

June 26, 2008

L -71,682

PRELIMINARY SOILS EXPLORATION  
SITE IMPROVEMENTS  
BELL VALLEY COMMONS SUBDIVISION  
BELL SCHOOL ROAD  
CHERRY VALLEY, ILLINOIS

PREPARED FOR:  
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1.0 INTRODUCTION

This report presents results of the Preliminary Soils Exploration performed in connection with the site improvements for the proposed Bell Valley Commons Subdivision in Cherry Valley, Illinois. These geotechnical services are provided in general accordance with TSC Proposal No. 41,151 dated June 16, 2008, and the attached General Conditions, incorporated herein by reference.

We understand the project consists of the development of vacant land. The subdivision will include residential, office and commercial lots, wet and dry detention ponds and roads.

The proposed subdivision is located on the east side of Bell School Road, north of Newburg Road, in Cherry Valley, Illinois. It is bounded on the east by I-90 (Northwest Tollway). The site is a piece of vacant land with rolling topography.

It should be noted that TSC performed a geotechnical exploration upon Lot 7 for a proposed office building, report dated November 23, 2007, under our file number L-70,352. While the reader is made aware of the existence of this previous report, no further reference to it is made in this report.

The results of field and laboratory testing and preliminary recommendations based upon these data are included in this report. Addressed are building foundations and mass-grading/floor slabs as well as pavement design and construction.

## 2.0 FIELD EXPLORATION AND LABORATORY TESTING

A total of eight (8) soil borings, numbered 101-108, were performed as part of this soils exploration at locations selected by others. The borings were placed at the following features, extended to the following depths:

<u>Boring</u>	<u>Feature</u>	<u>Depth</u>
101	Detention Pond C	15
102	Road	10
103	Lot 5	15
104	Road	10
105	Detention Pond A	15
106	Detention Pond A	18.5
107	Detention Pond B	15
108	Detention Pond B	15

The borings were staked in the field by Rosario Tarara Surveying. Ground surface elevations were interpolated to the nearest foot based upon the topo provided by Tarara. Reference is made to the Boring Location Plan in the Appendix for the approximate drilling layout and ground surface elevations at the borings.

The borings were drilled and samples tested according to currently recommended American Society for Testing and Materials specifications. Soil sampling was generally performed at 2½ foot intervals 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.

Soil samples were examined in the laboratory to verify field descriptions and to classify them in accordance with the Unified Soil Classification System. Laboratory testing included moisture content determinations for all cohesive and intermediate (silt or loamy) soil types. An estimate of unconfined compressive strength was obtained for clay soils using a calibrated pocket penetrometer.

Reference is made to the boring logs in the Appendix which indicate subsurface stratigraphy and soil descriptions, results of field and laboratory tests, as well as water level observations. Definitions of descriptive terminology are also included. While strata changes are shown as a definite line on the boring logs, the actual transition between soil layers will probably be more gradual. It should be noted that in the absence of foreign substances, it is often nearly impossible to distinguish fill materials from disturbed native soil samples. In addition, it should be noted that rock coring was not performed to confirm the presence of bedrock, as it was beyond the scope of this exploration.

### 3.0 DISCUSSION OF TEST DATA

Topsoil was found at the surface of all of the borings. The topsoil layer generally ranged from about 10 to 13 inches in thickness. However, about 1.5 to 2.5 feet of topsoil was observed in Borings 105, 106 and 107.

Stiff to tough, native silty clay deposits of medium to high plasticity were found below the topsoil in all of the borings except Boring 106, extending 3 to 8 feet below existing grade. These CL/CH materials (Unified classification) were typified by unconfined compressive strengths ranging from 0.75 to 1.5 tons per square foot (tsf) at moisture contents of 21 to 30 percent.

Soft to very soft, very silty to sandy clays were found below the topsoil in Boring 106, and they were also found below stiffer clays in Borings 102, 105, 106 and 107. These soft clays were encountered at depths of 2.0 to 8.0 feet below existing grade, extending 5.5 to 10.5 feet below existing grade. They exhibited unconfined compressive strengths of 0.5 tsf or less at moisture contents of 18 to 28 percent.

Layers of stiff to very tough, very silty to sandy clays and/or loose to firm silt and sand layers otherwise were generally sampled in the borings. These typically "loamy" deposits generally extended 10 to 15 feet below existing grade. The loamy clays were typified by unconfined compressive strengths of 0.75 to 4.5+ tsf at moisture contents of 8 to 24 percent. The sand and silt deposits typically exhibited Standard Penetration Test "N" values in the range of 4 to 28 blows per foot (bpf).

Dense to very dense silt and sand layers and occasional hard clay layers were encountered at depths of 13 to 15 feet in Borings 105 and 106. These relatively incompressible soil deposits had Standard Penetration Test N values of 63 to 100+ blows per foot. These materials may represent hard pan materials or weathered rock deposits. Hard drilling, possibly indicating the presence of bedrock or boulders, was encountered at a depth of approximately 15 feet in Boring 106.

It should be noted that soil borings are not a very reliable method for evaluating the presence and depth of bedrock. Our augers can sometimes experience refusal on materials which a backhoe could readily excavate. Conversely, sometimes our augers can penetrate rock materials which a backhoe cannot dig. If excavations will extend to a depth where the very dense materials were encountered, it may be advantageous to dig some test pits to evaluate the presence and depth of bedrock.

Borings 103-106 were "dry" both during and upon completion of drilling. Free water was otherwise encountered at depths ranging from 2 to 10 feet below existing grade.

## 4.0 ANALYSIS AND RECOMMENDATIONS

### 4.1 General Overview

Our exploration has generally revealed the presence of variable, but oftentimes soft soil deposits. The topsoil ranged from about 1 to 3 feet in thickness. Underlying soils generally consisted of a layer of marginal strength clay, underlain by variable strength clays and silts and sands of variable density. Hard drilling, possibly indicative of the presence of bedrock or boulders, was noted below depths in the range of 13 to 15 feet below existing grade in Borings 105 and 106.

The soils in general should be acceptable for use as engineered fill. However, it can be anticipated that most of the clay soils types will need to be reduced in moisture content in order to meet compaction specifications. It should be noted that the silts, silty/clayey sands and the lower plasticity clays (USCS ML, SM, SC and CL-ML) are typically considered frost susceptible under IDOT guidelines for grain size and plasticity. Ideally, these materials should not be used as fill, or left in place, within 3.5 feet of finished pavement grade.

Boring 103 was drilled in the location of Lot 5. Conventional, shallow spread footings are preliminarily recommended as a foundation type for this lot. The native soils encountered at shallow depths are considered suitable (or marginally suitable) for 2500 psf bearing. Marginal strength clay for 2500 psf bearing was found below the topsoil in this boring. Assuming low-rise construction, it is recommended that these marginal strength clays be undercut a minimum of 2.0 feet, the overexcavations to be replaced with coarse aggregate "structural fill", allowing footings to bear at design depths.

#### 4.2 Building Foundations

Boring 103 was drilled at Lot 5. As mentioned above, a maximum net allowable bearing stress of 2500 pounds per square foot (psf) is recommended in connection with spread footing design for a lightly loaded building. It is understood that the proposed mass-grading final subgrade elevation will be 830.0 at this lot, which is about 3 feet above existing grade.

Marginal bearing soils for 2500 psf bearing (clays with  $Q_u$  0.75 to 1.25) were encountered directly below the topsoil at Boring 103, extending approximately 3.0 feet below existing grade. It is recommended that marginal strength soils be overexcavated a minimum of 2.0 feet where encountered at footing grade, the foundation undercuts to exceed footing dimensions by at least 6 inches along each side for every foot of fill as measured at the base of the excavation. Replacement materials should consist of crushed stone or crushed gravel between 1/4 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 crushed stone or crushed gravel backfill may also be proportioned for 2500 psf bearing.

Clayey sand deposits in a moist condition were sampled below a depth of 5.5 feet below existing grade in Boring 103. These soils are considered suitable for 2500 psf bearing. However, they will tend to be disturbed and loosened by the excavation process. It is recommended that any sands (or moist silts) encountered at footing grade be recompacted by a few passes of a vibratory compactor prior to pouring footing concrete. If this would only produce instability, then it is recommended that the exposed soils be undercut 2.0 feet and replaced with structural fill in order to provide of stable platform for footing construction.

Footings may also be constructed upon an engineered fill placed in accordance with the mass-grading recommendations contained in this report. All topsoil would need to be removed prior to fill placement. Footings bearing upon the new fill may also be proportioned for 2500 psf bearing. It should be noted that the initial 1 to 2 feet of fill may need to consist of approved coarse granular material as the native soils found below the topsoil exhibited marginal strength/stability.

In order to preclude disproportionately small footing sizes, it is recommended that all continuous wall footings be made at least 24 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. It is recommended that foundation walls be reinforced so that they can span relatively minor differential settlements.

#### 4.3 Mass-Grading

It is recommended that building 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. The building and pavement areas should then be proof-rolled, in order to detect the presence of unsuitable or unstable soil types. The proof-roll should be performed using a loaded dump truck or other approved piece of heavy construction equipment. All soft or unstable materials determined by proof-rolling should be removed and replaced.

New fill should consist of approved granular materials or inorganic clays. 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). However, the uppermost 2.0 feet of fill below final subgrade in pavement areas should be compacted to 95 percent Modified Proctor density. 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 one (1) percentage point below and three (3) percentage points above optimum moisture as established by its laboratory compaction curve. If the soil is compacted too dry, 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.

With regard to potential use of the soils obtained at the proposed ponds as borrow, as mentioned previously, the clay soils will generally need to be reduced in moisture content to meet specifications and allow for proper compaction. Each of the potential pond borrow sources are discussed as follows:

Boring 101 was drilled in the area of (dry) Detention Pond C. It is understood that the bottom of the pond will be up to 5.5 feet below existing grade. The soils in the depth range consisted of about a foot of topsoil underlain by tough, CL/CH silty clays with moisture contents of 21 to 29 percent. It can be anticipated that these soils will need to be reduced in moisture content up to 10 percentage points in order to meet compaction specifications. Overdigging this pond may not be very practical, as very moist to wet silt and sand layers predominated below 5.5 feet.

Borings 105 and 106 were drilled in the area of (wet) Detention Pond A. The proposed pond bottom is about 9 feet below existing grade in Boring 105, and the proposed bottom roughly matches existing grade at Boring 106. The soils encountered below the topsoil in the upper 10 feet consisted of layers of very soft to stiff clays and firm silty/clayey sand deposits. Free water was not encountered in either boring. These materials are considered suitable for use as engineered fill, with the same cautions given previously that the silty/sandy clays and silty/clayey sands are considered frost susceptible, and ideally should not be used as fill in the upper 3.5 feet below finished grade in pavement areas. The clays will also need drying in order to meet compaction specifications. It should be noted that the density of the soils increased at depths below 8 and 10.5 feet in Borings 105 and 106, respectively, with firm to very dense silty/clayey



sands and silty and sandy clay layers exhibiting unconfined compressive strengths fo 3.75 to 4.5+ tsf being sampled.

Hard drilling, possibly representing the presence of weathered bedrock, was encountered at approximately 15 feet below existing grade, or at approximate Elevation 805, in Boring 106 - the presence of bedrock (or boulders) could cause difficulties if it is desired to overdig this pond. It may be useful to perform test pits in this area to look for and evaluate the extent of bedrock.

Borings 107 and 108 were drilled for (dry) Detention Pond B. It is understood that the pond bottom will be about 2.0 feet below existing grade in the area of each of these two borings. One (1) to 2.5 feet of topsoil was observed at the surface of Borings 108 and 107, respectively, underlain by high moisture content, silty clays extending to depths of 5.5 to 10.5 feet below existing grade, respectively. These materials will require significant drying in order to be used as fill, and free water was found in these borings at depths as shallow as 2.5 to 5.5 feet.

Underlying soils consisted of loose to firm, very moist to wet silty/clayey sands, clayey silts, some clay layers and occasional cobbles. Hard, very silty clay was found in Boring 108 at 13 feet. As mentioned previously, these loamy deposits are frost susceptible, and preferably should not be used as fill in the upper 3.5 feet below final grade in pavement areas. The presence of shallow free water in these two (2) borings may also point to difficulties with groundwater control if it is desired to overdig this pond, especially at depths below 5 to 10 feet below existing grade.

#### 4.4 Water Retention

It is understood that Pond A will be wet retention with a Normal Water Level (NWL) of 820.0. The CL or CL/CH clays (Unified Classification) in the upper 3.0 to 5.5 feet in these borings can be expected to be generally suitable for water retention, and for use as a pond liner. However, the underlying sandy clays (classification CL-ML) and clayey silts/sands are considered to be more permeable, and if water retention is important, it is recommended that such deposits be cut 2.0 feet from the sides and bottoms of the pond, to be replaced with compacted medium to high plasticity clays with USCS classification CL to CL/CH.

The liner materials should be placed in approximate 10 inch lifts loose measure and compacted to at least 90 percent of maximum dry density as determined by the Modified Proctor test (ASTM D 1557). At the time of placement and compaction the clay fill should also be on the wet side of optimum moisture content, as determined by the laboratory compaction curve.

#### 4.5 Pavement Design and Construction

Borings 102 and 104 were drilled in a proposed road location. It is understood that final subgrade elevation will be similar to existing. Pavement subgrade preparation may be in general accordance with previous recommendations for mass-grading. Where the unconfined strength of cohesive subgrade soils is less than about 2.25 tsf and/or their moisture content exceeds about 22 percent, the uppermost 2 to 3 feet of subgrade soils may need to be reworked and recompacted. These unfavorable conditions pointing towards subgrade instability were found at shallow depths in both of these borings, and in all of the other borings as well. If paving construction is performed when drying of surficial soils cannot be accomplished, lime or fly ash stabilization or removal of unstable subgrade and replacement with drier cohesive fill or one to two feet of coarse granular materials may be required.

It is recommended that a nominal Illinois Bearing Ratio (IBR) value of 3.0 be used in the design of pavements. Base course materials should conform to IDOT gradation CA-6 and be compacted to 95 percent Modified Proctor density or 100 percent of the Standard Proctor (ASTM D 698) maximum density value. Bituminous materials should conform to IDOT Class I requirements, Standard Specifications for Road and Bridge Construction, Section 406. They should be compacted to between 93 and 97 percent of their theoretical maximum density, the "Big D" as determined by IDOT.

#### 4.6 Groundwater Management

Groundwater was encountered in some of the borings at depths as shallow as 2.5 feet below existing grade. It should therefore be assumed that the accumulation of run-off water or seepage at the base of excavations will occur during foundation construction and site work. The Contractor should be prepared to remove these accumulations by dewatering procedures, as a minimum to include pumping from strategically placed sumps. It should be noted that excavations extending more than a few feet into saturated sand deposits may require the use of preconstruction dewatering methods.

## 5.0 CLOSURE

It is recommended that full-time observation and testing services be provided by Testing Service Corporation personnel during foundation construction, so that the soils at undercut and foundation levels can be observed and tested. In addition, building materials, stripping and undercutting, fill placement and compaction as well as slab-on-grade and pavement construction should be observed and tested for compliance with the recommended procedures and specifications.

This report is preliminary, as it has been prepared without benefit of final building or grading plans. 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. Additional borings may be suggested at that time, to delineate potential problem areas as well as to fill in any gaps in information.

The analysis and recommendations submitted in this report are based upon the data obtained from the eight (8) 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.

We are available to review this report with you at your convenience.



Steven R. Koester, P.E.  
Registered Professional Engineer  
Illinois No. 062-049549

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## 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. DOCUMENTS AND SAMPLES:** Client is granted an exclusive license to use findings and reports prepared and issued by TSC and any sub-consultants pursuant to this Agreement for the purpose set forth in TSC's proposal provided that TSC has received payment in full for its services. TSC and, if applicable, its sub-consultant, retain all copyright and ownership interests in the reports, boring logs, maps, field data, field notes, laboratory test data and similar documents, and the ownership and freedom to use all data generated by it for any purpose. 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:** TSC's obligation to provide services may be terminated by either party upon (7) seven days prior written notice. In the event of termination of TSC's services, TSC shall be compensated by Client for all services performed up to and including the termination date, including reimbursable expenses. The terms and conditions of these General Conditions shall survive the termination of TSC's obligation to provide services.

**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. Paragraph headings are for convenience only and shall not be construed as limiting the meaning of the provisions contained in these General Conditions.

## **APPENDIX**

UNIFIED CLASSIFICATION CHART

LEGEND FOR BORING LOGS

BORING LOGS

BORING LOCATION PLAN

**TESTING SERVICE CORPORATION  
UNIFIED CLASSIFICATION CHART**

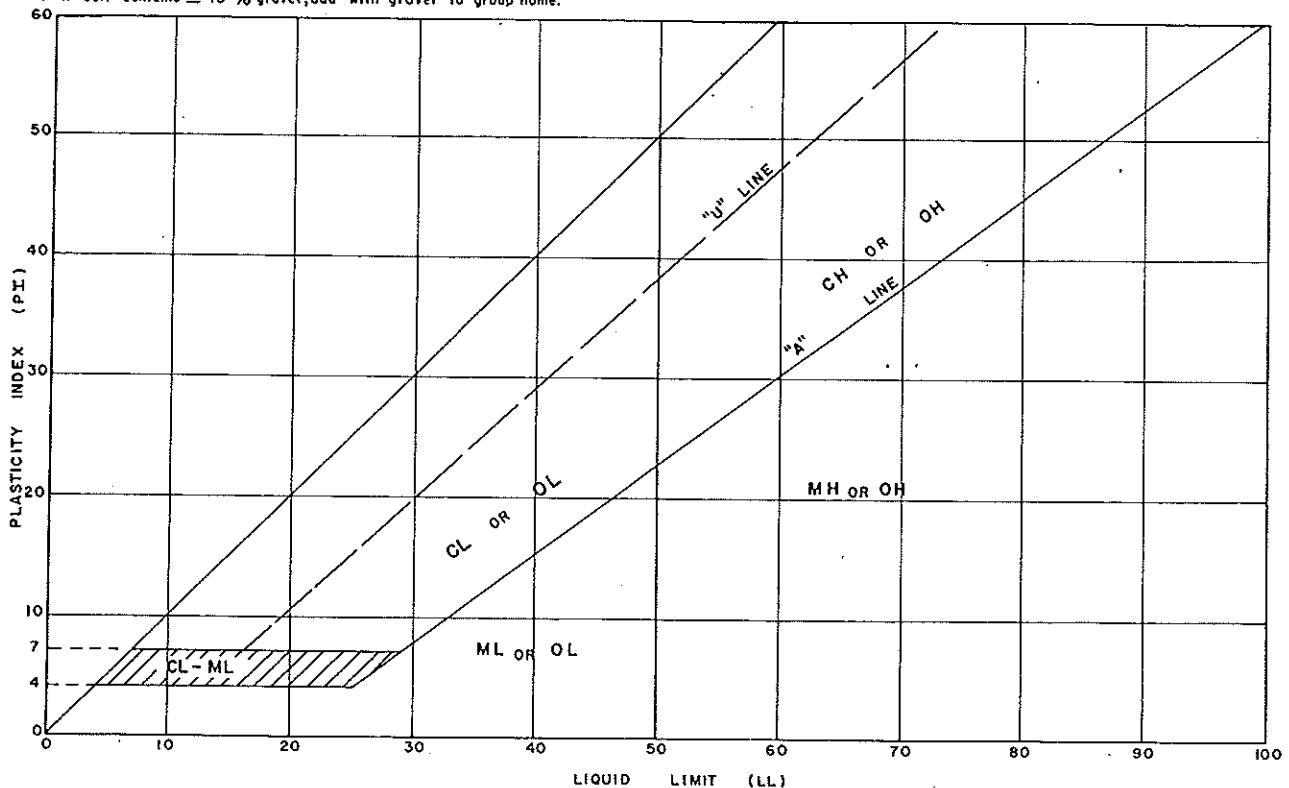
CRITERIA FOR ASSIGNING GROUP SYMBOLS AND GROUP NAMES USING LABORATORY TESTS <sup>a</sup>					SOIL CLASSIFICATION	
					GROUP SYMBOL	GROUP NAME <sup>b</sup>
COARSE-GRAINED SOILS more than 50% retained on No. 200 sieve	GRAVELS More than 50% of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS Less than 5% fines <sup>c</sup>	$C_u \geq 4$ and $1 \leq C_c \leq 3$ <sup>e</sup>	GW	Well graded gravel <sup>f</sup>	
			$C_u < 4$ and/or $1 > C_c > 3$ <sup>e</sup>	GP	Poorly graded gravel <sup>f</sup>	
		GRAVELS WITH FINES More than 12% fines <sup>c</sup>	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 <sup>d</sup>	$C_u \geq 6$ and $1 \leq C_c \leq 3$ <sup>e</sup>	SW	Well-graded sand <sup>i</sup>	
			$C_u < 6$ and/or $1 > C_c > 3$ <sup>e</sup>	SP	Poorly graded sand <sup>i</sup>	
		SANDS WITH FINES More than 12% fines <sup>d</sup>	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 <sup>k,l,m</sup>	
			PI $\leq 4$ or plots below "A" line j	ML	Silt <sup>k,l,m</sup>	
		Organic	$\frac{\text{Liquid limit - oven dried}}{\text{Liquid limit - not dried}} < 0.75$	OL	Organic clay <sup>k,l,m,n</sup> Organic silt <sup>k,l,m,o</sup>	
	SILTS & CLAYS Liquid limit 50% or more	Inorganic	PI plots on or above "A" line	CH	Fat clay <sup>k,l,m</sup>	
			PI plots below "A" line	MH	Elastic silt <sup>k,l,m</sup>	
		Organic	$\frac{\text{Liquid limit - oven dried}}{\text{Liquid limit - not dried}} < 0.75$	OH	Organic clay <sup>k,l,m,p</sup> Organic silt <sup>k,l,m,q</sup>	
		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

- 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.

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.



# TESTING SERVICE CORPORATION

## 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  
γD = 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

##### CONSISTENCY

##### Qu

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

##### RELATIVE DENSITY

##### N

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 Site Improvements, Bell Valley Commons Subdivision, Cherry Valley, ILCLIENT Bell Valley Commons, LLC, Rockford, IllinoisBORING 101 DATE STARTED 6-17-08 DATE COMPLETED 6-17-08 JOB L-71,682

## ELEVATIONS

GROUND SURFACE 827.0  
END OF BORING 812.0

## WATER LEVEL OBSERVATIONS

▼ WHILE DRILLING 8.0'  
 ▼ AT END OF BORING 5.0' Caved  
 ▼ 24 HOURS

	LENGTH RECOVERY	SAMPLE		N	WC	Qu	γ <sub>DRY</sub>	DEPTH	ELEV.	SOIL DESCRIPTIONS
		NO.	TYPE							
0										Black clayey TOPSOIL (OL)
		1	SS	5	28.9	1.25*		1.1	825.9	Tough brown silty CLAY, trace sand, trace organic, very moist (CL/CH)
		2	SS	4	21.2	1.0*		3.0	824.0	Tough brown and gray silty CLAY, little sand, trace organic, very moist (CL/CH)
5		3	SS	4	22.0			5.5	821.5	Loose brown clayey SILT, some fine sand, very moist to wet (ML)
		4	SS	7	10.4			8.0	819.0	▼
10		5	SS	10	9.8					Loose to firm pinkish-brown clayey SAND and silty SAND layers, little to some gravel, moist to wet (SC/SM)
15		6	SS	12	10.2					
20										
25										

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

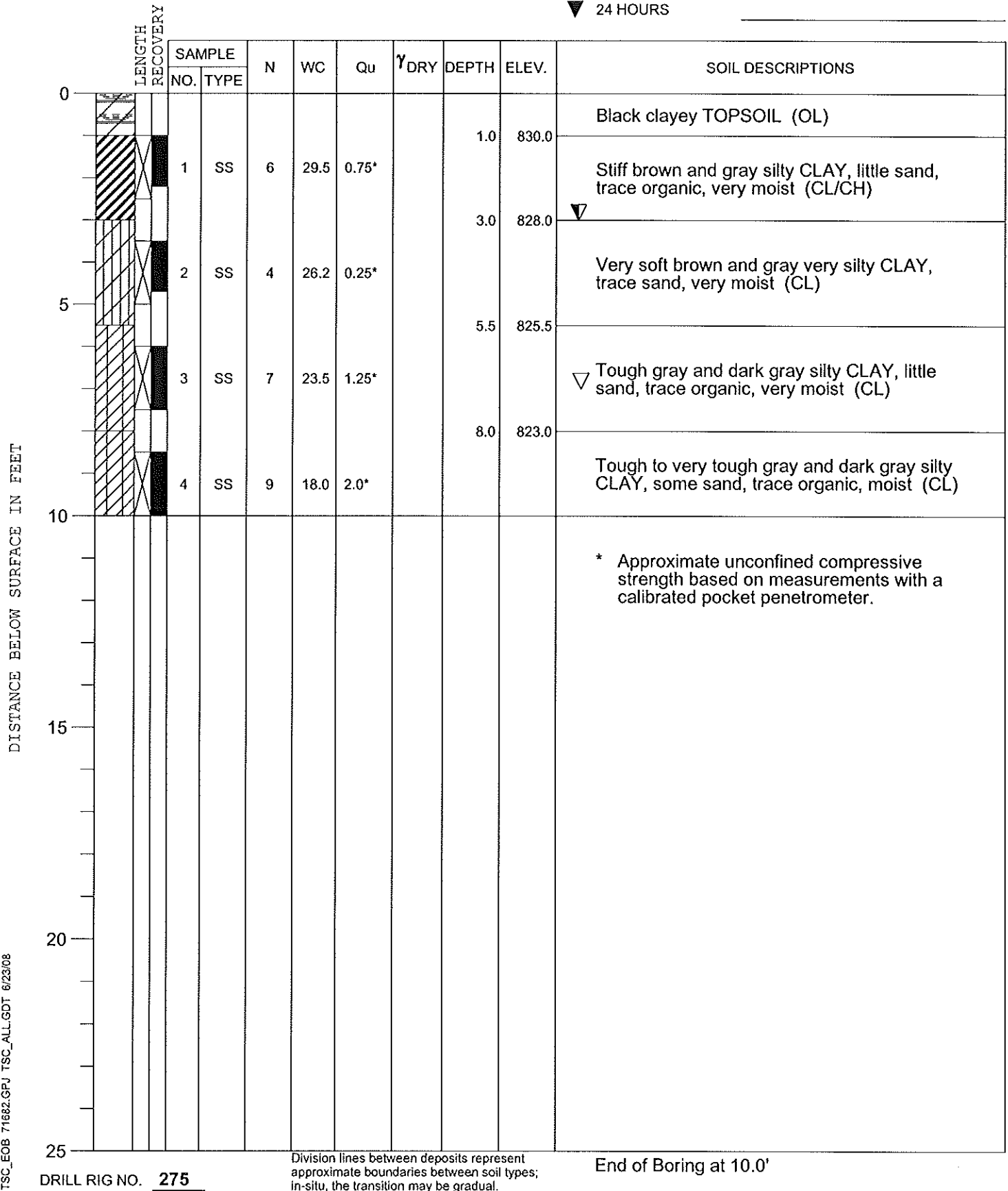
End of Boring at 15.0'

DRILL RIG NO. 275

PROJECT Site Improvements, Bell Valley Commons Subdivision, Cherry Valley, ILCLIENT Bell Valley Commons, LLC, Rockford, IllinoisBORING 102 DATE STARTED 6-17-08 DATE COMPLETED 6-17-08 JOB L-71,682

ELEVATIONS  
 GROUND SURFACE 831.0  
 END OF BORING 821.0

WATER LEVEL OBSERVATIONS  
 ▽ WHILE DRILLING 3.0'  
 ▽ AT END OF BORING 7.0'  
 ▽ 24 HOURS \_\_\_\_\_



PROJECT Site Improvements, Bell Valley Commons Subdivision, Cherry Valley, ILCLIENT Bell Valley Commons, LLC, Rockford, IllinoisBORING 103 DATE STARTED 6-17-08 DATE COMPLETED 6-17-08 JOB L-71,682

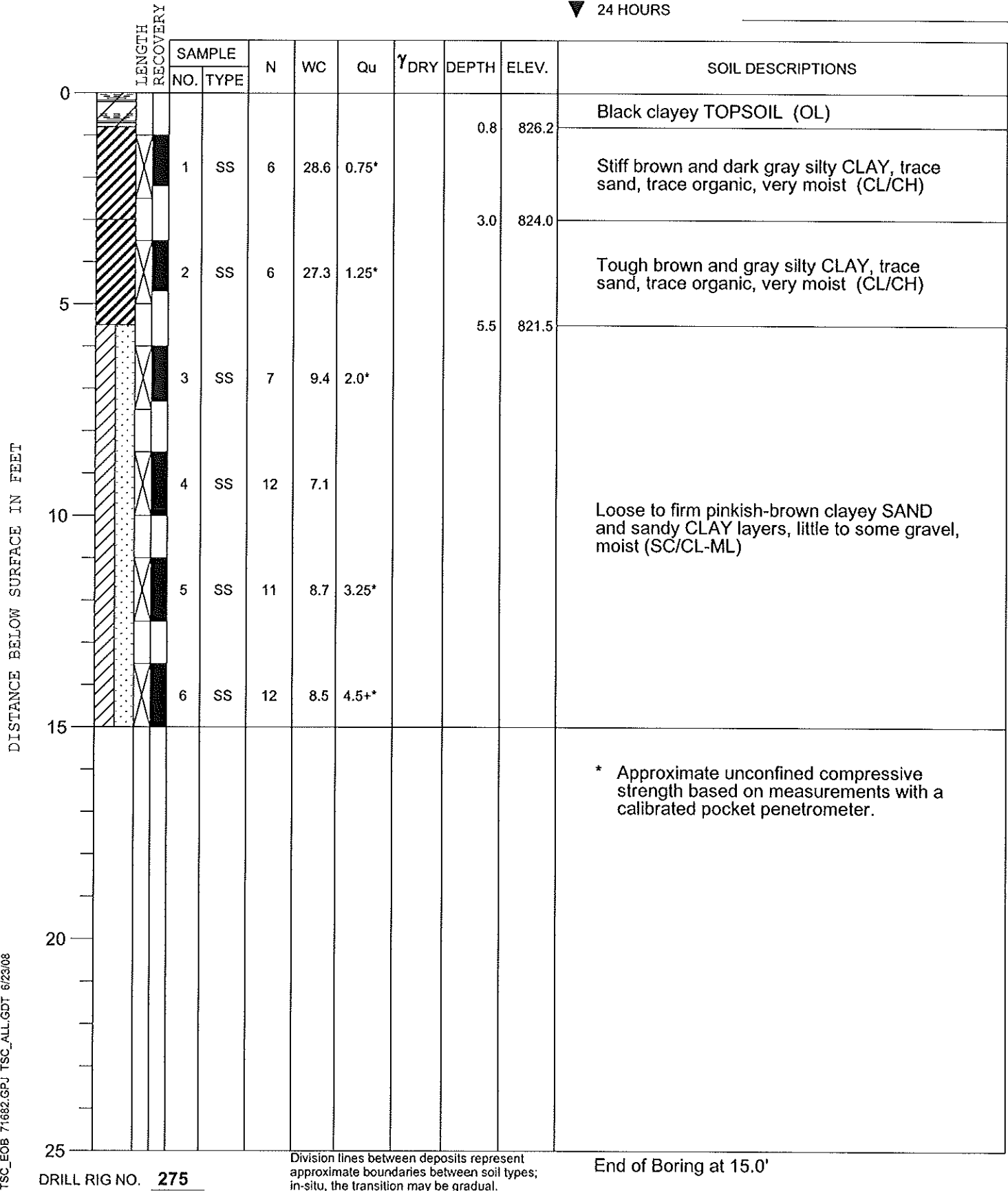
## ELEVATIONS

GROUND SURFACE 827.0END OF BORING 812.0

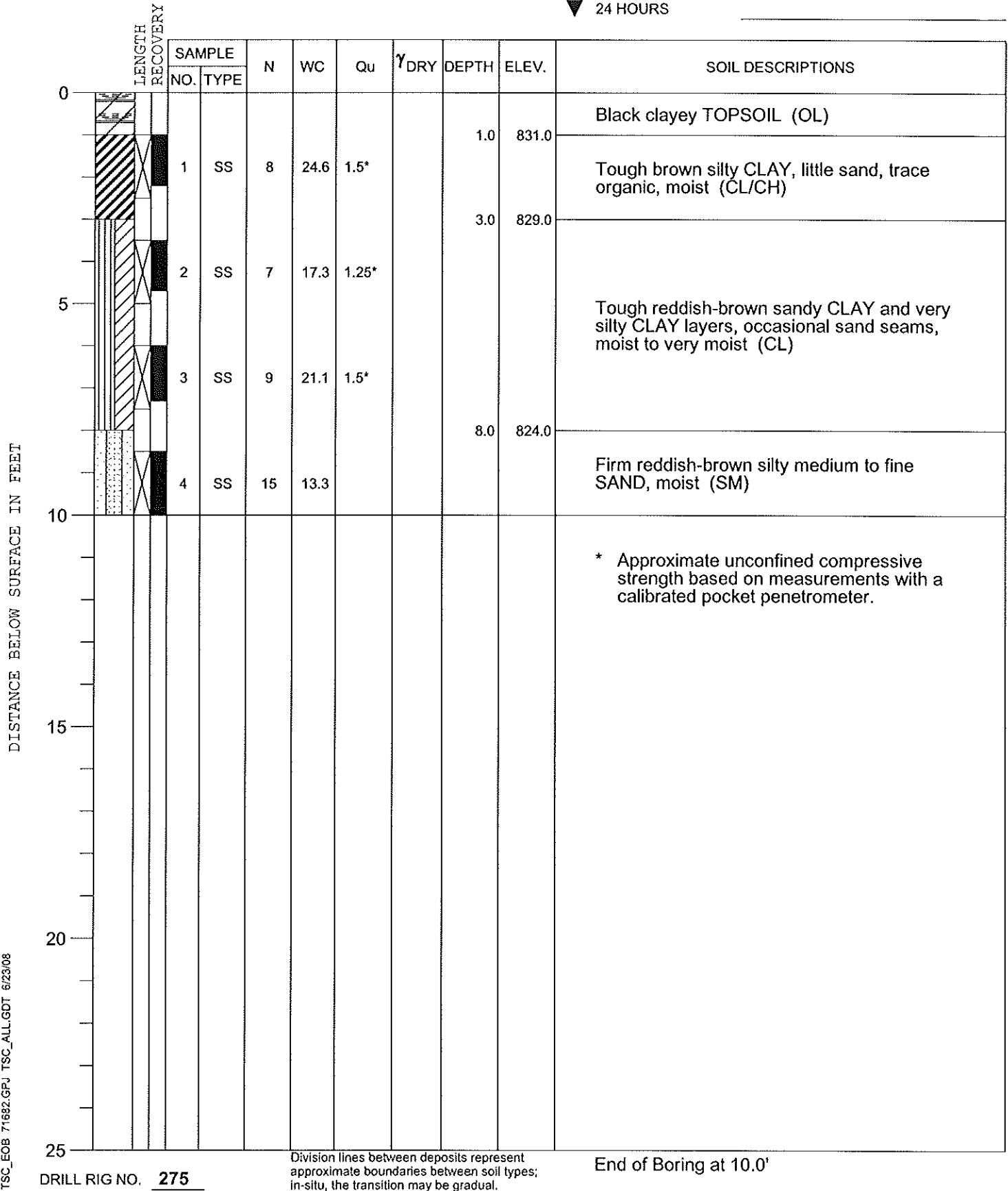
## WATER LEVEL OBSERVATIONS

▼ WHILE DRILLING Dry▼ AT END OF BORING Dry

▼ 24 HOURS



PROJECT Site Improvements, Bell Valley Commons Subdivision, Cherry Valley, ILCLIENT Bell Valley Commons, LLC, Rockford, IllinoisBORING 104 DATE STARTED 6-17-08 DATE COMPLETED 6-17-08 JOB L-71,682
 ELEVATIONS  
 GROUND SURFACE 832.0  
 END OF BORING 822.0

 WATER LEVEL OBSERVATIONS  
 ▼ WHILE DRILLING Dry  
 ▼ AT END OF BORING Dry  
 ▼ 24 HOURS \_\_\_\_\_


PROJECT **Site Improvements, Bell Valley Commons Subdivision, Cherry Valley, IL**CLIENT **Bell Valley Commons, LLC, Rockford, Illinois**BORING **105** DATE STARTED **6-17-08** DATE COMPLETED **6-17-08** JOB **L-71,682**

## ELEVATIONS

GROUND SURFACE **822.0**  
END OF BORING **807.0**

## 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 <sub>DRY</sub>	DEPTH	ELEV.	SOIL DESCRIPTIONS
		NO.	TYPE							
0										Black clayey TOPSOIL, moist (OL)
		A	SS	8	26.5	1.5*		1.5	820.5	Tough brown and dark brown silty CLAY, trace sand, trace organic, moist (CL/CH)
		1			26.3	1.5*				
		B						3.0	819.0	Tough brown sandy CLAY, trace gravel, very moist (CL-ML)
		2	SS	10	22.5	1.75*				
5								5.5	816.5	Soft reddish-brown sandy CLAY, little gravel, very moist (CL-ML)
		3	SS	4	23.9	0.5*				
								8.0	814.0	Firm pinkish-brown silty medium to fine SAND, trace gravel, trace clay, very moist (SM)
		4	SS	11	11.8					
10								10.5	811.5	Firm to dense pinkish-brown clayey SILT, some sand, trace gravel, moist (ML)
		5	SS	28	8.8					
		6	SS	63	8.0					
15										* Approximate unconfined compressive strength based on measurements with a calibrated pocket penetrometer.
20										
25										

DRILL RIG NO. **275**

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

End of Boring at 15.0'

PROJECT Site Improvements, Bell Valley Commons Subdivision, Cherry Valley, ILCLIENT Bell Valley Commons, LLC, Rockford, IllinoisBORING 106 DATE STARTED 6-17-08 DATE COMPLETED 6-17-08 JOB L-71,682

## ELEVATIONS

GROUND SURFACE 820.0END OF BORING 801.5

## WATER LEVEL OBSERVATIONS

▼ WHILE DRILLING Dry▼ AT END OF BORING Dry

▼ 24 HOURS

	LENGTH RECOVERY	SAMPLE		N	WC	Qu	γ <sub>DRY</sub>	DEPTH	ELEV.	SOIL DESCRIPTIONS
		NO.	TYPE							
0										Black clayey TOPSOIL, moist (OL)
		A 1	SS	6	24.5	1.75*		2.0	818.0	
		B			28.1	0.5*		3.0	817.0	Soft brown and dark gray very silty CLAY, trace sand, trace organic, very moist (CL)
		2	SS	6	24.3	0.75*				Stiff brown silty CLAY, little sand, very moist (CL)
5								5.5	814.5	
		3	SS	6	18.2	0.25*		8.0	812.0	Very soft brown very silty CLAY and clayey SAND layers, very moist (CL-ML/SC)
		4	SS	8	12.0	0.75*				Stiff brown and gray sandy CLAY, trace gravel, very moist (CL-ML)
10								10.5	809.5	
		5	SS	14	8.3	3.75*				Firm brown clayey SAND and sandy CLAY layers, trace to little gravel, moist (SC/CL-ML)
		6	SS	14	8.2	4.5+*				
15								15.5	804.5	
		7	SS	100/0"						Hard drilling - probable weathered bedrock or boulders (no recovery)
		8	SS	100/0"						
20										* Approximate unconfined compressive strength based on measurements with a calibrated pocket penetrometer.  Sampler refusal at 18.5 feet on probable bedrock or boulders.
25										

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

End of Boring at 18.5'

DRILL RIG NO. 275

PROJECT Site Improvements, Bell Valley Commons Subdivision, Cherry Valley, ILCLIENT Bell Valley Commons, LLC, Rockford, IllinoisBORING 107DATE STARTED 6-17-08DATE COMPLETED 6-17-08JOB L-71,682

## ELEVATIONS

GROUND SURFACE 823.0END OF BORING 808.0

## WATER LEVEL OBSERVATIONS

▼ WHILE DRILLING 2.5'▽ AT END OF BORING 5.0'

▼ 24 HOURS

	LENGTH RECOVERY	SAMPLE		N	WC	Qu	γ <sub>DRY</sub>	DEPTH	ELEV.	SOIL DESCRIPTIONS
		NO.	TYPE							
0										
		1	SS	5	30.3	<0.25*		2.5	820.5	Black clayey TOPSOIL, very moist (OL) ▼
		2	SS	4	23.8	1.25*		5.5	817.5	Tough dark brown silty CLAY, trace sand, trace organic, very moist (CL/CH) ▽
		3	SS	4	25.6	1.0*		8.0	815.0	Stiff to tough grayish-brown silty CLAY, trace sand, very moist (CL/CH)
		4	SS	4	25.9	0.25*		10.5	812.5	Very soft brown and gray silty CLAY, little sand, trace gravel, trace organic, occasional silt and sand seams, very moist (CL)
		5	SS	7				13.0	810.0	Loose brown silty fine SAND, trace clay, wet (SM)
		6	SS	8	22.7					Loose brown clayey SILT, silty fine SAND and silty CLAY layers, very moist to wet (ML/SM/CL)
										* Approximate unconfined compressive strength based on measurements with a calibrated pocket penetrometer.
25										

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

End of Boring at 15.0'

DRILL RIG NO. 275

PROJECT Site Improvements, Bell Valley Commons Subdivision, Cherry Valley, ILCLIENT Bell Valley Commons, LLC, Rockford, IllinoisBORING 108 DATE STARTED 6-17-08 DATE COMPLETED 6-17-08 JOB L-71,682

ELEVATIONS  
 GROUND SURFACE 824.0  
 END OF BORING 809.0

WATER LEVEL OBSERVATIONS  
 ▼ WHILE DRILLING 5.5'  
 ▼ AT END OF BORING 10.0'  
 ▼ 24 HOURS

DISTANCE BELOW SURFACE IN FEET	LENGTH RECOVERY	SAMPLE		N	WC	Qu	γ <sub>DRY</sub>	DEPTH	ELEV.	SOIL DESCRIPTIONS
		NO.	TYPE							
0										Black clayey TOPSOIL (OL)
		1	SS	8	29.5	1.25*		1.0	823.0	Tough brown silty CLAY, trace sand, trace organic, very moist (CL/CH)
		2	SS	5	22.9	0.75*		3.0	821.0	Stiff brown very silty CLAY, little to some sand, trace organic, very moist (CL)
5		3	SS	5	26.3			5.5	818.5	▼ Loose brown clayey SILT, trace sand, very moist to wet (ML)
		4	SS	7	13.6	1.0*		8.0	816.0	Loose brown and gray clayey SAND, trace gravel, occasional clay seams, occasional Cobbles, very moist (SC)
10		5	SS	10	12.7			10.5	813.5	Firm orange-brown clayey SILT, some fine sand, very moist to wet (ML)
		6	SS	22	10.9	4.5*		13.0	811.0	Hard orange-brown very silty CLAY, some sand, trace gravel, moist (CL-ML)
15										* Approximate unconfined compressive strength based on measurements with a calibrated pocket penetrometer.
20										
25										

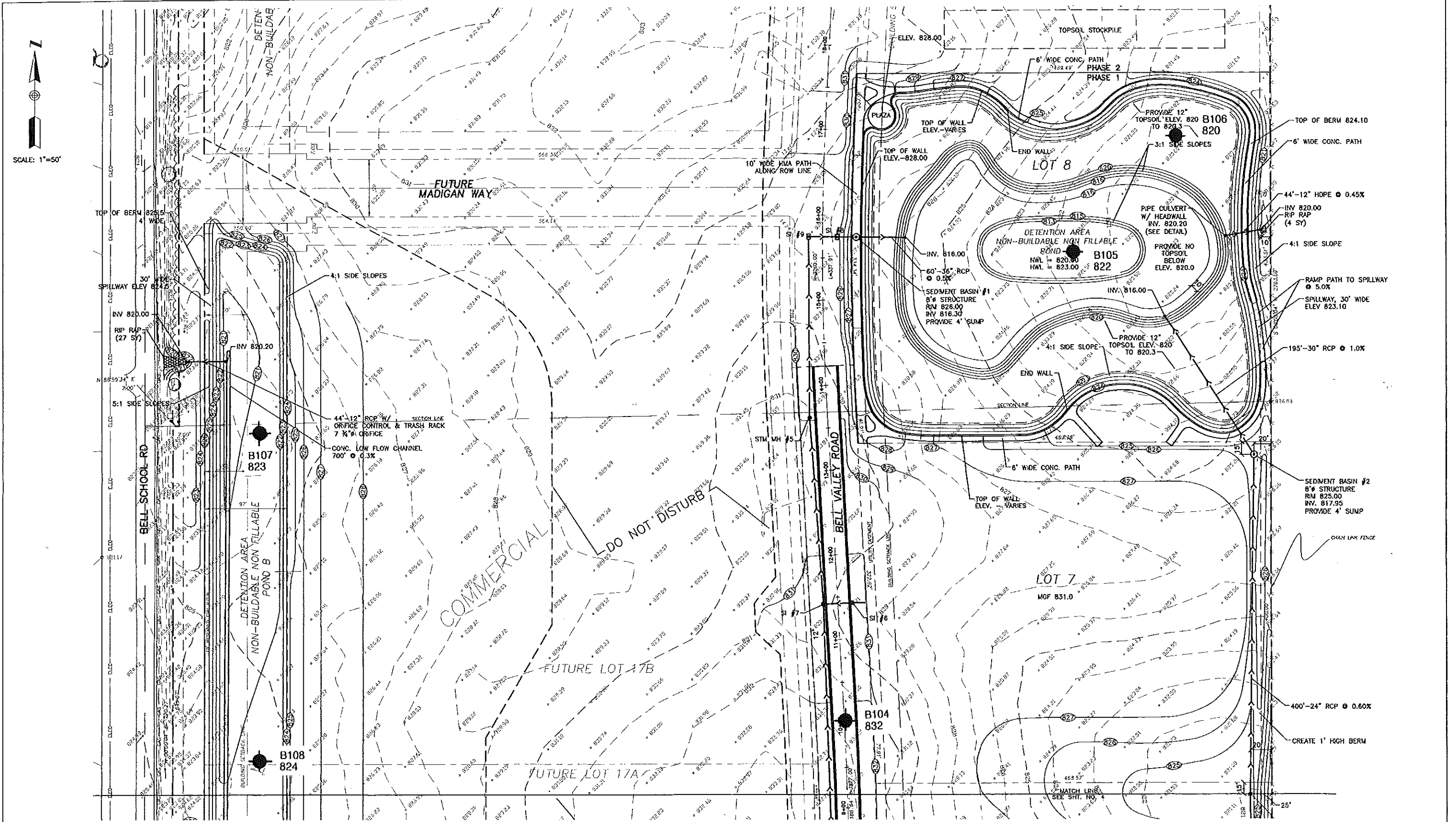
Division lines between deposits represent approximate boundaries between soil types; in-situ, the transition may be gradual.

End of Boring at 15.0'

DRILL RIG NO. 275







PLAN NOTES:

1. LIMIT TREE REMOVAL TO RIGHT OF WAY OR SETBACK LINES WHERE NECESSARY.
2. MGF = MINIMUM GROUND ELEVATION AT FOUNDATION.
3. XXXXX = FINISH GRADE UPON BLDG. CONSTRUCTION. MAY DIFFER FROM CONTOUR GRADE SET DURING ROAD CONSTRUCTION.
4. STOCKPILE EXCESS TOPSOIL WHERE INDICATED. EXCESS TOPSOIL IS ALL TOPSOIL GENERATED ON SITE EXCEPT THAT USED TO RESTORE PONDS.
5. PROVIDE MINIMUM 6" TOPSOIL OVER ALL DISTURBED AND GRADED AREAS, EXCEPT AS NOTED IN POND A, INCLUDING DETENTION PONDS. PROVIDE TEMPORARY SEED MIX ON GRADED LOTS. PROVIDE CLASS 1 SEED MIX IN PONDS B AND C AND NEWBURG ROAD. IN POND A, PROVIDE WETLAND PLANTINGS IN ACCORDANCE WITH LANDSCAPING PLAN BY OTHERS. IF PLAN IS NOT AVAILABLE, PROVIDE TEMPORARY SEEDING WITHIN 21 DAYS.
6. PROVIDE EXCELSIOR BLANKET ON ALL SLOPES STEEPER THAN 10:1, INCLUDING PONDS. DO NOT BLANKET BELOW ELEVATION 820 IN POND A.

NOTE:  
LOCATIONS OF UNDERGROUND UTILITIES ARE TAKEN FROM RECORD INFORMATION AND ARE APPROXIMATE. CALL JULLIE, AT 1-800-892-0123, BEFORE DIGGING, TO OBTAIN FIELD LOCATIONS.

Borings staked by Rosario S. Tarara Land Surveying

ELEVATIONS INTERPOLATED TO THE NEAREST FOOT BASED UPON TOPO.

BORING LOCATION PLAN  
TSC L-71,682 JUNE 2008  
PAGE 2 OF 2

GRADING PLAN - NORTH BELL VALLEY COMMONS SUBDIVISION-PHASE 1			
REVISED	BY	DATE	BY
05/15/2008	PER PRADO COMMENTS	05/15/2008	AT/CW/JJ
05/22/2008	PER VILLAGE COMMENTS	05/22/2008	AT/CW/JJ
PROJECT NO.		473	
SHEET NO.		5 OF 32	

ROSARIO S. TARARA  
LAND SURVEYING, INC.

3630 EAST STATE STREET, SUITE 215, HOUSTON, TEXAS 77058 (817) 547-3400

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