density tests were performed on select soil layers exposed during excavation to provide an indication as to the level of compaction the fills were compacted to during the spreading/placement operation. The tests was performed with a Troxler 3430 series nuclear meter. Percent compaction was determined by comparing the field dry unit weight values to the modified Proctor density established on representative samples of the fill per ASTM D1557 test methods. Maximum modified Proctor values used in establishing compaction levels ranged between 124.5 and 130 pcf. Recorded compaction levels ranged between 78 and 100+ percent, averaging 90 percent overall on the surficial fills tested.

Results of the tests performed are presented in Field Density Test Report No. 1 attached in Appendix B. Laboratory compaction (Proctor) test results for tests completed on representative samples of the fills observed are also included in Appendix B for your review.

- No testing was performed at the location of Test Pit No. 11. This test hole filled with water immediately upon completion of excavation. It should be noted that this test location was sited along the presumed alignment of the demolished north footing line of one of the former buildings once occupying the site.

C. Groundwater

With the exception of observations made in Boring Nos. 12A, 13A and 14A, no groundwater was observed during and/or upon completion of the supplemental borings completed within the northwest quadrant of the site. In Boring Nos. 12A, 13A and 14A (drilled along the apparent fringes of the former lime pit/lagoon), groundwater was recorded at depths of 10 to 17.5 ft. These observations are generally consistent with earlier borings completed on the site. Relatively high groundwater inflows were observed in Test Pit No. 11. We believe this water may reflect an entrapped water condition within the backfilled footing lines of the demolished building(s). Water levels can be expected to fluctuate based on seasonal variations in precipitation, infiltration, etc.

More detailed information regarding the subsurface and groundwater conditions encountered during the recent exploration are presented on the boring logs included in Appendix B.

DISCUSSION AND RECOMMENDATIONS

From a geotechnical viewpoint, it is our opinion that subsoil conditions within the northwestern quadrant of the site are generally suitable for future development using conventional spread footing techniques. Should additional fill placement proceed on the site in an undocumented manner (i.e., no testing during placement, etc.), however, the need for more extensive subgrade preparation measures will be required to develop suitable subgrades for eventual footing and/or floor slab construction. As previously discussed in the preliminary subsurface exploration report prepared for this site, building development elsewhere on the parcel would be greatly influenced by the presence of the relatively thick non-engineered fill, lime and/or buried organic soil deposits encountered within the former lagoon footprints. General recommendations/limitations and additional important information regarding this supplemental geotechnical report are included in Appendix C.

A. Site Preparation

1. Northwest Quadrant (Preferred Buildable Limits)

Based on targeted final site grades for this portion of the site (i.e., between Elevations 721 to 727 ft), it appears that 1 to 4 ft of additional fill will be required to establish the planned subgrade within this area. To prepare the site for future development, we recommend that surficial vegetation, topsoil and any end-dumped stockpiles of imported fills be removed from within and to a point at least 5 ft beyond the anticipated limits of any future building. Following the removal of surficial vegetation/topsoil and the stockpiles, the exposed subgrades are generally expected to consist of the earlier described pre-existing fill deposits. While these soils are generally deemed unsuitable for direct support of footings due to observed loose conditions and the inherent uncertainty associated with non-engineered fills, it is our opinion that the fills within this portion of the site generally appear suitable for support of floor slabs and pavements with some form of subgrade improvement. It is our opinion that the exposed subgrades need to be evaluated for stability prior to any further fill placement. To assist in the evaluation of the subgrades across the site, we recommend that exposed subgrades be thoroughly proof-rolled with a loaded tri-axle dump truck, scraper or a similar piece of rubber-tired construction equipment. The purpose of proof-rolling is to check the overall stability of the exposed subgrade, as well as for identifying soft or yielding conditions that may require recompaction or undercutting prior to any further fill placement. At this time, specific attention should also be directed to reviewing the condition of the backfilled excavations resulting from earlier demolition activities completed on the site. If unstable areas are detected, an initial attempt should be made to aerate and densify the subgrade by recompaction where natural moisture contents are at appropriate levels (i.e., on the dry side of optimum moisture content). If this procedure is ineffective, the disturbed soils should be undercut and replaced with compacted fill and/or stabilizing materials such as an imported 3-in. breaker rock. A relatively firm, non-yielding subgrade should be established prior to proceeding with any further fill placement.

After the subgrade is prepared as described above, we recommend that fill placement proceed as necessary to establish planned subgrade elevations. The exposed subgrade should be thoroughly compacted with an appropriate piece of construction equipment prior to placement of fills on the site. Selection, placement and compaction of engineered fills should be in accordance with the guidelines presented in our "Recommended Compacted Fill Specifications" included in Appendix D. It is our opinion that the non-organic granular or clayey soils stockpiled on the site may be used for fill placement. However, the use of cohesive soils in structural areas will require close observation on a regular basis during fill placement including the monitoring of moisture contents, compaction levels and the overall stability of the developing fill subgrade. Moisture conditioning (i.e., aeration)

of cohesive fills should be expected to aid in compactive efforts. Engineered fills placed below structures and pavement areas should be compacted to a minimum of 93 to 95% modified Proctor (ASTM D1557). Periodic field density testing should be conducted during fill placement to confirm that satisfactory compaction levels are being achieved.

2. Balance of Site

As indicated earlier in this report, a recent site reconnaissance revealed that a considerable number of end-dumped stockpiles are present on the site and are predominantly located outside the northwest quadrant area. The exploratory test pit program and corresponding field testing performed generally indicate, in our opinion, that the pre-existing fills appear to be reasonably well compacted to serve as a subgrade for support of future pavements. However, it is our opinion that the overall condition of the earlier placed fills can be improved by rigorous recompaction prior to further fill placement. We also recommend that the exposed subgrades be subjected to a proof-roll to check the overall stability of the prepared subgrade prior to additional fill placement, following the procedures outlined in the previous subsection. Following proof-rolling and stabilization of any soft/yielding areas by recompaction, etc., fill placement could resume with the non-organic stockpiled materials available on the site. Some sorting will be required, however, to separate out miscellaneous debris observed (i.e., larger pieces of concrete, metal, tires, etc.) that are not deemed suitable for re-use as engineered fill, particularly in relatively thin fill sections. These materials should be buried on the site in a designated non-structural area not being considered for pavement construction, etc.

Fill placement and compaction should then proceed in accordance with the guidelines presented in Appendix D. Due to the expected high moisture condition of the stockpiled materials, subsequent lifts of fill spread across the site should be limited to 8 in. thick, in our opinion, to aid in the drying of the fills and achieving satisfactory compaction.

B. Foundation Design

It is our opinion that light to moderately loaded industrial-type buildings can be supported on conventional spread footings within the northwest quadrant of the site provided the planned footings extend through the surficial fill deposits and bear within the underlying natural, stiff to hard lean clays soils or are established on engineered/prepared subgrades following undercutting of the fills. The need for undercutting is prompted by the inherent uncertainty associated with constructing footings on non-engineered fill deposits which have been delineated across the site. Table 1 below is presented to assist the designer/developer of any future building on the site in identifying the elevation and corresponding depth to the underlying, competent lean clays which have been targeted

as the desired bearing stratum. The table provides the "estimated depth to the bearing stratum" based on both the ground surface elevation at the time this supplemental exploration (October, 2007) was performed and for the eventual planned finished site grade of Elevation 726.9 ft (or Elev. 146.0 ft, MMSD datum).

Table 1
Summary of Recommended Bearing Conditions

Boring No.	G.S. Elevation, ft (approx.-as of 10/07)	Elevation of Targeted Bearing Stratum, ft	Est. Depth to Bearing Stratum (ft) Based on --	
			10/07 Grades	Targeted Grades*
Supplemental Exploration:				
1A	722.8	718.3	4.5	8.6
2A	722.4	719.4	3.0	7.5
3A	723.7	720.7	3.0	6.2
4A	722.2	721.2	1.0	5.7
5A	724.0	719.0	5.0	7.9
6A	723.3	720.3	3.0	6.6
7A	724.0	718.5	5.5	8.4
8A	725.0	721.5	3.5	5.4
9A	724.9	721.9	3.0	5.0
10A	724.2	718.7	5.5	8.2
11A	728.1	723.6	4.5	3.3
Preliminary Exploration:				
1	723.4±	719.4	4.0	7.5
2	723.4±	720.4	3.0	6.5
5	723.8±	720.3	3.5	6.6
6	725.0±	715.5	9.5	11.4
8	725.8±	723.3	2.5	3.6
9	727.0±	721.1	5.9	5.8

* Based on the targeted finish site grade of Elevation 726.9 ft (or Elev. 146.0 ft, MMSD datum) per Arcadis' Site Layout (Drawing No. 3; undated).

Upon reviewing the information provided in the above table, we direct the reader to consider the following:

- The supplemental borings designated as Nos. 12A, 13A and 14A were not included in the table summary because the existing fills at these locations extend to a depth of 18 ft below the existing ground surface, deeming this portion of the northwest quadrant unsuitable for considering conventional spread footings.

- It should be recognized that transitional subsoil conditions (i.e., fill zones which transition from 18± ft thick to the more typical 3 to 5± ft) are expected to exist between the borings drilled along the fringes of the former lime pits/lagoons with the more desirable subsoil conditions typically observed in the northwest quadrant area. Where these conditions are encountered (i.e., Borings 12A through 14A, and 6), fairly extensive undercutting should be expected to bypass the unsuitable surficial soil deposits. Should the footprint of any future building encroach upon these transitional areas of the site, CGC recommends additional borings and/or test pits be completed to better define the lateral extent of these thick fill deposits.

- Should the project advance beyond the conceptual stage where a specific building design and/or footprint is decided upon before further fill placement occurs on the site, there may be some advantages to considering the full removal/replacement of unsuitable pre-existing fills below planned footing lines/locations with engineered fill. Depending upon the siting of the building in the northwest quadrant of the site, the required removals of pre-existing fills would extend to depths ranging between 1 and 5.5 ft at this time. After filling resumes on the site to establish the targeted Elevation of 726.9 ft, however, the required undercutting below footings will typically be increased as suggested by the values in the right hand column of Table 1 above. If the pre-existing fills were re-engineered and all future required fills placed in an engineered manner (i.e., thin, compacted horizontal lifts with periodic field density testing, etc.), the footings for a future building could possibly be established on the fills with no undercutting required.

- If the pre-existing fills are not re-engineered as described above, undercutting below footings will be required. Footings can be either extended to bear on the underlying natural competent clayey soils or established on engineered granular fill placed within the undercut excavation. If an undercut/refill scheme is selected, the width of the over-excavation should be equal to the footing width plus the depth of undercut below the base of the footing. Fill placement should proceed in accordance with the guidelines presented in Appendix D.

Alternately, footing grades could be re-established with a lean-mixed structural concrete having a minimum strength of 500 psi. The main advantage with the use of lean concrete is that over-sizing of the undercut excavations can be reduced to a maximum width which equals the footing width plus approximately 6 in. each side.

It should be recognized that the development of specific design parameters for any future development on the site may require additional borings, exploratory test pits and/or engineering analysis once the actual siting of a building, anticipated building loads are known and an actual subgrade elevation is established. In the meantime, the following parameters can be used for preliminary planning purposes:

- **Maximum Allowable Bearing Pressure:**
  -- Footings bearing directly on very stiff to hard natural clays ..... 4000 to 6000 psf

  -- Footings bearing directly on select granular fill or lean concrete after undercutting ..... 4000 psf

  -- Footings bearing on re-engineered existing fills ..... 3000 psf

  -- Footings bearing on existing, non-engineered fills ..... Not recommended

- **Minimum Foundation Widths:**
  -- Continuous wall footings ..... 18 in.
  -- Individual column pads ..... 30 in.

- **Minimum Footing Depths:**
  -- Exterior footings ..... 4 ft
  -- Interior footings: ..... No minimum required

- **Site Classification for Seismic Design**
  In our opinion, the average soil/rock properties in the upper 100 ft of the site (based on undrained shear strengths exceeding 2000 psf on average) can be conservatively characterized as a very dense soil profile. This characterization would place the site in Site Class C for seismic design according to the 2000 International Building Code (see Table 1615.1.1).

C. Floor Slabs

After preparing the building site as described in the Site Preparation section of this report, soils present at floor subgrade should generally be suitable for slab-on-grade construction. Assuming a proposed floor slab grade at Elevation 727 ft ± 1 ft, subgrade soils beneath the slab are expected to consist predominantly of newly placed engineered fills used to raise site grades. Floor slabs supported on the prepared subgrade may be designed using a subgrade modulus of 125 pci. At a minimum, the slab should contain mesh for crack control. Prior to slab construction, the subgrades should be recompacted to densify soil that may become disturbed or loosened during construction activities. To serve as a capillary break, the final 4 to 6 in. of soils placed below the slab should consist of an imported well-graded sand or gravel with no more than 5 percent by weight passing the No. 200 U.S. Standard Sieve. To further minimize the potential for moisture migration, a plastic vapor barrier could also be utilized. Fill and drainage course materials required to prepare floor slab subgrades should be placed in accordance with the guidelines presented in Appendix D. If clean crushed stone is used as a drainage course material, these materials should be densified until no deflection or settlement is observed under compaction equipment.

Floor slabs should be isolated from the building walls and columns with a compressible filler, and the design should include an adequate number of isolation and contraction joints.

D. Other Design/Construction Related Issues

- We recommend that footing subgrades be observed by a CGC representative prior to footing construction to check that bearing soils are consistent with the findings of the borings. The evaluation would include checking for localized loose and/or soft zones that may have gone undetected beyond the fairly widely-spaced borings completed for the project, and confirming the adequacy of undercutting of the fill and/or buried topsoil-like deposits encountered at and/or below planned footing grades.

- The razing of the existing buildings on the property was not observed by CGC, nor has documentation been provided on the means/methods followed in the removal of the below-grade elements and backfilling operations. Excavations resulting from building demolition activities on the site should have been backfilled in an engineered/controlled manner. Unless details regarding the demolition operation are forthcoming, further exploration should proceed to specifically check on the nature of the subsoils within the former building footprints. This is particularly important if any future building is sited over this area.

- Other design/construction-related issues and considerations were outlined on Pages 11 through 13 of the "Preliminary Subsurface Exploration" report prepared for this site and will not be reiterated at this time.

* * * * *

It has been a pleasure to serve you on this project. We look forward to continuing our project involvement by providing construction testing services during the site development phase of the project. Please recognize that the recommendations presented in this report are based upon limited information regarding site development and may require further elaboration during the final design stage. It is recommended that we be consulted to confirm proper interpretation of geotechnical design recommendations. If you have any questions or need additional consultation, please contact us.

Sincerely,

CGC, Inc.

Jeff P. Simkowski, P.E.
Senior Consulting Professional

Encl: Appendix A - Field Exploration
Appendix B - Log of Test Boring - General Notes
Unified Soil Classification System
Soil Boring & Test Pit Location Map
Logs of Supplemental Test Borings (14)
Logs of Test Pits (14)
Field Density Test Report No. 1
Laboratory Compaction Test Reports (3)
Appendix C - Document Qualifications
Appendix D - Recommended Compacted Fill Specifications

cc: Mr. John Stibal / City of West Allis - CDA
Mr. Donald Gallo / Reinhart Boerner Van Deuren s.c.

APPENDIX A

FIELD EXPLORATION

1. Supplemental Soil Borings

The supplemental exploration completed on the site consisted of drilling a series of fourteen (14) soil borings between October 4 and 9, 2007. The approximate locations of the supplemental borings are shown on the Soil Boring & Test Pit Location Map presented in Appendix B. The borings, completed in accordance with SPT procedures (ASTM D1586), were drilled by J&J Soil Testing, Ltd. (under subcontract to CGC, Inc.) using a truck-mounted, rotary drill rig equipped with hollow-stem augers. The borings were drilled to depths of 15 to 20 ft. Ground surface elevations at the boring locations were determined by methods described in this report.

In most borings, soil samples were generally obtained at 2.5-ft intervals to a depth of 10 ft and at 5 ft intervals thereafter. In Borings 12A, 13A and 14A, however, supplemental SPT samples (i.e., at 2.5 ft intervals) were collected through the full thickness of the existing fills to aid in classifying and determining the in-situ strength of these materials. The specific procedures used for drilling and sampling are described below.

1. Boring Procedures Between Samples

   The boring is extended downward, between samples, by a hollow-stem auger.

2. Standard Penetration Test and Split-Barrel Sampling of Soils
   (ASTM Designation: D 1586)

   This method consists of driving a 2-inch outside diameter split barrel sampler using a 140-pound weight falling freely through a distance of 30 inches. The sampler is first seated 6 inches into the material to be sampled and then driven 12 inches. The number of blows required to drive the sampler the final 12 inches is recorded on the log of borings and is known as the Standard Penetration Resistance.

During the field exploration, the driller visually classified the soil and prepared a field log. Water level observations were made in each boring during and after drilling and are shown at the bottom of each boring log. *Field screening of the samples for possible environmental contaminants was not conducted by the drillers, as environmental site assessment activities were not part of CGC's work scope.* Upon completion of drilling, the boreholes were backfilled in accordance with WDNR regulations, and the soil samples were delivered to our laboratory for visual classification and laboratory testing. The soils were visually classified by a geotechnical engineer using the Unified Soil Classification System. The final logs prepared by the engineer, along with a description of the Unified Soil Classification System, are presented in Appendix B.

2. Exploratory Test Pits

On July 27, 2007, an exploratory test pit program was completed at the site for the purpose of evaluating the characteristics of the near surface fills known to exist on the site. The test pit program consisted of excavating a series of fourteen test pits to depths of 3 to 5 ft below the ground surface and at the approximate locations shown on the Soil Boring & Test Pit Location Map attached in Appendix B. The test pits were excavated by WP Grading, Inc. (under subcontract to CGC) using a tracked backhoe.

For each test pit location, a detailed log was developed to provide classification of the various fill materials observed in the profile. In addition, the individual fill layers were probed with a ⅝-in. diameter steel hand probe under full body weight to provide an indication as to the "tightness" of the materials. Where cohesive soils were exposed, the clays were tested with a pocket penetrometer to provide an estimation of the soil's unconfined compressive strength. Conventional field density testing was also performed utilizing nuclear methods (ASTM D2922) on select soil layers to provide an indication as to the level of compaction achieved during past fill placement/spreading operations.

The final logs prepared by the engineer, along with the results of the field density tests performed, are presented in Appendix B.

APPENDIX B

LOG OF TEST BORING - GENERAL NOTES
UNIFIED SOIL CLASSIFICATION SYSTEM
SOIL BORING & TEST PIT LOCATION MAP
LOGS OF SUPPLEMENTAL TEST BORINGS (14)
LOGS OF TEST PITS (14)
FIELD DENSITY TEST REPORT NO. 1
LABORATORY COMPACTION TEST REPORTS (3)

CGC, Inc.

LOG OF TEST BORING

General Notes

Descriptive Soil Classification

GRAIN SIZE TERMINOLOGY

Soil Fraction	Particle Size	U.S. Standard Sieve Size
Boulders	Larger than 12"	Larger than 12"
Cobbles	3" to 12"	3" to 12"
Gravel: Coarse	3/4" to 3"	3/4" to 3"
Fine	4.76 mm to 3/4"	#4 to 3/4"
Sand: Coarse	2.00 mm to 4.76 mm	#10 to #4
Medium	0.42 to mm to 2.00 mm	#40 to #10
Fine	0.074 mm to 0.42 mm	#200 to #40
Silt	0.005 mm to 0.074 mm	Smaller than #200
Clay	Smaller than 0.005 mm	Smaller than #200

Plasticity characteristics differentiate between silt and clay.

GENERAL TERMINOLOGY

Physical Characteristics
Color, moisture, grain shape, fineness, etc.
Major Constituents
Clay, silt, sand, gravel
Structure
Laminated, varved, fibrous, stratified, cemented, fissured, etc.
Geologic Origin
Glacial, alluvial, eolian, residual, etc.

RELATIVE DENSITY

Term	"N" Value
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	Over 50

RELATIVE PROPORTIONS OF OF COHESIONLESS SOILS

Proportional Term	Defining Range by Percentage of Weight
Trace	0%-5%
Little	5%-12%
Some	12%-35%
And	35%-50%

CONSISTENCY

Term	q_u-tons/sq. ft.
Very Soft	0.0 to 0.25
Soft	0.25 to 0.50
Medium	0.50 to 1.0
Stiff	1.0 to 2.0
Very Stiff	2.0 to 4.0
Hard	Over 4.0

ORGANIC CONTENT BY COMBUSTION METHOD

Soil Description	Loss on Ignition
Non Organic	Less than 4%
Organic Silt/Clay	4-12%
Sedimentary Peat	12-50%
Fibrous and Woody Peat	More than 50%

PLASTICITY

Term	Plastic Index
None to Slight	0-4
Slight	5-7
Medium	8-22
High to Very High	Over 22

The penetration resistance, N, is the summation of the number of blows required to effect two successive 6" penetrations of the 2" split-barrel sampler. The sampler is driven with a 140 lb. weight falling 30" and is seated to a depth of 6" before commencing the standard penetration test.

SYMBOLS

DRILLING AND SAMPLING

CS--Continuous Sampling
RC--Rock Coring: Size AW, BW, NW, 2"W
RQD--Rock Quality Designator
RB--Rock Bit
FT--Fish Tail
DC--Drove Casing
C--Casing: Size 2 1/2", NW, 4", HW
CW--Clear Water
DM--Drilling Mud
HSA--Hollow Stem Auger
FA--Flight Auger
HA--Hand Auger
COA--Clean-Out Auger
SS--2" Diameter Split-Barrel Sample
2ST--2" Diameter Thin-Walled Tube Sample
3ST--3" Diameter Thin-Walled Tube Sample
PT--3" Diameter Piston Tube Sample
AS--Auger Sample
WS--Wash Sample
PTS--Peat Sample
PS--Pitcher Sample
NR--No Recovery
S--Sounding
PMT--Borehole Pressuremeter Test
VS--Vane Shear Test
WPT--Water Pressure Test

LABORATORY TESTS

q_p--Penetrometer Reading, tons/sq. ft.
q_u--Unconfined Strength, tons/sq. ft.
W--Moisture Content, %
LL--Liquid Limit, %
PL--Plastic Limit, %
SL--Shrinkage Limit, %
LI--Loss on Ignition, %
D--Dry Unit Weight, lbs/cu. ft.
pH--Measure of Soil Alkalinity or Acidity
FS--Free Swell, %

WATER LEVEL MEASUREMENT

∇ --Water Level at time shown
NW--No Water Encountered
WD--While Drilling
BCR--Before Casing Removal
ACR--After Casing Removal
CW--Caved and Wet
CM--Caved and Moist

Note: Water level measurements shown on the boring logs represent conditions at the time indicated and may not reflect static levels, especially in cohesive soils.

UNIFIED SOIL CLASSIFICATION SYSTEM

COARSE-GRAINED SOILS

(More than half of material is larger than No. 200 seive size.)

GRAVELS More than half of coarse fraction larger than No. 4 sieve size

Clean Gravels (Little or no fines)

GW	Well-graded gravels, gravel-sand mixtures, little or no fines
GP	Poorly graded gravels, gravel-sand mixtures, little or no fines

Gravels with Fines (Appreciable amount of fines)

GM_u^d	Silty gravels, gravel-sand-silt mixtures
GC	Clayey gravels, gravel-sand-clay mixtures

SANDS More than half of coarse fraction smaller than No. 4 sieve size

Clean Sands (Little or no fines)

SW	Well-graded sands, gravelly sands, little or no fines
SP	Poorly graded sands, gravelly sands, little or no fines

Sands with Fines (Appreciable amount of fines)

SM_u^d	Silty sands, sand-silt mixtures
SC	Clayey sands, sand-clay mixtures

FINE-GRAINED SOILS

(More than half of material is smaller than No. 200 sieve.)

SILTS AND CLAYS Liquid limit less than 50%

ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
OL	Organic silts and organic silty clays of low plasticity

SILTS AND CLAYS Liquid limit greater than 50%

MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
CH	Inorganic clays of high plasticity, fat clays
OH	Organic clays of medium to high plasticity, organic silts

HIGHLY ORGANIC SOILS

PT	Peat and other highly organic soils

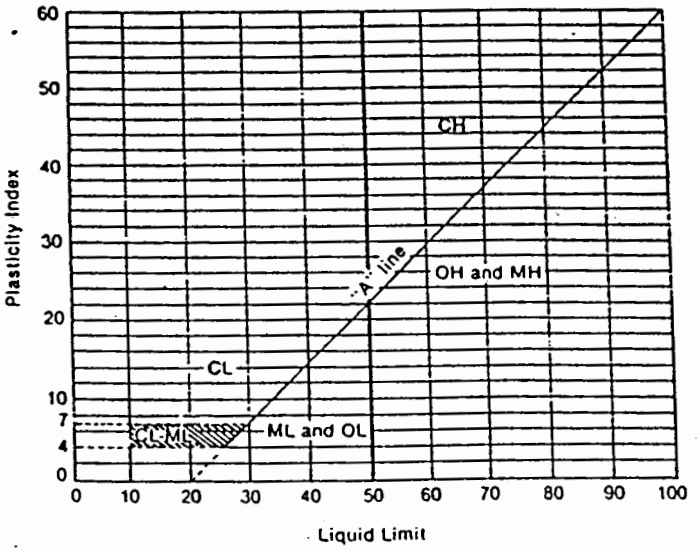
LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for SW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in hatched zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 per cent	GW, GP, SW, SP
More than 12 per cent	GM, GC, SM, SC
5 to 12 per cent	Borderline cases requiring dual symbols

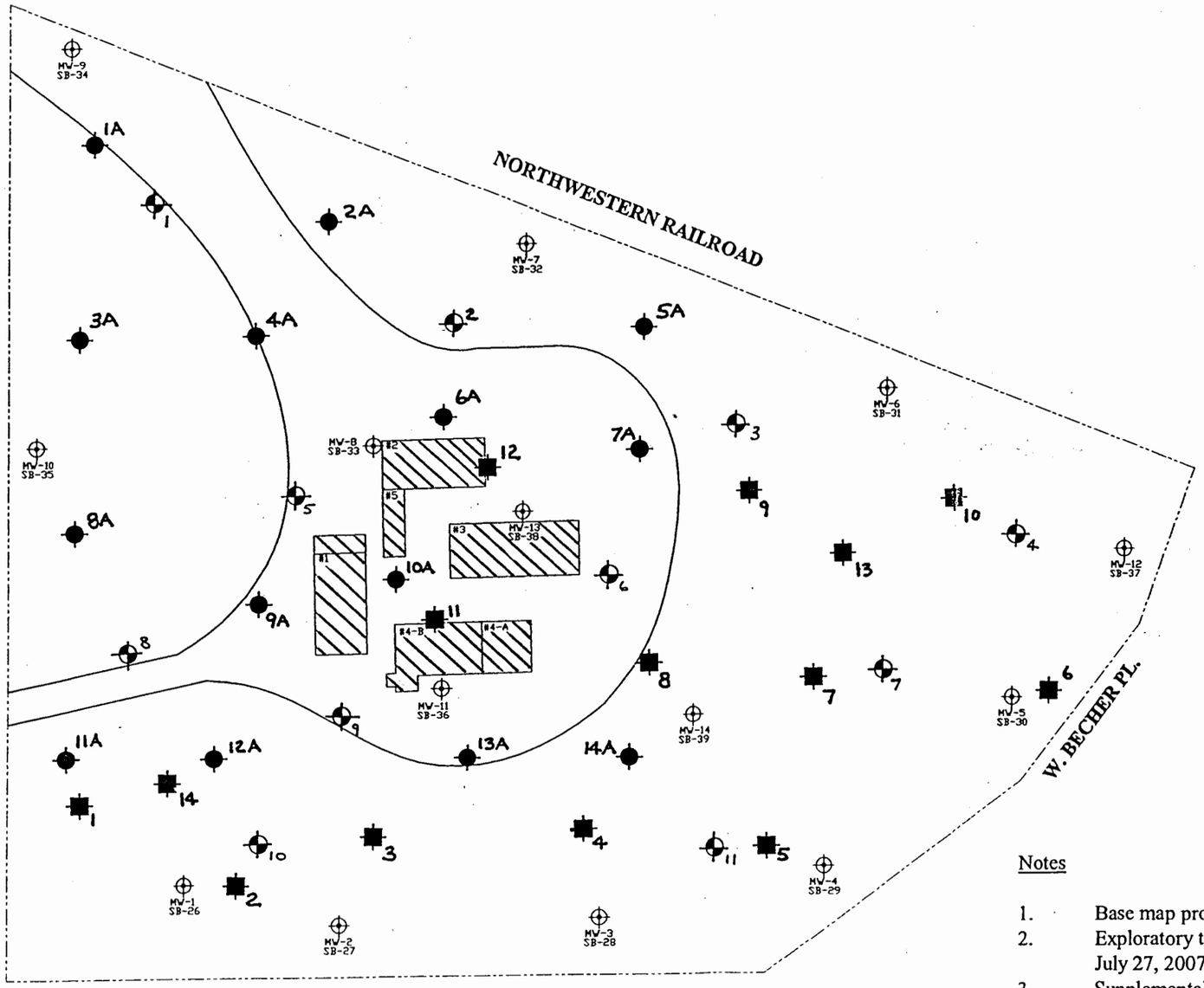
PLASTICITY CHART



For classification of fine-grained soils and fine fraction of coarse-grained soils.

Atterberg Limits plotting in hatched area are borderline classifications requiring use of dual symbols.

Equation of A-line: PI = 0.73 (LL - 20)



Legend

- 1A — Denotes Approximate Location and Number of Supplemental Soil Boring
- 1 — Denotes Approximate Location and Number of Exploratory Test Pit
- 2 — Denotes Approximate Location and Number of Previous CGC Soil Boring
- MW-1 — Denotes Location and Number of Monitoring Wells Installed On-Site Under TEMCO's Direction
- Approximate Footprint of Former Building

Notes

1. Base map provided by TEMCO.
2. Exploratory test pits were excavated by WP Grading, Inc. (under subcontract to CGC, Inc.) on July 27, 2007.
3. Supplemental soil borings were conducted by J&J Soil Testing, Ltd. (under subcontract to CGC, Inc.) between October 4 and 9, 2007.

Scale: 1" = 100' (approximate)

Drawn: --	Approved: JPS	Date: 1/12/09	CM07107-2	CGC, Inc.	SOIL BORING & TEST PIT LOCATION MAP Novak Site Redevelopment Project 1960 S. 67th Place West Allis, Wisconsin

LOGS OF SUPPLEMENTAL TEST BORINGS (14)

CGC,Inc.

LOG OF TEST BORING

Project **Novak Site Redevelopment Project**

1960 S. 67th Place

Location **West Allis, Wisconsin**

Boring No. **1A**

Surface Elevation **722.8'**

Job No. **CM07107-2**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099 • Email: cgcmilw@cgcinc.net

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Type	Rec (in.)	Moist	N	Depth		qu (qa) (tsf)	W	LL	PL	LI
						FILL: Very Dense, White Crushed Stone					
1		18	M	56							
2A/B		18	M	12		Medium Dense, Dark Brown Organic SILT (OL)	(1.5-4.0)				
					5	Stiff to Hard, Brown Slightly Mottled Lean CLAY; Little Fine to Coarse Sand, Trace Gravel (CL)					
3		18	M	18			(4.5+)				
4		18	M	20			(4.5+)				
					10						
						Stiff to Very Stiff, Gray Brown Lean CLAY; Little Fine Sand and Gravel (CL)					
5		18	M	9			(1.5-2.5)				
					15						
6		18	M	10			(2.25-3.5)				
					20	End of Boring at 20 ft Backfilled with Bentonite Chips					
					25						

WATER LEVEL OBSERVATIONS

While Drilling: NW Upon Completion of Drilling: NW

Time After Drilling: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 10/04/07 End 10/04/07

Driller J&J Chief JP Rig CME-45

Logger JP Editor JPS

Drill Method 2¼" HSA / Plug

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CGC,Inc.

LOG OF TEST BORING

Project **Novak Site Redevelopment Project**

1960 S. 67th Place

Location **West Allis, Wisconsin**

Boring No. **2A**

Surface Elevation **722.4'**

Job No. **CM07107-2**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099 • Email: cgcmilw@cgcinc.net

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Type	Rec (in.)	Moist	N	Depth		qu (qa) (tsf)	W	LL	PL	LI
						FILL: 2" Brown Sand and Gravel					
1		18	M	47		FILL: Dense, Black Foundry Sand, Some Brown Sandy Silt, Some Fine to Coarse Gravel Layers					
2		18	M	17		Hard, Brown Slightly Mottled Lean CLAY; Little Fine Sand, Trace Gravel (CL)	(4.5+)				
					5						
3		18	M	16			(4.5+)				
4		18	M	21			(4.5+)				
					10						
						Very Stiff, Gray Brown Lean CLAY; Little Fine Sand, Trace Gravel (CL)					
5		18	M	11			(2.5)				
					15	End of Boring at 15 ft Backfilled with Bentonite Chips					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling: NW Upon Completion of Drilling: NW

Time After Drilling: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 10/09/07 End 10/09/07

Driller J&J Chief JP Rig CME-45

Logger JP Editor JPS

Drill Method 2¼" HSA / Plug

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CGC,Inc.

LOG OF TEST BORING

Project **Novak Site Redevelopment Project**

1960 S. 67th Place

Location **West Allis, Wisconsin**

Boring No. 3A

Surface Elevation 723.7'

Job No. CM07107-2

Sheet 1 of 1

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099 • Email: cgcmilw@cgcinc.net

SAMPLE No.	Type	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						FILL: 7" Brown Sand and Gravel					
1		6	M	12		FILL: Mixture of Brown Lean Clay, Black Clayey Topsoil and Brown Fine to Coarse Sand and Gravel					
2		18	M	19		Hard, Brown Slightly Mottled Lean CLAY; Little Fine Sand, Trace Gravel (CL)	(4.5+)				
					5						
3		18	M	22			(4.5+)				
4		18	M	27			(4.5+)				
					10						
						Stiff to Very Stiff, Gray Brown Lean CLAY; Little Fine Sand, Some Gray Silt Seams and Layers (CL)					
5		18	M	10			(1.75-2.25)				
					15	End of Boring at 15 ft Backfilled with Bentonite Chips					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling: NW Upon Completion of Drilling: NW

Time After Drilling: ____ ____ ____ ____

Depth to Water: ____ ____ ____ ____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 10/09/07 End 10/09/07

Driller J&J Chief JP Rig CME-45

Logger JP Editor JPS

Drill Method 2¼" HSA / Plug

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CGC,Inc.

LOG OF TEST BORING

Project **Novak Site Redevelopment Project**

1960 S. 67th Place

Location **West Allis, Wisconsin**

Boring No. **4A**

Surface Elevation **722.2'**

Job No. **CM07107-2**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099 • Email: cgcmilw@cgcinc.net

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Type	Rec (in.)	Moist	N	Depth		qu (qa) (tsf)	W	LL	PL	LI
						FILL: Brown Sandy Silt, Some Fine to Coarse Gravel					
1		18	M	16		Very Stiff to Hard, Brown Slightly Mottled Lean CLAY; Little Fine Sand, Trace Gravel (CL)	(3.75) (4.5+)				
2		18	M	22			(4.5+)				
					5						
3		18	M	20			(4.5+)				
4		18	M	14			(2.5-4.5+)				
					10						
						Stiff, Gray Brown Lean CLAY; Little Fine Sand, Trace Gravel (CL)					
5		18	M	14							
					15	End of Boring at 15 ft Backfilled with Bentonite Chips					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling: NW Upon Completion of Drilling: NW

Time After Drilling: ____ ____ ____ ____

Depth to Water: ____ ____ ____ ____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 10/09/07 End 10/09/07

Driller J&J Chief JP Rig CME-45

Logger JP Editor JPS

Drill Method 2¼" HSA / Plug

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CGC,Inc.

LOG OF TEST BORING

Project **Novak Site Redevelopment Project**

1960 S. 67th Place

Location **West Allis, Wisconsin**

Boring No. **5A**

Surface Elevation **724.0'**

Job No. **CM07107-2**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099 • Email: cgcmilw@cgcinc.net

SAMPLE No.	Type	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						FILL: Very Stiff to Hard, Brown Lean Clay, Little Fine Sand, Trace Gravel					
1		12	M	7			(3.5-4.0)				
2		12	M	9			(3.5-4.0)				
					5	Very Stiff to Hard, Brown Lean CLAY; Little Fine Sand, Trace Gravel (CL)					
3		18	M	16			(4.5+)				
4		18	M	31							
					10						
5		18	M	15			(2.25-3.5)				
					15	End of Boring at 15 ft Backfilled with Bentonite Chips					
					20	Note: Drilled 25 ft south of lath (toward Boring 7A) due to fill pile.					
					25						

WATER LEVEL OBSERVATIONS

While Drilling: NW Upon Completion of Drilling: NW

Time After Drilling: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 10/08/07 End 10/08/07

Driller J&J Chief JP Rig CME-45

Logger JP Editor JPS

Drill Method 2¼" HSA / Plug

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CGC,Inc.

LOG OF TEST BORING

Project **Novak Site Redevelopment Project**

1960 S. 67th Place

Location **West Allis, Wisconsin**

Boring No. **6A**

Surface Elevation **723.3'**

Job No. **CM07107-2**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099 • Email: cgcmilw@cgcinc.net

SAMPLE No.	Type	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						FILL: Brown Sandy Silt, Trace Asphalt Rubble, Some Black Foundry Sand Seams and Layers					
1		18	M	63							
						Very Stiff to Hard, Brown Slightly Mottled Lean CLAY; Little Fine Sand, Trace Gravel (CL)					
2		18	M	12			(3.5)				
					5						
3		18	M	25			(4.5+)				
4		18	M	17			(3.5-4.5+)				
					10						
						Very Stiff, Gray Brown Lean CLAY; Little Fine Sand, Trace Gravel (CL)					
5		18	M	9			(2.0-2.25)				
					15	End of Boring at 15 ft Backfilled with Bentonite Chips					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling: NW Upon Completion of Drilling: NW

Time After Drilling: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 10/09/07 End 10/09/07

Driller J&J Chief JP Rig CME-45

Logger JP Editor JPS

Drill Method 2¼" HSA / Plug

CGC,Inc.

LOG OF TEST BORING

Project **Novak Site Redevelopment Project**

1960 S. 67th Place

Location **West Allis, Wisconsin**

Boring No. **7A**

Surface Elevation **724.0'**

Job No. **CM07107-2**

Sheet **1** of **1**

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SAMPLE No.	Type	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						FILL: 7" Brown Sand and Gravel					
1		12	M	14		FILL: Hard, Brown Lean Clay, Little Fine to Coarse Sand	(4.5+)				
						FILL: Black Foundry Sand, Little Wood, Glass and Brick Debris					
2		10	M	9		FILL: Very Stiff, Brown Lean Clay, Little Fine Sand	(3.5)				
					5						
3		18	M	19		Very Stiff to Hard, Brown Slightly Mottled Lean CLAY; Little Fine Sand, Trace Gravel (CL)	(4.5+)				
4		18	M	18			(4.5+)				
					10						
5		18	M	14			(3.5)				
					15						
						Stiff, Gray Brown Lean CLAY; Little Fine Sand, Trace Gravel (CL)					
6		18	M	7			(1.25-1.5)				
					20	End of Boring at 20 ft Backfilled with Bentonite Chips					
					25						

WATER LEVEL OBSERVATIONS

While Drilling: NW Upon Completion of Drilling: NW

Time After Drilling: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 10/08/07 End 10/08/07

Driller J&J Chief JP Rig CME-45

Logger JP Editor JPS

Drill Method 2¼" HSA / Plug

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CGC,Inc.

LOG OF TEST BORING

Project **Novak Site Redevelopment Project**

1960 S. 67th Place

Location **West Allis, Wisconsin**

Boring No. **8A**

Surface Elevation **725.0'**

Job No. **CM07107-2**

Sheet 1 of 1

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099 • Email: cgcmilw@cgcinc.net

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Type	Rec (in.)	Moist	N	Depth		qu (qa) (tsf)	W	LL	PL	LI
						FILL: Brown Lean Clay, Little Fine Sand					
1		10	M	9		FILL: Crushed Concrete and Brick Debris					
						FILL: Mixture of Brown Lean Clay and Black Organic Silt					
2		18	M	19		Hard, Brown Slightly Mottled Lean CLAY; Little Fine Sand, Trace Gravel (CL)	(4.5+)				
					5						
3		18	M	25			(4.5+)				
4		18	M	13		Very Stiff, Gray Brown Lean CLAY; Little Fine Sand, Trace Gravel (CL)	(2.0-2.75)				
					10						
5		18	M	10			(2.0-2.75)				
					15	End of Boring at 15 ft Backfilled with Bentonite Chips					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling: NW Upon Completion of Drilling: NW

Time After Drilling: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 10/08/07 End 10/08/07

Driller J&J Chief JP Rig CME-45

Logger JP Editor JPS

Drill Method 2¼" HSA / Plug

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CGC,Inc.

LOG OF TEST BORING

Project **Novak Site Redevelopment Project**

1960 S. 67th Place

Location **West Allis, Wisconsin**

Boring No. **9A**

Surface Elevation **724.9'**

Job No. **CM07107-2**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099 • Email: cgcmilw@cgcinc.net

SAMPLE No.	Type	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						FILL: Brown Sand and Gravel					
1		10	M	16		FILL: Medium Dense, White Crushed Stone FILL: Dark Brown to Black Organic Silt, Few Brown Clay Layers					
						Hard, Brown Slightly Mottled Lean CLAY; Little Fine Sand and Gravel (CL)					
2		18	M	16			(4.5+)				
					5						
3		18	M	19			(4.5+)				
4		18	M	17			(4.5+)				
					10						
						Stiff to Very Stiff, Gray Brown Lean CLAY; Little Fine Sand, Trace Gravel (CL)					
5		18	M	11			(1.5-2.0)				
					15	End of Boring at 15 ft Backfilled with Bentonite Chips					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling: NW Upon Completion of Drilling: NW

Time After Drilling: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 10/09/07 End 10/09/07

Driller J&J Chief JP Rig CME-45

Logger JP Editor JPS

Drill Method 2¼" HSA / Plug

CGC,Inc.

LOG OF TEST BORING

Project **Novak Site Redevelopment Project**

1960 S. 67th Place

Location **West Allis, Wisconsin**

Boring No. **10A**

Surface Elevation **724.2'**

Job No. **CM07107-2**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099 • Email: cgcmilw@cgcinc.net

SAMPLE No.	Type	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						FILL: Medium Stiff to Very Stiff, Brown Lean Clay, Little Fine Sand, Trace Topsoil, Trace Debris					
1		10	M	8			(2.0)				
2		4	M	3			(1.0)				
					5						
						Hard, Brown Lean CLAY; Little Fine Sand and Gravel (CL)					
3		18	M	26			(4.5+)				
						Stiff to Very Stiff, Gray Brown Lean CLAY; Little Fine Sand and Gravel (CL)					
4		18	M	11			(2.5-3.0)				
					10						
5		18	M	7			(1.5-2.0)				
					15						
						End of Boring at 15 ft Backfilled with Bentonite Chips					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling: NW Upon Completion of Drilling: NW

Time After Drilling: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 10/08/07 End 10/08/07

Driller J&J Chief JP Rig CME-45

Logger JP Editor JPS

Drill Method 2¼" HSA / Plug

CGC,Inc.

LOG OF TEST BORING

Project **Novak Site Redevelopment Project**

1960 S. 67th Place

Location **West Allis, Wisconsin**

Boring No. **11A**

Surface Elevation **728.1'**

Job No. **CM07107-2**

Sheet 1 of 1

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099 • Email: cgcmilw@cgcinc.net

SAMPLE No.	Type	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						FILL: Dark Brown Silty Clay, Little Fine Sand and Black Clayey Topsoil Inclusions					
1		1	M	9							
						FILL: Dark Brown Clayey Topsoil					
2A/B		18	M	15		FILL: Brown Sandy Silt					
					5	Very Stiff to Hard, Brown Slightly Mottled Lean CLAY; Little Fine Sand and Gravel (CL)					
3		18	M	19			(2.5)				
4		18	M	27	10						
5		18	M	46	15						
						Stiff, Gray Brown Lean CLAY; Little Fine Sand, Trace Gravel (CL)					
6		18	M	11	20		(1.25)				
						End of Boring at 20 ft Backfilled with Bentonite Chips					
					25						

WATER LEVEL OBSERVATIONS

While Drilling: NW Upon Completion of Drilling: NW

Time After Drilling: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 10/04/07 End 10/04/07

Driller J&J Chief JP Rig CME-45

Logger JP Editor JPS

Drill Method 2¼" HSA / Plug

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CGC,Inc.

LOG OF TEST BORING

Project **Novak Site Redevelopment Project**

1960 S. 67th Place

Location **West Allis, Wisconsin**

Boring No. **12A**

Surface Elevation **728.2'**

Job No. **CM07107-2**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099 • Email: cgcmilw@cgcinc.net

SAMPLE No.	Type	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						FILL: Very Stiff to Hard, Brown Lean Clay, Little Fine Sand and Gravel					
1		18	M	30		FILL: Mixture of Very Stiff, Brown Lean Clay and Black to Dark Brown Clayey Topsoil, Little Fine Gravel	(3.0-4.5+)				
2		18	M	18	5		(3.5)				
3		6	M	5							
4		6	M	9	10	FILL: Gray Lime					
5		12	M	15		FILL: Very Stiff to Hard, Brown Lean Clay, Little Fine Sand, Trace Wood Debris	(3.0-4.0)				
6		NR	–	6	15	FILL: Gray Lime					
7		6	W	1							
8		18	M	17	20	Very Stiff to Hard, Brown Lean CLAY; Little Fine Sand, Trace Gravel (CL)	(3.5-4.5+)				
						End of Boring at 20 ft Backfilled with Bentonite Chips					
					25						

WATER LEVEL OBSERVATIONS

While Drilling: 10' Upon Completion of Drilling: 10'

Time After Drilling: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 10/08/07 End 10/08/07

Driller J&J Chief JP Rig CME-45

Logger JP Editor JPS

Drill Method 2¼" HSA / Plug

CGC,Inc.

LOG OF TEST BORING

Project **Novak Site Redevelopment Project**

1960 S. 67th Place

Location **West Allis, Wisconsin**

Boring No. **13A**

Surface Elevation **725.9'**

Job No. **CM07107-2**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099 • Email: cgcmilw@cgcinc.net

SAMPLE No.	Type	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						FILL: Very Stiff, Brown Lean Clay, Little Fine Sand					
1		15	M	64		FILL: Stiff to Hard, Gray Sandy Clay, Little Fine Gravel	(1.5) (4.5+)				
						FILL: Mixture of Wood and Concrete Debris, Some Fine to Coarse Gravel					
2		12	M	19	5						
						FILL: Mixture of Brown Lean Clay and Dark Clayey Topsoil					
3		1	M	5							
						FILL: Very Soft to Soft, Brown Lean Clay, Trace Sand					
4		18	M	5	10		(0.25-0.5)				
						FILL: Gray Lime					
5		18	M	5							
6		12	W	1	15						
7		18	W	1							
						Hard, Brown Lean CLAY; Little Fine Sand, Trace Gravel (CL)					
8		18	M	18	20		(4.0-4.5+)				
						End of Boring at 20 ft Backfilled with Bentonite Chips					
					25						

WATER LEVEL OBSERVATIONS

While Drilling: 13' Upon Completion of Drilling: 17.5'

Time After Drilling: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 10/08/07 End 10/08/07

Driller J&J Chief JP Rig CME-45

Logger JP Editor JPS

Drill Method 2¼" HSA / Plug

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CGC,Inc.

LOG OF TEST BORING

Project **Novak Site Redevelopment Project**

1960 S. 67th Place

Location **West Allis, Wisconsin**

Boring No. **14A**

Surface Elevation **723.9'**

Job No. **CM07107-2**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099 • Email: cgcmilw@cgcinc.net

SAMPLE No.	Type	Rec (in.)	Moist	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						FILL: Very Stiff to Hard, Brown Lean Clay, Some Fine Sand and Gravel, Little Glass and Wood Debris, Trace Black Silty Topsoil					
1		14	M	26			(3.5-4.5+)				
2		18	M	32			(4.5+)				
					5						
						FILL: Dark Brown Clayey Topsoil					
3		10	M	4							
						FILL: Mixture of Gray Lean Clay, Black Clayey Topsoil and Concrete and Wood Debris					
4		9	M	9							
					10						
5		NR	M	30/0"							
6		1	M	5							
					15						
						FILL: Gray Lime					
7A/B		18	M/W	6							
						FILL: Mixture of Brown Lean Clay and Black Foundry Sand					
						Hard, Brown Slightly Mottled Lean CLAY; Little Fine Sand and Gravel					
8		18	M	18			(4.5+)				
					20						
						End of Boring at 20 ft Backfilled with Bentonite Chips					
					25						

WATER LEVEL OBSERVATIONS

While Drilling: 13' Upon Completion of Drilling: 10.5'

Time After Drilling: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 10/08/07 End 10/08/07

Driller J&J Chief JP Rig CME-45

Logger JP Editor JPS

Drill Method 2¼" HSA / Plug

CGC,Inc.

LOG OF TEST PIT

Project **The Novak Site**

1960 S. 67th Place

Location **West Allis, Wisconsin**

Pit No. **1**

Surface Elevation **729.6'**

Job No. **CM07107-1**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE No.	SAMPLE Moist	SAMPLE Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M		FILL: Very Stiff, Brown Lean Clay, Little Fine Gravel	(2.5)	9.6			1
			FILL: Mixture of Crushed Stone, Brown Lean Clay, Some Fine to Coarse Gravel and Miscellaneous Demolition Debris		9.0			<1
2	M		FILL: Miscellaneous Demolition Debris					3-4
3	M		Very Stiff, Gray Brown Lean CLAY; Little Fine Gravel (CL)	(3.0)	18.4			
			End of Excavation at 3.5 ft					
		5						
		10						
		15						

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

WATER LEVEL OBSERVATIONS

While Excavating: NW Upon Completion of Excavating: NW

Time After Excavating: _____

Depth to Water: _____

Depth to Cave In:

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Date Excavated: 7/27/07

Logger RM Editor JPS

Equipment Used: Tracked Backhoe

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CGC,Inc.

LOG OF TEST PIT

Project: **The Novak Site**

1960 S. 67th Place

Location: **West Allis, Wisconsin**

Pit No. **2**

Surface Elevation **730.1'**

Job No. **CM07107-1**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE No.	SAMPLE Moist	SAMPLE Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M		FILL: Very Stiff, Brown Lean Clay, Little Fine Gravel	(4.0)	10.0			1-2
2	M		FILL: Mixture of Brown Lean Clay, Some Fine to Coarse Gravel and Miscellaneous Demolition Debris	(4.5)	9.4			<1
3	M		FILL: Hard, Mixture of Black to Brown Gravelly Silty Clay, Some Demolition Debris	(4.5)	4.7			<1
		5	End of Excavation at 3.5 ft					
		10						
		15						

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

WATER LEVEL OBSERVATIONS

While Excavating: NW Upon Completion of Excavating: NW

Time After Excavating: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

Depth to Cave In:

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Date Excavated: 7/27/07

Logger RM Editor JPS

Equipment Used: Tracked Backhoe

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CGC,Inc.

LOG OF TEST PIT

Project: **The Novak Site**

1960 S. 67th Place

Location: **West Allis, Wisconsin**

Pit No. 3

Surface Elevation **727.6'**

Job No. **CM07107-1**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE No.	SAMPLE Moist	SAMPLE Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M		FILL: Very Stiff, Brown Lean Clay, Little Fine Gravel	(3.5-4.0)	17.0			1-2
2	M		FILL: ¾" T.B./Crushed Stone with Fines		4.4			0-1
								6-8
			FILL: Gray Lime					
		5	End of Excavation at 4 ft					
		10						
		15						

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

WATER LEVEL OBSERVATIONS

While Excavating: NW Upon Completion of Excavating: NW

Time After Excavating: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

Depth to Cave In:

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Date Excavated: 7/27/07

Logger RM Editor JPS

Equipment Used: Tracked Backhoe

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CGC,Inc.

LOG OF TEST PIT

Project: **The Novak Site**

1960 S. 67th Place

Location: **West Allis, Wisconsin**

Pit No. 4

Surface Elevation 724.4'

Job No. CM07107-1

Sheet 1 of 1

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE No.	Moist	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M		FILL: Hard, Brown Lean Clay, Little Fine Gravel		11.8			1
2	M			(4.5)	7.5			0-1
								0-1
			FILL: Black Cinders and Slag, Little Clay and Gravel					
								0-1
3	M		FILL: ¾" T.B./Crushed Stone with Fines					
			End of Excavation at 3.5 ft					
		5						
		10						
		15						

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

WATER LEVEL OBSERVATIONS

While Excavating: NW Upon Completion of Excavating: NW

Time After Excavating: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

Depth to Cave In:

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Date Excavated: 7/27/07

Logger RM Editor JPS

Equipment Used: Tracked Backhoe

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CGC,Inc.

LOG OF TEST PIT

Project: **The Novak Site**

1960 S. 67th Place

Location: **West Allis, Wisconsin**

Pit No. **5**

Surface Elevation **723.9'**

Job No. **CM07107-1**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE No.	SAMPLE Moist	SAMPLE Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M		FILL: Brown to Gray Mottled Lean Clay, Some Black Organic Clay Inclusions	(1.0)	14.9			5
2	M		FILL: Stiff, Gray to Brown Lean Clay, Some Fine to Coarse Gravel and Miscellaneous Demolition Debris		22.2			4-5
3	M			(1.5)	18.0			3-4
			FILL: Mixture of Gray to Brown Lean Clay, Demolition Debris & Boulders	(0.25-1.0)				3-4
		5	End of Excavation at 4.5 ft					
		10						
		15						

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

WATER LEVEL OBSERVATIONS

While Excavating: NW Upon Completion of Excavating: NW

Time After Excavating: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

Depth to Cave In:

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Date Excavated: 7/27/07

Logger RM Editor JPS

Equipment Used: Tracked Backhoe

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CGC,Inc.

LOG OF TEST PIT

Project: **The Novak Site**
1960 S. 67th Place
Location: **West Allis, Wisconsin**

Pit No. 6
Surface Elevation 722.4'
Job No. CM07107-1
Sheet 1 of 1

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE No.	SAMPLE Moist	SAMPLE Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M		FILL: Hard, Brown Lean Clay, Little Fine Gravel	(4.5+)	18.3			0-1
2	M		FILL: Medium Stiff to Stiff, Brown to Gray Lean Clay, Little Fine Gravel, Some Black Organic Clay Inclusions	(1.0-1.5)	21.6			4-5
3	M		FILL: Hard, Gray Brown Lean Clay, Some Fine Gravel and Demolition Debris	(4.5)	15.5			0-1
4	M		*	(4.5)	21.3			0-1
			End of Excavation at 3.5 ft					
		5						
			* FILL: Mixture of Dark Brown Fine to Coarse Gravel, Lean Clay and Demolition Debris					
		10						
		15						

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

WATER LEVEL OBSERVATIONS

While Excavating: NW Upon Completion of Excavating: NW

Time After Excavating: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

Depth to Cave In:

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Date Excavated: 7/27/07

Logger RM Editor JPS

Equipment Used: Tracked Backhoe

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CGC,Inc.

LOG OF TEST PIT

Project: **The Novak Site**

1960 S. 67th Place

Location: **West Allis, Wisconsin**

Pit No. **7**

Surface Elevation **724.9'**

Job No. **CM07107-1**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE No.	SAMPLE Moist	SAMPLE Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M		FILL: Very Stiff, Gray to Brown Mottled Lean Clay, Little Fine to Coarse Sand	(2.5)	16.4			2
2	M			(2.5)	14.8			2
3	M		FILL: Mixture of Brown and Black Lean Clay, Crushed Stone and Demolition Debris	(4.5)	11.1			0-1
			End of Excavation at 3.5 ft					
		5						
		10						
		15						

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

WATER LEVEL OBSERVATIONS

While Excavating: NW Upon Completion of Excavating: NW

Time After Excavating: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

Depth to Cave In:

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Date Excavated: 7/27/07

Logger RM Editor JPS

Equipment Used: Tracked Backhoe

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CGC,Inc.

LOG OF TEST PIT

Project: **The Novak Site**

1960 S. 67th Place

Location: **West Allis, Wisconsin**

Pit No. 8

Surface Elevation 723.8'

Job No. CM07107-1

Sheet 1 of 1

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE No.	SAMPLE Moist	SAMPLE Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M		FILL: Mixture of Black and Brown Lean Clay, Fine to Coarse Gravel and Demolition Debris	(4.25)	21.0			0
2	M		FILL: Very Stiff, Dark Brown Lean Clay, Some Cinders and Slag	(3.5)	21.5			1
3	M		Hard, Brown to Gray Mottled Lean CLAY (CL) (POSSIBLE FILL)	(4.5)	21.3			0
			Gray Brown Mottled Lean CLAY (CL)					
			End of Excavation at 3.5 ft					
		5						
		10						
		15						

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

WATER LEVEL OBSERVATIONS

While Excavating: NW Upon Completion of Excavating: NW

Time After Excavating: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

Depth to Cave In:

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Date Excavated: 7/27/07

Logger RM Editor JPS

Equipment Used: Tracked Backhoe

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CGC,Inc.

LOG OF TEST PIT

Project: **The Novak Site**

1960 S. 67th Place

Location: **West Allis, Wisconsin**

Pit No. 9

Surface Elevation 725.1'

Job No. CM07107-1

Sheet 1 of 1

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE No.	SAMPLE Moist	SAMPLE Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M		FILL: Very Stiff, Brown Lean Clay, Little Fine Gravel (Blocky Structure)	(3.5-4.0)	13.7			1
2	M		FILL: Hard, Brown Lean Clay	(4.5)	15.4			0-1
3	M		FILL: Hard, Mixture of Black to Brown Gravelly Silty Clay, Some Demolition Debris, Some Crushed Stone	(4.5)	13.7			0-1
		5	End of Excavation at 3.5 ft					
		10						
		15						

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

WATER LEVEL OBSERVATIONS

While Excavating: NW Upon Completion of Excavating: NW

Time After Excavating: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

Depth to Cave In:

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Date Excavated: 7/27/07

Logger RM Editor JPS

Equipment Used: Tracked Backhoe

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CGC,Inc.

LOG OF TEST PIT

Project	The Novak Site
	1960 S. 67th Place
Location	West Allis, Wisconsin

Pit No.	10
Surface Elevation	723.7'
Job No.	CM07107-1
Sheet	1 of 1

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE No.	SAMPLE Moist	SAMPLE Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M		FILL: Very Stiff, Brown Lean Clay, Little Fine Gravel	(2.5-4.0)	16.8			2-3
2	M		FILL: ¾" T.B./Crushed Stone with Fines					0-1
3	M		FILL: Very Stiff, Brown and Black Sandy Lean Clay, Some Fine to Coarse Gravel and Demolition Debris	(4.0)	14.2			0-1
			FILL: Mixture of Concrete Block, Black to Brown Lean Clay and Demolition Debris					
		5	End of Excavation at 5 ft					
		10						
		15						

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

WATER LEVEL OBSERVATIONS

While Excavating: NW Upon Completion of Excavating: NW

Time After Excavating: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

Depth to Cave In:

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Date Excavated: 7/27/07

Logger RM Editor JPS

Equipment Used: Tracked Backhoe

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CGC,Inc.

LOG OF TEST PIT

Project: **The Novak Site**

1960 S. 67th Place

Location: **West Allis, Wisconsin**

Pit No. **11**

Surface Elevation **725.4'**

Job No. **CM07107-1**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE No.	SAMPLE Moist	SAMPLE Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
		5 10 15	Note: The excavation was excavated to a depth of 3 ft and immediately filled with water before profile could be logged.					

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

WATER LEVEL OBSERVATIONS

While Excavating: 2' Upon Completion of Excavating: 1'

Time After Excavating: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

Depth to Cave In:

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Date Excavated: 7/27/07

Logger RM Editor JPS

Equipment Used: Tracked Backhoe

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CGC,Inc.

LOG OF TEST PIT

Project **The Novak Site**

1960 S. 67th Place

Location **West Allis, Wisconsin**

Pit No. **12**

Surface Elevation **725.1'**

Job No. **CM07107-1**

Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE No.	SAMPLE Moist	SAMPLE Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M		FILL: Mixture of Brown and Black Lean Clay, Crushed Stone and Demolition Debris	(4.25)	8.6			0
2	M		FILL: Brown and Dark Brown Mottled Lean Clay, Some Cinders and Pieces of Asphalt Debris	(3.5)	20.6			1
3	M		Hard, Gray Brown Lean CLAY; Trace Gravel (CL)	(4.5)				0
				(4.5+)				0
		5	End of Excavation at 4 ft					
		10						
		15						

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

WATER LEVEL OBSERVATIONS

While Excavating: NW Upon Completion of Excavating: NW

Time After Excavating: _____

Depth to Water: _____

Depth to Cave In:

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Date Excavated: 7/27/07

Logger RM Editor JPS

Equipment Used: Tracked Backhoe

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CGC,Inc.

LOG OF TEST PIT

Project: **The Novak Site**
1960 S. 67th Place
Location: **West Allis, Wisconsin**

Pit No. **13**
Surface Elevation **724.9'**
Job No. **CM07107-1**
Sheet **1** of **1**

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE No.	SAMPLE Moist	SAMPLE Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M		FILL: Very Stiff, Brown Lean Clay, Little Fine Gravel	(3.0-4.0)	16.3			1-2
2	M		FILL: ¾" T.B./Crushed Stone with Fines					
3	M		FILL: Mixture of Crushed Stone, Brown Lean Clay, Some Fine to Coarse Gravel and Miscellaneous Demolition Debris	(4.5)	14.2			0-1
			*	(4.5)	10.6			0-1
			End of Excavation at 4 ft					
		5						
			* FILL: Hard, Dark Brown Lean Clay, Some Gravel and Demolition Debris					
		10						
		15						

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

WATER LEVEL OBSERVATIONS

While Excavating: NW Upon Completion of Excavating: NW

Time After Excavating: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

Depth to Cave In:

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Date Excavated: 7/27/07

Logger RM Editor JPS

Equipment Used: Tracked Backhoe

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CGC,Inc.

LOG OF TEST PIT

Project: **The Novak Site**

1960 S. 67th Place

Location: **West Allis, Wisconsin**

Pit No. 14

Surface Elevation 729.7'

Job No. CM07107-1

Sheet 1 of 1

336 S. Curtis Road • West Allis, WI 53214 • (414) 443-2000 • FAX (414) 443-2099

SAMPLE No.	SAMPLE Moist	SAMPLE Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	H.P.'s (in.)
1	M		FILL: Mixture of Demolition Debris and Lean Clay					3-4
2	M							2
3	M		FILL: Dark Brown Lean Clay and Crushed Stone					1-2
			End of Excavation at 3 ft					
		5						
		10						
		15						

H.P.'s = denotes penetration depth with a 5/8-in. diameter steel hand probe under full body weight.

WATER LEVEL OBSERVATIONS

While Excavating: NW Upon Completion of Excavating: NW

Time After Excavating: _____ _____ _____ _____

Depth to Water: _____ _____ _____ _____

Depth to Cave In:

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Date Excavated: 7/27/07

Logger RM Editor JPS

Equipment Used: Tracked Backhoe

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FIELD DENSITY TEST REPORT NO. 1
LABORATORY COMPACTION TEST REPORTS (3)

Job No.	CM07107-1
Tested By:	RM

CGC, Inc.

FIELD DENSITY TEST REPORT - NO. 1

CGC, Inc., 336 S. Curtis Road, West Allis, WI 53214 - Phone (414) 443-2000 - Fax (414) 443-2099

PROJECT: The Novak Site
1960 South 67th Place
West Allis, Wisconsin

TO: TEMCO
2088 Washington Avenue
P.O. Box 856
Cedarburg, WI 53012

ATTN: Mr. Jeff Hosler

TEST METHODS: Moisture-density relationship of soils based on MODIFIED Proctor (ASTM D1557).
"METHOD" indicates: (N) Nuclear (ASTM D2922)

Test No.	METHOD	Location	Test Elevation (ft)	Distance Below Fill Surface (in.)	Description of Material Tested	Moisture %	Dry Density lb/cuft	Maximum Density lb/cuft	Meas. Comp.	Spec. Comp.
7/27/07										
1	N	Test Pit No. 1	-0.3	0	Specimen No. 1	9.6	119.8	126	95%	n/a
2	N	Test Pit No. 1	-1.0	0	Specimen No. 3	9.0	131.1	130	100+%	n/a
3	N	Test Pit No. 1	-3.0	0	Specimen No. 1	18.4	108.4	126	86%	n/a
4	N	Test Pit No. 2	-0.3	0	Specimen No. 1	10.5	111.7	126	89%	n/a
5	N	Test Pit No. 2	-1.0	0	Specimen No. 3	9.4	107.6	126.5	85%	n/a
6	N	Test Pit No. 2	-2.0	0	Specimen No. 3	10.5	112.7	126.5	89%	n/a
7	N	Test Pit No. 2	-3.0	0	Specimen No. 3	4.9	119.2	130	92%	n/a
8	N	Test Pit No. 3	-0.2	0	Specimen No. 1	11.0	117.8	126	93%	n/a
9	N	Test Pit No. 4	-0.2	0	Specimen No. 1	11.8	112.6	126	89%	n/a
10	N	Test Pit No. 4	-1.0	0	Specimen No. 1	7.5	116.4	126	92%	n/a
11	N	Test Pit No. 5	-0.2	0	Specimen No. 1	14.9	115.9	126	92%	n/a
12	N	Test Pit No. 5	-1.0	0	Specimen No. 3	22.2	99.2	126.5	78%	n/a

Test No.	METHOD	Location	Test Elevation (ft)	Distance Below Fill Surface (in.)	Description of Material Tested	Moisture %	Dry Density lb/cuft	Maximum Density lb/cuft	Meas. Comp.	Spec. Comp.
13	N	Test Pit No. 5	-2.0	0	Specimen No. 3	18.0	110.8	126.5	88%	n/a
14	N	Test Pit No. 5	-3.0	0	Specimen No. 3	17.1	118.7	130	91%	n/a
15	N	Test Pit No. 6	-0.2	0	Specimen No. 1	18.3	112.4	126	89%	n/a
16	N	Test Pit No. 6	-1.0	0	Specimen No. 1	21.6	102.6	126	81%	n/a
17	N	Test Pit No. 6	-2.0	0	Specimen No. 3	15.5	103.5	126.5	82%	n/a
18	N	Test Pit No. 6	-3.0	0	Specimen No. 1	21.3	117.1	130	90%	n/a
19	N	Test Pit No. 7	-0.2	0	Specimen No. 1	16.4	114.7	126	91%	n/a
20	N	Test Pit No. 7	-1.0	0	Specimen No. 1	17.8	111.4	126	88%	n/a
21	N	Test Pit No. 7	-2.0	0	Specimen No. 1	14.8	114.5	126	91%	n/a
22	N	Test Pit No. 7	-3.0	0	Specimen No. 2	11.1	123.3	126.5	97%	n/a
23	N	Test Pit No. 8	-0.2	0	Specimen No. 3	21.0	115.7	130	89%	n/a
24	N	Test Pit No. 8	-1.0	0	Specimen No. 1	18.9	102.7	126	82%	n/a
25	N	Test Pit No. 8	-2.0	0	Specimen No. 1	15.4	114.7	126	91%	n/a
26	N	Test Pit No. 9	-0.2	0	Specimen No. 1	13.7	118.1	126	94%	n/a
27	N	Test Pit No. 9	-1.0	0	Specimen No. 1	15.4	116.9	126	93%	n/a
28	N	Test Pit No. 9	-2.0	0	Specimen No. 2	11.5	118.6	126.5	94%	n/a
29	N	Test Pit No. 9	-3.0	0	Specimen No. 2	13.6	105.3	124.5	85%	n/a
30	N	Test Pit No. 10	-0.2	0	Specimen No. 1	16.8	112.2	126	89%	n/a
31	N	Test Pit No. 10	-2.0	0	Specimen No. 2	14.2	113.1	126.5	89%	n/a
32	N	Test Pit No. 10	-3.0	0	Specimen No. 2	12.9	119.7	126.5	95%	n/a
33	N	Test Pit No. 12	-0.2	0	Specimen No. 2	8.2	122.6	126.5	97%	n/a
34	N	Test Pit No. 12	-2.0	0	Specimen No. 1	16.0	116.3	126	92%	n/a
35	N	Test Pit No. 13	-0.2	0	Specimen No. 1	16.3	113.7	126	90%	n/a
36	N	Test Pit No. 13	-2.0	0	Specimen No. 3	14.2	121.8	130	94%	n/a

Test No.	METHOD	Location	Test Elevation (ft)	Distance Below Fill Surface (in.)	Description of Material Tested	Moisture %	Dry Density lb/cuft	Maximum Density lb/cuft	Meas. Comp.	Spec. Comp.
37	N	Test Pit No. 13	-3.0	0	Specimen No. 3	10.2	120.4	130	93%	n/a
38	N	Test Pit No. 14	-0.2	0	Specimen No. 3	19.7	111.4	126.5	88%	n/a
39	N	Test Pit No. 14	-1.0	0	Specimen No. 3	15.0	113.9	126.5	90%	n/a

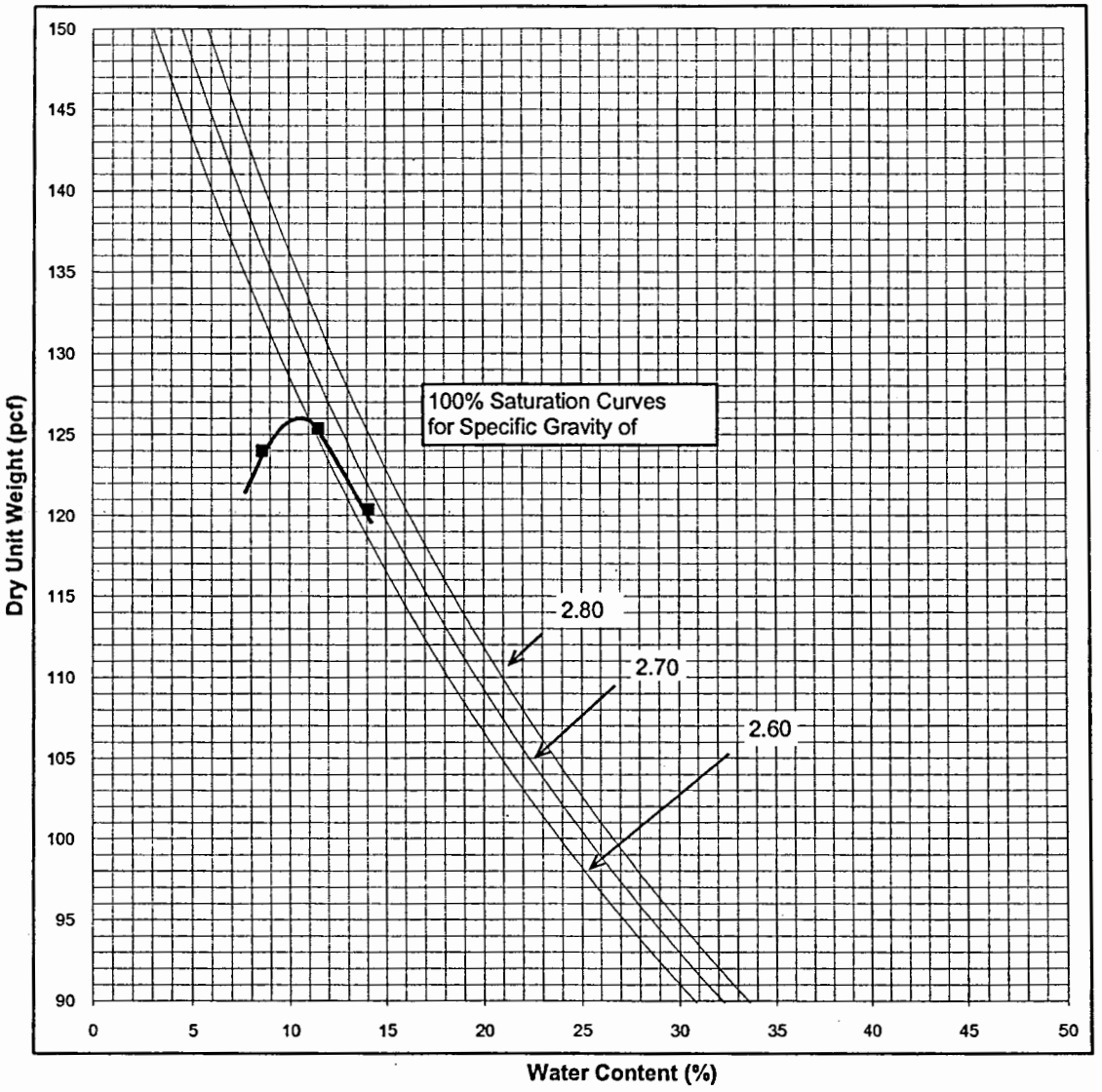
Remarks:

Based on the variable nature of the fills exposed at each test location, along with the variable gravel contents, etc., the measured compaction levels noted should be considered "approximate".

Signed _____ Dated 1/19/09

Jeff H. Simkowski, P.E.

TEST REPORT



Specimen No.		Maximum Dry Unit Weight, pcf		Optimum Water Content, %	
1		126.0		10.5	
Specimen Description					
Brown Lean CLAY; Trace Gravel					
Corrected Maximum Dry Unit Weight, pcf		Corrected Optimum Water Content, %			
n/a		n/a			
Test Method		Liquid Limit	Plastic Limit	Plasticity Index	Specific Gravity
ASTM D1557, Method A		-	-	-	2.7 (est.)
Preparation Method	USCS	% Gravel	% Sand	% Fines	% Oversize
Dry	CL	-	-	-	-

PROJECT: The Novak Site
West Allis, Wisconsin

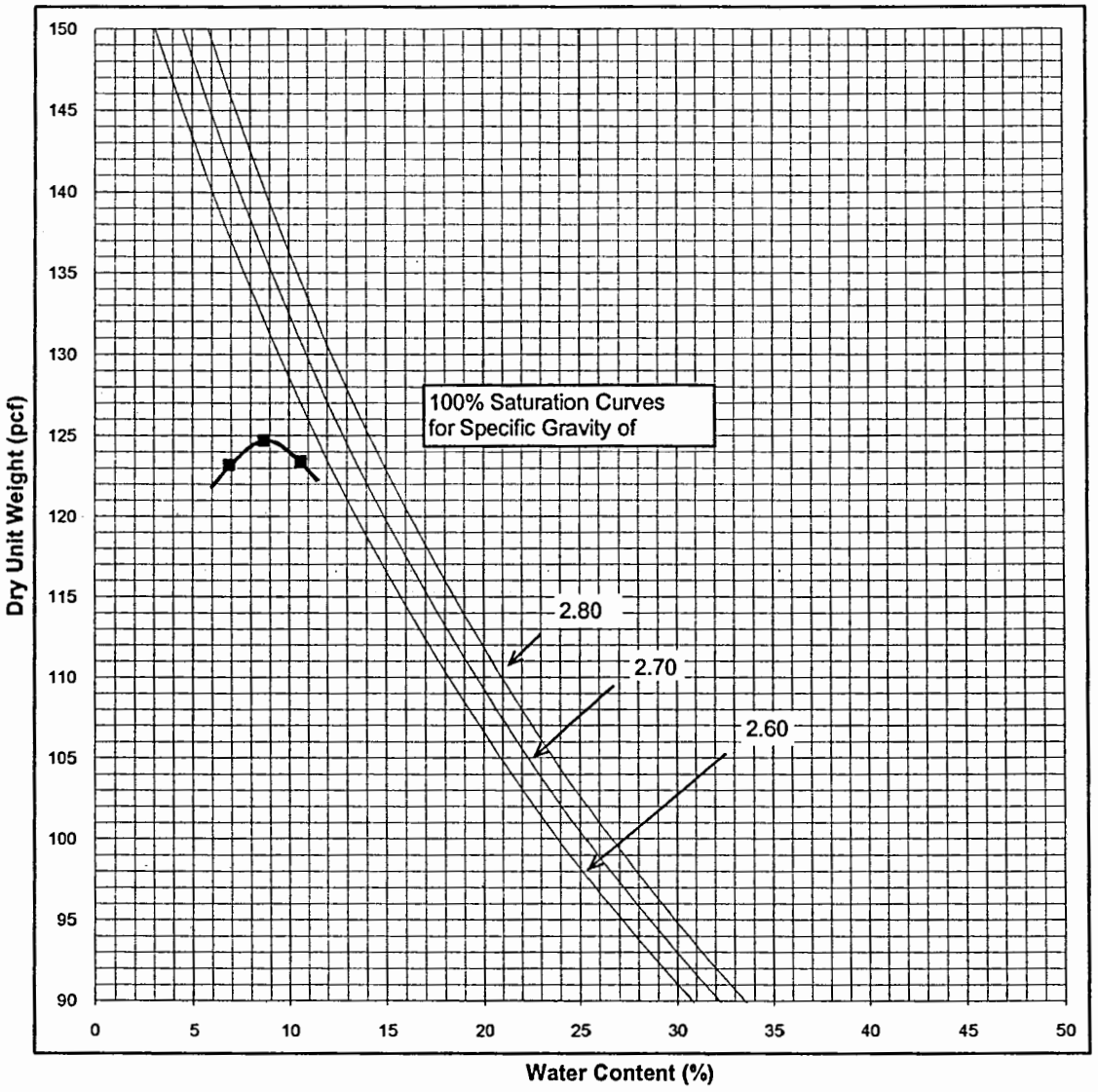
PROJECT NUMBER: CM07107-1

LABORATORY COMPACTION TEST

CGC, Inc.	CHECKED BY: RM	REVIEWED BY: JPS	DATE: 07/27/07

File:07107-1 pc1

TEST REPORT



Specimen No.	Maximum Dry Unit Weight, pcf	Optimum Water Content, %
2	124.5	9.0

Specimen Description
Mixture of Black to Dark Brown Lean Clay and Crushed Stone, Some Demolition Debris

Corrected Maximum Dry Unit Weight, pcf	Corrected Optimum Water Content, %	
126.5	7.5	

Test Method	Liquid Limit	Plastic Limit	Plasticity Index	Specific Gravity
ASTM D1557, Method B	-	-	-	2.7 (est.)

Preparation Method	USCS	% Gravel	% Sand	% Fines	% Oversize
Dry	-	-	-	-	14.6

PROJECT: The Novak Site
West Allis, Wisconsin

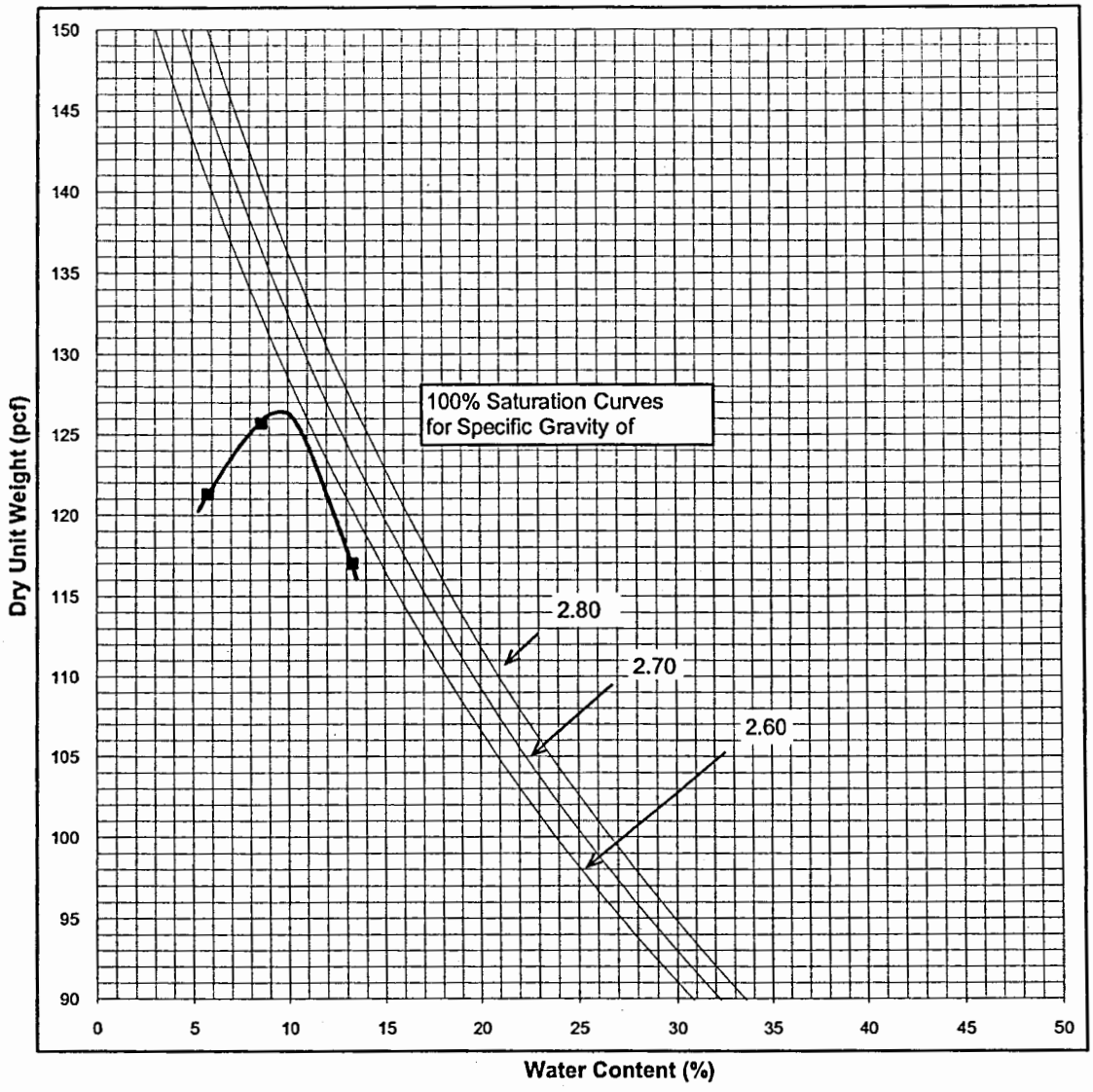
PROJECT NUMBER: CM07107-1

LABORATORY COMPACTION TEST

CGC, Inc. | CHECKED BY: TC | REVIEWED BY: JPS | DATE: 07/27/07

File:07107-1 pc2

TEST REPORT



Specimen No.		Maximum Dry Unit Weight, pcf		Optimum Water Content, %	
3		126.5		9.5	
Specimen Description					
Mixture of Dark Brown Lean Clay, Fine to Coarse Gravel and Demolition Debris, Trace Organics					
Corrected Maximum Dry Unit Weight, pcf		Corrected Optimum Water Content, %			
130.0		7.5			
Test Method		Liquid Limit	Plastic Limit	Plasticity Index	Specific Gravity
ASTM D1557, Method B		-	-	-	2.7 (est.)
Preparation Method	USCS	% Gravel	% Sand	% Fines	% Oversize
Dry	-	-	-	-	19.0

PROJECT: The Novak Site
West Allis, Wisconsin

PROJECT NUMBER: CM07107-1

LABORATORY COMPACTION TEST

CGC, Inc.	CHECKED BY: TC	REVIEWED BY: JPS	DATE: 07/27/07

File:07107-1 pc3

APPENDIX C

DOCUMENT QUALIFICATIONS

APPENDIX C
DOCUMENT QUALIFICATIONS

I. GENERAL RECOMMENDATIONS/LIMITATIONS

CGC, Inc. should be provided the opportunity for a general review of the final design and specifications to confirm that earthwork and foundation requirements have been properly interpreted in the design and specifications. CGC should be retained to provide soil engineering services during excavation and subgrade preparation. This will allow us to observe that construction proceeds in compliance with the design concepts, specifications and recommendations, and also will allow design changes to be made in the event that subsurface conditions differ from those anticipated prior to the start of construction. CGC does not assume responsibility for compliance with the recommendations in this report unless we are retained to provide construction testing and observation services.

This report has been prepared in accordance with generally accepted soil and foundation engineering practices and no other warranties are expressed or implied. The opinions and recommendations submitted in this report are based on interpretation of the subsurface information revealed by the test borings indicated on the location plan. The report does not reflect potential variations in subsurface conditions between or beyond these borings. Therefore, variations in soil conditions can be expected between the boring locations and fluctuations of groundwater levels may occur with time. The nature and extent of the variations may not become evident until construction.

II. IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING REPORT

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.

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 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. *CGC cannot accept responsibility or liability for problems that occur because our reports do not consider developments of which we 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 judgement 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 over-rely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgement and opinion. Geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. *CGC cannot assume responsibility or liability for the report's recommendations if we do 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 CGC 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 such risks, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineer's 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.*

RELY ON YOUR GEOTECHNICAL ENGINEER FOR ADDITIONAL ASSISTANCE

Membership in ASFE 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 CGC, a member of ASFE, for more information.

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ASFE
8811 Colesville Road, Suite G 106
Silver Spring, MD 20910

APPENDIX D

RECOMMENDED COMPACTED FILL SPECIFICATIONS

APPENDIX D

CGC, INC.

RECOMMENDED COMPACTED FILL SPECIFICATIONS

Fill Materials

Proposed fill shall contain no vegetation, roots, topsoil, peat, ash, wood or any other non-soil material which by decomposition might cause settlement. Also, fill shall never be placed while frozen or on frozen surfaces. Rock, stone or broken concrete greater than 6 in. in the largest dimension shall not be placed within 10 ft of the building area. Fill used greater than 10 ft beyond the building limits shall not contain rock, boulders or concrete pieces greater than a 2 sq ft area and shall not be placed within the final 2 ft of finish subgrade or in designated utility construction areas. The rock, boulders or concrete pieces should contain finer material to fill in void spaces between the larger material.

Placement Method

The approved fill shall be placed, spread and leveled in layers generally not exceeding 10 in. in thickness before compaction. The fill shall be placed at a moisture content capable of achieving the desired compaction level. For clay soils or granular soils containing an appreciable amount of cohesive fines, moisture conditioning will likely be required.

It is the Contractor's responsibility to provide all necessary compaction equipment and other grading equipment that may be required to attain the specified compaction. Hand-guided vibratory or tamping compactors will be required whenever fill is placed adjacent to walls, footings, columns or in confined areas.

Compaction Specifications

Maximum dry density and optimum moisture content of the fill soil shall be determined in accordance with modified Proctor methods (ASTM D1557). The recommended field compaction as a percentage of the maximum dry density is shown in Table 1.

Table 1
Compaction Guidelines

Area	Percent Compaction[+] Clay/Silt	Sand/Gravel
Within 10 feet of building lines		
• Footing bearing soils	93-95	95
• Under floors, steps and walks		
- Lightly loaded floor slab	90	90
- Heavily loaded floor slab & thicker fill zones	92	95
Beyond 10 feet of building lines		
• Under walks and pavements		
- Less than 2 ft below subgrade	92	95
- Greater than 2 ft below subgrade	90	90
• Landscaping	85	90

NOTES:

[+] Based on Modified Proctor (ASTM D 1557)

Testing Procedures

Representative samples of proposed fill shall be submitted to CGC, Inc. for optimum moisture-maximum density determination (ASTM D1557) prior to the start of fill placement. The sample size should be approximately 50 lb.

CGC, Inc. shall be retained to perform field density tests to determine the level of compaction being achieved in the fill. The tests shall generally be conducted on each lift at the beginning of fill placement and at a frequency mutually agreed upon by the project team for the remainder of the project.