

10 April 2015

Ms. Lee Andrews/Tina Guziec
444 E. Roosevelt Road, #289
Lombard, Illinois 60148

Re: Geotechnical Investigation
851 West Grand/444 N Green
Chicago, Illinois

Dear Ms. Andrews,

Enclosed are the results of the soil investigation performed on 26 March 2015, at the above project.

We would be pleased to discuss this report with you at your convenience.

Yours Very Truly,



Glen Hodson



Walter H. Flood, P.E.

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I. Summary of Borings

The subsurface investigation consisted of four (4) preliminary borings that were taken at the approximate locations shown on the attached sketch. The test borings were taken to a depth of 30' using a truck mounted power auger. Soil samples were taken by means of split barrel sampling procedures in general accordance with ASTM D-1586 specifications. Sampling was at two and one-half (2 ½) foot intervals for the first ten (10) feet and every five (5) feet thereafter.

The borings are identified as B-1 through B-4. All samples were identified and sealed in the field and returned to our laboratory for further identification and testing. During the field operation, the drilling crew maintained a log of drilling procedures and subsurface conditions including changes in soil stratigraphy and ground water levels. The investigation focused upon the proposed building and development areas for the development of initial soil, construction and bearing recommendations.

II. Laboratory Testing

The laboratory testing program consisted of moisture content and hand penetrometer tests on portions of the cohesive soils recovered from the borings. The unconfined compressive strength is estimated to a maximum value of four and one-half (4 ½) tons per square foot (TSF) by using a hand penetrometer. This measures the resistance of a sample to penetration by small spring calibrated cylinder. Water content tests were also performed on representative portions of the cohesive material obtained. The results of all laboratory tests are indicated on the enclosed boring logs.

The retrieved soil samples were examined in our laboratory and classified on the basis of texture and plasticity in accordance with the Unified Soil Classification System (ASTM D2487). The soil descriptions on the boring logs are in conformance with this system and estimated group symbol according to this system is included in parenthesis following each soil description in the boring logs. Stratification lines, as indicated on the boring logs, are in some cases estimated *insitu*. The transition between soil types may be gradual.

III. Site Conditions

The surface elevation on the boring logs represents the existing ground surface at the time of the investigation. The ground surface elevation is estimated at +20 CCD. The site is currently occupied by a two story masonry structure and associated parking located at 444 N Green (B-1) and 851 West Grand (B-2 through B-4) Streets in

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Chicago, Illinois. The borings were taken within the proposed building and development areas. The attached sketch indicates the approximate locations of the borings.

IV. Soil Profile

All locations investigated were noted to be overlain by asphalt pavement or crushed stone fill. The asphalt pavement was noted to be approximately 4" in thickness and was underlain by crushed stone fill to a depth of approximately 12" below existing grade. The crushed stone was noted to extend to between approximately 4" and 12" below existing grade. Below this, miscellaneous fill, which consisted mainly of clay with some stone, concrete and brick, was encountered. The fill layer was noted to extend to between 3.5' and 13' (B-1) below existing grade. The standard penetration value for this layer was found to range from 4 to 59 and varied greatly depending on the material composition.

Below the fill at B-2 through B-4, stiff to very stiff brown and gray silty clay was encountered. The standard penetration value for this layer was found to range from 4 to 8. The unconfined compressive strength was noted to range from 2,000 psf and 5,000 psf. This stratum was found to extend to approximately 13.5' below existing grade.

Below this, soft to stiff gray silty clay was encountered to the depth investigated (30'). The standard penetration value for this layer was found to range from 3 to 5. The unconfined compressive strength was noted to range from 1,000 psf and 2,000 psf.

V. Ground Water

Ground water levels were taken during the boring operation and after completion of the drilling. While some locations were dry while drilling, water was encountered at 6' and 13' while drilling. All locations were noted to be dry at drilling completion. This most likely represents a "perched water table" due to the urban fill present and the low permeability of the underlying silty clay strata encountered. Fluctuations in ground water levels may occur depending on fluctuations in precipitation, evaporation and surface run-off.

VI. Foundations

Specific recommendations are difficult without more knowledge of the proposed structure; however, we understand the intention is to support a 2 story residential structures on spread footings at frost elevation (444 N. Green) and a 6 story residential structures on spread footings at frost elevation (851 W Grand). Based on conversations

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with the structural engineer we understand that preliminary maximum column loads of 350 to 400 kips are expected for the 6 story structure. It is our understanding that there will not be basements in the proposed structures.

444 N Green

Due to the varying consistency of the miscellaneous fill present, it is necessary to remove this material to the underlying brown and gray silty clay layer in the footing areas. Assuming that the footings are to be placed at frost elevation (-3.5') some of the miscellaneous fill material will be removed although undercuts of approximately 9.5' should be expected dependent upon location. Due to obstructions encountered during the investigation and due to the presence of "urban" type fill, additional excavation should be expected to remove possible obstructions in these locations. It is possible, and should be anticipated, to encounter deeper areas of urban fill on sites of this type. At the undercut areas, footings could be backfilled to -3.5' using select material (clay or dense graded stone compacted to 95% of ASTM D1557) at a ratio of 1' of additional width for each foot of depth. Based upon our understanding of the structure the virgin clay or an engineered fill compacted as indicated, will be capable of supporting a net allowable load of 3,000 psf. It would be necessary to limit wall footing sizes to no greater than 2.5' and pier footings to no greater than 5.0' when placed at 3.5' below grade, due to the presence of a soft clay layer below 13.5'.

Due to the depth of fill, another option is the use of a "Geopier" rammed aggregate pier system for support of the foundation system. If the use of a rammed aggregate pier system is advantageous, the information obtained from the geotechnical investigation should be forwarded to Fran Miller of Geopier at (630) 665-8585 for review and suggestions regarding feasibility.

Regardless of the option selected, the foundation should be installed in the presence of a qualified FTL soil technician, experienced with the site and urban conditions, to confirm the type and consistency of the bearing material present and to confirm removal of the miscellaneous fill.

851 West Grand

Due to the varying consistency of the miscellaneous fill present, it is necessary to remove this material to the underlying brown and gray silty clay layer in the footing areas. Assuming that the footings are to be placed at frost elevation (-3.5') some of the miscellaneous fill material will be removed although undercuts of approximately 2.5' should be expected dependent upon location. Due to obstructions encountered during the investigation and due to the presence of "urban" type fill, additional excavation

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should be expected to remove possible obstructions in these locations. It is possible, and should be anticipated, to encounter deeper areas of urban fill on sites of this type. At the undercut areas, footings could be backfilled to -3.5' using select material (clay or dense graded stone compacted to 95% of ASTM D1557) at a ratio of 1' of additional width for each foot of depth. Based upon our understanding of the structure the virgin clay or an engineered fill compacted as indicated, will be capable of supporting a net allowable load of 3,000 psf. *It would be necessary to limit wall footing sizes to no greater than 2.5' and pier footings to no greater than 5.0' when placed at 3.5' below grade, due to the presence of a soft clay layer below 13.5'. This option may not be feasible for the intended loads of the structure.*

Due to the depth of fill, potential building loads and footing size limitations, the use of a "Geopier" rammed aggregate pier system for support of the foundation system may be desirable. If the use of a rammed aggregate pier system is advantageous, the information obtained from the geotechnical investigation should be forwarded to Fran Miller of Geopier at (630) 665-8585 for review and suggestions regarding feasibility.

Multiple foundation options are available for support of the structure. These include a mat style foundation, auger cast piles and caissons or driven pile. Specific building loads and additional deep borings would be required for most of these options, to allow recommendations to be generated.

Regardless of the option selected, the foundation should be installed in the presence of a qualified FTL soil technician, experienced with the site and urban conditions, to confirm the type and consistency of the bearing material present and to confirm removal of the miscellaneous fill.

VII. Slabs on Grade and Pavements

Assuming that the pavement present on the surface of the project will be removed, the miscellaneous fill encountered is generally suitable for support of slabs on grade and pavement. While not encountered during the investigation, any organic material encountered during excavation must be removed and replaced with compacted material. The subsoil should be compacted and then proofrolled using a heavy vehicle such as loaded dump truck with an axle weight exceeding 15,000 lbs. or a roller exceeding 12 tons. Soft or voided areas encountered should be removed and replaced with granular material compacted in lifts to at least 90% of an ASTM D-1557 proctor value or 75% of a relative density. A compacted drainage course of gap graded crushed material (IL CA-7 or similar) or sand at least 4" in thickness should be used below the slab on grades.

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VIII. Backfill

The on-site miscellaneous fill is suitable for backfill but should not be utilized below structural members. The material should be screened to remove all material larger than 3" in size. The material should be compacted and then proofrolled using a medium to large vibratory roller. *The fill operation must be monitored full time by a qualified FTL soil technician trained and experienced in the use of urban fill for fill or significant differential settlement may occur.* Beware of wood that may be present in the fill. This material is not acceptable and will deteriorate over time. Any organic material encountered is unsuitable and must be removed. No organic material or wood was encountered at the time of this investigation.

If a granular backfill material is elected CA-6, CA-10, or a gap graded material such as CA-7 or CA-11 may be utilized. If a large material such as CA-1 (3") material is utilized, proofrolling should be substituted for nuclear density testing. Regardless of the type of material used it still must be placed and compacted in lifts.

All fill should be placed in maximum loose lifts of 8" and compacted to a minimum 95% of ASTM D-1557 below footings, 90% below the slabs and paving, and 85% in the lawn and landscaped areas.

IX. Excavation Considerations

Due to the mixed nature of the miscellaneous fill present at the surface, excavations should be cut to a 1.5:1 slope to maintain stability. As the structure will most likely have some areas of deep excavation for fill removal, water will most likely be encountered during excavation. In the past, conventional sump and pump operations have been adequate to remove the water. However, depending on the height of the water table at the time of excavation, the bottom elevation, and the length of time the excavation must remain open, the ease of draining and maintaining a dry construction environment may be difficult. The excavation should be kept as dry as possible prior to the placement of fill materials.



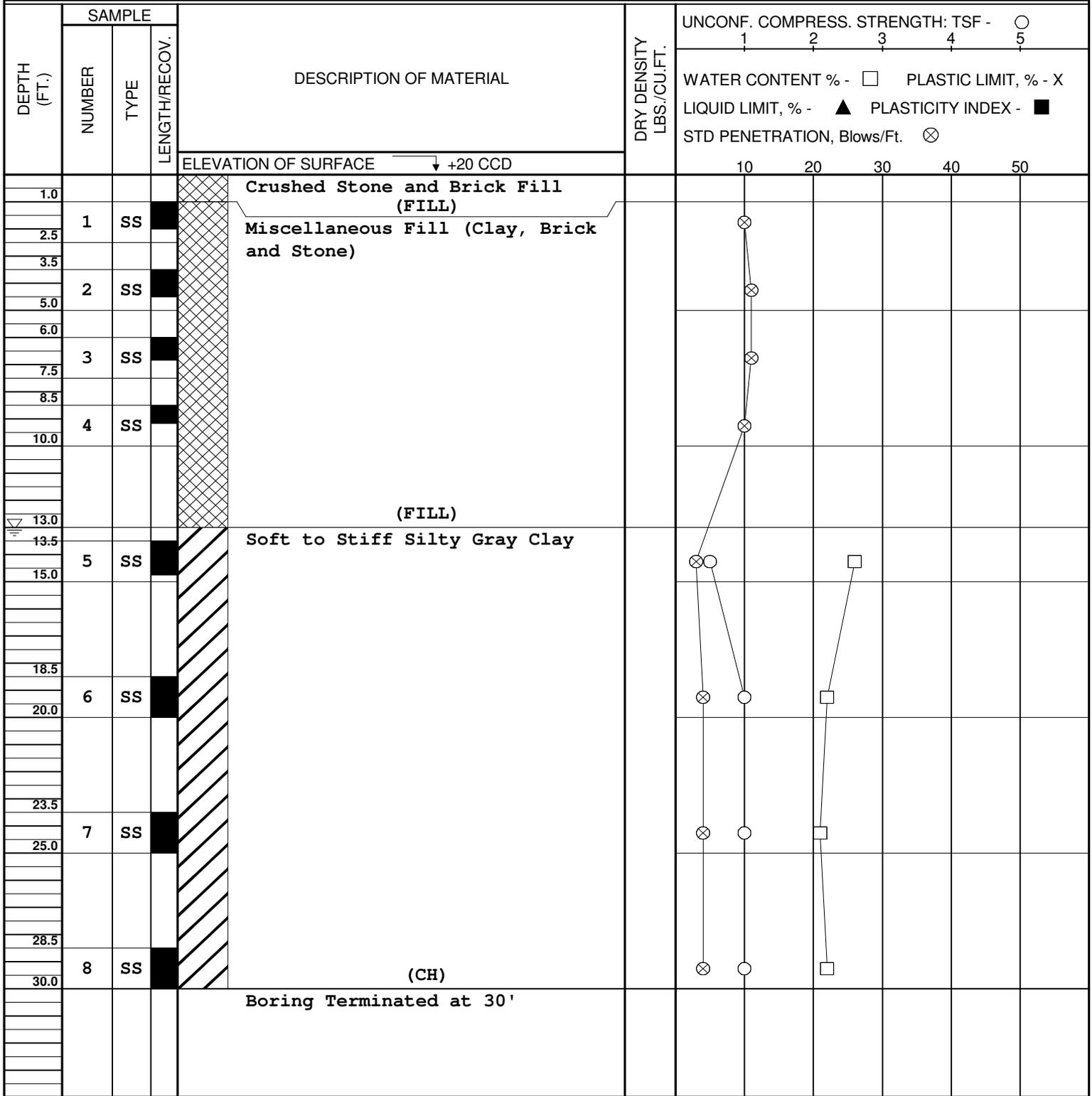
1945 EAST 87TH STREET
CHICAGO, IL 60617-2946
PHONE (773) 721-2200
FAX (773) 721-2206

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Boring Logs

PROJECT: 851 West Grand

CLIENT: Lee Andrews

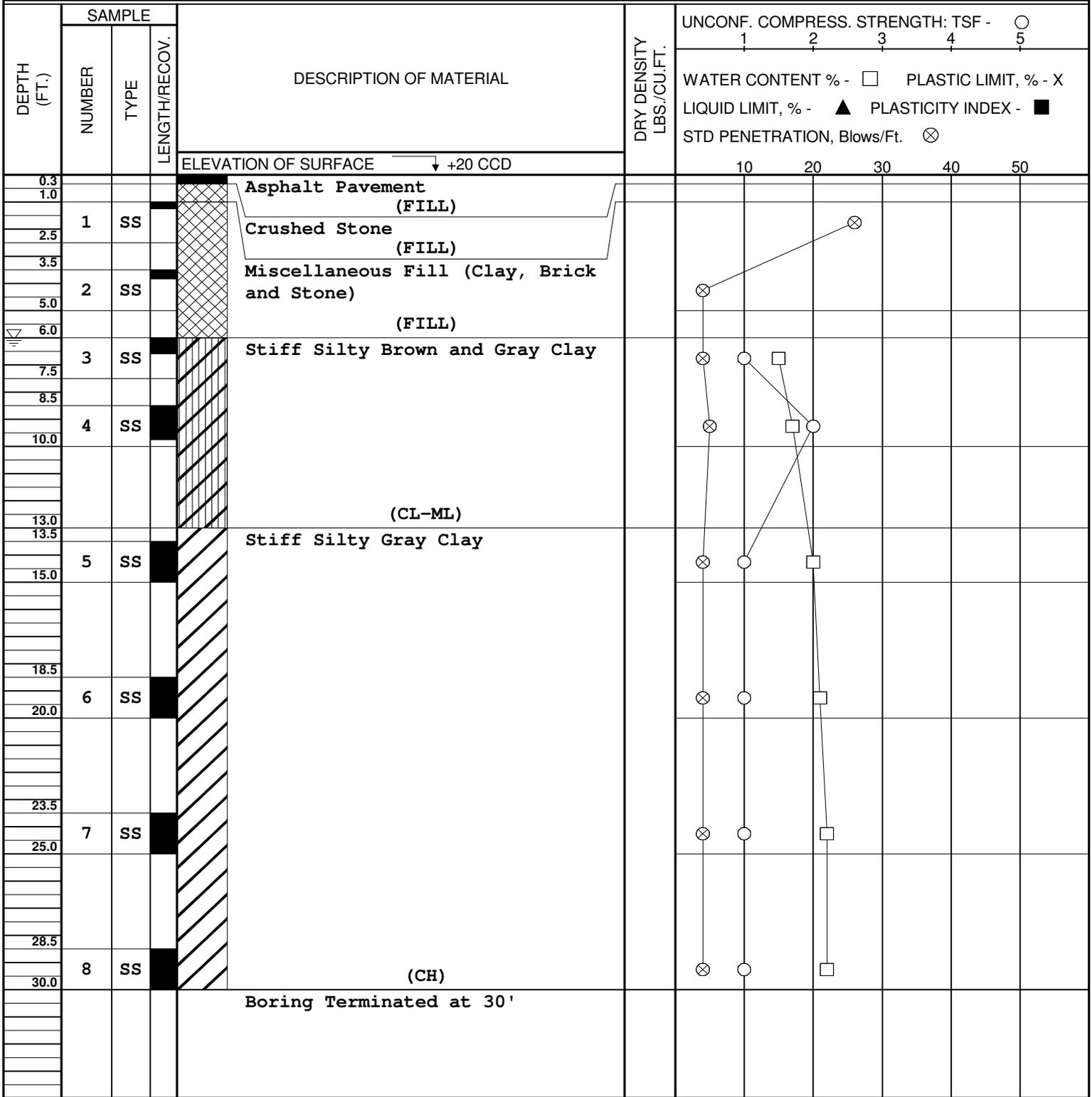


WATER LEVEL: 13.0 FT. AT WD HRS.
Dry FT. AT AC HRS.

BORING STARTED: 26 March 2015
BORING COMPLETED: 26 March 2015

PROJECT: 851 West Grand

CLIENT: Lee Andrews

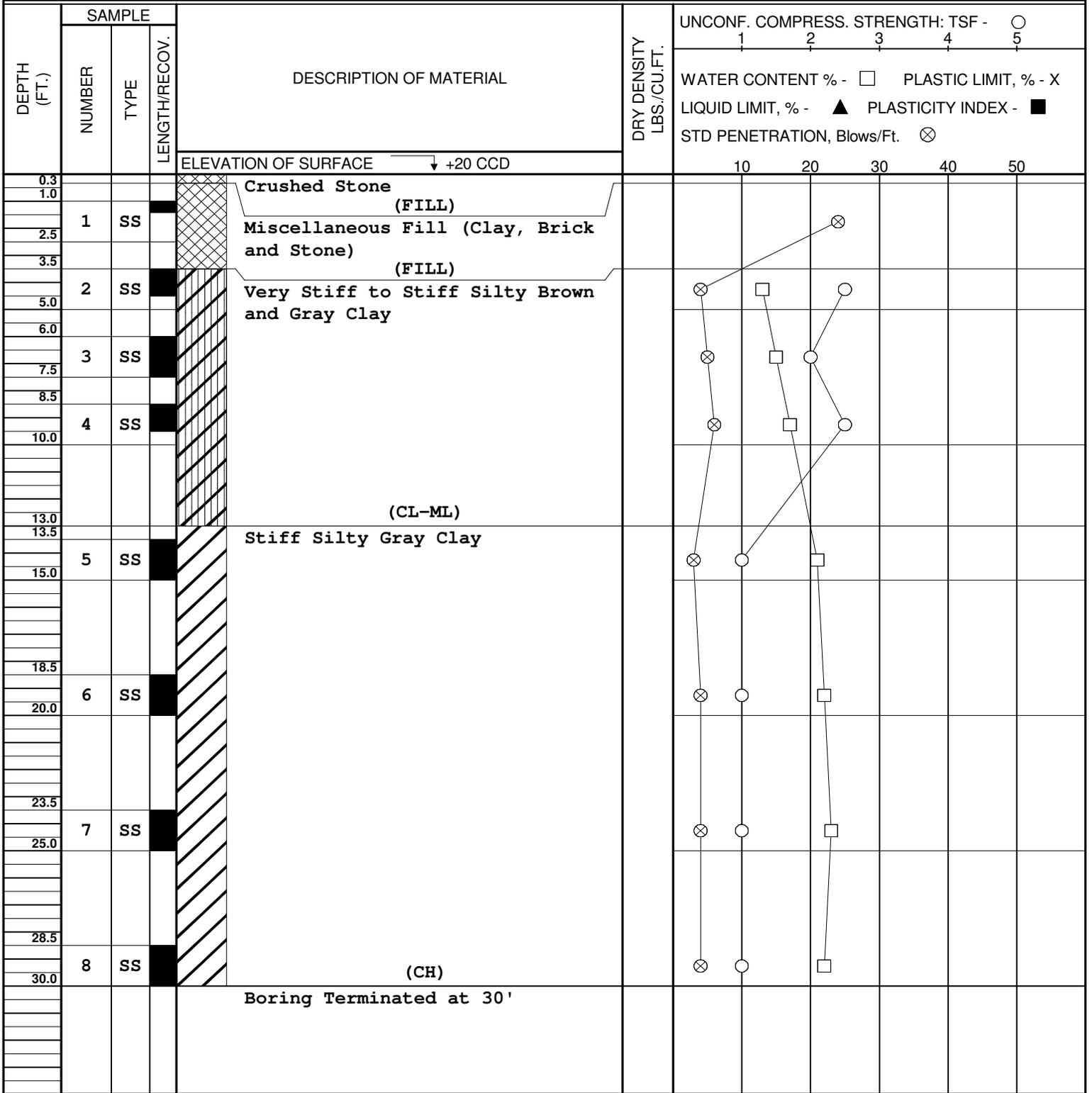


WATER LEVEL: 6.0 FT. AT WD HRS.
Dry FT. AT AC HRS.

BORING STARTED: 26 March 2015
BORING COMPLETED: 26 March 2015

PROJECT: **851 West Grand**

CLIENT: **Lee Andrews**

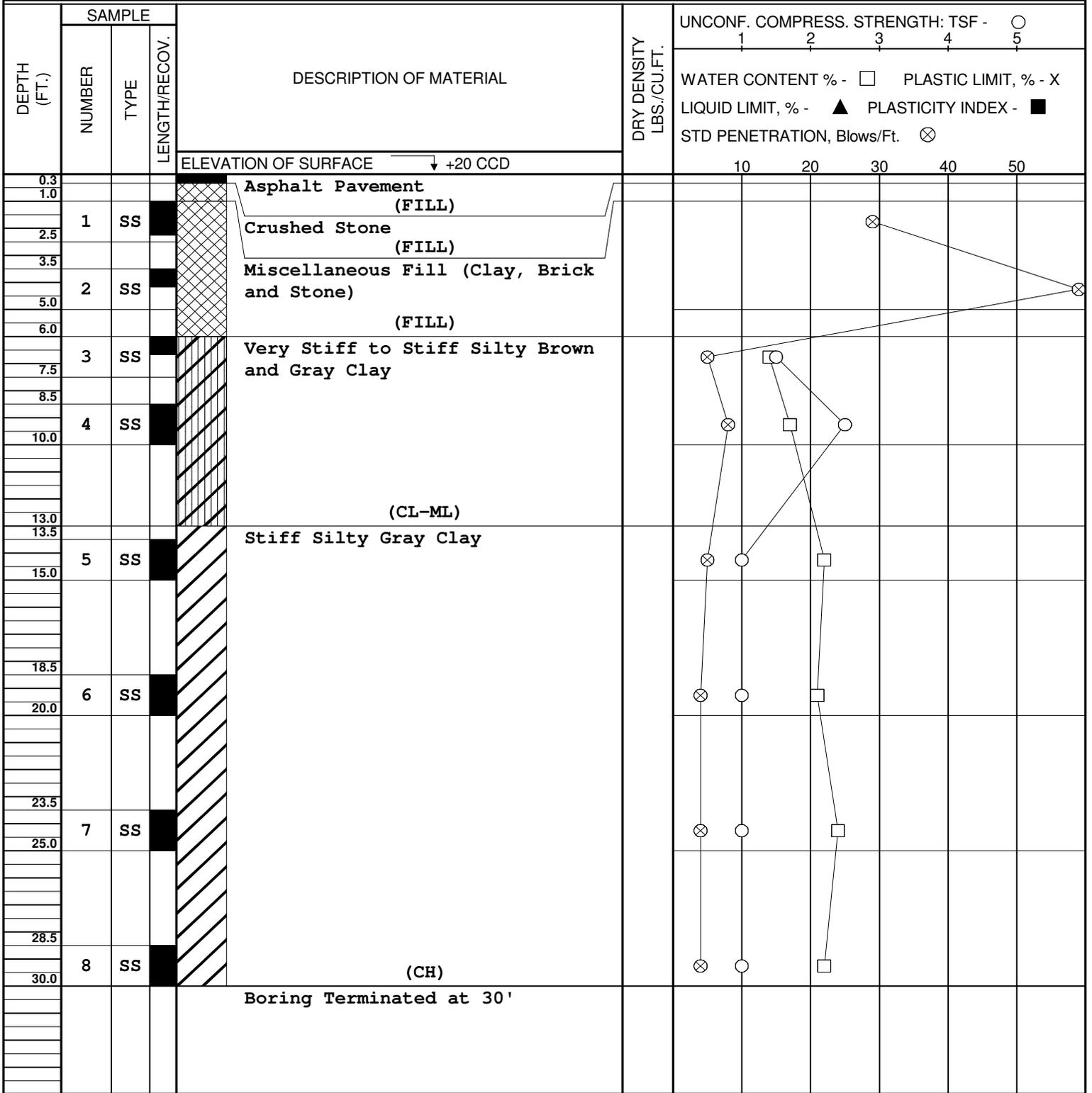


WATER LEVEL: **Dry** FT. AT **WD** HRS.
Dry FT. AT **AC** HRS.

BORING STARTED: **26 March 2015**
BORING COMPLETED: **26 March 2015**

PROJECT: 851 West Grand

CLIENT: Lee Andrews



WATER LEVEL: Dry FT. AT WD HRS.
Dry FT. AT AC HRS.

BORING STARTED: 26 March 2015
BORING COMPLETED: 26 March 2015

KEY TO SYMBOLS

Symbol Description

Strata symbols



Fill



High plasticity
clay



Paving



Silty low plasticity
clay

Misc. Symbols



Water table during
drilling



N-Value



Water Content

Notes:

1. Exploratory borings were drilled on 26 March 2015 using a 4-inch diameter continuous flight power auger.
2. No free water was encountered at the time of drilling or when re-checked the following day.
3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
4. These logs are subject to the limitations, conclusions, and recommendations in this report.
5. Results of tests conducted on samples recovered are reported on the logs.



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Boring Location Plan



W Grand Ave

N Peoria St

N Milwaukee Ave

N Sangamon St

B-3

B-2

B-4

B-1

444 N Green St



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Gray Buildings © 2008 Sanborn



218 ft



Imagery Date: 4/2/2013 41°53'26.76" N 87°38'58.32" W elev 621 ft eye alt 1539 ft