ADDENDUM NUMBER 1

Peoria Park District

PROJECT TITLE: Golf Course Storage Buildings Newman and Kellogg Golf Courses
PROJECT #: 17-012 - (A/E # 2015904.16 & 2015904.17)

Planning, Design and Construction Department
1314 N. Plank Road.
Peoria, IL 61604
Telephone: (309) 686-3386

ISSUANCE DATE:29 March 2019

LOCATION: Golf Course Storage Buildings Newman and Kellogg Golf Courses
2021 W. Nebraska Ave. and 7716 Radnor Road, Peoria Illinois

The proposed Contract Documents for this Work are modified as follows:

I. **DRAWINGS**:
- A. Sheet A102
  1. Detail 1/A102
     a. Reference "5'-0" North Side" Dimension on far left of drawing and change to "10'-0" North Side Dimension""
- B. Drawing E002 – Newman Storage Facility Site Plan - Electrical
  1. Site Electrical Plan:
     a. Add keyed note #4 symbol at upper left of plan, where existing and new overhead electrical services intersect.
     b. Keyed Electrical Notes:
     c. Revise Keyed Note #8 to read: "Provide new meter cabinet and mast for reconnection of previously disconnected service drop. Cabinet and installation shall comply with all Ameren and NEC requirements."
- C. Drawing E100 – Kellogg Storage Facility Floor Plan – Electrical
  1. Keyed Electrical Notes:
     a. Add Keyed Note #5 to read: "Provide weatherproof adjustable photo switch for operation of exterior lighting. Mount on exterior wall, under roof eave. Adjust to avoid accidental trigger from man made light sources. Reference Material Schedule for additional information.
- D. Drawing E101 – Newman Storage Facility Floor Plan – Electrical
  1. Keyed Electrical Notes:
     a. Revise Keyed Note #4 to read: "Provide new meter cabinet and 2" rigid conduit mast with weatherhead for Ameren reconnection of previously removed service drop. Coordinate with Ameren. See Site Plan on sheet E002."
- E. Drawing E201 – Newman Electrical Panel Schedule & Service Diagrams
  1. One-Line Diagram 1/E201:
     a. Revise note at meter to read: "Provide new meter cabinet per Ameren standards."
  2. Keyed Electrical Notes:
     a. Revise Keyed Note #3 to read: "Provide new meter cabinet. Coordinate with Ameren-Illinois for requirements."
- F. Drawing E500 – Luminaire & Material Schedules & General Notes
  1. Luminaire Schedule:
  2. Type A: Add the following to Model List:
     a. Columbia series LCL.
     b. Day-Brite series FSS.
  3. Type B: Add the following to Model List.
     a. Columbia LXEM series.

b. Day-Brite series V3W.

4. Type C: Add the following to Model List.
   a. Hubbell WGH series.
5. Type C1: Add the following to Model List.
   a. Hubbell SG series.

2. Material Schedule:
   1. Item #8: Add Philips OccuSwitch LRM series to Manufacturer List.
   2. Item #9: Add Philips OccuSwitch LCA series to Manufacturer List.
   3. Item #15: Revise to indicate meter cabinet is new, as approved by Ameren.

II. **PROJECT MANUAL / SPECIFICATIONS/GENERAL CONDITIONS/ETC:**

A. Specification Section 133420
   1. Reference 1.5 G.1.
      a. Change language "**2009**" to the following: "**2012**"**."**
   2. Reference 2.1.A.
      a. Add the following Manufacture to the list: 5. FBI Buildings; Address 3823 W. 1800 S, Remington, IN. 47977

B. Specification Section 312000
   1. Reference 3.18 A.
      a. Change language "**Using Agency**" to "**Owner's"**

C. Division 26 Specifications
   1. In all Division 26 specification sections, in Part 1, where the term "General Contractor" is used as the responsible party for the defined work, change term to "Contractor". The projects are being bid with all work being assigned to single responsible entities. The division of assigned work to various trades, and the coordination of the work between trades, is also the responsibility of the "Contractor" to include all work required in the Contract Documents.

III. **INVITATION TO BID**:
   1. Bid Date and Time has not changed.

B. **GENERAL ITEMS:**
   1. The contractor shall utilize a minimum soil bearing pressure for design and loading per the attached Geotechnical Data Soils reports by Whitney and Associates.
   2. Owner will perform temporary seeding of disturbed areas per Civil drawings.

END OF ADDENDUM NO. 1
This addenda consist of 2 typed pages and 2 soils reports (1 for each Newman 17 pages and Kellogg 15 pages)
Total of 34 pages in all

REPORT OF SUBSURFACE EXPLORATION AND SITE DEVELOPMENT RECOMMENDATIONS NEWMAN GOLF COURSE STORAGE BUILDING PEORIA, ILLINOIS

BY

WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

PREPARED FOR

Ms. Rebecca Fredrickson
Peoria Park District
1314 North Park Road
Peoria, Illinois 61604

DATE

March 27, 2019

TELEPHONE
309-673-2131

TESTS ★ INVESTIGATIONS
ANALYSIS ★ DESIGN ★ EVALUATIONS
CONSULTATION ★ REPORTS ★ INSPECTIONS
ARBITRATION ★ EXPERT WITNESS TESTIMONY
★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★
SOILS ★ PORTLAND CEMENT CONCRETE
BITUMINOUS CONCRETE ★ STEEL
ASPHALT ★ AGGREGATES ★ EMULSIONS
POZZOLANIC MATERIALS ★ LIME

WHITNEY & ASSOCIATES
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2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604-3193

TELEFAX
309-673-3050

GEOTECHNICAL ENGINEERING
CONSTRUCTION QUALITY CONTROL
SUBSURFACE EXPLORATIONS
ENVIRONMENTAL INVESTIGATIONS
★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★
MONITORING WELL INSTALLATIONS
BUILT-UP ROOF INVESTIGATIONS
WELDER CERTIFICATIONS
INSURANCE INVESTIGATIONS

March 27, 2019

Ms. Rebecca Fredrickson
Peoria Park District
1314 North Park Road
Peoria, Illinois 61604

Re: Subsurface Exploration and
Foundation Recommendations
Newman Golf Course Storage Building
Peoria, Illinois

Dear Ms. Fredrickson:

Pursuant to your request, our geotechnical engineering firm has performed a subsurface soils and ground water investigation in conjunction with an evaluation of these subsurface conditions for the above referenced site.

The results of our investigation and evaluation indicate that a conventional shallow, foundation system is appropriate for the proposed building complex. Few, if any, excavation or construction problems are anticipated at the proposed site as a result of the subsurface soil and ground water conditions encountered, provided all of the recommendations outlined in this report are satisfied.

If any questions or comments arise in regard to this geotechnical engineering report, or if any additional information is desired, please do not hesitate to contact us at your convenience.

Respectfully submitted,
WHITNEY & ASSOCIATES

LICENSED PROFESSIONAL ENGINEER
JAMES R. KRUSEMARK
062-059810
STATE OF ILLINOIS

(By) James R. Krusemark
James R. Krusemark, P. E.

JRK: rma
Enclosures

REPORT OF SUBSURFACE EXPLORATION
AND SITE
DEVELOPMENT RECOMMENDATIONS
NEWMAN GOLF COURSE
STORAGE BUILDING
PEORIA, ILLINOIS
BY
WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

INTRODUCTION

This geotechnical engineering report presents the summary of a subsurface soils and ground water investigation performed at the site for the proposed Newman Golf Course Storage Building in Peoria, Illinois. Included in this report are the results of our field and laboratory tests as well as a summary of the data that was obtained during the investigation. In addition, this engineering report includes our recommendations regarding the proposed site development, foundation construction and potential construction problems which may exist as a result of either adverse soil and/or ground water conditions present at the proposed site.

This subsurface soils and ground water investigation included the drilling of two (2) exploratory soil borings for the proposed structure, which extended to a depth of sixteen (16) feet below the existing ground surface. During the drilling and sampling phase of the investigation, tests, visual classifications and analyses of the various soil types encountered were performed by our personnel and their results were recorded on the enclosed Soil Boring Logs.

The soil samples obtained in the field were returned to our materials testing laboratory where they were further subjected to engineering tests and evaluation. An analysis of the field and laboratory tests was conducted by our geotechnical engineer and this engineering report was prepared which presents our recommendations and our substantiating data regarding the earthwork operations and foundation construction.

EXISTING SITE AND SUBSURFACE CONDITIONS

At the present time, the site for the proposed storage building exists as a lawn and parking area located within the southeastern limits of the Newman Golf Course. In the areas of the exploratory borings, approximately seven (7) to eight (8) inches of dark brown, Silty Clay organic topsoil was noted at the existing surface grades. Significant root structure was also noted below the existing surface grades in the area of Boring B-2.

SUBSURFACE SOIL CONDITIONS

Beneath the existing surface cover, normally consolidated cohesive soils were noted to depths ranging from approximately seven (7) to nine (9) feet from the existing surface grades. These soils were classified as a Lean Clay (Silty Clay to Silty Clay Loam) soil type near the existing surface grades as well as Lean Clay With Sand (Clay Loam) and Sandy Lean Clay (Sandy Clay Loam) soils at the mid to lower extent of this mantle in Boring B-1. As the exploratory borings were extended into the subsoils, preconsolidated glacial till soils were encountered and extended in depth until the exploratory borings were discontinued by our drill crew personnel. The composition of these soils was primarily classified as a Lean Clay With Sand soil type as well as some Sandy Lean Clay soils.

The consistency of the normally consolidated cohesive soils ranged from medium to very stiff whereas the glacial till soils were classified as stiff to very stiff. Standard penetration tests, designated as "N" values, ranged from 5 to 8 blows per foot within the normally consolidated soils and from 8 to 16 blows per foot within the glacial till soils encountered at the lower extent of the borings.

A somewhat high, but acceptable, range of natural moisture contents was recorded for the soils encountered at this site. The natural moisture contents of the normally consolidated soils ranged from 18 to 27 percent and would be considered above an estimated optimum moisture content of approximately 16 to 20 percent for the typical soil types encountered. Upon encountering the glacial till soils, natural moisture content ranging from 13 to 15 percent were recorded and these soils would be considered near to slightly above their respective optimum moisture content range of approximately 10 to 13 percent.

GROUND WATER CONDITIONS

It may also be observed from the Soil Boring Logs that ground water was encountered at the site. The presence of ground water in the open bore holes was checked after the completion of the drilling operations and after a brief time lapse to 24 hours following the soil boring operations. The bore holes were subsequently backfilled and capped which prevented long-term ground water monitoring. These readings and site observations indicate that the ground water level at the site currently appears to exist at a depth of approximately five (5) to six (6) feet below the existing surface grades. Some variation in the ground water levels may be anticipated however due to typical seasonal fluctuations. Few, if any, excavation or construction problems are anticipated

as a result of the ground water conditions due to the fact that construction of the shallow foundation system will most likely take place above the ground water level.

DISCUSSIONS

FIELD DRILLING PROCEDURES

The exploratory soil borings were conducted with a truck-mounted, rotary auger drill rig using eight-inch diameter, hollow-stem, continuous-flight auger attachments. By using these hollow-stem augers, our drill crew was able to retrieve relatively undisturbed soil samples in advance of the auger cutting head as well as determine the approximate depth at which ground water was encountered. Also by using the hollow stem augers, the depth of water could be obtained upon removal of the augers from the bore holes after a time lapse of preferably 24 hours.

FIELD SAMPLING PROCEDURES

Representative soil samples were obtained at approximately two and one-half (2.5) feet intervals until the borings were discontinued by our drill crew personnel. Standard split-barrel soil samplers (ASTM D-1586) were used in the investigation to obtain the soil samples. In addition, the split-barrel samplers were used to determine the number of blows per foot "N" of standard penetration into the subsoils, using a 140-pound, automatic hammer dropping freely 30 inches per stroke. The results of these standard penetration tests indicate a comparative consistency of the soils and thereby provide a basis for estimating the relative shear strength and compressibility characteristics of the soil profile components.

TESTING PROCEDURES

The cohesive soil samples obtained during the field investigation were tested in unconfined compression with the aid of a calibrated, compression testing

machine to determine their relative shear strength characteristics. A hand penetrometer was also used to assist our geotechnical engineer in determining the relative consistency of the soils. Natural moisture content and dry density tests were also conducted on the representative soil samples obtained. The results of all of the field and laboratory tests are shown on the Soil Boring Logs included in the Appendix of this report. All tests were conducted in accordance with current ASTM specifications and procedures.

SOIL CLASSIFICATION

The Unified Soil Classification System (USCS) in conjunction with the United States Bureau of Soils and Chemistry (USBSC) classification system were used to describe the soils encountered in the soil borings. The soils were identified in the field and further verification or refinement of these classifications was made in the laboratory. The soils encountered in the borings have been described in accordance with the textural classification charts included in the Appendix of this report. A Soil Mechanics Classification sheet is also included in the Appendix which will aid in clarifying the descriptions of the various soils. All of the soils were classified visually.

The enclosed Soil Boring Logs provide descriptions of the subsurface conditions at the exploratory boring locations and variations from these conditions may be encountered throughout the site. The lines of stratification indicated on the Soil Boring Logs represent the approximate boundaries of the soil types although the transition between the materials may be gradual.

SOIL BORING LOCATIONS AND ELEVATIONS

The locations of the exploratory soil borings with respect to the proposed site development were established by personnel from the Peoria Park District and were

field located by Whitney & Associates personnel. A Plot Plan sheet illustrating the locations of the exploratory soil borings has been included in the Appendix of this report. The approximate ground surface elevations of the borings, as indicated on the Soil Boring Logs, have been referenced to the U.S.G.S. datum from topographical information presented on the preliminary plan sheet. Corresponding depths below the existing ground surface have also been depicted on the Soil Boring Logs.

RECOMMENDATIONS

The following recommendations are made in regard to the proposed site development and foundation work. These recommendations are based on the data which was obtained in the subsurface investigation and the laboratory tests which were conducted on select representative soil samples.

EARTHWORK OPERATIONS

Throughout the limits of the proposed storage building, it is recommended that the organic topsoil be removed to a depth of approximately eight (8) inches. Removal of all significant tree roots is also recommended during the initial site development. It is further recommended that the subgrade soils be scarified and recompacted to 95 percent of standard Proctor maximum dry density (ASTM D-698) prior to placement of the engineering structural fills. Should any soft or unstable materials be observed during the subgrade preparation, it is recommended that these soils be reprocessed and recompacted or removed and replaced with engineered structural fills as discussed below.

Where engineered structural fills will be required to satisfy the proposed subgrade elevations, it is recommended that the fills consist of select cohesive soils or

pit-run sands and gravels which are to be placed in eight (8)-inch thick layers near their respective moisture content range. It is also recommended that the structural fill materials, as well as the finished subgrade in those areas requiring excavation cuts, be compacted near optimum moisture content to 95 percent of standard Proctor maximum dry density (ASTM D-698).

All downspouts which collect runoff water from the roof areas must be directed away from the foundation system at all times. Positive surface water management practices must be established at this building site which includes, but is not limited to, the diversion of all surface waters away from the structure at all times in the future. It is imperative that no waters be allowed to impound adjacent to any foundation system. This requirement of design must be satisfied at all times both during construction as well as upon completion of the project.

FOUNDATION DESIGN INFORMATION

It is recommended that the proposed Newman Golf Course Storage Building in Peoria, Illinois, be supported on a system of conventional, shallow concrete foundations established within the native soils. It is further recommended that the bases of the foundations established on these soils be proportioned to utilize a maximum, NET Allowable Soil Bearing Pressure of 1500 pounds per square foot.

Bank-poured foundations in lieu of formed and poured construction techniques are recommended to aid in generating the recommended soil bearing pressure. Removal of all soils disturbed during the foundation excavation is also considered essential prior to the concrete placement. It is further recommended that the bases of the exterior concrete foundations throughout the proposed structure be established at a minimum depth of forty-two (42) inches below the final, exterior ground surface elevations to satisfy normal frost penetration requirements.

The weight of the concrete in the foundations and the depth of surcharge below the existing ground surface have been taken into consideration and compensated for in the bearing value specified. The bearing pressure recommended is a net pressure in that it reflects the bearing capacities of the soils at the depths specified with a reasonable factor of safety included.

A preliminary estimate of the potential settlements has been made by our geotechnical engineer and it has been estimated that total settlement should not exceed one (1.0) inch; differential settlements of less than one-half (0.5) of an inch may possibly be anticipated, assuming that all requirements as set forth in this report are satisfied. It should be reiterated however that the compaction requirements and site development recommendations as specified must be satisfied and are important from the standpoint of curtailing settlement of the shallow, concrete foundation system.

SUMMARY

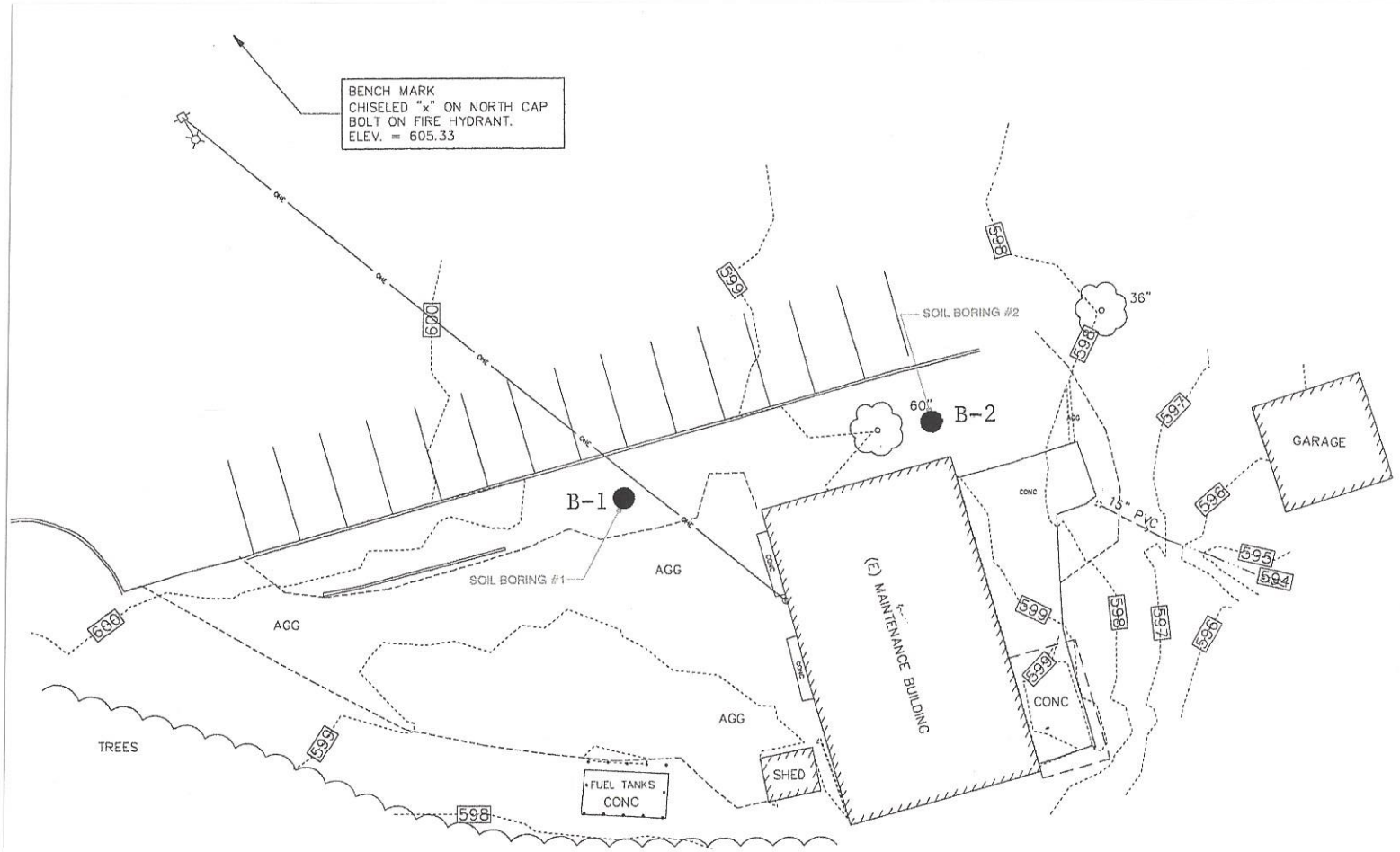
A subsurface investigation and evaluation of the soil and ground water conditions has been conducted at the site for the proposed Newman Golf Course Storage Building in Peoria, Illinois. Site development and foundation design criteria has been recommended and potential design and construction considerations have been discussed in some detail. The exploration and analyses of the subsurface conditions presented in this engineering report are considered of sufficient detail and scope to form a reasonable basis for design evaluation. The observations and comments submitted within this geotechnical engineering report are based upon the subsurface soil and ground water information which was obtained as well as the preliminary design details which have been furnished by the Owner's representative.

Any revisions in the plans for the proposed site development from those enumerated in this engineering report should be brought to the attention of our geotechnical engineer so that it can be determined if changes or alterations in the recommendations will be required and additional evaluations reviewed or proposed. Should deviations from the noted subsurface conditions be encountered during construction, it is mandatory that they be brought to the attention of our personnel for further evaluation.

****

PROJECT		
Newman Golf Course Storage Building PROJECT LOCATION Peoria, Illinois		DATE March 27, 2019 W. & A. FILE NO. 8008 SCALE None

PLOT PLAN



● Exploratory Soil Boring Locations
(Site Plan Provided by the Peoria Park District)

WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

BORING NO. B-01
DATE 03-13-19
W. & A. FILE NO. 8008
SHEET 1 OF 2

WHITNEY & ASSOCIATES
INCORPORATED
2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

BORING LOG

PROJECT NEWMAN GOLF COURSE STORAGE BUILDING
LOCATION Peoria, Illinois
BORING LOCATION See Plot Plan Sheet
DRILLED BY Fehl
BORING TYPE Hollow Stem Augers With Auto Hammer
WEATHER CONDITIONS Partly Cloudy & Mild
SOIL CLASSIFICATION SYSTEM USCS / USBSC
SEEPAGE WATER ENCOUNTERED AT ELEVATION None
GROUND SURFACE ELEVATION 600±
GROUND WATER ELEVATION AT 1 HRS. (-)10.2 Ft.
BORING DISCONTINUED AT ELEVATION 584±
GROUND WATER ELEVATION AT COMPLETION None

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Q_p	Q_u	D_d	M_c
Dark Brown SILTY CLAY Organic Topsoil	7"						
Very Stiff, Light Brown and Brown LEAN CLAY - CL (Silty Clay)							
	3	SS	8	2.4	2.2	96	24
Medium, Brown LEAN CLAY WITH SAND - CL (Clay Loam)		SS	6	1.0	0.8	99	20
	6						
Medium, Light Brown SANDY LEAN CLAY - CL (Sandy Clay Loam)		SS	7	1.1	0.8	102	18
Very Stiff, Light Brown LEAN CLAY WITH SAND - CL (Glacial Till)	9						
		SS	12	2.4	2.2	119	14
Very Stiff, Light Brown SANDY LEAN CLAY - CL (Glacial Till)	12						
		SS	16	2.8	2.7	120	13
Stiff, Light Brown LEAN CLAY WITH SAND - CL (Glacial Till)	15						
		SS	10	2.0	1.8	118	14
EXPLORATORY BORING DISCONTINUED	18						

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE

Q_p - CALIBRATED PENETROMETER READING - T.S.F.
Q_u - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
D_d - NATURAL DRY DENSITY - P.C.F.
M_c - NATURAL MOISTURE CONTENT - %

BORING NO. B-02
DATE 03-13-19
W. & A. FILE NO. 8008
SHEET 2 OF 2

WHITNEY & ASSOCIATES
INCORPORATED
2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

BORING LOG

PROJECT NEWMAN GOLF COURSE STORAGE BUILDING
LOCATION Peoria, Illinois
BORING LOCATION See Plot Plan Sheet
DRILLED BY Fehl
BORING TYPE Hollow Stem Augers With Auto Hammer
WEATHER CONDITIONS Partly Cloudy & Mild
SOIL CLASSIFICATION SYSTEM USCS / USBSC
SEEPAGE WATER ENCOUNTERED AT ELEVATION None
GROUND SURFACE ELEVATION 599+
GROUND WATER ELEVATION AT 24+ HRS. (-) 5.2 Ft.
BORING DISCONTINUED AT ELEVATION 583+
GROUND WATER ELEVATION AT COMPLETION None

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Qp	Qu	Dd	Mc
Dark Brown SILTY CLAY Organic Topsoil	8"						
Very Stiff, Light Brown LEAN CLAY - CL (Silty Clay)							
	3	SS	8	2.4	2.3	97	23
Medium, Light Brown and Gray Mottled Dark Brown LEAN CLAY - CL (Silty Clay Loam)							
		SS	5	0.9	0.7	93	27
	6						
Very Stiff, Light Brown LEAN CLAY WITH SAND - CL (Glacial Till)							
		SS	9	2.4	2.2	117	15
	9						
		SS	11	2.5	2.4	119	14
	12						
		SS	9	2.3	2.1	118	14
Stiff, Light Brown LEAN CLAY WITH SAND - CL (Glacial Till)	15						
		SS	8	2.0	1.8	117	15
EXPLORATORY BORING DISCONTINUED							
	18						

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE

Qp - CALIBRATED PENETROMETER READING - T.S.F.
Qu - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
Dd - NATURAL DRY DENSITY - P.C.F.
Mc - NATURAL MOISTURE CONTENT - %

TELEPHONE
309 673-2131

TESTS
DESIGN
REPORTS
ANALYSIS
INSPECTION
CONSULTATION
INVESTIGATIONS

WHITNEY & ASSOCIATES
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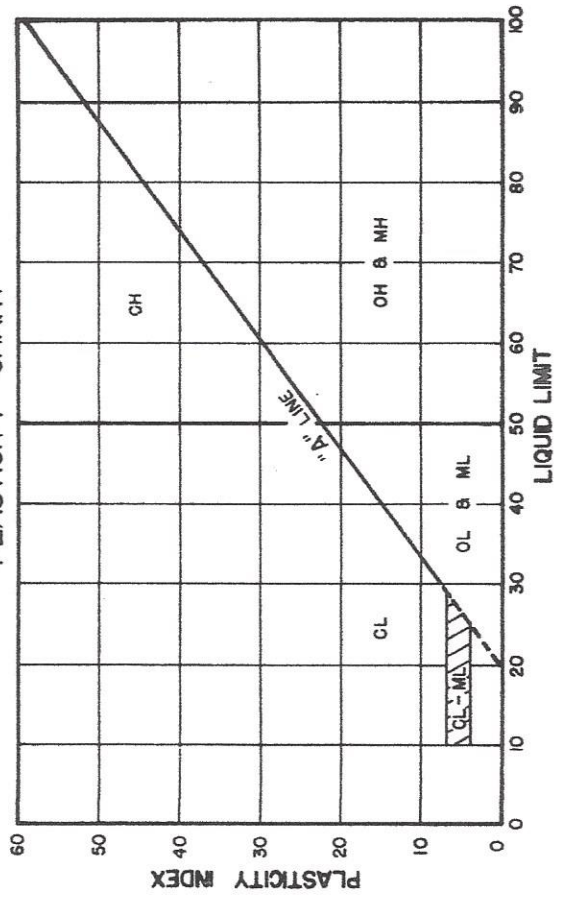
2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

SPECIALISTS IN
SOILS - PORTLAND CEMENT CONCRETE
STEEL - BITUMINOUS CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - POZ-O-PAC

SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

MAJOR DIVISIONS			GROUP SYMBOLS	DESCRIPTIONS
COARSE – GRAINED SOILS (MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE)	GRAVELS (MORE THAN 50% RETAINED NO.4 SIEVE SIZE)	CLEAN GRAVELS (LITTLE OR NO FINES)	GW	WELL – GRADED GRAVELS, GRAVEL – SAND MIXTURES
			GP	POORLY – GRADED GRAVELS, GRAVEL – SAND MIXTURES
		GRAVELS WITH FINES (CONSIDERABLE FINES)	GM	SILTY GRAVELS, GRAVEL – SAND – SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL – SAND – CLAY MIXTURES
	SANDS (MORE THAN 50% PASSING NO.4 SIEVE SIZE)	CLEAN SANDS (LITTLE OR NO FINES)	SW	WELL – GRADED SANDS, GRAVELLY SANDS
			SP	POORLY – GRADED SANDS, GRAVELLY SANDS
		SANDS WITH FINES (CONSIDERABLE FINES)	SM	SILTY – SANDS, SAND – SILT MIXTURES
			SC	CLAYEY – SANDS, SAND – CLAY MIXTURES
FINE – GRAINED SOILS (MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE)	SILTS AND CLAYS (LIQUID LIMIT LESS THAN 50)		ML	INORGANIC SILTS AND FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS
			CL	INORGANIC CLAYS, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS
	SILTS AND CLAYS (LIQUID LIMIT GREATER THAN 50)		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, SILTS
	HIGHLY ORGANIC SOILS		Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS



COARSE – GRAINED SOILS CLASSIFICATION

FRACTION SMALLER THAN NO. 200 SIEVE SIZE	GROUP SYMBOLS
LESS THAN 5 %	GW, GP, SW, SP
MORE THAN 12 %	GM, GC, SM, SC
BETWEEN 5% & 12 %	BORDERLINE CASES REQUIRING DUAL SYMBOLS

$GW\text{-}C_U = \frac{D_{60}}{D_{10}}$ GREATER THAN 4 ; $C_C = \frac{(D_{30})^2}{D_{60} D_{10}}$ BETWEEN 1 & 3

$SW\text{-}C_U = \frac{D_{60}}{D_{10}}$ GREATER THAN 6 ; $C_C = \frac{(D_{30})^2}{D_{60} D_{10}}$ BETWEEN 1 & 3

UNIFIED SOIL CLASSIFICATION SYSTEM

DEVELOPED BY
DR. ARTHUR CASAGRANDE

TELEPHONE
309 673-2131

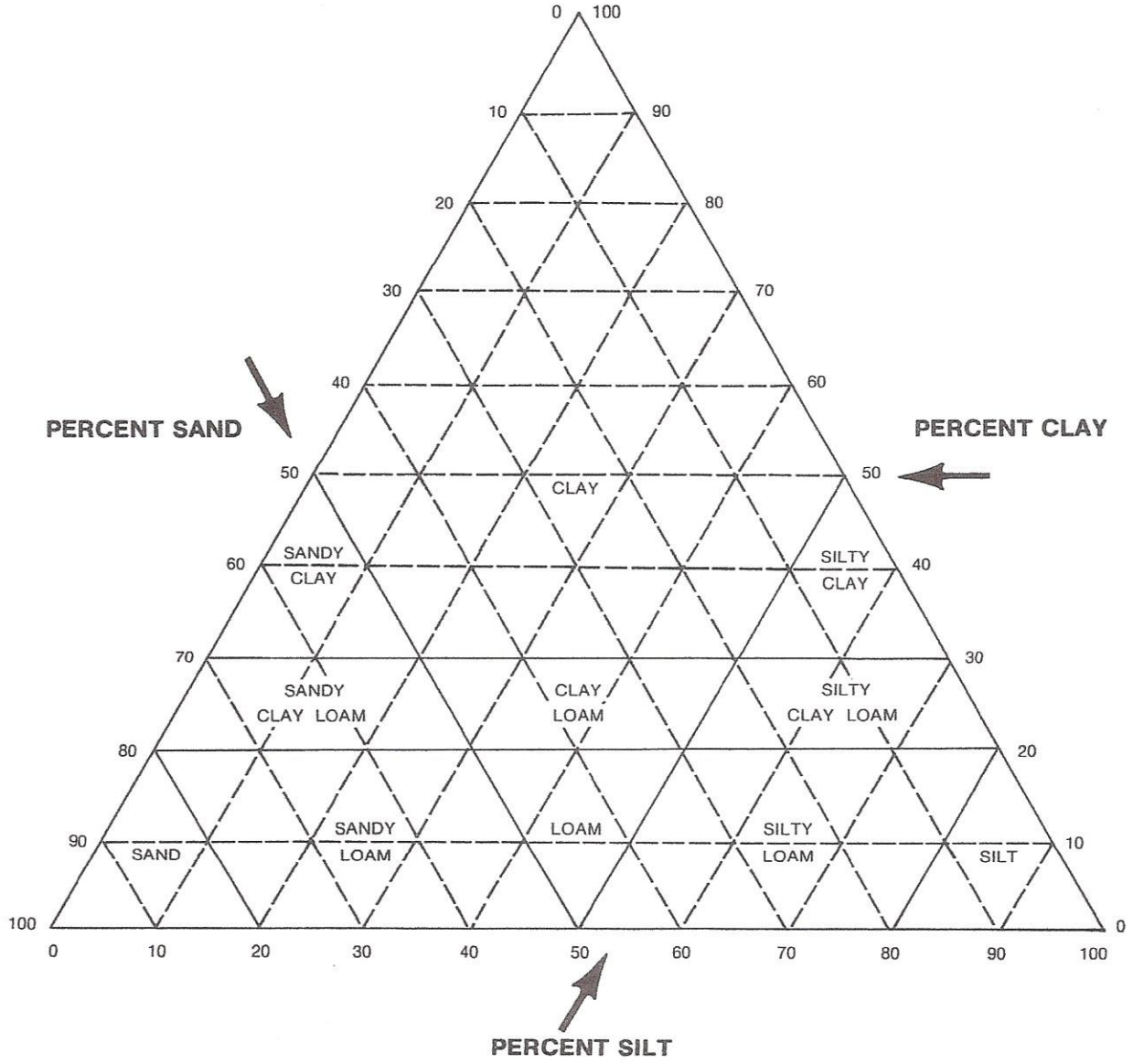
TESTS
DESIGN
REPORTS
ANALYSIS
INSPECTION
CONSULTATION
INVESTIGATIONS

WHITNEY & ASSOCIATES
INCORPORATED
2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

SPECIALISTS IN

SOILS - PORTLAND CEMENT CONCRETE
STEEL - BITUMINOUS CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - POZ-O-PAC

SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING



TRIANGULAR TEXTURAL CLASSIFICATION CHART

DEVELOPED BY
UNITED STATES BUREAU OF SOILS AND CHEMISTRY
(U.S.B.S.C.)

TELEPHONE
309-673-2131

TESTS * INVESTIGATIONS
ANALYSIS * DESIGN * EVALUATIONS
CONSULTATION * REPORTS * INSPECTIONS
ARBITRATION * EXPERT WITNESS TESTIMONY
* * * * * * * * * * *
SOILS * PORTLAND CEMENT CONCRETE
BITUMINOUS CONCRETE * STEEL
ASPHALT * AGGREGATES * EMULSIONS
POZOLANIC MATERIALS * LIME

WHITNEY & ASSOCIATES
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PEORIA, ILLINOIS 61604-3193

TELEFAX
309-673-3050

GEOTECHNICAL ENGINEERING
CONSTRUCTION QUALITY CONTROL
SUBSURFACE EXPLORATIONS
ENVIRONMENTAL INVESTIGATIONS
* * * * * * * * * * *
MONITORING WELL INSTALLATIONS
BUILT-UP ROOF INVESTIGATIONS
WELDER CERTIFICATIONS
INSURANCE INVESTIGATIONS

SOIL MECHANICS CLASSIFICATION SYSTEMS

TEXTURAL CLASSIFICATION

DESCRIPTION	SIZE
BOULDERS	LARGER THAN 3.0 IN.
COARSE GRAVEL	0.75 IN. — 3.0 IN.
FINE GRAVEL	NO. 4 SIEVE — 0.75 IN.
COARSE SAND	NO. 10 SIEVE — NO. 4 SIEVE
MEDIUM SAND	NO. 40 SIEVE — NO. 10 SIEVE
FINE SAND	NO. 200 SIEVE — NO. 40 SIEVE
SILT	LESS THAN NO. 200 SIEVE — NONPLASTIC
CLAY	LESS THAN NO. 200 SIEVE — PLASTIC

QUANTITY CLASSIFICATION

DESCRIPTION	PERCENT
TRACE	0 - 5
SMALL AMOUNT	5 - 10
SOME	10 - 15
CONSIDERABLE	15 - 20
SUBORDINATE TEXTURAL CLASSIFICATION	OVER 20

RELATIVE DENSITY CLASSIFICATION — COHESIONLESS SOILS

N. BLOWS / FT.	RELATIVE DENSITY
0 - 4	VERY LOOSE
4 - 10	LOOSE
10 - 30	MEDIUM
30 - 50	DENSE
OVER 50	VERY DENSE

* CONSISTENCY CLASSIFICATION — COHESIVE SOILS

N. BLOWS / FT.	CONSISTENCY	Q_U, TONS / SQ. FT.
0 - 2	VERY SOFT	0.00 - 0.25
2 - 4	SOFT	0.25 - 0.50
4 - 8	MEDIUM	0.50 - 1.00
8 - 15	STIFF	1.00 - 2.00
15 - 30	VERY STIFF	2.00 - 4.00
OVER 30	HARD	OVER - 4.00

*** NOTE:**

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GEOTECHNICAL ENGINEERING REPORT
OF
SITE INVESTIGATION
KELLOGG GOLF COURSE
STORAGE BUILDING
PEORIA, ILLINOIS
BY
WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

PREPARED FOR

Ms. Rebecca Fredrickson
Peoria Park District
1314 North Park Road
Peoria, Illinois 61604

DATE

March 28, 2019

TELEPHONE
309-673-2131
TESTS ★ INVESTIGATIONS
ANALYSIS ★ DESIGN ★ EVALUATIONS
CONSULTATION ★ REPORTS ★ INSPECTIONS
ARBITRATION ★ EXPERT WITNESS TESTIMONY
★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★
SOILS ★ PORTLAND CEMENT CONCRETE
BITUMINOUS CONCRETE ★ STEEL
ASPHALT ★ AGGREGATES ★ EMULSIONS
POZZOLANIC MATERIALS ★ LIME

WHITNEY & ASSOCIATES
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GEOTECHNICAL ENGINEERING
CONSTRUCTION QUALITY CONTROL
SUBSURFACE EXPLORATIONS
ENVIRONMENTAL INVESTIGATIONS
★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★
MONITORING WELL INSTALLATIONS
BUILT-UP ROOF INVESTIGATIONS
WELDER CERTIFICATIONS
INSURANCE INVESTIGATIONS

March 28, 2019

Ms. Rebecca Fredrickson
Peoria Park District
1314 North Park Road
Peoria, Illinois 61604

Re: Geotechnical Engineering
Report of Site Investigation
Kellogg Golf Course Storage Building
Peoria, Illinois

Dear Ms. Fredrickson:

Pursuant to your request, our geotechnical engineering firm has performed a brief subsurface soils and ground water investigation in conjunction with an evaluation of these subsurface conditions for the above referenced project.

The results of our investigation and evaluation indicate that a conventional, shallow concrete foundation system is appropriate for the proposed storage building. Few, if any, excavation or construction problems are anticipated at the proposed site, provided all of the recommendations presented in this report are satisfied.

If any questions or comments arise in regard to this geotechnical engineering report, or if any additional information is desired, please do not hesitate to contact us at your convenience.

Respectfully submitted,
WHITNEY & ASSOCIATES

LICENSED PROFESSIONAL ENGINEER
JAMES R. KRUSEMARK
062-059810
STATE OF ILLINOIS

(By) James R. Krusemark
James R. Krusemark, P. E.

JRK: rma
Enclosures

GEOTECHNICAL ENGINEERING REPORT
OF
SITE INVESTIGATION
KELLOGG GOLF COURSE
STORAGE BUILDING
PEORIA, ILLINOIS
BY
WHITNEY & ASSOCIATES
PEORIA, ILLINOIS

INTRODUCTION

This geotechnical engineering report presents a summary of the results of a subsurface soils and ground water investigation performed for the proposed Kellogg Golf Course Storage Building in Peoria, Illinois. Included in this report are the results of our field and laboratory tests as well as a summary of the data that was obtained during the investigation. In addition, this engineering report includes our recommendations regarding the proposed foundation construction and potential problems which may occur as a result of either adverse soil and/or ground water conditions present at the proposed site.

SCOPE OF THE INVESTIGATION

This subsurface soils and ground water investigation included the drilling of one (1) exploratory soil probe for the proposed structure on March 25, 2019, which extended to a depth of sixteen (16) feet below the existing surface grades. During the sampling phase of the investigation, tests, visual classifications and analyses of the

various soil types encountered were performed by our personnel and their results were recorded on the enclosed Soil Boring Log.

The soil samples obtained in the field were returned to our materials testing laboratory where they were further subjected to engineering tests and evaluation. An analysis of the field and laboratory tests was conducted by our geotechnical engineer, and this engineering report was prepared which presents our recommendations and substantiating data regarding the proposed foundation construction.

EXISTING SITE AND SUBSURFACE CONDITIONS

At the present time, the site for the proposed storage building exists as undeveloped property located southeast of the existing maintenance facility within the northwestern portion of the Kellogg Golf Course. In the area of the exploratory boring, approximately five (5) inches of dark brown and brown, Silty Clay Organic Topsoil was noted at the existing surface grades.

SUBSURFACE SOIL CONDITIONS

Beneath the existing surface cover, normally consolidated cohesive soils were noted to a depth of approximately twelve (12) feet from the existing surface grades which were classified as a Lean Clay (Silty Clay to Silty Clay Loam) soil type. As the exploratory probe was extended into the subsoils, granular soils were encountered and extended in depth until the probe was discontinued by our drill crew personnel. The composition of these soils consisted of fine- to medium-grained Sands with varying amounts of Silt and fine Gravel. The consistency of the cohesive soils encountered at this site was classified as medium to stiff and the relative density of the granular soils was classified as loose to medium-density.

A relatively high range of natural moisture contents prevails within the soils encountered at the site. The natural moisture contents of the cohesive soils encountered at this site ranged from 25 to 30 percent and would be considered well above an estimated optimum moisture content range of approximately 17 to 20 percent for the typical soils encountered. The granular soils would be considered at or approaching saturation.

GROUND WATER CONDITIONS

It may also be observed from the Soil Boring Log that ground water was encountered at the site. The ground water level in the bore hole was checked after the completion of the drilling operations and after a brief time lapse. These readings and site observations indicate that the ground water levels currently appear to exist at a depth of approximately five (5) to six (6) feet below the existing surface grades. Some variation in the ground water levels may be anticipated however due to typical seasonal fluctuations. No excavation or construction problems are anticipated at this site due to the fact that the ground water level appears to exist at a depth beyond the limits of the proposed foundation excavation and construction.

DISCUSSIONS

FIELD INVESTIGATION PROCEDURES

The exploratory soil boring was conducted with skid steer-mounted, GeoProbe direct push sampling equipment in conjunction with 1.5-inch diameter, continuous sampling tubes. By using these samplers, our drill crew was able to retrieve relatively undisturbed soil samples as well as determine the approximate depth at which ground water was encountered. Representative soil samples were obtained at continuous intervals throughout the soil boring until the boring was discontinued by our drill crew personnel.

LABORATORY TESTING PROCEDURES

The representative cohesive soil samples obtained during the field investigation were tested in unconfined compression with the aid of a calibrated, compression testing machine to determine their relative shear strength characteristics. A hand penetrometer was also used to assist our geotechnical engineer in determining the relative consistency of the cohesive soils encountered at the various soil strata. Natural moisture content and dry density tests were also conducted on the representative cohesive soil samples obtained. The results of all of the field and laboratory tests are shown on the Soil Boring Log included in the Appendix of this report. All tests were conducted in accordance with current ASTM specifications and procedures.

SOIL CLASSIFICATION

The Unified Soils Classification System (USCS) in conjunction with the United States Bureau of Soils and Chemistry (USBSC) classification system were used to describe the soils encountered in the boring. The soils were identified in the field and further verification or refinement of these classifications were made in the laboratory. The soils encountered in the boring have been described in accordance with the textural classification charts included in the Appendix of this report. Also included in the Appendix is a Soil Mechanics Classification System sheet which will aid in clarifying the descriptions of the various soils. The soil samples obtained during this site investigation were visually classified.

The enclosed Soil Boring Log provide descriptions of the subsurface conditions at the exploratory boring location and variations from these conditions may be encountered throughout the site. The lines of stratification indicated on the Soil Boring Log represents the approximate boundaries of the soil types although the transition between the materials may be gradual.

SOIL BORING LOCATION AND ELEVATION

The location of the exploratory soil boring with respect to the site was established by personnel from the Peoria Park District and was field located by Whitney & Associates personnel. A Plot Plan sheet illustrating the location of the exploratory soil boring has been included in the Appendix of this report. The approximate ground surface elevation of the boring, as indicated on the Soil Boring Log, has been referenced to the U.S.G.S. datum from topographical information presented on the preliminary plan sheet. Corresponding depths below the existing ground surface have also been depicted on the Soil Boring Log.

RECOMMENDATIONS

The following recommendations are made in regard to the proposed site development and foundation work. These recommendations are based on the data which was obtained in the subsurface investigation and the laboratory tests which were conducted on select representative soil samples.

EARTHWORK OPERATIONS

Throughout the limits of the proposed storage building, it is recommended that the organic topsoil be removed to a depth of approximately five (5) inches. Removal of all significant tree roots is also recommended during the initial site development. It is further recommended that the subgrade soils be scarified and recompacted to 95 percent of standard Proctor maximum dry density (ASTM D-698) prior to placement of the engineering structural fills. Should any soft or unstable materials be observed during the subgrade preparation, it is recommended that these soils be reprocessed and recompacted or removed and replaced with engineered structural fills as discussed below.

Where engineered structural fills will be required to satisfy the proposed subgrade elevations, it is recommended that the fills consist of select cohesive soils or pit-run sands and gravels which are to be placed in eight (8)-inch thick layers near their respective moisture content range. It is also recommended that the structural fill materials, as well as the finished subgrade in those areas requiring excavation cuts, be compacted near optimum moisture content to 95 percent of standard Proctor maximum dry density (ASTM D-698).

All downspouts which collect runoff water from the roof areas must be directed away from the foundation system at all times. Positive surface water management practices must be established at this building site which includes, but is not limited to, the diversion of all surface waters away from the structure at all times in the future. It is imperative that no waters be allowed to impound adjacent to any foundation system. This requirement of design must be satisfied at all times both during construction as well as upon completion of the project.

FOUNDATION DESIGN INFORMATION

It is recommended that the proposed Kellogg Golf Course Storage Building in Peoria, Illinois, be supported on a system of conventional, shallow concrete foundations established within the native soils. It is further recommended that the bases of the foundations established on these soils be proportioned to utilize a maximum, NET Allowable Soil Bearing Pressure of 1200 pounds per square foot.

Bank-poured foundations in lieu of formed and poured construction techniques are recommended to aid in generating the recommended soil bearing pressure. Removal of all soils disturbed during the foundation excavation is also considered essential prior to the concrete placement. It is further recommended that the bases of the exterior concrete foundations throughout the proposed structure be

established at a minimum depth of forty-two (42) inches below the final, exterior ground surface elevations to satisfy normal frost penetration requirements.

The weight of the concrete in the foundations and the depth of surcharge below the existing ground surface have been taken into consideration and compensated for in the bearing value specified. The bearing pressure recommended is a net pressure in that it reflects the bearing capacities of the soils at the depths specified with a reasonable factor of safety included.

A preliminary estimate of the potential settlements has been made by our geotechnical engineer and it has been estimated that total settlement should not exceed one (1.0) inch; differential settlements of less than one-half (0.5) of an inch may possibly be anticipated, assuming that all requirements as set forth in this report are satisfied. It should be reiterated however that the compaction requirements and site development recommendations as specified must be satisfied and are important from the standpoint of curtailing settlement of the shallow, concrete foundation system.

SUMMARY

A subsurface investigation and evaluation of the soil and ground water conditions has been conducted at the site for the proposed Kellogg Golf Course Storage Building in Peoria, Illinois. Site development and foundation design criteria has been recommended and potential design and construction considerations have been discussed in some detail. The exploration and analyses of the subsurface conditions presented in this engineering report are considered of sufficient detail and scope to form a reasonable basis for design evaluation. The observations and comments submitted within this geotechnical engineering report are based upon the subsurface soil and

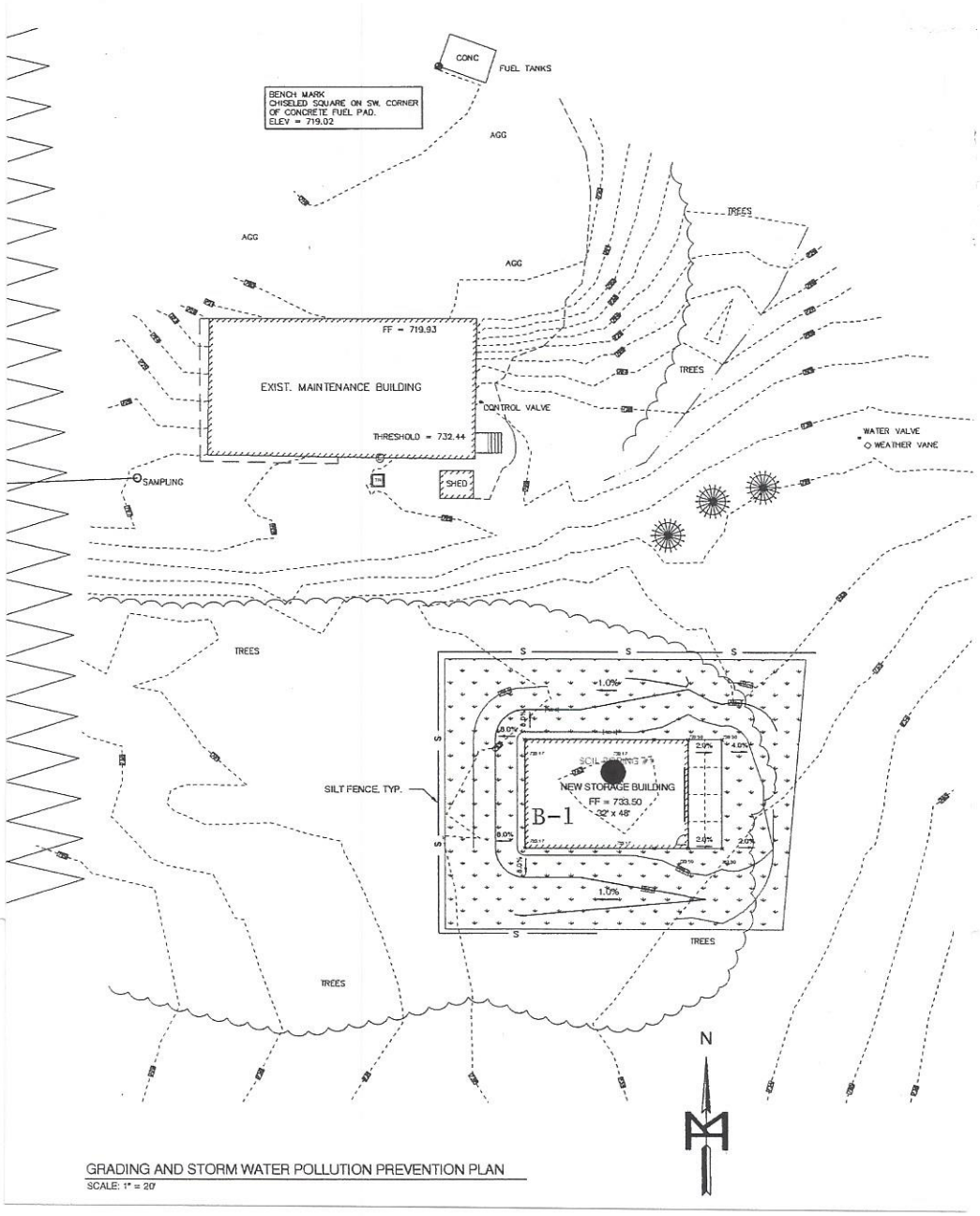
ground water information which was obtained as well as the preliminary design details which have been furnished by the Owner's representative.

Any revisions in the plans for the proposed structure from those enumerated in this engineering report should be brought to the attention of our geotechnical engineer so that it can be determined if changes or alterations in the recommendations will be required and additional evaluations reviewed or proposed. Should deviations from the noted subsurface conditions be encountered during construction, it is mandatory that they be brought to the attention of our personnel for further evaluation.

****

PROJECT		DATE March 28, 2019
Kellogg Golf Course Storage Building		W. & A. FILE NO. 8009
PROJECT LOCATION Peoria, Illinois		SCALE None

PLOT PLAN



● Exploratory Soil Boring Location

(Site Plan Developed by Mohr & Kerr Engineering)

WHITNEY & ASSOCIATES
INCORPORATED
2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

BORING LOG

BORING NO. B-01
DATE 03-25-19
W. & A. FILE NO. 8009
SHEET 1 OF 1
PROJECT KELLOGG GOLF COURSE STORAGE BUILDING
LOCATION Peoria, Illinois
BORING LOCATION See Plot Plan Sheet
DRILLED BY Fehl
BORING TYPE GeoProbe Direct Push
WEATHER CONDITIONS Partly Cloudy & Mild
SOIL CLASSIFICATION SYSTEM USCS / USBSC
SEEPAGE WATER ENCOUNTERED AT ELEVATION (-)13.0 Ft.
GROUND SURFACE ELEVATION 733+
GROUND WATER ELEVATION AT - HRS. -
BORING DISCONTINUED AT ELEVATION 717+
GROUND WATER ELEVATION AT COMPLETION (-)12.2 Ft.

DESCRIPTION	DEPTH IN FEET	SAMPLE TYPE	N	Qp	Qu	Dd	Mc
Dark Brown and Brown SILTY CLAY Organic Topsoil	5"						
Stiff, Light Brown and Gray Mottled Dark Brown LEAN CLAY - CL (Silty Clay)	3	GP	-	1.6	1.5	96	25
Medium, Light Brown and Gray Mottled Dark Brown LEAN CLAY - CL (Silty Clay)	6	GP	-	0.7	0.6	90	30
Medium, Gray and Light Brown LEAN CLAY - CL (Silty Clay Loam)	9	GP	-	0.7	0.5	92	27
	12	GP	-	0.7	0.6	93	26
Loose, Light Brown, Fine- To Medium-Grained SAND With Some Silt - SP-SM	15	GP	-	-	-	-	18
Medium-Density, Light Brown, Fine- To Medium-Grained SAND With Some Fine Gravel and Considerable Silt - SP-SM		GP	-	-	-	-	-
EXPLORATORY BORING DISCONTINUED	18						

N - BLOWS DELIVERED PER FOOT BY A 140 LB. HAMMER FALLING 30 INCHES
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE

Qp - CALIBRATED PENETROMETER READING - T.S.F.
Qu - UNCONFINED COMPRESSIVE STRENGTH - T.S.F.
Dd - NATURAL DRY DENSITY - P.C.F.
Mc - NATURAL MOISTURE CONTENT - %

TELEPHONE
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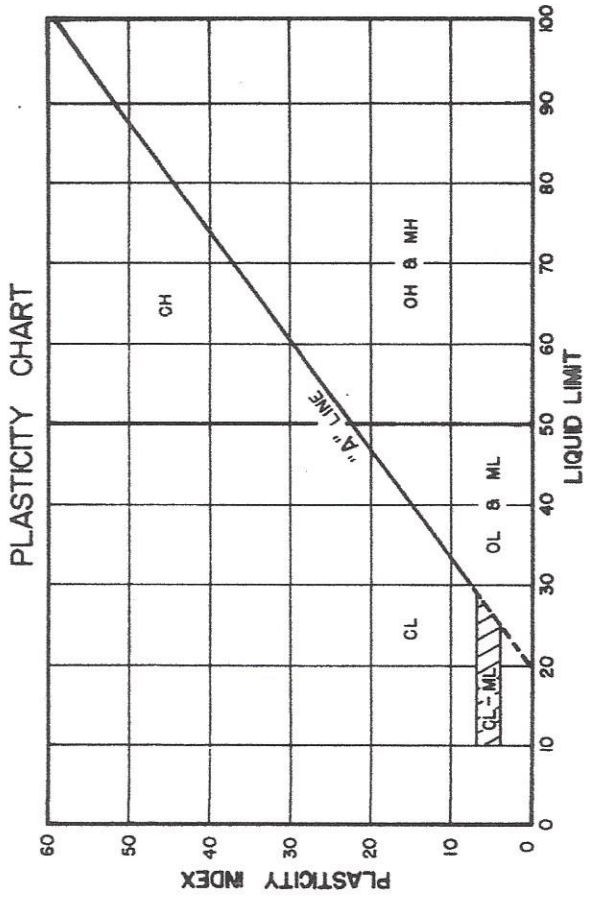
TESTS
DESIGN
REPORTS
ANALYSIS
INSPECTION
CONSULTATION
INVESTIGATIONS

WHITNEY & ASSOCIATES
INCORPORATED
2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

SPECIALISTS IN
SOILS - PORTLAND CEMENT CONCRETE
STEEL - BITUMINOUS CONCRETE
CONSTRUCTION MATERIALS
AGGREGATES - ASPHALT - POZ-O-PAC

SOILS AND GRAVEL SURVEYS
MATERIALS QUALITY CONTROL
SOIL MECHANICS AND
FOUNDATION ENGINEERING
DRILLING - CORING - TESTING

MAJOR DIVISIONS			GROUP SYMBOLS	DESCRIPTIONS
COARSE – GRAINED SOILS (MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE)	GRAVELS (MORE THAN 50% RETAINED NO.4 SIEVE SIZE)	CLEAN GRAVELS (LITTLE OR NO FINES)	GW	WELL – GRADED GRAVELS, GRAVEL – SAND MIXTURES
			GP	POORLY – GRADED GRAVELS, GRAVEL – SAND MIXTURES
		GRAVELS WITH FINES (CONSIDERABLE FINES)	GM	SILTY GRAVELS, GRAVEL – SAND – SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL – SAND – CLAY MIXTURES
	SANDS (MORE THAN 50% PASSING NO.4 SIEVE SIZE)	CLEAN SANDS (LITTLE OR NO FINES)	SW	WELL – GRADED SANDS, GRAVELLY SANDS
			SP	POORLY – GRADED SANDS, GRAVELLY SANDS
		SANDS WITH FINES (CONSIDERABLE FINES)	SM	SILTY – SANDS, SAND – SILT MIXTURES
			SC	CLAYEY – SANDS, SAND – CLAY MIXTURES
FINE – GRAINED SOILS (MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE)	SILTS AND CLAYS (LIQUID LIMIT LESS THAN 50)		ML	INORGANIC SILTS AND FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS
			CL	INORGANIC CLAYS, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS
	SILTS AND CLAYS (LIQUID LIMIT GREATER THAN 50)		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, SILTS
	HIGHLY ORGANIC SOILS		Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS



COARSE – GRAINED SOILS CLASSIFICATION

FRACTION SMALLER THAN NO. 200 SIEVE SIZE	GROUP SYMBOLS
LESS THAN 5 %	GW, GP, SW, SP
MORE THAN 12 %	GM, GC, SM, SC
BETWEEN 5% & 12 %	BORDERLINE CASES REQUIRING DUAL SYMBOLS

$GW\text{-}C_U = \frac{D_{60}}{D_{10}}$ GREATER THAN 4 ; $C_C = \frac{(D_{30})^2}{D_{60}D_{10}}$ BETWEEN 1 & 3

$SW\text{-}C_U = \frac{D_{60}}{D_{10}}$ GREATER THAN 6 ; $C_C = \frac{(D_{30})^2}{D_{60}D_{10}}$ BETWEEN 1 & 3

UNIFIED SOIL CLASSIFICATION SYSTEM

DEVELOPED BY
DR. ARTHUR CASAGRANDE

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INVESTIGATIONS

WHITNEY & ASSOCIATES
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2406 West Nebraska Avenue
PEORIA, ILLINOIS 61604

SPECIALISTS IN

SOILS - PORTLAND CEMENT CONCRETE
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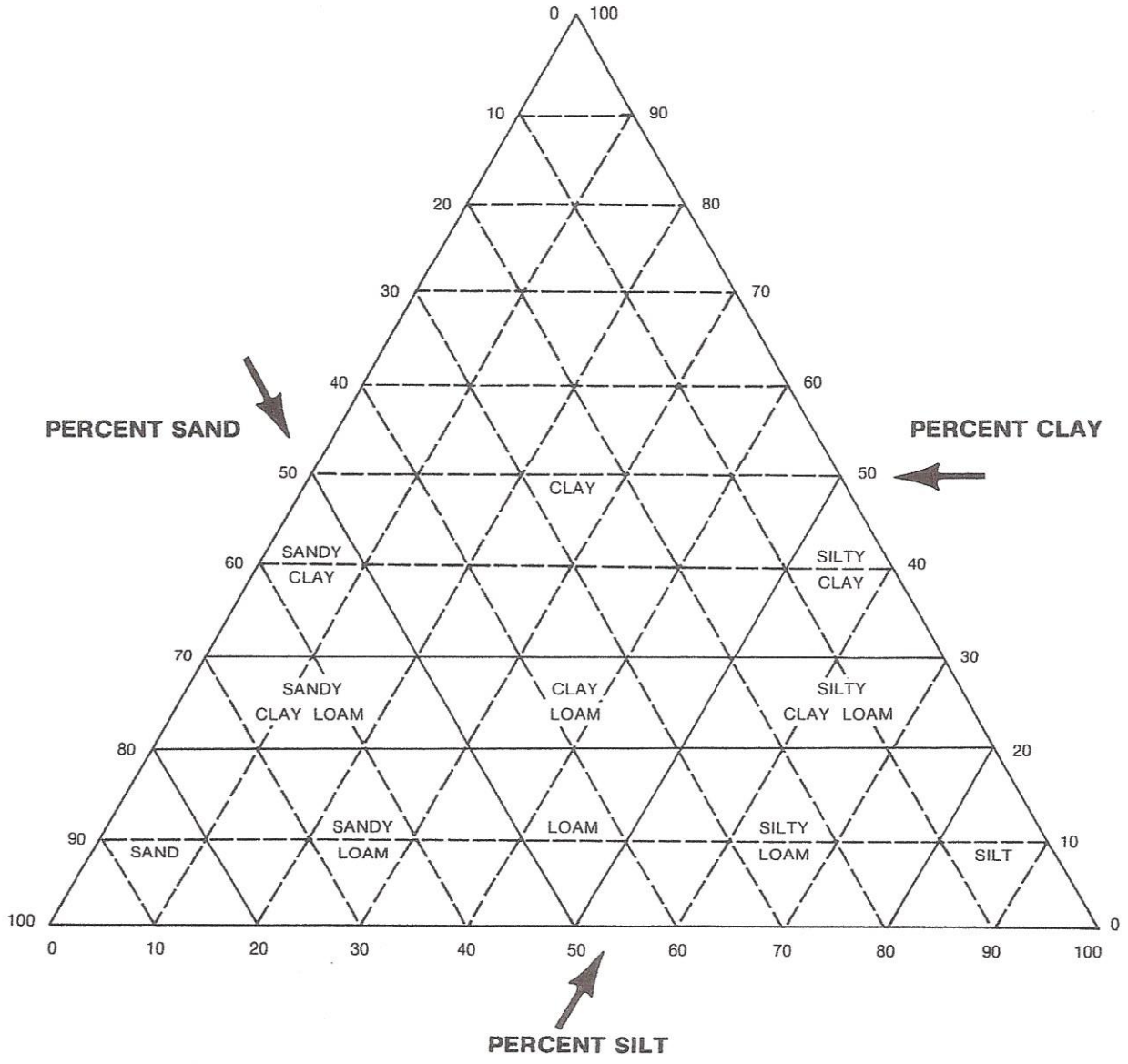

TRIANGULAR TEXTURAL CLASSIFICATION CHART

DEVELOPED BY
UNITED STATES BUREAU OF SOILS AND CHEMISTRY
(U.S.B.S.C.)

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TESTS * INVESTIGATIONS
ANALYSIS * DESIGN * EVALUATIONS
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* * * * * * * * * *
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GEOTECHNICAL ENGINEERING
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15 - 30	VERY STIFF	2.00 - 4.00
OVER 30	HARD	OVER - 4.00

*** NOTE:**

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