



TESTING SERVICE CORPORATION

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Soils Exploration

6.4 Acre Parcel

501 & 545 Railroad Avenue

Round Lake, Illinois

Village of Round Lake c/o NBG Land Partners

Geotechnical & Environmental Engineering



Construction Materials Engineering & Testing



Laboratory Testing of Soils, Concrete & Asphalt



Geo-Environmental Drilling & Sampling

GEOTECHNICAL GROUP

CAROL STREAM



TESTING SERVICE CORPORATION

Local Office
March 5, 2007

Corporate Office:

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Village of Round Lake
c/o Mr. Marc Neuerman
NBG Land Partners
9575 W. Higgins Road, Suite 700
Rosemont, Illinois 60018

Local Office:

457 E. Gundersen Drive, Carol Stream, IL 60188-2492
630.653.3920 • Fax 630.653.2726

Re: L-68,075
6.4 Acre Parcel
501 & 545 Railroad Avenue
Round Lake, Illinois

Dear Mr. Neuerman:

This report presents results of the soils exploration performed for a 6.4 acre parcel located at 501 and 545 Railroad Avenue in Round Lake, Illinois. These geotechnical services have been provided in accordance with TSC Proposal No. 37,456 dated January 16, 2007 and the attached General Conditions, incorporated herein by reference.

The project site comprises an infill parcel, lying south of Illinois Route 134 (across from the Metra Railroad tracks) and north of Avilion Avenue. A commercial building and asphalt parking lot are located along the northern property limit, the eastern portion of the site being wooded. Ground surface elevations at the boring locations varied by about 17 feet, with grade dropping east to west.

A present there are no specific plans for the subject property. However, it is understood that Cedar Lake Road is likely to be extended through the western portion of it (tying in with Route 134). The remainder may comprise future retail and/or residential development.

Field Investigation and Laboratory Testing

Five (5) soil borings were performed as part of this exploration, one each near of the four corners and center of the site. A Boring Location Plan is attached herewith showing the drilling layout. Ground surface elevations at the boring locations were referenced to the rim of a sanitary manhole located approximately 190' north of the southwest corner of the site, given an assumed elevation of 100.0; they were rounded to nearest 0.5 foot on the boring logs.

Borings 1-5 were extended 15 to 25 feet in depth. They were drilled and samples tested in accordance with currently recommended American Society for Testing and Materials specifications. Soil sampling was performed at 2½-foot intervals to a depth of 15 and at 5-foot intervals thereafter. The samples were taken in conjunction with the Standard Penetration Test, for which driving resistance to a 2" split-spoon sampler (N value in blows per foot) provides an indication of the relative density of granular materials and consistency of cohesive soils. Water level readings were taken during and following completion of drilling operations.

All soil samples were examined in the laboratory to verify field descriptions as well as to classify them in accordance with the Unified Soil Classification System. Laboratory testing included moisture content and dry density determinations as well as measurements of unconfined compressive strength, as appropriate. Reference is made to the attached boring logs which indicate subsurface stratigraphy and soil descriptions, water level observations, and results of field and laboratory tests. Definitions of descriptive terminology are also included.

Discussion of Test Data

Approximately 3 feet of clay/topsoil fill was encountered at the surface of Borings 1 and 5. Samples of the fill were variable in consistency, exhibiting moisture contents and dry unit weights ranging from 19 to 26 percent and 96 to 109 pounds per cubic foot (pcf), respectively. Surficial topsoil at Borings 2-4 was on the order of 12 inches thick.

Tough to hard silty clay of medium to high plasticity was found underlying the fill and topsoil materials, extending 3 to 8 feet below existing grade. These uppermost native soils had unconfined compressive strengths ranging from 1.3 to 4.5+ tons per square foot (tsf) at moisture contents typically between 24 and 31 percent. Relatively soft and very moist silty clay ($Q_u = 0.5$ tsf) was found underlying a stiffer crust at B-4, extending from approximately 8 to 10½ feet in depth.

Tough to hard silty clay soils of low to medium plasticity were then encountered in Borings 1-3 and 5, extending 8 to 25+ feet below existing grade. These deeper cohesive materials had unconfined compressive strengths typically ranging from 2.0 to 6.0 tsf at moisture contents of 12 to 20 percent. Firm to dense sand, gravel and silty sand and gravel deposits were found underlying the cohesive materials and extending to the bottom of Borings 2 and 4 (15 feet), also occurring as interbedded layers in B-3. These granular materials had Standard Penetration Test (N) values ranging from 14 to 41 blows per foot (bpf).

Borings 1 and 4, located on the low-lying western portion of the site, were drilled in standing water (likely due to recent snowmelt). Borings 2 and 3 encountered free water at depths in the range of 10 to 18 feet. Boring 5 was "dry" both during and following completion of drilling operations.

Building Foundations

Summarized in the following table is the shallowest depth/elevation at which in-situ soil considered capable of supporting a net allowable bearing pressure of 3000 pounds per square foot (psf) were encountered at the boring locations. The depth of existing fill (F) and surficial topsoil are also indicated. Added notes relate to the presence of relatively low strength clay or loose silt and sand deposits underlying the bearing elevation shown (L), marginal bearing soils for fill placement and/or foundation support (M), and undercut depths for building pad construction (U). The 3000 psf bearing value is typical and generally satisfactory for retail and residential construction.

Boring Number	Ground Surface Elevation*	Depth of Fill and/or Topsoil (Feet)	3000 psf Bearing	
			Depth (Feet)**	Elevation**
1	98.0	3.0 F	3.0 UM	95.0
2	103.0	0.9	1.0 M	1020
3	109.0	1.2	1.5 M	107.5
4	98.5	1.0	3.0 UML	95.5
5	115.0	3.0 F	3.0 UM	112.0

- * Ground surface elevations at the borings were referenced to a temporary benchmark indicated on the Boring Plan, given an assumed elevation of 100.0.
- ** Depth/elevation of 3000 psf bearing rounded to nearest 0.5 foot.
- F Existing fill present to depth indicated.
- L Relatively low strength clay or loose silt and sand deposits found underlying the bearing elevation shown.
- M Marginal bearing soils for fill placement and/or foundation support.
- U Undercut depth for building pad construction.

Tough to hard native silty clay soils encountered at shallow depths in the borings are considered suitable (or marginally suitable) for support of 3000 psf bearing. These are indicated by bearing depths ranging from 1.0 to 3.0 feet in the above table. Uppermost bearing soils typically consist of silty clays exhibiting unconfined compressive strengths on the order of 1.5 tsf or greater, having relatively high moisture contents exceeding 25 percent in the case of marginal bearing soils.

In areas of satisfactory bearing, footings may also be constructed on engineered fill that is placed as part of mass-grading. Assuming that surficial topsoil (and existing fill) is stripped and new fill placed and compacted to the 95 percent criterion, footings constructed on the engineered fill may also be sized for 3000 psf bearing. However, in areas underlain by low to marginal strength and/or relatively high moisture content soils, as well as anywhere that the height of new fill is to exceed 10 feet, it is recommended that settlement considerations related to fill placement be further evaluated. This would be the case at B-4, where relatively soft and very moist silty clay soils were found underlying a stiffer crust.

Removal and replacement of uppermost relatively soft and very moist silty clay at B-4 and existing fill at Borings 1 and 5 is recommended as part of mass-grading. These unsuitable soil types extended up to approximately 3 feet below existing grade. If left in-place, consolidation of them could lead to settlement cracking of floor slabs and foundations constructed thereupon. Please note that we have no reason to believe that existing fill on the site was placed under controlled conditions, i.e. in lifts which were compacted and tested prior to the placement of additional fill.

Marginal bearing soils were otherwise encountered at relatively shallow depths in all of the borings. They consist of native silty clay soils having unconfined compressive strengths on the order of 1.5 tsf and/or moisture contents exceeding 25 percent. Relatively low strength or unstable soils exposed at footing grade should be removed and replaced with structural backfill, with undercut of between 1 and 2 feet generally required based on field observations. Foundation overexcavations are then typically backfilled and footings constructed at design elevations in accordance with the following recommended procedures.

The base of foundation overexcavations should exceed footing dimensions by at least 12 inches along each side, 6 inches for every foot of overdig where the undercut exceeds 2.0 feet in depth. Replacement materials should consist of crushed stone or crushed gravel between ¼ to 3 inches in size and containing no fines; IDOT gradations CA-1 and CA-7 meet these criteria. This "structural" fill should be spread in 12-inch layers loose thickness, each lift to be densified using vibratory compaction equipment or by tamping with a backhoe bucket. Footings constructed on the crushed stone or crushed gravel backfill may also be proportioned for 3000 psf bearing.

In order to preclude disproportionately small footing sizes, it is recommended that all continuous wall footings be made at least 24 inches wide, trench footings at least 12 inches wide and isolated foundations at least 3.0 feet square, regardless of calculated dimensions. For frost considerations, all exterior footings should be constructed at least 3.5 feet below outside finished grade and 4.0 feet for foundations located outside of heated building limits. Interior footings may be constructed at higher elevations as long as they are protected against frost heave in the event of winter construction. Due to the presence of marginal bearing soils in all of the borings, consideration should also be given to reinforcing foundation walls with two #5 rebars top and bottom.

Mass-Grading

It is recommended that building pad and pavement areas be cleared of vegetation prior to mass-grading. Stripping operations should also include the removal of all surficial topsoil and other decomposable plant matter. Existing fill as encountered at Borings 1 and 5 should also be removed and replaced from building pad areas. In this regard, we have no reason to believe that the fill was placed under controlled conditions, i.e. compacted in lifts with density testing performed.

The building pad and pavement areas should then be proof-rolled using a loaded dump truck or other approved piece of heavy construction equipment, in order to detect the presence of unsuitable soil types. All soft or unstable materials determined by proof-rolling should be reworked and recompacted or, if that does not substantially improve subgrade stability, removed and replaced. Consideration may be given to leaving existing fill in-place under pavement areas, subject to it passing the proof-roll.

In addition to the existing fill present at Borings 1 and 5; removal and replacement of unsuitable soil types is specifically recommended at B-4. Relatively soft and very moist native silty clay extended to approximately 3 feet below existing grade at this location. If left in-place, consolidation of the uppermost soft clays could lead to settlement and cracking of floor slabs and foundations constructed thereupon.

Undercutting of unsuitable soil types will require that building pads be enlarged to permit the horizontal distribution of footing loads. It is recommended that the base of the undercut, or zone of stripping where only topsoil is to be removed, extend a minimum of 5 feet outside the outer edge of the structure plus 0.5 feet for every foot of fill to be placed.

Marginal subgrade stability, represented by clay soil types having unconfined compressive strengths on the order of 1.5 tsf and/or moisture contents exceeding 25 percent, was otherwise encountered in all of the borings. These materials may need to be reduced in moisture content and recompacted in order to provide a stable base. Lime stabilization can achieve similar results for clayey soil types and has the advantage of allowing work to proceed under adverse weather conditions. In any event, the need for subgrade reworking or additional undercutting should be evaluated on the basis of proof-rolling.

New fill should consist of inorganic silty clays of medium plasticity or approved granular materials. It is recommended that compaction for building pad and pavement areas be to a minimum of 95 and 90 percent of maximum dry density, respectively, as determined by the Modified Proctor test (ASTM D 1557). The upper 2 feet of pavement subgrade is also often compacted to the 95 percent criterion, to create a more stable base for final proof-rolling. The fill should be placed in approximate 9 inch lifts loose measure for cohesive soils and up to 12 inches for granular materials, each lift to be compacted to the specified density prior to the placement of additional fill.

Moisture control is important in the compaction of most soil types, and it is recommended that the water content of new fill be within about 3 percentage points on the high side of optimum moisture as established by its laboratory compaction curve. If the soil is compacted on the dry side, it will have an apparent stability which will be lost if it later becomes saturated. If the soil is too wet, the Contractor will not be able to achieve proper compaction.

In regard to the use of on-site borrow, shallow silty clay soils were often relatively moist - having water contents of between 24 and 31 percent. It is estimated their use as engineered fill will require that the in-situ moisture be reduced by about 5 to 10+ percentage points. This reduction in moisture content is typically achieved by spreading the material in a single lift and aerating with a continuous discing operation. For obvious reasons it will work best in hot, dry and windy weather. Lime modification can also be used and has the advantage of working in less ideal weather conditions.

Pavement subgrade preparation may be in general accordance with previous recommendations for mass-grading. It is anticipated that existing subgrade will in some areas have to be reduced in moisture content and recompacted prior to paving; compaction to at least 90 percent Modified Proctor density is recommended. However, as noted above the upper 2 feet of roadway subgrade is often compacted to 95 percent Modified Proctor density to aid in proof-rolling. If paving construction is performed when drying of surficial soils cannot be accomplished, lime stabilization or removal of unstable subgrade and replacement with drier cohesive fill or 1 to 2 feet of granular materials may be required.

It is recommended that a nominal Illinois Bearing Ratio (IBR) value of 3.0 be used in the preliminary design of pavements. This reflects the cohesive subgrade soils which are prevalent in the area. Use of an IBR of 3.0 assumes that any soft or unstable areas will be remediated, i.e., subgrade stabilized until passing a proof-roll.

Groundwater Management

Serious groundwater problems are not anticipated due in large part to the predominately cohesive nature of subsurface soils. However, the accumulation of run-off water or seepage at the base of excavations is still expected to occur during foundation construction and site work, the latter to be associated with interbedded silt and sand layers. Also, standing water was present at Borings 1 and 4, located on the low-lying western portion of the site, at the time of drilling. The Contractor should therefore be prepared to implement construction dewatering procedures, as a minimum to include pumping from strategically placed sumps.

Any basement and below grade structures should be provided with perimeter drain tile tied into sump pit with automatic pumping system. This is a standard requirement in the project area, the effectiveness of which will be dependent on groundwater at the site being controllable. If problems are encountered such as continuous or high rates of groundwater seepage, the design engineer and geotechnical consultant should be notified so that the condition can be further evaluated.

Closure

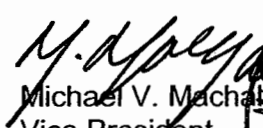

This preliminary report has been prepared without benefit of any building plans or grading information. It is therefore suggested that Testing Service Corporation review these plans when available, to check the accuracy of this report as it may be affected, to verify the correct interpretation of recommendations contained herein and to modify the findings accordingly. Supplemental borings and/or test pits may be suggested at that time, to delineate potential problem areas or to fill in gaps in information.

The analysis and preliminary recommendations submitted in this report are based upon the data obtained from the five (5) soil borings performed at the locations indicated on the Boring Location Plan. This report does not reflect any variations which may occur between these borings, the nature and extent of which may not become evident until during the course of construction. If variations are then identified, recommendations contained in this report should be re-evaluated after performing on-site observations.

It has been a pleasure to assist you with this work. Please call if there are any questions or if we may be of further service on this project.

Respectfully submitted,

TESTING SERVICE CORPORATION


Michael V. Machalinski 62-038559
Vice President
Registered Professional Engineer
Illinois No. 062-038559


MVM:tlv
Enc. (4 books)



TESTING SERVICE CORPORATION

GENERAL CONDITIONS

Geotechnical and Construction Services

1. PARTIES AND SCOPE OF WORK: If Client is ordering the services on behalf of another, Client represents and warrants that Client is the duly authorized agent of said party for the purpose of ordering and directing said services, and in such case the term "Client" shall also include the principal for whom the services are being performed. Prices quoted and charged by TSC for its services are predicated on the conditions and the allocations of risks and obligations expressed in these General Conditions. Unless otherwise stated in writing, Client assumes sole responsibility for determining whether the quantity and the nature of the services ordered by Client are adequate and sufficient for Client's intended purpose. Unless otherwise expressly assumed in writing, TSC's services are provided exclusively for client. TSC shall have no duty or obligation other than those duties and obligations expressly set forth in this Agreement. TSC shall have no duty to any third party. Client shall communicate these General Conditions to each and every party to whom the Client transmits any report prepared by TSC. Ordering services from TSC shall constitute acceptance of TSC's proposal and these General Conditions.

2. SCHEDULING OF SERVICES: The services set forth in this Agreement will be accomplished in a timely and workmanlike manner. If TSC is required to delay any part of its services to accommodate the requests or requirements of Client, regulatory agencies, or third parties, or due to any cause beyond its reasonable control, Client agrees to pay such additional charges, if any, as may be applicable.

3. ACCESS TO SITE: TSC shall take reasonable measures and precautions to minimize damage to the site and any improvements located thereon as a result of its services or the use of its equipment; however, TSC has not included in its fee the cost of restoration of damage which may occur. If Client desires or requires TSC to restore the site to its former condition, TSC will, upon written request, perform such additional work as is necessary to do so and Client agrees to pay to TSC the cost thereof plus TSC's normal markup for overhead and profit.

4. CLIENT'S DUTY TO NOTIFY ENGINEER: Client represents and warrants that Client has advised TSC of any known or suspected hazardous materials, utility lines and underground structures at any site at which TSC is to perform services under this agreement.

5. DISCOVERY OF POLLUTANTS: TSC's services shall not include investigation for hazardous materials as defined by the Resource Conservation Recovery Act, 42 U.S.C. § 6901, et, seq., as amended ("RCRA") or by any state or Federal statute or regulation. In the event that hazardous materials are discovered and identified by TSC, TSC's sole duty shall be to notify Client.

6. MONITORING: If this Agreement includes testing construction materials or observing any aspect of construction of improvements, Client's construction personnel will verify that the pad is properly located and sized to meet Client's projected building loads. Client shall cause all tests and inspections of the site, materials and work to be timely and properly performed in accordance with the plans, specifications, contract documents, and TSC's recommendations. No claims for loss, damage or injury shall be brought against TSC unless all tests and inspections have been so performed and unless TSC's recommendations have been followed.

TSC's services shall not include determining or implementing the means, methods, techniques or procedures of work done by the contractor(s) being monitored or whose work is being tested. TSC's services shall not include the authority to accept or reject work or to in any manner supervise the work of any contractor. TSC's services or failure to

perform same shall not in any way operate or excuse any contractor from the performance of its work in accordance with its contract. "Contractor" as used herein shall include subcontractors, suppliers, architects, engineers and construction managers.

Information obtained from borings, observations and analyses of sample materials shall be reported in formats considered appropriate by TSC unless directed otherwise by Client. Such information is considered evidence, but any inference or conclusion based thereon is, necessarily, an opinion also based on engineering judgment and shall not be construed as a representation of fact. Subsurface conditions may not be uniform throughout an entire site and ground water levels may fluctuate due to climatic and other variations. Construction materials may vary from the samples taken. Unless otherwise agreed in writing, the procedures employed by TSC are not designed to detect intentional concealment or misrepresentation of facts by others.

7. SAMPLE DISPOSAL: Unless otherwise agreed in writing, test specimens or samples will be disposed immediately upon completion of the test. All drilling samples or specimens will be disposed sixty (60) days after submission of TSC's report.

8. TERMINATION: This Agreement may be terminated by either party upon seven days prior written notice. In the event of termination, TSC shall be compensated by Client for all services performed up to and including the termination date, including reimbursable expenses.

9. PAYMENT: Client shall be invoiced periodically for services performed. Client agrees to pay each invoice within thirty (30) days of its receipt. Client further agrees to pay interest on all amounts invoiced and not paid or objected to in writing for valid cause within sixty (60) days at the rate of twelve (12%) per annum (or the maximum interest rate permitted by applicable law, whichever is the lesser) until paid and TSC's costs of collection of such accounts, including court costs and reasonable attorney's fees.

10. WARRANTY: TSC's professional services will be performed, its findings obtained and its reports prepared in accordance with these General Conditions and with generally accepted principles and practices. In performing its professional services, TSC will use that degree of care and skill ordinarily exercised under similar circumstances by members of its profession. In performing physical work in pursuit of its professional services, TSC will use that degree of care and skill ordinarily used under similar circumstances. This warranty is in lieu of all other warranties or representations, either express or implied. Statements made in TSC reports are opinions based upon engineering judgment and are not to be construed as representations of fact.

Should TSC or any of its employees be found to have been negligent in performing professional services or to have made and breached any express or implied warranty, representation or contract, Client, all parties claiming through Client and all parties claiming to have in any way relied upon TSC's services or work agree that the maximum aggregate amount of damages for which TSC, its officers, employees and agents shall be liable is limited to \$50,000 or the total amount of the fee paid to TSC for its services performed with respect to the project, whichever amount is greater.

In the event Client is unwilling or unable to limit the damages for which TSC may be liable in accordance with the provisions set forth in the preceding paragraph, upon written request of Client received within five days of Client's acceptance of TSC's proposal together with payment of an additional fee in the amount of 5% of TSC's estimated cost for its services (to be adjusted to 5% of the amount actually billed by TSC

for its services on the project at time of completion), the limit on damages shall be increased to \$500,000 or the amount of TSC's fee, whichever is the greater. This charge is not to be construed as being a charge for insurance of any type, but is increased consideration for the exposure to an award of greater damages.

11. INDEMNITY: Subject to the provisions set forth herein, TSC and Client hereby agree to indemnify and hold harmless each other and their respective shareholders, directors, officers, partners, employees, agents, subsidiaries and division (and each of their heirs, successors, and assigns) from any and all claims, demands, liabilities, suits, causes of action, judgments, costs and expenses, including reasonable attorneys' fees, arising, or allegedly arising, from personal injury, including death, property damage, including loss of use thereof, due in any manner to the negligence of either of them or their agents or employees or independent contractors. In the event both TSC and Client are found to be negligent or at fault, then any liability shall be apportioned between them pursuant to their pro rata share of negligence or fault. TSC and Client further agree that their liability to any third party shall, to the extent permitted by law, be several and not joint. The liability of TSC under this provision shall not exceed the policy limits of insurance carried by TSC. Neither TSC nor Client shall be bound under this indemnity agreement to liability determined in a proceeding in which it did not participate represented by its own independent counsel. The indemnities provided hereunder shall not terminate upon the termination or expiration of this Agreement, but may be modified to the extent of any waiver of subrogation agreed to by TSC and paid for by Client.

12. SUBPOENAS: TSC's employees shall not be retained as expert witnesses except by separate, written agreement. Client agrees to pay TSC pursuant to TSC's then current fee schedule for any TSC employee(s) subpoenaed by any party as an occurrence witness as a result of TSC's services.

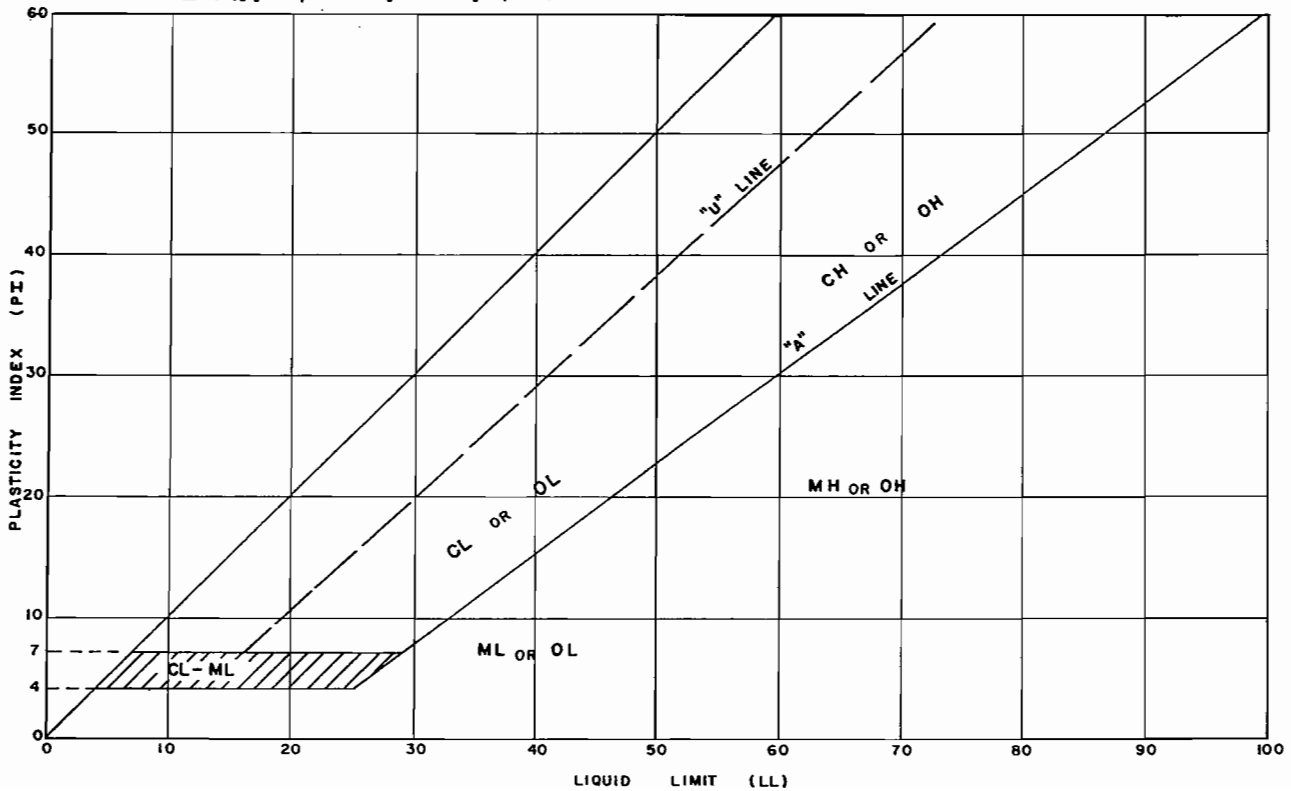
13. OTHER AGREEMENTS: TSC shall not be bound by any provision or agreement (i) requiring or providing for arbitration of disputes or controversies arising out of this Agreement or its performance, (ii) wherein TSC waives any rights to a mechanics lien or surety bond claim; (iii) that conditions TSC's right to receive payment for its services upon payment to Client by any third party or (iv) that requires TSC to indemnify any party beyond its own negligence. These General Conditions are notice, where required, that TSC shall file a lien whenever necessary to collect past due amounts. This Agreement contains the entire understanding between the parties. Unless expressly accepted by TSC in writing prior to delivery of TSC's services, Client shall not add any conditions or impose conditions which are in conflict with those contained herein, and no such additional or conflicting terms shall be binding upon TSC. The unenforceability or invalidity of any provision or provisions shall not render any other provision or provisions unenforceable or invalid. This Agreement shall be construed and enforced in accordance with the laws of the State of Illinois. In the event of a dispute arising out of or relating to the performance of this Agreement, the breach thereof or TSC's services, the parties agree to try in good faith to settle the dispute by mediation under the Construction Industry Mediation Rules of the American Arbitration Association as a condition precedent to filing any demand for arbitration, or any petition or complaint with any court. Should litigation be necessary, the parties consent to jurisdiction and venue in an appropriate Illinois State Court in and for the County of DuPage, Wheaton, Illinois or the Federal District Court for the Northern District of Illinois. Paragraph headings are for convenience only and shall not be construed as limiting the meaning of the provisions contained in these General Conditions.

**TESTING SERVICE CORPORATION
UNIFIED CLASSIFICATION CHART**

CRITERIA FOR ASSIGNING GROUP SYMBOLS AND GROUP NAMES USING LABORATORY TESTS ^a				SOIL CLASSIFICATION	
				GROUP SYMBOL	GROUP NAME ^b
COARSE-GRAINED SOILS more than 50% retained on No. 200 sieve	GRAVELS More than 50% of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS Less than 5% fines ^c	$C_u \geq 4$ and $1 \leq C_c \leq 3$ ^e	GW	Well graded gravel ^f
			$C_u < 4$ and/or $1 > C_c > 3$ ^e	GP	Poorly graded gravel ^f
		GRAVELS WITH FINES More than 12% fines ^c	Fines classify as ML or MH	GM	Silty gravel ^{f,g,h}
			Fines classify as CL or CH	GC	Clayey gravel ^{f,g,h}
	SANDS 50% or more of coarse fraction passes No. 4 sieve	CLEAN SANDS Less than 5% fines ^d	$C_u \geq 6$ and $1 \leq C_c \leq 3$ ^e	SW	Well-graded sand ^l
			$C_u < 6$ and/or $1 > C_c > 3$ ^e	SP	Poorly graded sand ^l
		SANDS WITH FINES More than 12% fines ^d	Fines classify as ML or MH	SM	Silty sand ^{g,h,f}
			Fines classify as CL or CH	SC	Clayey sand ^{g,h,f}
FINE-GRAINED SOILS 50% or more passed the No. 200 sieve	SILTS & CLAYS Liquid limit less than 50%	Inorganic	$PI \geq 7$ and plots on or above "A" line ^j	CL	Lean clay ^{k,l,m}
			$PI < 4$ or plots below "A" line ^j	ML	Silt ^{k,l,m}
	SILTS & CLAYS Liquid limit 50% or more	Inorganic	PI plots on or above "A" line	CH	Fat clay ^{k,l,m}
			PI plots below "A" line	MH	Elastic silt ^{k,l,m}
		Organic	$\frac{\text{Liquid limit} - \text{oven dried}}{\text{Liquid limit} - \text{not dried}} < 0.75$	OH	Organic clay ^{k,l,m,p} Organic silt ^{k,l,m,q}
			Highly organic soils	Primarily organic matter, dark in color, and organic odor	PT

- a. Based on the material passing the 3-in (75-mm) sieve.
- b. If field sample contained cobbles and/or boulders, add "with cobbles and/or boulders" to group name.
- c. Gravels with 5 to 12% fines require dual symbols
GW-GM well graded gravel with silt
GW-GC well graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay
- d. Sands with 5% to 12% fines require dual symbols
SW-SM well graded sand with silt
SW-SC well graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay
- e. $C_u = D_{60}/D_{10}$ $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
- f. If soil contains $\geq 15\%$ sand, add "with sand" to group name.
- g. If fines classify as CL-ML, use dual symbol GC-GM, SC-SM.
- h. If fines are organic, add "with organic fines" to group name.
- i. If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.

- j. If Atterberg Limits plot in hatched area, soil is a CL-ML, silty clay.
- k. If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel" whichever is predominant.
- l. If soil contains $\geq 30\%$ plus No. 200, predominantly sand, add "sandy" to group name.
- m. If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.
- n. $PI \geq 4$ and plots on or above "A" line.
- o. $PI \geq 4$ or plots below "A" line.
- p. PI plots on or above "A" line.
- q. PI plots below "A" line.



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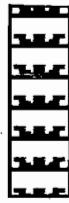
LEGEND FOR BORING LOGS



FILL



TOPSOIL



PEAT



GRAVEL



SAND



SILT



CLAY



DOLOMITE

SAMPLE TYPE:

- SS = Split Spoon
- ST = Thin-Walled Tube
- A = Auger

FIELD AND LABORATORY TEST DATA:

- N = Standard Penetration Resistance in Blows per Foot
- Wc = In-Situ Water Content
- Qu = Unconfined Compressive Strength in Tons per Square Foot
 - * Pocket Penetrometer Measurement; Maximum Reading = 4.5 tsf
- γ_D = Dry Unit Weight in Pounds per Cubic Foot

WATER LEVELS:

- ▽ While Drilling
- ▽ End of Boring
- ▽ 24 Hours

SOIL DESCRIPTION:

MATERIAL

- BOULDER
- COBBLE
- Coarse GRAVEL
- Small GRAVEL
- Coarse SAND
- Medium SAND
- Fine SAND
- SILT and CLAY

PARTICLE SIZE RANGE

- Over 12 inches
- 12 inches to 3 inches
- 3 inches to ¾ inch
- ¾ inch to No. 4 Sieve
- No. 4 Sieve to No. 10 Sieve
- No. 10 Sieve to No. 40 Sieve
- No. 40 Sieve to No. 200 Sieve
- Passing No. 200 Sieve

COHESIVE SOILS

<u>CONSISTENCY</u>	<u>Qu</u>
Very Soft	Less than 0.3
Soft	0.3 to 0.6
Stiff	0.6 to 1.0
Tough	1.0 to 2.0
Very Tough	2.0 to 4.0
Hard	4.0 and over

COHESIONLESS SOILS

<u>RELATIVE DENSITY</u>	<u>N</u>
Very Loose	0 - 4
Loose	4 - 10
Firm	10 - 30
Dense	30 - 50
Very Dense	50 and over

MODIFYING TERM

- Trace
- Little
- Some

PERCENT BY WEIGHT

- 1 - 10
- 10 - 20
- 20 - 35

PROJECT **6.4 Acre Parcel, 501 & 545 Railroad Avenue, Round Lake, Illinois**



CLIENT **NBG Land Partners, Rosemont, Illinois**

BORING **1** DATE STARTED **2-28-07** DATE COMPLETED **2-28-07** JOB **L-68,075**

ELEVATIONS
 GROUND SURFACE **98.0**
 END OF BORING **83.0**

WATER LEVEL OBSERVATIONS
 ▽ WHILE DRILLING **0.0'**
 ▽ AT END OF BORING **0.5'**
 ▽ 24 HOURS

DISTANCE BELOW SURFACE IN FEET	LENGTH RECOVERY	SAMPLE		N	WC	Qu	γ _{DRY}	DEPTH	ELEV.	SOIL DESCRIPTIONS
		NO.	TYPE							
0										▽ FILL - Brown silty CLAY and black clayey TOPSOIL, little sand, trace gravel, very moist (CL/OL)
2.5		1	SS	4	26.1	1.0*	96		95.5	
5.0		2	SS	4	28.6	1.29 1.25*			93.0	Tough brown and gray silty CLAY, trace sand, trace organic, moist to very moist (CL/CH)
8.0		3	SS	7	17.8	3.25*			90.0	Very tough brown and gray silty CLAY, little sand and gravel, moist (CL)
10.0		4	SS	12	15.0	3.14 2.75*				
12.0		5	SS	18	14.5	4.5+*				Very tough to hard gray silty CLAY, little to some sand and gravel, moist (CL)
15.0		6	SS	22	14.2	5.90 4.5+*				
15.0										End of Boring at 15.0' * Approximate unconfined compressive strength based on measurements with a calibrated pocket penetrometer.

Division lines between deposits represent approximate boundaries between soil types; in-situ, the transition may be gradual.

DRILL RIG NO. **275**

TSC 68075.GPJ TSC_ALL.GDT 3/5/07

PROJECT **6.4 Acre Parcel, 501 & 545 Railroad Avenue, Round Lake, Illinois**



CLIENT **NBG Land Partners, Rosemont, Illinois**

BORING **2** DATE STARTED **2-28-07** DATE COMPLETED **2-28-07** JOB **L-68,075**

ELEVATIONS
 GROUND SURFACE **103.0**
 END OF BORING **88.0**

WATER LEVEL OBSERVATIONS
 ▽ WHILE DRILLING **10.5'**
 ▽ AT END OF BORING **12.0'**
 ▽ 24 HOURS

DISTANCE BELOW SURFACE IN FEET	LENGTH RECOVERY	SAMPLE		N	WC	Qu	γ DRY	DEPTH	ELEV.	SOIL DESCRIPTIONS
		NO.	TYPE							
0									102.1	Black clayey TOPSOIL (OL)
0.9		1	SS	10	24.7	4.5+*				Hard to very tough brown and gray silty CLAY, trace sand, trace roots, moist (CL/CH)
5.0		2	SS	11	26.5	3.26 3.5*		5.0	98.0	
8.0		3	SS	13	15.5	2.5*				Very tough brown silty/sandy CLAY, trace to little gravel, moist (CL)
10.0		4	SS	14						Firm brown silty SAND, trace to little gravel, moist (SM)
13.0		5	SS	34						▽ Dense brown silty SAND and GRAVEL, very moist to wet (SM/GM)
15.0		6	SS	26						Firm brown SAND and GRAVEL, saturated (SP/GP)
15.0										End of Boring at 15.0' * Approximate unconfined compressive strength based on measurements with a calibrated pocket penetrometer.

TSC 68075.GPJ TSC_ALL.GDT 3/5/07

DRILL RIG NO. **275**

Division lines between deposits represent approximate boundaries between soil types; in-situ, the transition may be gradual.

PROJECT **6.4 Acre Parcel, 501 & 545 Railroad Avenue, Round Lake, Illinois**



CLIENT **NBG Land Partners, Rosemont, Illinois**

BORING **3** DATE STARTED **2-28-07** DATE COMPLETED **2-28-07** JOB **L-68,075**

ELEVATIONS
 GROUND SURFACE **109.0**
 END OF BORING **84.0**

WATER LEVEL OBSERVATIONS
 ▽ WHILE DRILLING **18.0'**
 ▽ AT END OF BORING **15.0'**
 ▽ 24 HOURS

DISTANCE BELOW SURFACE IN FEET	LENGTH RECOVERY	SAMPLE		N	WC	Qu	γ _{DRY}	DEPTH	ELEV.	SOIL DESCRIPTIONS
		NO.	TYPE							
0										Dark brown clayey TOPSOIL (OL)
1.2		1	SS	16	26.9	3.5*			107.8	Very tough brown silty CLAY, trace sand, trace roots, moist (CL/CH)
3.0									106.0	
5		2	SS	14	20.9	3.75 4.25*				Very tough to hard brown silty CLAY, little sand, occasional silt seams, moist (CL)
		3	SS	20	17.9	4.5*				
8.0									101.0	
10		4	SS	41						Dense brown silty SAND, little gravel, moist (SM)
10.5									98.5	Hard brown silty CLAY, little to some sand and gravel, occasional Cobbles and Boulders, moist (CL)
13.0		5	SS	26	14.9	4.5*			96.0	
15		6	SS	13	12.0	1.89 2.0*				▽ Tough to very tough gray silty CLAY, little to some sand and gravel, moist (CL)
17.0									92.0	▽ Firm gray SAND and GRAVEL, occasional Cobbles and Boulders, saturated (SP/GP) * Approximate unconfined compressive strength based on measurements with a calibrated pocket penetrometer.
20		7	SS	22						
22.0									87.0	Very tough gray silty CLAY, little to some sand and gravel, moist (CL)
25		8	SS	16	13.1	2.75*				

Division lines between deposits represent approximate boundaries between soil types; in-situ, the transition may be gradual.

DRILL RIG NO. **275**

End of Boring at 25.0'

TSC 68075.GPJ TSC_ALL.GDT 3/5/07

PROJECT **6.4 Acre Parcel, 501 & 545 Railroad Avenue, Round Lake, Illinois**



CLIENT **NBG Land Partners, Rosemont, Illinois**

BORING **4** DATE STARTED **2-28-07** DATE COMPLETED **2-28-07** JOB **L-68,075**

ELEVATIONS
 GROUND SURFACE **98.5**
 END OF BORING **83.5**

WATER LEVEL OBSERVATIONS
 ▽ WHILE DRILLING **0.0'**
 ▽ AT END OF BORING **0.0'**
 ▽ 24 HOURS

DISTANCE BELOW SURFACE IN FEET	LENGTH RECOVERY	SAMPLE		N	WC	Qu	γ _{DRY}	DEPTH	ELEV.	SOIL DESCRIPTIONS
		NO.	TYPE							
0										Black clayey TOPSOIL (OL)
1.0								1.0	97.5	
2.5		1	SS	5	31.3	1.25*		2.5	96.0	Tough dark gray silty CLAY, trace sand, trace organic, moist to very moist (CL/CH)
5										
5.5		2	SS	4	31.2	1.29 1.0*		5.5	93.0	Tough brown and gray silty CLAY, trace sand, trace organic, very moist (CL/CH)
8.0										
8.0		3	SS	5	22.5	1.42 1.25*		8.0	90.5	Tough gray silty CLAY, little sand, moist to very moist (CL)
10										
10.5		4	SS	1	21.5	0.5*		10.5	88.0	Soft gray silty CLAY, little sand, occasional sand seams, very moist (CL)
13.0										
13.0		5	SS	16	17.3			13.0	85.5	Firm gray medium to fine SAND with clayey SILT layers, moist to very moist (SP/ML)
15										
15		6	SS	33						Dense gray SAND and GRAVEL, saturated (SP/GP)
15.0		End of Boring at 15.0'								
		* Approximate unconfined compressive strength based on measurements with a calibrated pocket penetrometer.								

Division lines between deposits represent approximate boundaries between soil types; in-situ, the transition may be gradual.

DRILL RIG NO. **275**

TSC 68075.GPJ TSC_ALL.GDT 3/5/07

PROJECT **6.4 Acre Parcel, 501 & 545 Railroad Avenue, Round Lake, Illinois**



CLIENT **NBG Land Partners, Rosemont, Illinois**

BORING **5** DATE STARTED **2-28-07** DATE COMPLETED **2-28-07** JOB **L-68,075**

ELEVATIONS
 GROUND SURFACE **115.0**
 END OF BORING **100.0**

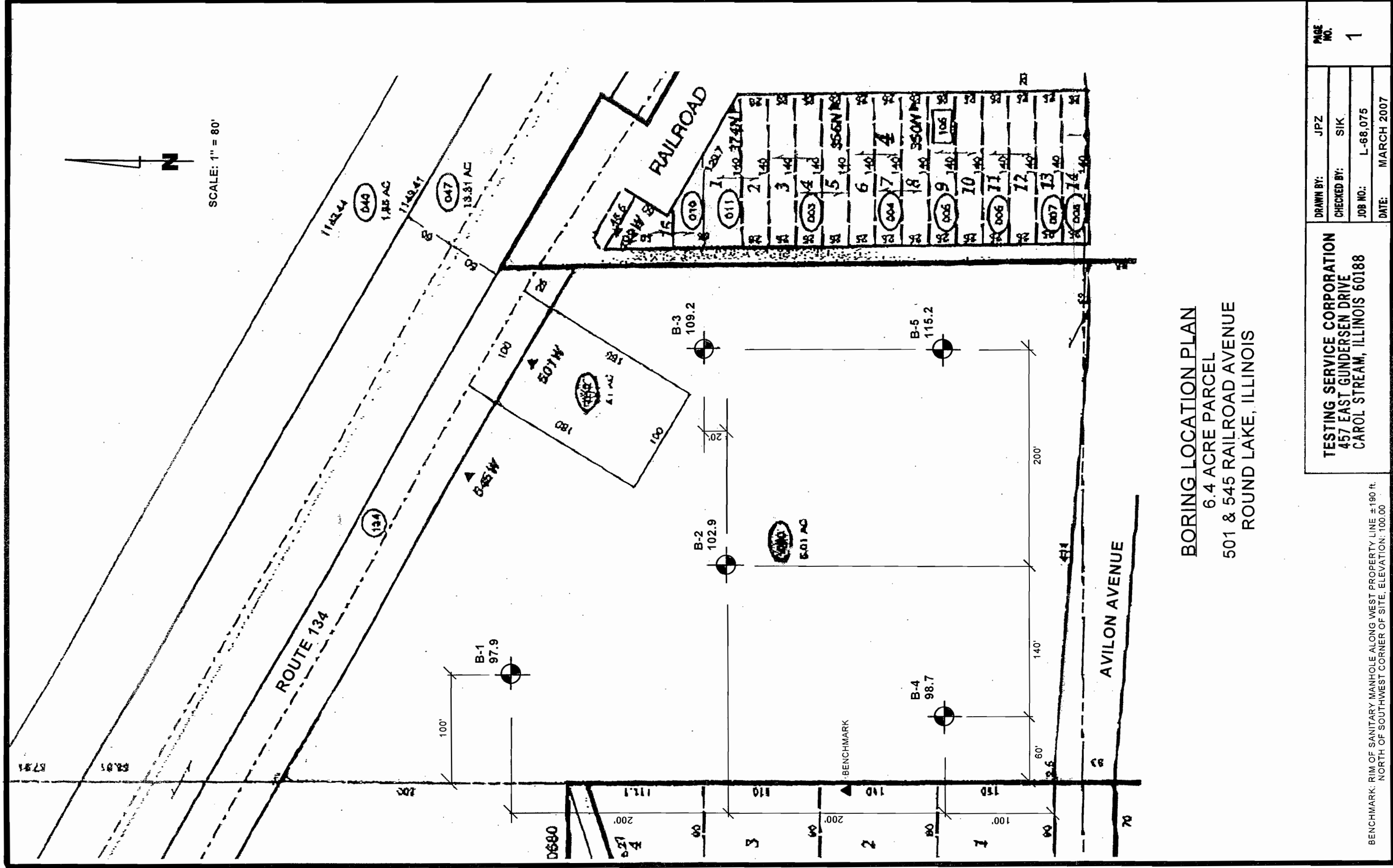
WATER LEVEL OBSERVATIONS
 ▽ WHILE DRILLING **Dry**
 ▽ AT END OF BORING **Dry**
 ▽ 24 HOURS

DISTANCE BELOW SURFACE IN FEET	LENGTH RECOVERY	SAMPLE		N	WC	Qu	γ _{DRY}	DEPTH	ELEV.	SOIL DESCRIPTIONS
		NO.	TYPE							
0										
		1	SS	9	19.6	3.75*	109	3.0	112.0	FILL - Brown silty CLAY, little sand and gravel, trace organic, moist (CL)
		2	SS	8	28.3	2.5*				
5		3	SS	13	24.2	4.25*		8.0	107.0	Very tough to hard brown and gray silty CLAY, trace sand, trace roots, moist (CL/CH)
		4	SS	12	20.9	4.5+*				
10		5	SS	14	17.5	4.5+*		10.5	104.5	Hard brown silty CLAY, little sand, occasional silt seams, moist (CL)
		6	SS	17	15.7	4.5+*				
15		End of Boring at 15.0'								
		* Approximate unconfined compressive strength based on measurements with a calibrated pocket penetrometer.								
20										
25										

Division lines between deposits represent approximate boundaries between soil types; in-situ, the transition may be gradual.

DRILL RIG NO. **275**

TSC 68075.GPJ TSC_ALL.GDT 3/5/07



BORING LOCATION PLAN
 6.4 ACRE PARCEL
 501 & 545 RAILROAD AVENUE
 ROUND LAKE, ILLINOIS

TESTING SERVICE CORPORATION
 457 EAST GUNDERSEN DRIVE
 CAROL STREAM, ILLINOIS 60188

DRAWN BY: JPZ
 CHECKED BY: SIK
 JOB NO.: L-68,075
 DATE: MARCH 2007

BENCHMARK: RIM OF SANITARY MANHOLE ALONG WEST PROPERTY LINE ±190 ft. NORTH OF SOUTHWEST CORNER OF SITE. ELEVATION: 100.00