City of Dublin

Department of Parks & Recreation
6555 Shier Rings Road • Dublin, OH 43016
Phone: 614.410.4710 • Fax: 614.761-6512

ADDENDUM

Addendum#: 2
Project: Coffman Park – Pickleball Courts
Date: 09.08.2020
Bids Due: 09.11.2020

Addendum Narrative:

The following Addendum contains clarifications and revisions to the Construction Documents issued for bid on August 28th, 2020 for the above mentioned project. This Addendum forms a part of the Contract Documents and modifies all previously issued specifications and drawings. Bidders shall update their Bidding Documents with the information contained in the Addendum. Where new Drawings are enclosed with this Addendum, discard the old Drawings and insert the new. Where Supplemental drawings (sketches) are enclosed with the Addendum, attach the Supplemental drawing to the documents as noted. Where only written modifications are given, copy the information onto the appropriate Documents and note the Addendum number. All items contained herein shall be included with the bid. Acknowledgement receipt of this addendum by inserting the number and date on the bid form.

Note: This Addendum does not modify the bid due date.

Bid Documents:

1. Bid Openings on 09.11.2020
    a. Due to COVID 19 Restrictions, the bid opening will be virtual.
    b. Connection / Call in information:

    Join Zoom Meeting
    https://gpdgroup.zoom.us/j/92354203334

    Meeting ID: 923 5420 3334
    One tap mobile
    +13126266799,,92354203334# US (Chicago)
    +19292056099,,92354203334# US (New York)

    Dial by your location
    +1 312 626 6799 US (Chicago)
    +1 929 205 6099 US (New York)
    +1 301 715 8592 US (Germantown)
    +1 346 248 7799 US (Houston)
    +1 669 900 6833 US (San Jose)
    +1 253 215 8782 US (Tacoma)
    877 853 5247 US Toll-free
    888 788 0099 US Toll-free

Meeting ID: 923 5420 3334
Find your local number: https://gpdgroup.zoom.us/u/aTEw42vj2

Join by Skype for Business
https://gpdgroup.zoom.us/skype/92354203334

2. Providing the 2014 Geotechnical Report by S&ME.

Drawings:

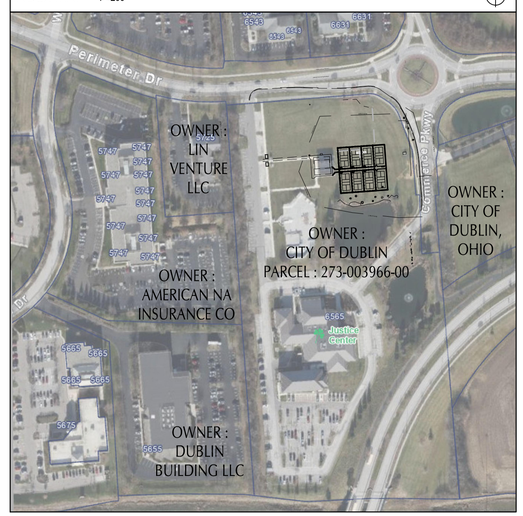
1. Sheet TS-001 – Title Sheet
    a. Alternate Bid table has been updated to match the Bid Sheet in Section 2 – Page 2-2.
2. Sheet C-503 – DETAILS
    a. Indicates a 5" diameter posts for 10'-0" fence sections, 4" diameter posts maybe utilized in lieu of the 5" posts.
    b. Fence post foundation was also reduced some due to the post diameter reduction.
3. Stormwater Structure Specification/Clarifications:
    a. Pre-formed flexible joint sealants per ASTM-990 may be utilized in lieu of "O-Ring" joints per ASTM C-443 for square structures.
    b. Connections to structure are not required to be booted per plan, but are required to be sealed water-tight.

THE CITY OF DUBLIN
COFFMAN PARK - PICKLE BALL COURTS

6565 COMMERCE PARKWAY
DUBLIN, OHIO
AUGUST, 2020

LOCATION MAP 1"=1000'

INDEX MAP 1"=200'



STANDARD DRAWING INDEX
CITY OF DUBLIN:

CITY OF COLUMBUS:

ODOT:

PLAN REPRODUCTION WARNING
THE PLANS HAVE BEEN PREPARED FOR PRINTING ON ANSI D (22"x34") SHEETS. PRINTING ON OTHER SIZE SHEETS MAY DISTORT SCALES. REFER TO GRAPHIC SCALES.

BENCHMARKS:
PROJECT CONTROL
POSITIONING METHOD: ODOT VRS
MONUMENT TYPE: 5/8" X 30" REBAR W/ RED GPD CAP

VERTICAL POSITIONING
ORTHOMETRIC HEIGHT DATUM: NAVD88
GEOID:12B

HORIZONTAL POSITIONING
REFERENCE FRAME: NAD83(2011)
ELLIPSOID: GRS80
MAP PROJECTION: LAMBERT CONFORMAL CONIC
COORDINATE SYSTEM: OHIO STATE PLANE, SOUTH ZONE, 3402
COMBINED SCALE FACTOR: 1.0000000000
METHOD OF OBTAINING SCALE FACTOR: ODOT VRS
ORIGIN OF COORDINATE SYSTEM: 0,0

BENCHMARK #1 - NW CORNER OF CONCRETE PAD.
ELEVATION=893.83

BENCHMARK #2 - SE CORNER CONCRETE PAD.
ELEVATION=897.58

OHIO 811 Before You Dig

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PREPARED FOR:
MATT EARMAN, DIRECTOR
CITY OF DUBLIN PARKS & RECREATION
6555 SHIER RINGS ROAD
DUBLIN, OH 43016
614.761.6520

PROJECT DESCRIPTION
BASE BID: LUMP SUM BID FOR ALL TRADES, LABOR, MATERIALS, SUPPLIES, EQUIPMENT, AND SERVICES NEEDED TO FURNISH AND CONSTRUCT ALL WORK AS PER PLANS AND SPECIFICATIONS IDENTIFIED AS THE EXPANSION OF COFFMAN PARK TO INCLUDE SIX (6) PICKLEBALL COURTS. SCOPE INCLUDES ACRYLIC SURFACED AND LINED ASPHALT COURTS, POURED-IN-PLACE PAVING, SIDEWALK CONNECTION, FENCING AND GATES, BENCHES, AND STORMWATER CONTROL.

ALTERNATE BID A: LUMP SUM BID FOR ALL TRADES, LABOR, MATERIALS, SUPPLIES, EQUIPMENT, AND SERVICES NEEDED TO FURNISH AND CONSTRUCT ALL WORK AS PER PLANS AND SPECIFICATIONS IDENTIFIED AS THE EXPANSION OF COFFMAN PARK TO INCLUDE THE LIGHTING DESIGN, COMPLETE.

ALTERNATE BID B: LUMP SUM BID FOR ALL TRADES, LABOR, MATERIALS, SUPPLIES, EQUIPMENT, AND SERVICES NEEDED TO FURNISH AND CONSTRUCT ALL WORK AS PER PLANS AND SPECIFICATIONS IDENTIFIED AS THE EXPANSION OF COFFMAN PARK TO INCLUDE THE WIND SCREEN ON THE PERIMETER FENCE FOR BASE BID COURTS ONLY.

ALTERNATE BID C: LUMP SUM BID FOR ALL TRADES, LABOR, MATERIALS, SUPPLIES, EQUIPMENT, AND SERVICES NEEDED TO FURNISH AND CONSTRUCT ALL WORK AS PER PLANS AND SPECIFICATIONS IDENTIFIED AS THE EXPANSION OF COFFMAN PARK TO INCLUDE THE WIND SCREEN ON THE PERIMETER FENCE FOR ALTERNATE BID COURTS ONLY.

B

ALTERNATE BID D: LUMP SUM BID FOR ALL TRADES, LABOR, MATERIALS, SUPPLIES, EQUIPMENT, AND SERVICES NEEDED TO FURNISH AND CONSTRUCT ALL WORK AS PER PLANS AND SPECIFICATIONS IDENTIFIED AS THE EXPANSION OF COFFMAN PARK TO INCLUDE TWO (2) ADDITIONAL PICKLEBALL COURTS. SCOPE INCLUDES ACRYLIC SURFACED AND LINED ASPHALT COURTS, POURED-IN-PLACE PAVING, SIDEWALK CONNECTION, FENCING AND GATES, AND A BENCH.

OHIO SPECIFICATION

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, CITY OF DUBLIN, AND CITY OF COLUMBUS INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

APPROVALS

DATE : _____

DIRECTOR OF ENGINEERING / CITY ENGINEER
CITY OF DUBLIN, OHIO
PAUL A. HAMMERSMITH, P.E.

DATE : _____

DIRECTOR OF PLANNING
CITY OF DUBLIN, OHIO
JENNIFER RAUCH

GPD GROUP®
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.
1801 Watermark Drive, Suite 210
Columbus, Ohio 43215
614.210.0751 Fax 614.210.0752

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REV.	DATE	DESCRIPTION
B	09.08.2020	ADDENDUM B

STATE OF OHIO
LEONARDO A. SFERRA
E -71842
REGISTERED PROFESSIONAL ENGINEER
09/08/20

CITY OF DUBLIN
6565 Commerce Parkway, Dublin OH, 43017
Coffman Park - Pickleball Courts

TITLE SHEET

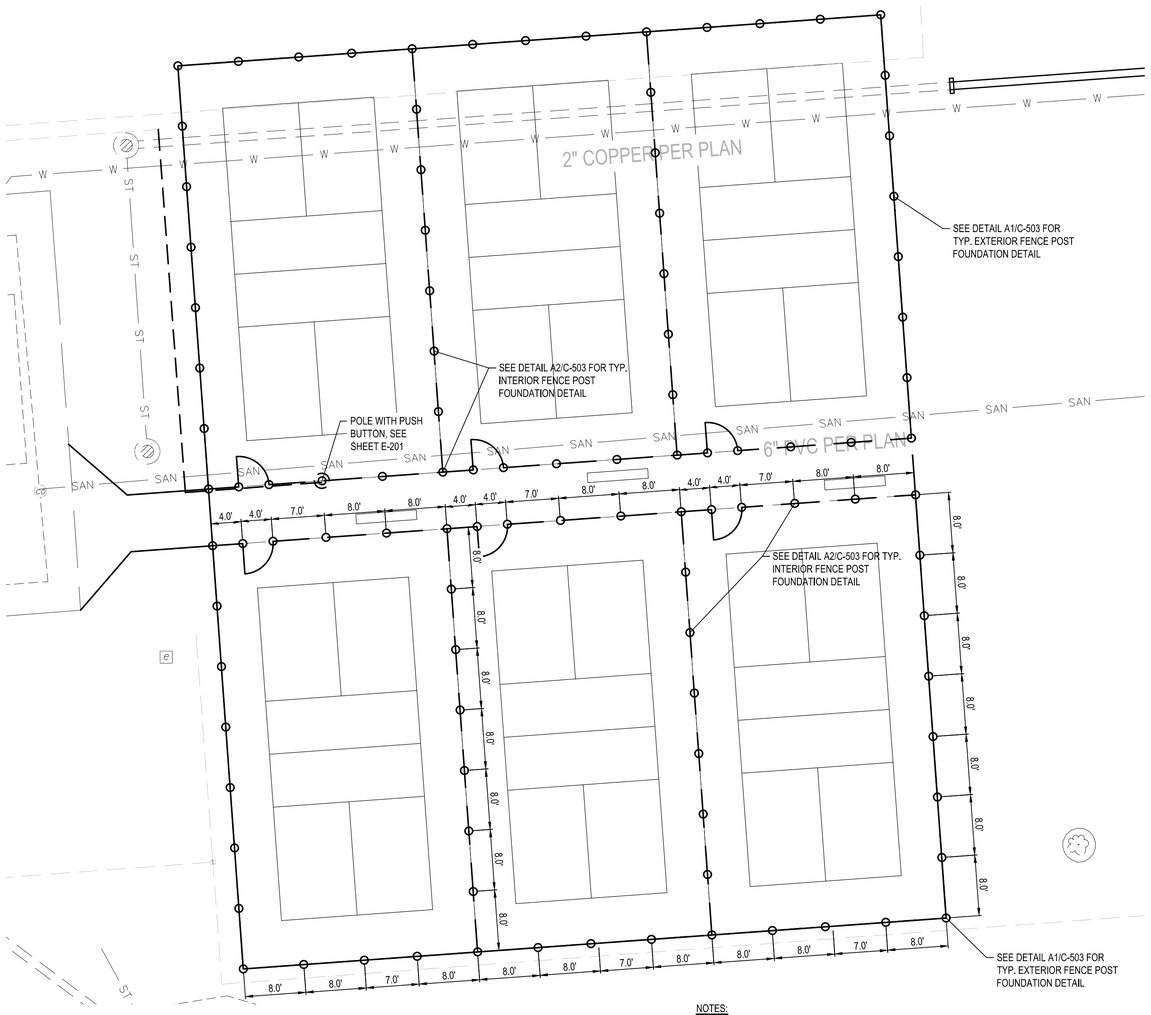
ISSUED FOR:	
PERMIT	08.06.2020
BID	
CONSTRUCTION	
RECORD	

PROJECT MANAGER	DESIGNER
AMS	MK

JOB NO.
2020085.03

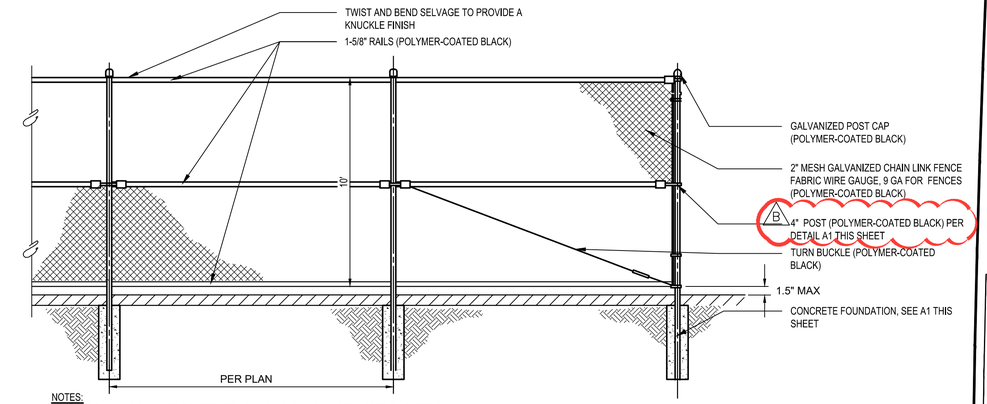
TS-001

Drawing Name: O:\2020\2020085\03 Pickleball Courts\4_Working Files\00_CAD\00_Dwg\L\2020085.03 Notes And Details.dwg
September 8, 2020 10:53 AM - ashort



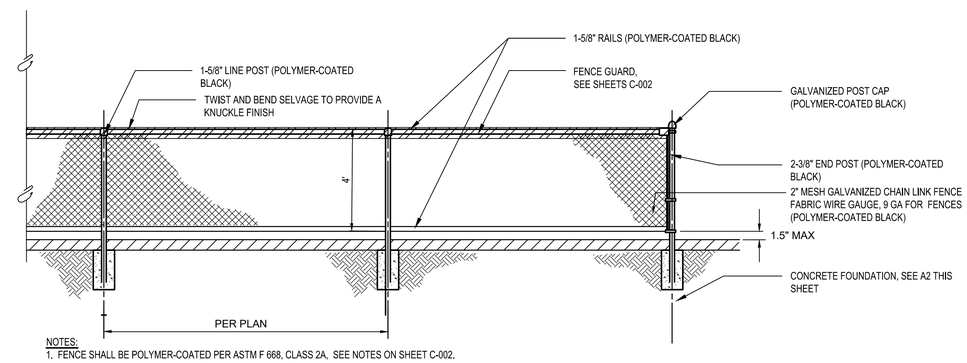
NOTES:
1. CONTRACTOR SHALL FIELD VERIFY UTILITY LOCATIONS PRIOR TO INSTALLING FENCE POSTS AND NOTIFY THE CONSTRUCTION MANAGER IF ANY DISCREPANCIES EXIST PRIOR TO PROCEEDING. NO EXTRA COMPENSATION SHALL BE PAID TO THE CONTRACTOR FOR WORK HAVING TO BE REDONE DUE TO INFORMATION SHOWN INCORRECTLY ON THESE PLANS IF SUCH NOTIFICATION HAS NOT BEEN GIVEN.
2. SEE UTILITY AND ELECTRICAL PLANS FOR UTILITY INFORMATION.

B2 FENCE POST PLAN
N.T.S.



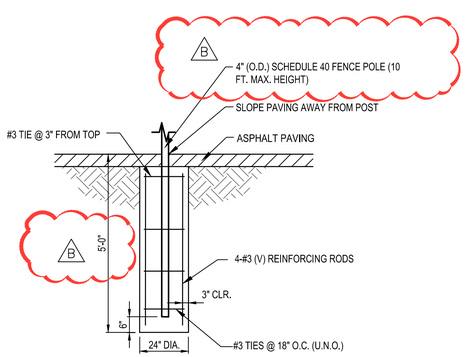
NOTES:
1. FENCE SHALL BE POLYMER-COATED PER ASTM F 668, CLASS 2A, SEE NOTES ON SHEET C-002.
2. IF THE ALTERNATE WIND SCREEN IS ACCEPTED, WIND SCREEN SHALL BE CENTERED ON THE 10' PANEL.

C4 PERIMETER CHAIN LINK FENCE - 10'
N.T.S.



NOTES:
1. FENCE SHALL BE POLYMER-COATED PER ASTM F 668, CLASS 2A, SEE NOTES ON SHEET C-002.

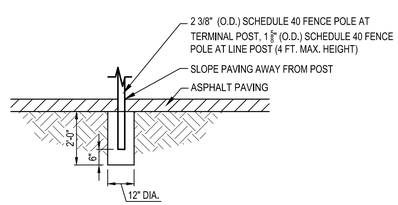
B4 INTERIOR CHAIN LINK FENCE- 4'
N.T.S.



ELEVATION

NOTES:
1. FENCE FOUNDATION IS DESIGNED FOR 10' H FENCE WITH WIND SCREEN. SEE C-001 FOR CONCRETE NOTES, C-002 FOR FENCE NOTES. REINFORCING BARS SHALL CONFORM TO ASTM A615, GRADE 60.

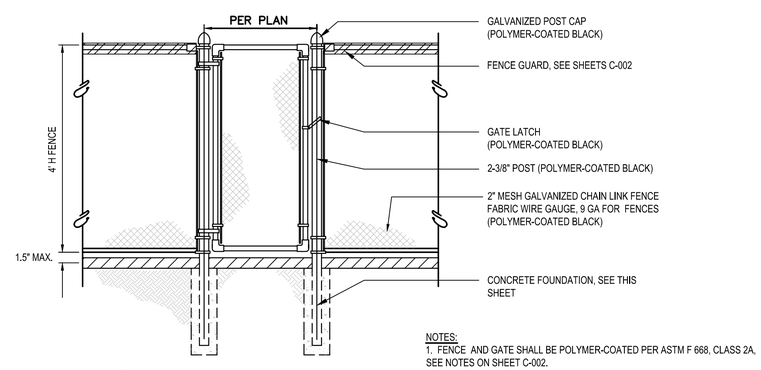
A1 EXTERIOR FENCE POST FOUNDATION
N.T.S.



ELEVATION

NOTES:
1. FENCE FOUNDATION IS DESIGNED FOR 4' H FENCE, NO WIND SCREEN.. SEE C-001 FOR CONCRETE NOTES, C-002 FOR FENCE NOTES.

A2 INTERIOR FENCE POST FOUNDATION
N.T.S.



NOTES:
1. FENCE AND GATE SHALL BE POLYMER-COATED PER ASTM F 668, CLASS 2A, SEE NOTES ON SHEET C-002.

A4 CHAIN LINK FENCE MAN GATE
N.T.S.

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REV.	DATE	DESCRIPTION
B	09.08.2020	ADDENDUM B

STATE OF OHIO
LEONARDO A. SFERRA
E -71842
REGISTERED PROFESSIONAL ENGINEER
09/08/20

CITY OF DUBLIN
6565 Commerce Parkway, Dublin OH, 43017
Coffman Park - Pickleball Courts

DETAILS

ISSUED FOR:	
PERMIT	08.06.2020
BID	
CONSTRUCTION	
RECORD	

PROJECT MANAGER	DESIGNER
AMS	MB

JOB NO.
2020085.03

C-503

Drawing Name: O:\2020\2020085\03 Pickleball Courts\4_Working Files\00_CAD\00_Dwg\L\2020085.03 Notes And Details.dwg
September 8, 2020 3:13 PM - ashort

SUBSURFACE INVESTIGATION
COFFMAN PARK RECREATION AREA
DUBLIN, OHIO

S&ME Project No. 1117-14-058A

Prepared for:

City of Dublin
Dublin, Ohio

Prepared by:

S&ME

6190 Enterprise Ct.
Dublin, Ohio 43016

December, 2014

December 5, 2014
1117-14-058A

City of Dublin
Division of Parks and Open Spaces
6555 Shier-Rings Road
Dublin, Ohio 43016.

Attention: Laura Ball

Reference: Geotechnical Subsurface Investigation
Coffman Park Recreation Area
Dublin, Ohio

Dear Ms. Ball:

S&ME, Inc. (S&ME) has completed a subsurface investigation for the above referenced project in accordance with our proposal dated October 24, 2014, which was authorized by City of Dublin with a purchase order on October 28, 2014. For this project, a total of fifteen (15) borings were performed in the field by S&ME personnel. The approximate site location is depicted on the Vicinity Map presented as Plate 1 in the Appendix of this report. Our observations and recommendations associated with the investigation are herewith submitted.

We appreciate having been given the opportunity to be of service on this project. If you require additional assistance or have any questions, please feel free to contact our office at any time.

Respectfully submitted,

S&ME, Inc.
Dublin, Ohio

Alekhya Kondalamahanthy, E.I.
Staff Professional

Christopher J. Nye, P.E.
Project Engineer

cc: EAA

Submitted: 1 electronic copy (pdf) via email to lball@dublin.oh.us

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EXECUTIVE SUMMARY

This summary is presented for the convenience of the reader. However, the full report text should be studied and understood before preparing any estimation of quantities or designs based on this summary.

Based on the information provided by City of Dublin, S&ME understands that the project includes further development of Coffman Park Recreation Area to be located at the southwest corner of the roundabout near Perimeter Dr. and Commerce Parkway in Dublin, Ohio. S&ME understands that the proposed development will include construction of five (5) tennis courts, two (2) platform tennis courts, restrooms, two (2) basketball courts, a skate board park (100'x100'), two (2) parking lots and associated drive lanes, and a walking path.

The following recommendations are discussed in detail in the subsequent sections:

- All fifteen (15) borings encountered 3 to 6 inches of topsoil. Underlying the surficial materials, natural soils were present in all the borings and primarily consisted of stiff to hard cohesive soils. Medium -stiff silty clay was encountered in Boring B-5 at a depth of 3.5 feet. Cobbles were noted in fourteen (14) of the borings at depths varying from 1.0 to 11.0 feet.
- Liquid limit (LL) determinations performed on near surface cohesive samples from Borings B-3 and B-15 revealed liquid limits ranging from 61% to 63%. Based on the laboratory testing, these soils are considered highly plastic or "fat" and may need to be stabilized to support new fill or construction materials. The material may also be difficult to dry out during wet or cold weather conditions. Extra site development cost may be associated with the presence of highly plastic FAT CLAY soils.
- A maximum allowable bearing pressure of 3,000 psf may be used for design of the spread foundations bearing in natural very-stiff to hard cohesive soils (silty clay) or newly placed and compacted engineered fill.
- A modulus of subgrade reaction of 100 pci may be used for floor slab design.
- A CBR (California Bearing Ratio) of 3 may be used for design of pavements placed on the natural soils.
- Groundwater was encountered in Boring B-7 at a depth of 10.0 feet following completion of drilling. No seepage or groundwater was encountered in the remaining fourteen (14) borings. These borings were noted as being "dry", that is to say no measurable amount of water had collected in the borehole prior to backfilling. The quantities of groundwater encountered are anticipated to be controllable by bailing or pumping from temporary sumps.

1. INTRODUCTION

S&ME, Inc. (S&ME) has completed a subsurface investigation for the proposed Coffman Park Recreation Area in Dublin, Ohio. The work was performed in general accordance with our proposal dated October 24, 2014. The purpose of this investigation was to obtain subsurface information to allow us to characterize the subsurface conditions at the site and to develop recommendations concerning site preparation, foundation design, and other related construction issues. This report describes our understanding of the project, presents the results of the field exploration and laboratory testing, and discusses our conclusions and recommendations.

2. SITE AND PROJECT DESCRIPTION

The property being considered for development is located at the southwest corner of the roundabout near Perimeter Dr. and Commerce Parkway in Dublin, Ohio. A project Vicinity Map is included as Plate 1 in the Appendix. A separate parking lot is also planned at the northeast quadrant, approximately 300 ft north of the intersection. S&ME understands that the proposed park development will include construction of five (5) tennis courts, two (2) platform tennis courts, restrooms, two (2) basketball courts, a skate board park (100'x100'), two (2) parking lots and associated drive lanes, and a walking path. Based on information shown on the Proposed Site Plan dated October 15, 2014, and prepared by MKSK, existing site grades vary from approximately El. 899 to El. 901.

S&ME understands that the skateboard park will be a slab-on-grade structure and that the platform tennis courts and restrooms will bear on shallow foundations. The remaining structures are expected to be constructed on at-grade pads. Based on the site plan, we anticipate that minimal (less than 3 feet) cuts or fills will be required to reach proposed grades. In addition, no structure loading information was available, but this report considers that the structures will be lightly loaded. The project site is currently undeveloped, relatively flat, and is covered with grass and saplings.

3. REGIONAL GEOLOGY

Geologic references indicate that this site is located in a portion of Ohio which was previously glaciated. Soil overburden in this area consists of loamy, high lime, Wisconsinan-age till and extensive outwash in the Scioto Valley over Devonian to Mississippian-age carbonate rocks, shales, and siltstones. ODNR bedrock topography mapping suggests that bedrock may be present near Elevation 820, or approximately 70 to 80 feet below the existing ground surface. The "Ohio Karst Areas" map published by ODNR does not show probable karst areas in the immediate vicinity of the site.

4. SUBSURFACE CONDITIONS

4.1 Field Exploration Procedures

On November 7, 2014, S&ME was on-site and performed fifteen (15) borings (designated as Borings B-1 through B-15) to obtain subsurface information at the project site. Boring locations were selected by City of Dublin and field located by S&ME using a hand held GPS approximately at the coordinates requested by the client. The

approximate final locations of the borings are shown on the Plan of Borings submitted as Plate 2 in the Appendix of this report. Top of boring elevations were estimated from available topographic mapping.

An All-Terrain-Vehicle (ATV) mounted drill rig equipped with a 4½- inch outside diameter (O.D.) continuous flight auger was used to advance the borings between samples. Disturbed, but representative, soil samples were attempted at regular intervals using a 2-inch O.D. split barrel sampler. The sampler was lowered to the bottom of the boring and then driven 18 inches into the soil with blows from a 140 pound hammer freely falling 30 inches (Standard Penetration Test, ASTM D-1586). Split-barrel samples were examined immediately after recovery and representative portions of each sample were placed in air-tight jars and retained for subsequent laboratory testing. Additionally, the borings were checked for the presence of groundwater during sampling and at the completion of the drilling operations. Following the completion of the groundwater level readings, the borings were backfilled with soil cuttings. All of the samples collected during the field exploration were returned to the laboratory for visual examination and selected laboratory testing.

4.2 Soil Stratification

In general, 3 to 6 inches of topsoil was encountered at the ground surface in each of the fifteen (15) borings. Underlying the surficial materials, natural soils were obtained from all of the borings. The natural soils primarily consisted of stiff to hard cohesive soil to the boring termination depths ranging from 6.5 to 14.4 feet below the ground surface. A zone of medium-stiff cohesive (silty clay) soil was encountered in Boring B-5 at a depth of 3.5 feet. Fat clay was encountered from 3.5 to 7.7 feet below the ground surface in Boring B-3, from 0.2 to 6.2 feet in Boring B-15, and may be present in other borings. Cobbles were also encountered in fourteen (14) of the borings at depths varying from 1.0 to 11.0 feet. For further detail of subsurface conditions encountered, refer to the individual boring logs presented on Plates 4 through 18 of the Appendix.

4.3 Water Levels

Groundwater observations were made as each boring was being advanced and measurements were made at the completion of drilling. Groundwater/seepage was observed in Boring B-7 during drilling at a depth of 10.9 feet, and had accumulated to a depth of 10.0 feet following completion of drilling operations. No seepage or groundwater was encountered in the remaining fourteen (14) borings. These borings were noted as being “dry”, that is to say no measurable amount of water had collected in the borehole prior to backfilling.

5. LABORATORY TEST RESULTS

In the laboratory, the samples were visually identified and on a few representative samples, moisture contents, liquid and plastic limit determinations, and grain-size analyses were performed. Results of these tests permit an evaluation of strength and compressibility characteristics of the soil by comparison with similar soils for which these characteristics have been previously determined.

Based upon the results of the laboratory testing program, soil descriptions contained on the field logs were modified, if necessary and laboratory-corrected logs are submitted as Plates 4 through 18 of the Appendix.

A summary of laboratory test results is presented on Plate 19, and results of the grain- size analyses and Atterberg Limits are presented on Plates 20 through 22 of the Appendix.

Soils described in this report have been classified generally in accordance with the Unified Soil Classification System. However, the system has been augmented by the use of special adjectives to designate the approximate percentages of minor soil components. An explanation of the symbols and terms used on the boring logs and definitions of the special adjectives used to denote the minor soil components are presented on Plate 3 of the Appendix.

5.1 Results of Soil Classification Testing

Four (4) Atterberg limit tests were performed to provide engineering classification of the on-site soil. The liquid limit (LL) of the cohesive soil samples tested ranged from 28 to 63 percent, with plasticity index (PI) values of 11 to 43 percent. In addition, a grain-size analysis was performed on two of the same soil samples as the Atterberg limits, with the percentage of material finer than the No. 200 sieve of 57.7 and 88.8 percent. These soils samples classify as sandy lean clay (CL) and fat clay (CH) in accordance with the Unified Soil Classification System.

5.2 Results of Moisture Testing

Natural moisture content testing was performed on the four (4) samples with Atterberg limits testing. The moisture contents of the soils ranged from 18.6 to 26.0 percent, with results ranging from 0 to 6 percent above the corresponding plastic limit for the four samples tested. Moisture content testing was also performed on an additional four (4) samples, with test results ranging from 15.4 to 20.9 percent.

6. DESIGN RECOMMENDATIONS

6.1 Geotechnical Evaluation

In general, the site appears suitable for support of the proposed structures using conventional spread foundations and slab-on-grade floors. Extra site development cost may be associated with the presence of highly plastic FAT CLAY soils. Liquid limit values of soil samples tested ranged from 28% to 63% and plastic index (PI) values ranged from 11% to 43%. These values are indicative of fat clays and they will likely be difficult to dry out during wet or cold weather conditions. Presence of fat clays within the proposed subgrade areas indicates a possible need for site remediation in some areas of the site.

6.2 Site Preparation

Prior to placing any new fill or construction materials, it is recommended that all vegetation, topsoil, organic soil, or any other unsuitable material be stripped from the proposed building, pavement, and park facility footprints. If existing fill is encountered

within the proposed building footprint, it is recommended to be removed and replaced with controlled fill for support of the proposed structure. Existing fill encountered in proposed pavement areas and park facilities supported on slabs-on-grade may remain in-place, provided the fill is not organic, performs favorably to proofrolling efforts, and if the owner is willing to accept the costs of potential additional maintenance due to possible future settlement.

Following stripping and any necessary undercutting, the entire exposed subgrade soils should be proofrolled using a heavily-loaded, tandem-axle truck to detect soft, wet or weak zones. It is recommended that any observed unsuitable materials or subgrade soils which exhibit significant pumping and/or rutting during proofrolling, be stabilized by one of the following methods:

1) scarifying, aerating, and recompacting;
2) overexcavating and replacing with compacted suitable fill in accordance with the Fill Placement section of this report,
3) using a geogrid on top of the subgrade in connection with granular base; or,
4) chemical modification.

The determination of which of the four methods is appropriate for remediation of weak portions of the subgrade could best be determined by an S&ME representative witnessing a proofroll.

Liquid limit (LL) determinations performed on near surface cohesive samples from Borings B-3 and B-15 revealed liquid limits of 61% to 63%. Based on the laboratory testing, these silty clay soils are considered highly plastic or “fat”. These materials can be problematic as they can shrink/swell with changes in moisture content, potentially causing heave or settlement at site improvements. As such, the fat clays may need to be stabilized to support the proposed construction, and they may also be difficult to dry out during wet or cold weather conditions. Consideration should be given to including project contingency to address the potential remediation of these “fat” clays, such as:

- Compacting the soils at 0% to 2% over their optimum moisture content to a minimum depth of 3 feet below planned subgrade elevation and 5 feet beyond the slabs-on-grade foot prints;
- Performing chemical modification or stabilization; or,
- Removing and wasting the unsuitable soils in on-site green areas.

6.3 Fill Placement

In areas where new fill will be required for the support of the new structures, it is recommended that the fill be placed in uniform, thin lifts (eight inches maximum loose thickness) and be compacted to a dry unit weight of no less than 100 percent of the Standard Proctor maximum dry density (ASTM D 698). New fill placed for support of proposed pavements is recommended to be compacted to no less than 98 percent (based on ASTM D 698). The moisture content of all soil that is used as structural fill should be maintained within +/-2% of the optimum moisture content during all compaction operations. Based on the results of the borings performed for this investigation, portions

of the on-site soils may be reusable as structural fill provided the soils are properly moisture conditioned, are free of debris and organics., and are inert (not fit).

All soil used as structural fill should be non-organic and free of miscellaneous debris, cobbles, and boulders. Cobbles were noted in the borings at depths varying from 1.0 to 11.0 feet below the ground surface. These cobbles should not be allowed in fill or backfill. The fill should not be in a frozen condition during placement and should not be placed on a frozen subgrade. The final determination of whether a soil is suitable for structural fill should be made in the field by a representative of S&ME as construction proceeds.

6.4 Foundations

Based on the conditions encountered in the borings and considering that minimal amounts of cut and fill (less than 3 feet) are required to obtain grade for the proposed building construction, foundations will likely be bearing in either natural very-stiff to hard cohesive (silty clay or clayey silt) soil or newly compacted fill.

- A maximum net allowable bearing pressure of 3,000 pounds per square foot (psf) may be used for the design of shallow spread foundations bearing on natural very-stiff to hard cohesive (silty clay or clayey silt) soils or newly placed and compacted fill.
- If weak natural soils or existing uncontrolled fill are encountered at the plan foundation bearing elevation, it is recommended that footing excavations be extended through these zones to stronger, more suitable bearing soils. The footing over-excavations below the plan bearing elevation are recommended to be backfilled with low-strength concrete having a minimum 28-day compressive strength of 1500 psi or additional footing concrete. It is recommended that this low strength concrete be placed at least 24 hours prior to the placement of footing concrete.
- Exterior footings bear at least 32 inches below the lowest adjacent grade for frost protection or in accordance with local codes.
- A minimum footing width of 16 inches for wall footings and 36 inches for column footings are recommended, regardless of calculated size based upon bearing capacity.
- Footings designed and constructed in accordance with the foregoing recommendations and procedures will have a factor of safety of at least 3 with respect to shearing strength.
- It is anticipated that settlements for the proposed structure will be within tolerable ranges (less than 1-inch of total settlement and differential settlements not exceeding ½-inch) provided the site preparation and foundation construction are performed in accordance with the recommendations provided in this report.
- All footing excavations should be observed by an S&ME representative to verify suitable bearing soils are present and capable of supporting the loads as designed and to minimize the amounts of undercuts required during excavation if weak soils and/or existing fill are encountered.

6.5 Floor Slab Support

The proposed FFE was not available at the time of this report. Dependent upon final grading, it is anticipated that the proposed floor slab will generally be supported on either natural soils deemed suitable for slab support following a favorable proofroll, or newly placed and compacted fill comprised of on-site soils. On this basis, concrete floors may be designed as slabs-on-grade utilizing a Modulus of Subgrade Reaction of 100 pounds per cubic inch (pci). The preceding recommendation considers a minimum 4-inch washed gravel or crushed stone base is placed as a moisture barrier directly below the floor slab concrete.

It is recommended that final subgrade preparations be performed immediately prior to the placement of the granular base material to minimize damage to the subgrade from repeated construction traffic and/or exposure to weather. Proofrolling operations should be performed on the final subgrades to expose any soft or unsuitable bearing materials which may have developed during construction as a result of heavy construction traffic. We recommend that the proofrolling operations be performed using a fully-loaded, tandem-axle dump truck. Any soft or unsuitable material exhibiting rutting, yielding, and/or pumping during the proofroll should be either undercut to a firm bearing material and be replaced with engineered fill to re-establish final subgrade, or be stabilized in accordance with the recommendations presented in the Site Preparation section of this report.

6.6 Pavement Subgrade Evaluation

Prior to pavement construction, any topsoil, organic material, or other unsuitable material should be removed from proposed parking areas and driveways and the pavement subgrades should be prepared as described in the Site Preparation section of this report. It is anticipated that the subgrade for the pavements within the site will consist of natural very-stiff to hard cohesive soils, existing fill, or newly placed controlled fill deemed suitable for pavement support following favorable proofrolling. Based on laboratory tests performed on the near surface cohesive soils and ODOT Group Index correlations, a CBR (California Bearing Ratio) value of 3 may be used for the design of pavements to be placed on these materials.

In addition to proper subgrade preparation, we recommend that the pavement design and construction include surface and subsurface drainage measures. Water which infiltrates the pavement and remains trapped within the pavement components during traffic loading is one of the leading causes of premature pavement failure. Effective design measures include the use of finger drains below pavements and/or the use of perimeter swales, perimeter edge drains, curbs, or a combination of these features to collect surface water runoff from areas adjacent to the pavement. Cohesive subgrade soils should be crowned or sloped to promote drainage of infiltrating water towards subsurface drainage collection systems.

6.7 Yielding Subgrades

High plasticity cohesive soils (i.e., “fat” clays) in natural cuts have the tendency to yield and become spongy under the weight of heavy construction equipment. This phenomenon, which rarely occurs in a properly compacted fill, is generally understood,

but cannot be readily predicted by means of density, moisture or other simple, routine types of soil tests. If yielding does occur, however, it is imperative that the subgrade be stabilized before a full-depth pavement is constructed, and it is also advisable to stabilize the subgrade even if aggregate base is to be used.

Restricting construction activity and permitting the subgrade to dry will frequently eliminate yielding if weather conditions are favorable. If exceptionally good drying weather is not expected or does not occur, however, it will be necessary to scarify the subgrade to a depth of about 8 to 12 inches and to compact the loosened soil subsequent to a period of drying and aerating. The process of drying and aerating is dependent entirely upon weather conditions, and it would be advisable to limit the work area to a size which can be scarified and compacted the same day to avoid precipitation that might occur during an extended period of exposure.

Another procedure that can be used to improve the yielding subgrade would be to remove or "undercut" severely disturbed areas to a depth of 12 inches or greater and to fill these areas with a more suitable (stable) compacted soil. This procedure would usually be performed during the original site preparation but often yielding does not become evident until after the subgrade has been subjected to repetitive construction traffic.

Other procedures for improving an usually weak or severely yielding subgrade include the use of lime or lime/flyash stabilization. At times, it is also possible to use a system of geogrid or geotextile and aggregates to provide the stability necessary to construct the pavement without further improving the subgrade.

6.8 Groundwater Considerations

Based on the groundwater observations made during drilling, it is anticipated that shallow excavations for utilities, foundations, and removal of any unsuitable soils will encounter little to no groundwater seepage. Seepage was only observed in Boring B-7 at 10.5 feet below the existing ground surface. The groundwater table can fluctuate with the time of year. Deeper excavations, such as those for utilities, which extend through granular seams, pockets/lenses, or layers, may encounter greater amounts of seepage or groundwater. The quantities of groundwater encountered are anticipated to be controllable by bailing or pumping from temporary sumps. If pumping from sump pits is not effectively keeping the groundwater below excavation levels, then S&ME should be retained to provide additional recommendations.

During construction, surface runoff and precipitation should not be permitted to collect and stand in excavations as the soil will absorb water. Soils softened by standing water or disturbed by construction activities should be removed from excavations before concrete is placed. Sloughing and caving should be anticipated when excavations extend into/through granular lenses or weaker cohesive seams and layers. If weak cohesive or granular soils are encountered, the use of trench boxes may be necessary to keep excavations open. All excavations should be laid back or braced in accordance with the most recent OSHA excavation rules and regulations.

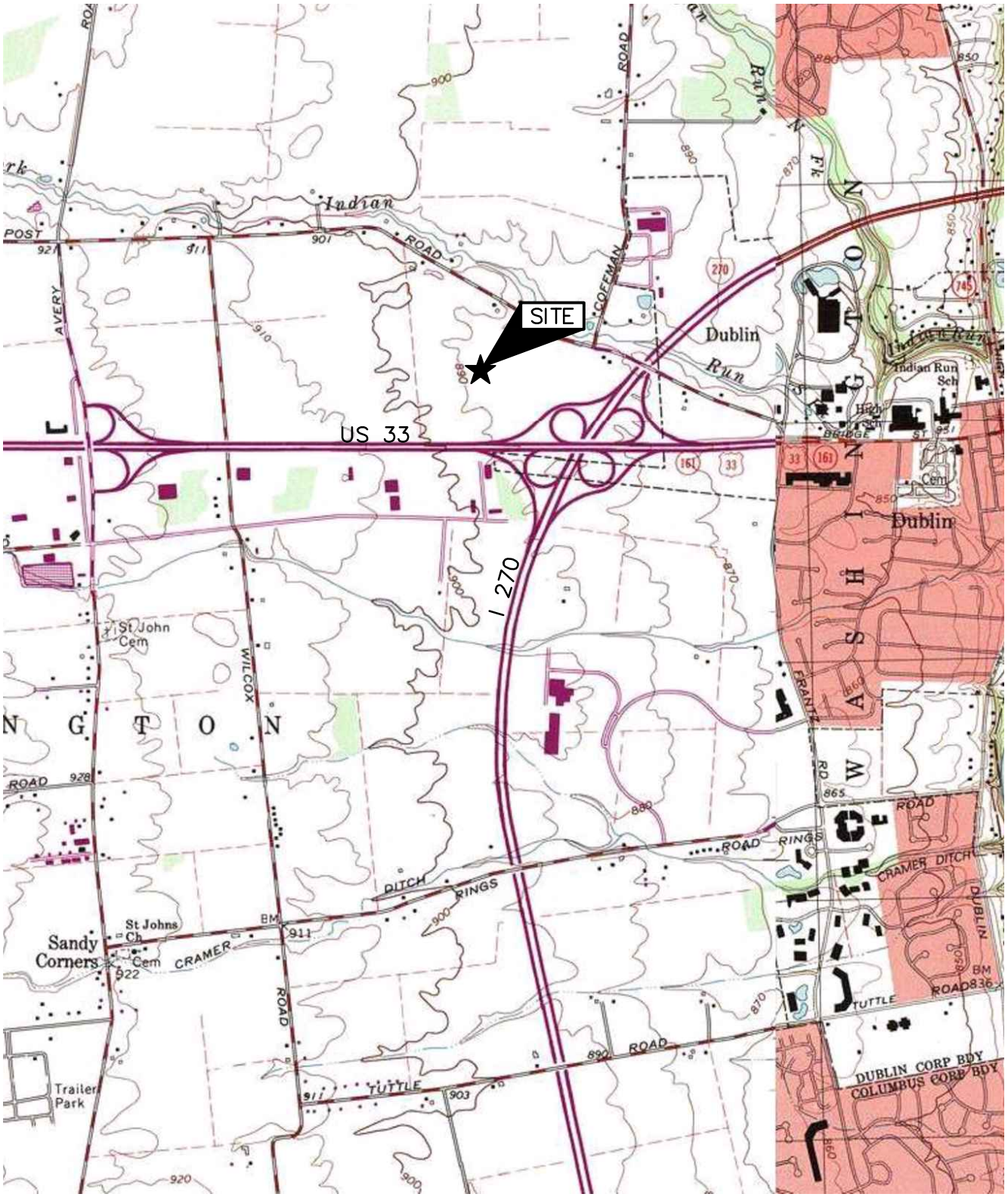
7. FINAL CONSIDERATIONS

The analyses, conclusions and recommendations discussed in this report are based on conditions as they exist at the time of our field investigation and further on the consideration that the exploratory borings are representative of subsurface conditions throughout the areas investigated. Actual subsurface conditions between and beyond the borings might differ from those encountered at the boring locations. If subsurface conditions are encountered during construction that vary from those discussed in this report, S&ME should be notified immediately so that we may evaluate the effects, if any, on the design and construction.

S&ME should be retained to review the final foundation and site grading plans to verify that the intent of our recommendations has been followed. During construction, it is recommended that a representative from this office be on-site to observe the removal of unsuitable soils, proofrolling operations, to perform fill testing, to verify suitable bearing conditions in foundation excavations, and to verify that the conditions encountered during construction are similar to those encountered in our borings. S&ME cannot assume responsibility or liability for the adequacy of recommendations if we do not observe construction.

This report was written for our client, City of Dublin, Division of Parks and Open Spaces. This report may not be relied upon for use in other projects, additions to the current project, or any other purpose for which the material was not strictly intended by S&ME without S&ME's express written permission.

APPENDIX



USGS Mapping:
Franklin Quad

0 2000 4000
SCALE IN FEET

VICINITY MAP

DUBLIN COFFMAN PARK
RECREATION AREA
FRANKLIN COUNTY, DUBLIN, OHIO

Project: 1117-14-058A	
Drawing Date: 11-25-2014	
Last Updated: 11-26-2014	
Drawn By: PRR	
Approved By: AKK	
Scale: GRAPHIC	1:1

S&ME
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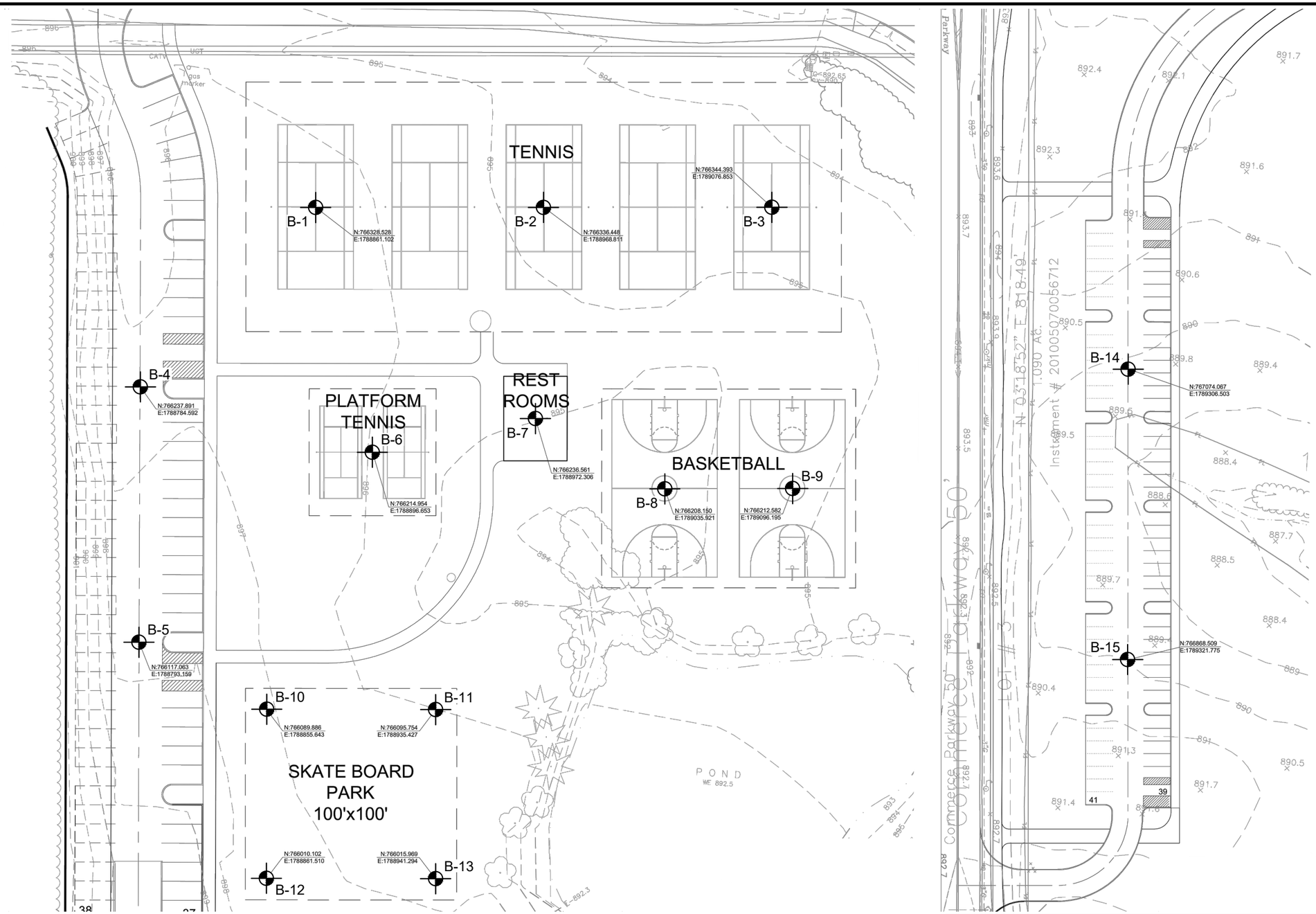
ENGINEERING FIRM. 03530

PLATE 1

Images: ~ dublin_TOPO!map.TIF
Xrefs:
File Last Updated: Nov 26, 2014
Plot Info: 11-26-2014 @ 7:51am By: prock
S&ME Filename: Q:\Projects\1117-Geotech Columbus\1117-14-058A\Drawings\V-Map-POB_11-25-14.dwg Layout: V-Map



NOTE: BASE MAP WAS PREPARED BY MKSK FOR THE CITY OF DUBLIN AND RECEIVED BY S&ME, INC. ON 10/15/2014.

0 50 100
SCALE IN FEET

LEGEND

B-1 BORING NUMBER AND LOCATION

PLAN OF BORINGS

DUBLIN COFFMAN PARK
RECREATION AREA
FRANKLIN COUNTY, DUBLIN, OHIO

Project: 1117-14-058A	Drawn By: PRR	
Drawing Date: 11-25-2014	Approved By: AKK	
Last Updated: 11-26-2014	Scale: GRAPHIC	1:1

S&ME
WWW.SMEINC.COM
ENGINEERING FIRM. 03530

PLATE 2

Images: ~ dublin_TOPO1map.TIF
Xrefs:
File Last Updated: Nov 26, 2014
Plot Info: 11-26-2014 @ 7:44am By: prock
S&ME Filename: Q:\Projects\1117-Geotech Columbus\1117-14-058A\Drawings\V-Map-POB_11-25-14.dwg Layout: POB

EXPLANATION OF SYMBOLS AND TERMS USED ON BORING LOGS FOR SAMPLING AND DESCRIPTION OF SOIL

SAMPLING DATA

▮ - Indicates sample was attempted within this depth interval.

2 3 5 - The number of blows required for each 6-inch increment of penetration of a "Standard" 2-inch O.D. split-barrel sampler, driven a distance of 18 inches by a 140-pound hammer freely falling 30 inches (SPT). The raw "blowcount" or "N" is equal to the sum of the second and third 6-inch increments of penetration.

N_{60} - Corrected Blowcount = [(Drill Rod Energy Ratio) / (0.60 Standard)] X N

SS - Split-barrel sampler, any size.

ST - Shelby tube sampler, 3″ O.D., hydraulically pushed.

R - Refusal of sampler in very-hard or dense soil, or on a resistant surface.

50-3" - Number of blows (50) to drive a split-barrel sampler a certain distance (3 inches) other than the normal 6-inch increment.

DEPTH DATA

W - Depth of water or seepage encountered during drilling.

▼ AD - Depth to water in boring after drilling (AD) is teminated.

▼ 5 days - Depth to water in a monitoring well, or a piezometer in a boring, a certain number of days (5) after termination of drilling.

TR - Depth to top of rock.

SOIL DESCRIPTIONS

Soils have been classified in general accordance with Section 603 of the most recent ODOT SGE, and described in general accordance with Section 602, including the use of special adjectives to designate approximate percentages of minor components as follows:

Adjective	Percent by Weight
trace	1 to 10
little	10 to 20
some	20 to 35
"and"	35 to 50

The following terms are used to describe density and consistency of soils:

Term (Granular Soils)	Blows per foot (N_{60})
Very-loose	Less than 5
Loose	5 to 10
Medium-dense	11 to 30
Dense	31 to 50
Very-dense	Over 50

Term (Cohesive Soils)	Qu (tsf)
Very-soft	Less than 0.25
Soft	0.25 to 0.5
Medium-stiff	0.5 to 1.0
Stiff	1.0 to 2.0
Very-stiff	2.0 to 4.0
Hard	Over 4.0

LOG OF BORING NO. B-1
DUBLIN COFFMAN PARK & RECREATION AREA
DUBLIN, OHIO

S&ME

LOCATION: See Plate 2 of Appendix. ELEVATION: 896.2 DATE: 11/7/14

DRILLING METHOD: 4-1/2" O.D. Continuous-flight Auger COMPLETION DEPTH: 6.5'

SAMPLER(S): 2" O.D. Split-barrel Sampler

ELEV.	DEPTH, FEET	SAMPLE NUMBER	SAMPLE	SAMPLE EFFORT	N_{60}	SAMPLE REC-%	DESCRIPTION	NATURAL CONSISTENCY INDEX / NATURAL MOISTURE CONTENT (PLASTIC LIMIT – LIQUID LIMIT; 10 20 30 40)	TEST RESULTS
896.0	0						TOPSOIL - 3 INCHES		
		1	■	8/15/22	46	73	Very-stiff to hard brown silty clay, little fine to coarse sand, trace fine to coarse gravel, few cobbles.		H=3.75-4.5+
892.7							Very-stiff to hard brown clayey silt, some fine to coarse sand, trace fine gravel, few cobbles.		
	5	2	■	19/27/32	74	100			H=3.5-4.0
889.7		3		50-0"R		0			
	10						- No seepage encountered. - Encountered cobbles at 3.0' and 4.0'. - Elevations estimated from available topographic mapping and should be considered approximate.		
	15								
	20								
	25								

2010 NEW DEFAULT BORING LOG-W/ N60

WATER LEVEL: "Dry"
WATER NOTE: At Completion
DATE: 11/7/14

SYMBOLS USED TO INDICATE TEST RESULTS

G - Gradation
Q - Uncon Comp
T - Triax Comp
C - Consol.
(See Separate Curves)

H - Penetrometer (tsf)
W - Unit Dry Wt (pcf)
D - Relative Dens (%)

Drill Rod Energy Ratio : 0.75
Last Calibration Date : 2/20/2013
Drill Rig Number : S&ME
ATV 550-2

JOB: 1117-14-058A

LOG OF BORING NO. B-2
DUBLIN COFFMAN PARK & RECREATION AREA
DUBLIN, OHIO

S&ME

LOCATION: See Plate 2 of Appendix. ELEVATION: 894.8 DATE: 11/7/14

DRILLING METHOD: 4-1/2" O.D. Continuous-flight Auger COMPLETION DEPTH: 8.0'

SAMPLER(S): 2" O.D. Split-barrel Sampler

ELEV.	DEPTH, FEET	SAMPLE NUMBER	SAMPLE	SAMPLE EFFORT	N_{60}	SAMPLE REC-%	DESCRIPTION	NATURAL CONSISTENCY INDEX / NATURAL MOISTURE CONTENT (PLASTIC LIMIT – LIQUID LIMIT; 10 20 30 40)	TEST RESULTS
894.6	0						TOPSOIL - 3 INCHES		
		1	■	13/21/19	50	67	Hard brown and dark-brown silty clay, little fine to coarse sand, trace fine to coarse gravel.		H=4.0-4.5+
891.3									
	5	2	■	10/21/47	85	100	Very-stiff brown mottled with gray silty clay, some fine to coarse sand, trace fine to coarse gravel, few cobbles.		H=3.0-4.0
888.3									
		3	■	7/10/11	26	100	Very-stiff brown mottled with gray clayey silt, some fine sand, trace fine gravel.		H=2.75-4.0
886.8									
	10						- No seepage encountered. - Encountered cobbles from 3.5' to 5.5'. - Elevations estimated from available topographic mapping and should be considered approximate.		
	15								
	20								
	25								

2010 NEW DEFAULT BORING LOG-W/ N60

WATER LEVEL: "Dry"
WATER NOTE: At Completion
DATE: 11/7/14

SYMBOLS USED TO INDICATE TEST RESULTS

G - Gradation, Q - Uncon Comp, T - Triax Comp, C - Consol. (See Separate Curves)

H - Penetrometer (tsf)
W - Unit Dry Wt (pcf)
D - Relative Dens (%)

Drill Rod Energy Ratio : 0.75
Last Calibration Date : 2/20/2013
Drill Rig Number : S&ME
ATV 550-2

LOG OF BORING NO. B-3
DUBLIN COFFMAN PARK & RECREATION AREA
DUBLIN, OHIO

S&ME

LOCATION: See Plate 2 of Appendix. ELEVATION: 894.5 DATE: 11/7/14

DRILLING METHOD: 4-1/2" O.D. Continuous-flight Auger COMPLETION DEPTH: 7.7'

SAMPLER(S): 2" O.D. Split-barrel Sampler

ELEV.	DEPTH, FEET	SAMPLE NUMBER	SAMPLE	SAMPLE EFFORT	N_{60}	SAMPLE REC-%	DESCRIPTION	NATURAL CONSISTENCY INDEX / NATURAL MOISTURE CONTENT (PLASTIC LIMIT — LIQUID LIMIT)	TEST RESULTS
894.2	0						TOPSOIL - 4 INCHES	10 20 30 40	
		1	■	18/37/32	86	100	Hard brown silty clay, some fine to coarse sand, trace fine gravel.		H=4.5+
891.0							Very-stiff brown mottled with dark-gray silty clay, little fine to coarse sand, trace fine gravel.		
	5	2	■	3/7/7	18	80			H=2.75-3.5 LL=61%
		3	■	15/17/50-2"R		75			H=3.5
886.8							- No seepage encountered. - Encountered possible cobble at 7.5'. - Elevations estimated from available topographic mapping and should be considered approximate.		
	10								
	15								
	20								
	25								

2010 NEW DEFAULT BORING LOG-W/ N60

WATER LEVEL: "Dry"
WATER NOTE: At Completion
DATE: 11/7/14

SYMBOLS USED TO INDICATE TEST RESULTS

G - Gradation, Q - Uncon Comp, T - Triax Comp, C - Consol. — See Separate Curves

H - Penetrometer (tsf)
W - Unit Dry Wt (pcf)
D - Relative Dens (%)

Drill Rod Energy Ratio : 0.75
Last Calibration Date : 2/20/2013
Drill Rig Number : S&ME
ATV 550-2

JOB: 1117-14-058A

LOG OF BORING NO. B-4
DUBLIN COFFMAN PARK & RECREATION AREA
DUBLIN, OHIO

S&ME

LOCATION: **See Plate 2 of Appendix.** ELEVATION: **896.5** DATE: **11/7/14**

DRILLING METHOD: **4-1/2" O.D. Continuous-flight Auger** COMPLETION DEPTH: **6.7'**

SAMPLER(S): **2" O.D. Split-barrel Sampler**

ELEV.	DEPTH, FEET	SAMPLE NUMBER	SAMPLE	SAMPLE EFFORT	N_{60}	SAMPLE REC-%	DESCRIPTION	NATURAL CONSISTENCY INDEX / NATURAL MOISTURE CONTENT (PLASTIC LIMIT — LIQUID LIMIT; 10 20 30 40)	TEST RESULTS
896.0	0						TOPSOIL - 6 INCHES		
		1		7/12/18	38	60	Stiff to very-stiff brown silty clay, little to some fine to coarse sand, trace to little fine gravel, few cobbles.		H=2.5-3.0
	5	2		5/6/6	15	100			H=1.75-2.75
889.8		3		50-2"R		100			H=1.5-2.0
	10						- No seepage encountered. - Encountered cobbles at 5.5' and 6.0'. - Elevations estimated from available topographic mapping and should be considered approximate.		
	15								
	20								
	25								

2010 NEW DEFAULT BORING LOG-W/ N60

WATER LEVEL: "Dry"
WATER NOTE: At Completion
DATE: 11/7/14

SYMBOLS USED TO INDICATE TEST RESULTS

G - Gradation
Q - Uncon Comp
T - Triax Comp
C - Consol.
(See Separate Curves)

H - Penetrometer (tsf)
W - Unit Dry Wt (pcf)
D - Relative Dens (%)

Drill Rod Energy Ratio : 0.75
Last Calibration Date : 2/20/2013
Drill Rig Number : S&ME
ATV 550-2

JOB: 1117-14-058A

LOG OF BORING NO. B-5
DUBLIN COFFMAN PARK & RECREATION AREA
DUBLIN, OHIO

S&ME

LOCATION: See Plate 2 of Appendix. ELEVATION: 897.8 DATE: 11/7/14

DRILLING METHOD: 4-1/2" O.D. Continuous-flight Auger COMPLETION DEPTH: 8.0'

SAMPLER(S): 2" O.D. Split-barrel Sampler

ELEV.	DEPTH, FEET	SAMPLE NUMBER	SAMPLE	SAMPLE EFFORT	N_{60}	SAMPLE REC-%	DESCRIPTION	NATURAL CONSISTENCY INDEX / NATURAL MOISTURE CONTENT (PLASTIC LIMIT — LIQUID LIMIT) 10 20 30 40	TEST RESULTS
897.5	0						TOPSOIL - 4 INCHES		
		1	■	18 / 50-4"R		50	Very-stiff brown clayey silt, some fine to coarse sand, trace fine to coarse gravel, few cobbles.		H=3.25
894.3							Medium-stiff to stiff brown mottled with gray silty clay, some to "and" fine to coarse sand, trace fine gravel.		
	5	2	■	8 / 10 / 50-2"R		75			H=0.75-2.0 G
		3	■	5 / 7 / 7	18	100			H=3.0
889.8							- No seepage encountered. - Encountered cobbles at 2.0' and 5.5'. - Elevations estimated from available topographic mapping and should be considered approximate.		
	10								
	15								
	20								
	25								

2010 NEW DEFAULT BORING LOG-W/ N60

WATER LEVEL: "Dry"
WATER NOTE: At Completion
DATE: 11/7/14

SYMBOLS USED TO INDICATE TEST RESULTS

G - Gradation
Q - Uncon Comp
T - Triax Comp
C - Consol.
See Separate Curves

H - Penetrometer (tsf)
W - Unit Dry Wt (pcf)
D - Relative Dens (%)

Drill Rod Energy Ratio : 0.75
Last Calibration Date : 2/20/2013
Drill Rig Number : S&ME
ATV 550-2

JOB: 1117-14-058A

LOG OF BORING NO. B-6
DUBLIN COFFMAN PARK & RECREATION AREA
DUBLIN, OHIO

S&ME

LOCATION: **See Plate 2 of Appendix.** ELEVATION: **896** DATE: **11/7/14**

DRILLING METHOD: **4-1/2" O.D. Continuous-flight Auger** COMPLETION DEPTH: **13.8'**

SAMPLER(S): **2" O.D. Split-barrel Sampler**

ELEV.	DEPTH, FEET	SAMPLE NUMBER	SAMPLE	SAMPLE EFFORT	N_{60}	SAMPLE REC-%	DESCRIPTION	NATURAL CONSISTENCY INDEX / NATURAL MOISTURE CONTENT (PLASTIC LIMIT — LIQUID LIMIT; 10 20 30 40)	TEST RESULTS
895.5	0						TOPSOIL - 6 INCHES		
		1		50-2"R 7/13/15	35	66	Hard brown silty clay, trace fine to coarse sand, trace fine to coarse gravel, many cobbles.		H=4.5+
		2S							
	5	2		13/50-5"R		78			H=4.0
888.5							Hard gray silty clay, trace fine to coarse sand, trace fine to coarse gravel, many cobbles.		
		3		50-3"R		100			H=4.5+
	10								
882.2		4		50-4"R		100			H=4.0-4.5+
	15						- No seepage encountered. - Encountered cobbles at 1.0', and from 5' o 13.8'. - Auger refusal encountered at 5.6'. Boring was offset and advanced to final depth. - Elevations estimated from available topographic mapping and should be considered approximate.		
	20								
	25								

WATER LEVEL: "Dry"
WATER NOTE: At Completion
DATE: 11/7/14

SYMBOLS USED TO INDICATE TEST RESULTS

G - Gradation, Q - Uncon Comp, T - Triax Comp, C - Consol. — See Separate Curves

H - Penetrometer (tsf)
W - Unit Dry Wt (pcf)
D - Relative Dens (%)

Drill Rod Energy Ratio : 0.75
Last Calibration Date : 2/20/2013
Drill Rig Number : S&ME
ATV 550-2

JOB: 1117-14-058A

2010 NEW DEFAULT BORING LOG-W/ N60

LOG OF BORING NO. B-7
DUBLIN COFFMAN PARK & RECREATION AREA
DUBLIN, OHIO

S&ME

LOCATION: See Plate 2 of Appendix. ELEVATION: 895 DATE: 11/7/14

DRILLING METHOD: 4-1/2" O.D. Continuous-flight Auger COMPLETION DEPTH: 14.4'

SAMPLER(S): 2" O.D. Split-barrel Sampler

ELEV.	DEPTH, FEET	SAMPLE NUMBER	SAMPLE	SAMPLE EFFORT	N_{60}	SAMPLE REC-%	DESCRIPTION	NATURAL CONSISTENCY INDEX / NATURAL MOISTURE CONTENT (PLASTIC LIMIT — LIQUID LIMIT)	TEST RESULTS
894.7	0						TOPSOIL - 4 INCHES	10 20 30 40	
		1		7/10/8	23		Hard brown silty clay, little fine to coarse sand, trace fine to coarse gravel.		H=4.0-4.25
		2S		50-3"R					
891.5							Very-stiff to hard brown silty clay, trace fine to coarse sand, trace fine to coarse gravel, many cobbles.		
	5	2		7/13/17	38	100			H=2.0-2.5
		3		50-5"R		80			H=4.5+
	10								
880.6		4		18/50-5"R		78			H=4.0-4.5+
	15						- No seepage encountered. - Encountered cobbles at 9.5', 10.5' and 11.0'. - Encountered water at 10.9'. - Elevations estimated from available topographic mapping and should be considered approximate.		
	20								
	25								

2010 NEW DEFAULT BORING LOG-W/ N60

WATER LEVEL:	10.0	
WATER NOTE:	At Completion	Caved at 12.5
DATE:	11/7/14	11/7/14

SYMBOLS USED TO INDICATE TEST RESULTS

G - Gradation, Q - Uncon Comp, T - Triax Comp, C - Consol. — See Separate Curves

H - Penetrometer (tsf)
W - Unit Dry Wt (pcf)
D - Relative Dens (%)

Drill Rod Energy Ratio : 0.75
Last Calibration Date : 2/20/2013
Drill Rig Number : S&ME ATV 550-2

JOB: 1117-14-058A

LOG OF BORING NO. B-8
DUBLIN COFFMAN PARK & RECREATION AREA
DUBLIN, OHIO

S&ME

LOCATION: See Plate 2 of Appendix. ELEVATION: 894.6 DATE: 11/7/14

DRILLING METHOD: 4-1/2" O.D. Continuous-flight Auger COMPLETION DEPTH: 8.0'

SAMPLER(S): 2" O.D. Split-barrel Sampler

ELEV.	DEPTH, FEET	SAMPLE NUMBER	SAMPLE	SAMPLE EFFORT	N_{60}	SAMPLE REC-%	DESCRIPTION	NATURAL CONSISTENCY INDEX / NATURAL MOISTURE CONTENT (PLASTIC LIMIT — LIQUID LIMIT; 10 20 30 40)	TEST RESULTS
894.4	0						TOPSOIL - 3 INCHES		
		1	■	4 / 7 / 5	15	87	Hard brown and dark-brown silty clay, little fine to coarse sand, trace fine to coarse gravel, few cobbles.		H=4.5+
891.1							Stiff to very-stiff brown mottled with gray silty clay, some fine to coarse sand, trace fine gravel.		
	5	2	■	9 / 17 / 24	51	80		●	H=1.25-2.5
		3	■	4 / 4 / 6	13	100			H=2.75-4.0
886.6									
	10						- No seepage encountered. - Encountered cobbles at 1.5' and 2.5'. - Elevations estimated from available topographic mapping and should be considered approximate.		
	15								
	20								
	25								

2010 NEW DEFAULT BORING LOG-W/ N60

WATER LEVEL:	"Dry"	
WATER NOTE:	At Completion	Caved at 5.5
DATE:	11/7/14	11/7/14

SYMBOLS USED TO INDICATE TEST RESULTS

G - Gradation, Q - Uncon Comp, T - Triax Comp, C - Consol. — See Separate Curves

H - Penetrometer (tsf)
W - Unit Dry Wt (pcf)
D - Relative Dens (%)

Drill Rod Energy Ratio : 0.75
Last Calibration Date : 2/20/2013
Drill Rig Number : S&ME
ATV 550-2

JOB: 1117-14-058A

LOG OF BORING NO. B-9
DUBLIN COFFMAN PARK & RECREATION AREA
DUBLIN, OHIO

S&ME

LOCATION: **See Plate 2 of Appendix.** ELEVATION: **895** DATE: **11/7/14**

DRILLING METHOD: **4-1/2" O.D. Continuous-flight Auger** COMPLETION DEPTH: **8.0'**

SAMPLER(S): **2" O.D. Split-barrel Sampler**

ELEV.	DEPTH, FEET	SAMPLE NUMBER	SAMPLE	SAMPLE EFFORT	N_{60}	SAMPLE REC-%	DESCRIPTION	NATURAL CONSISTENCY INDEX / NATURAL MOISTURE CONTENT (PLASTIC LIMIT — LIQUID LIMIT; 10 20 30 40)	TEST RESULTS
894.6	0						TOPSOIL - 5 INCHES		
		1	■	50-6"R		80	Stiff to very-stiff brown silty clay, some fine to coarse sand, trace fine gravel, few cobbles.		H=1.75-3.0
	5	2	■	16/21/27	60	100			H=3.0-3.5
		3	■	12/19/24	54	100			H=3.5-4.0
887.0							- No seepage encountered. - Encountered possible cobble at 1.0'. - Elevations estimated from available topographic mapping and should be considered approximate.		
	10								
	15								
	20								
	25								

2010 NEW DEFAULT BORING LOG-W/ N60

WATER LEVEL: "Dry"
WATER NOTE: At Completion
DATE: 11/7/14

SYMBOLS USED TO INDICATE TEST RESULTS

G - Gradation
Q - Uncon Comp
T - Triax Comp
C - Consol.
(See Separate Curves)

H - Penetrometer (tsf)
W - Unit Dry Wt (pcf)
D - Relative Dens (%)

Drill Rod Energy Ratio : 0.75
Last Calibration Date : 2/20/2013
Drill Rig Number : S&ME ATV 550-2

LOG OF BORING NO. B-10
DUBLIN COFFMAN PARK & RECREATION AREA
DUBLIN, OHIO

S&ME

LOCATION: See Plate 2 of Appendix. ELEVATION: 897 DATE: 11/7/14

DRILLING METHOD: 4-1/2" O.D. Continuous-flight Auger COMPLETION DEPTH: 8.0'

SAMPLER(S): 2" O.D. Split-barrel Sampler

ELEV.	DEPTH, FEET	SAMPLE NUMBER	SAMPLE	SAMPLE EFFORT	N_{60}	SAMPLE REC-%	DESCRIPTION	NATURAL CONSISTENCY INDEX / NATURAL MOISTURE CONTENT (PLASTIC LIMIT — LIQUID LIMIT; 10 20 30 40)	TEST RESULTS
896.8	0						TOPSOIL - 3 INCHES		
							Hard brown silty clay, little to some fine to coarse sand, trace fine gravel, possible cobble.		
		1	■	3/9/11	25	87			H=4.5+
	5	2	■	36/50-3"R		88			H=4.5+
		3	■	3/6/10	20	100			H=4.0-4.5+
889.0									
	10						- No seepage encountered. - Encountered possible cobble at 5.0'. - Elevations estimated from available topographic mapping and should be considered approximate.		
	15								
	20								
	25								

2010 NEW DEFAULT BORING LOG-W/ N60

WATER LEVEL: "Dry"
WATER NOTE: At Completion
DATE: 11/7/14

SYMBOLS USED TO INDICATE TEST RESULTS

G - Gradation, Q - Uncon Comp, T - Triax Comp, C - Consol. — See Separate Curves

H - Penetrometer (tsf)
W - Unit Dry Wt (pcf)
D - Relative Dens (%)

Drill Rod Energy Ratio : 0.75
Last Calibration Date : 2/20/2013
Drill Rig Number : S&ME
ATV 550-2

JOB: 1117-14-058A

LOG OF BORING NO. B-11
DUBLIN COFFMAN PARK & RECREATION AREA
DUBLIN, OHIO

S&ME

LOCATION: See Plate 2 of Appendix. ELEVATION: 896 DATE: 11/7/14

DRILLING METHOD: 4-1/2" O.D. Continuous-flight Auger COMPLETION DEPTH: 7.9'

SAMPLER(S): 2" O.D. Split-barrel Sampler

ELEV.	DEPTH, FEET	SAMPLE NUMBER	SAMPLE	SAMPLE EFFORT	N_{60}	SAMPLE REC-%	DESCRIPTION	NATURAL CONSISTENCY INDEX / NATURAL MOISTURE CONTENT (PLASTIC LIMIT – LIQUID LIMIT; 10 20 30 40)	TEST RESULTS
895.8	0						TOPSOIL - 3 INCHES		
		1	■	5 / 7 / 13	25	60	Very-stiff to hard brown silty clay, some fine to coarse sand, trace fine gravel, many cobbles.		H=2.5-4.0
	5	2	■	5 / 6 / 6	15	80			H=3.5-4.0
		3	■	10 / 12 / 20	40	93			H=4.0-4.5+
888.0							- No seepage encountered. - Encountered cobbles at 3.5', 5.0', 6.0' and 7.9'. - Elevations estimated from available topographic mapping and should be considered approximate.		
	10								
	15								
	20								
	25								

2010 NEW DEFAULT BORING LOG-W/ N60

WATER LEVEL: "Dry"
WATER NOTE: At Completion
DATE: 11/7/14

SYMBOLS USED TO INDICATE TEST RESULTS

G - Gradation
Q - Uncon Comp
T - Triax Comp
C - Consol.
(See Separate Curves)

H - Penetrometer (tsf)
W - Unit Dry Wt (pcf)
D - Relative Dens (%)

Drill Rod Energy Ratio : 0.75
Last Calibration Date : 2/20/2013
Drill Rig Number : S&ME ATV 550-2

JOB: 1117-14-058A

LOG OF BORING NO. B-12
DUBLIN COFFMAN PARK & RECREATION AREA
DUBLIN, OHIO

S&ME

LOCATION: **See Plate 2 of Appendix.** ELEVATION: **897.5** DATE: **11/7/14**

DRILLING METHOD: **4-1/2" O.D. Continuous-flight Auger** COMPLETION DEPTH: **8.0'**

SAMPLER(S): **2" O.D. Split-barrel Sampler**

ELEV.	DEPTH, FEET	SAMPLE NUMBER	SAMPLE	SAMPLE EFFORT	N_{60}	SAMPLE REC-%	DESCRIPTION	NATURAL CONSISTENCY INDEX / NATURAL MOISTURE CONTENT (PLASTIC LIMIT — LIQUID LIMIT)	TEST RESULTS
897.3	0						TOPSOIL - 3 INCHES	10 20 30 40	
		1	■	3 / 4 / 3	9	40	Very-stiff to hard brown silty clay, some fine to coarse sand, little fine to coarse gravel, few cobbles.		H=2.0-3.5
	5	2	■	5 / 6 / 8	18	87			H=2.0-3.5
		3	■	10 / 7 / 9	20	100			H=3.5-4.5
889.5									
	10						- No seepage encountered. - Encountered cobbles at 6.8'. - Elevations estimated from available topographic mapping and should be considered approximate.		
	15								
	20								
	25								

2010 NEW DEFAULT BORING LOG-W/ N60

WATER LEVEL: "Dry"
WATER NOTE: At Completion
DATE: 11/7/14

SYMBOLS USED TO INDICATE TEST RESULTS

G - Gradation
Q - Uncon Comp
T - Triax Comp
C - Consol.
(See Separate Curves)

H - Penetrometer (tsf)
W - Unit Dry Wt (pcf)
D - Relative Dens (%)

Drill Rod Energy Ratio : 0.75
Last Calibration Date : 2/20/2013
Drill Rig Number : S&ME
ATV 550-2

JOB: 1117-14-058A

LOG OF BORING NO. B-13
DUBLIN COFFMAN PARK & RECREATION AREA
DUBLIN, OHIO

S&ME

LOCATION: See Plate 2 of Appendix. ELEVATION: 896.8 DATE: 11/7/14

DRILLING METHOD: 4-1/2" O.D. Continuous-flight Auger COMPLETION DEPTH: 8.0'

SAMPLER(S): 2" O.D. Split-barrel Sampler

ELEV.	DEPTH, FEET	SAMPLE NUMBER	SAMPLE	SAMPLE EFFORT	N_{60}	SAMPLE REC-%	DESCRIPTION	NATURAL CONSISTENCY INDEX / NATURAL MOISTURE CONTENT (PLASTIC LIMIT – LIQUID LIMIT; 10 20 30 40)	TEST RESULTS
896.5	0						TOPSOIL - 4 INCHES		
		1	■	3/13/19	40	73	Very-stiff brown and dark-brown silty clay, trace fine to coarse sand, trace fine gravel.		H=3.25-4.0
893.3									
	5	2	■	10/27/40	84	40	Very-stiff to hard brown silty clay, some fine to coarse sand, trace fine gravel, few cobbles.		H=2.0-4.5
890.5									
		3	■	8/9/8	21	100	Hard brown silty clay, little fine to coarse sand, trace fine to coarse gravel.		H=4.0-4.5+
888.8									
	10						- No seepage encountered. - Encountered cobbles at 5.1'. - Elevations estimated from available topographic mapping and should be considered approximate.		
	15								
	20								
	25								

2010 NEW DEFAULT BORING LOG-W/ N60

WATER LEVEL: "Dry"
WATER NOTE: At Completion
DATE: 11/7/14

SYMBOLS USED TO INDICATE TEST RESULTS

G - Gradation
Q - Uncon Comp
T - Triax Comp
C - Consol.
(See Separate Curves)

H - Penetrometer (tsf)
W - Unit Dry Wt (pcf)
D - Relative Dens (%)

Drill Rod Energy Ratio : 0.75
Last Calibration Date : 2/20/2013
Drill Rig Number : S&ME
ATV 550-2

JOB: 1117-14-058A

LOG OF BORING NO. B-14
DUBLIN COFFMAN PARK & RECREATION AREA
DUBLIN, OHIO

S&ME

LOCATION: **See Plate 2 of Appendix.** ELEVATION: **890** DATE: **11/7/14**

DRILLING METHOD: **4-1/2" O.D. Continuous-flight Auger** COMPLETION DEPTH: **8.0'**

SAMPLER(S): **2" O.D. Split-barrel Sampler**

ELEV.	DEPTH, FEET	SAMPLE NUMBER	SAMPLE	SAMPLE EFFORT	N_{60}	SAMPLE REC-%	DESCRIPTION	NATURAL CONSISTENCY INDEX / NATURAL MOISTURE CONTENT (PLASTIC LIMIT — LIQUID LIMIT; 10 20 30 40)	TEST RESULTS
889.8	0						TOPSOIL - 3 INCHES		
							Hard brown silty clay, some fine to coarse sand, trace fine gravel, few cobbles.		
		1	■	5/8/8	20	53		●	H=4.0-4.5+
	5	2	■	5/7/8	19	100			H=4.0-4.5+
		3	■	3/6/8	18	100			H=4.0-4.5+
882.0									
	10						- No seepage encountered. - Encountered cobbles at 2.5' and 3.5'. - Elevations estimated from available topographic mapping and should be considered approximate.		
	15								
	20								
	25								

2010 NEW DEFAULT BORING LOG-W/ N60

WATER LEVEL: ▽ "Dry" ▼
WATER NOTE: At Completion
DATE: 11/7/14

SYMBOLS USED TO INDICATE TEST RESULTS

G - Gradation, Q - Uncon Comp, T - Triax Comp, C - Consol. — See Separate Curves

H - Penetrometer (tsf)
W - Unit Dry Wt (pcf)
D - Relative Dens (%)

Drill Rod Energy Ratio : 0.75
Last Calibration Date : 2/20/2013
Drill Rig Number : S&ME
ATV 550-2

LOG OF BORING NO. B-15
DUBLIN COFFMAN PARK & RECREATION AREA
DUBLIN, OHIO

S&ME

LOCATION: See Plate 2 of Appendix. ELEVATION: 889 DATE: 11/7/14

DRILLING METHOD: 4-1/2" O.D. Continuous-flight Auger COMPLETION DEPTH: 8.0'

SAMPLER(S): 2" O.D. Split-barrel Sampler

ELEV.	DEPTH, FEET	SAMPLE NUMBER	SAMPLE	SAMPLE EFFORT	N_{60}	SAMPLE REC-%	DESCRIPTION	NATURAL CONSISTENCY INDEX / NATURAL MOISTURE CONTENT (PLASTIC LIMIT – LIQUID LIMIT; 10 20 30 40)	TEST RESULTS
888.8	0						TOPSOIL - 3 INCHES		
		1	■	4 / 4 / 5	11	80	Stiff to very-stiff brown mottled gray silty clay, little fine to coarse sand, trace fine gravel.		H=1.5-2.0 G LL=63%
	5	2	■	5 / 7 / 7	18	100			H=2.0-2.5
882.8									
		3	■	5 / 8 / 11	24	100	Hard brown silty clay, little fine to coarse sand, trace fine to coarse gravel.		H=4.0-4.5+
881.0									
	10						- No seepage encountered. - Elevations estimated from available topographic mapping and should be considered approximate.		
	15								
	20								
	25								

2010 NEW DEFAULT BORING LOG-W/ N60

WATER LEVEL: "Dry"
WATER NOTE: At Completion
DATE: 11/7/14

SYMBOLS USED TO INDICATE TEST RESULTS

G - Gradation
Q - Uncon Comp
T - Triax Comp
C - Consol.
(See Separate Curves)

H - Penetrometer (tsf)
W - Unit Dry Wt (pcf)
D - Relative Dens (%)

Drill Rod Energy Ratio : 0.75
Last Calibration Date : 2/20/2013
Drill Rig Number : S&ME ATV 550-2

JOB: 1117-14-058A

SUMMARY OF LABORATORY TEST RESULTS

BORING	G'int Id.	MC	LL	PL	PI	GRADATION			COMPACTION		TRIAXIAL					DIRECT SHEAR			UNCONFIN COMPRESS	CONSOLID.	SPECIFIC GRAVITY	UNIT WEIGHT DRY	REMOLDED	PERMEABILITY				RELATIVE DENSITY	LOI	ROCK CORE	SHELBY TUBE	Slake Index
						sieve	Hydrometer short	Hydrometer long	standard	modified	unconsol. undrain	consolid undrain	w/ pores	drained	drained	undrain	residual							cohesive	non/cohes	rigid wall	flexible wall					
		%	%	%	%	* SEE INDIVIDUAL TEST CURVES															PCF						%	%			
B-3	**5.25**	**23.5**	**61**	**18**	**43**																											
B-4	**5.25**	**15.4**																														
B-5	**5.25**	**19.2**	**28**	**17**	**11**	*																										
B-8	**5.25**	**20.9**																														
B-10	**5.25**	**16.5**																														
B-13	**5.25**	**18.6**	**28**	**15**	**13**																											
B-14	**1.75**	**19.9**																														
B-15	**1.75**	**26.0**	**63**	**26**	**37**	*																										

S&ME

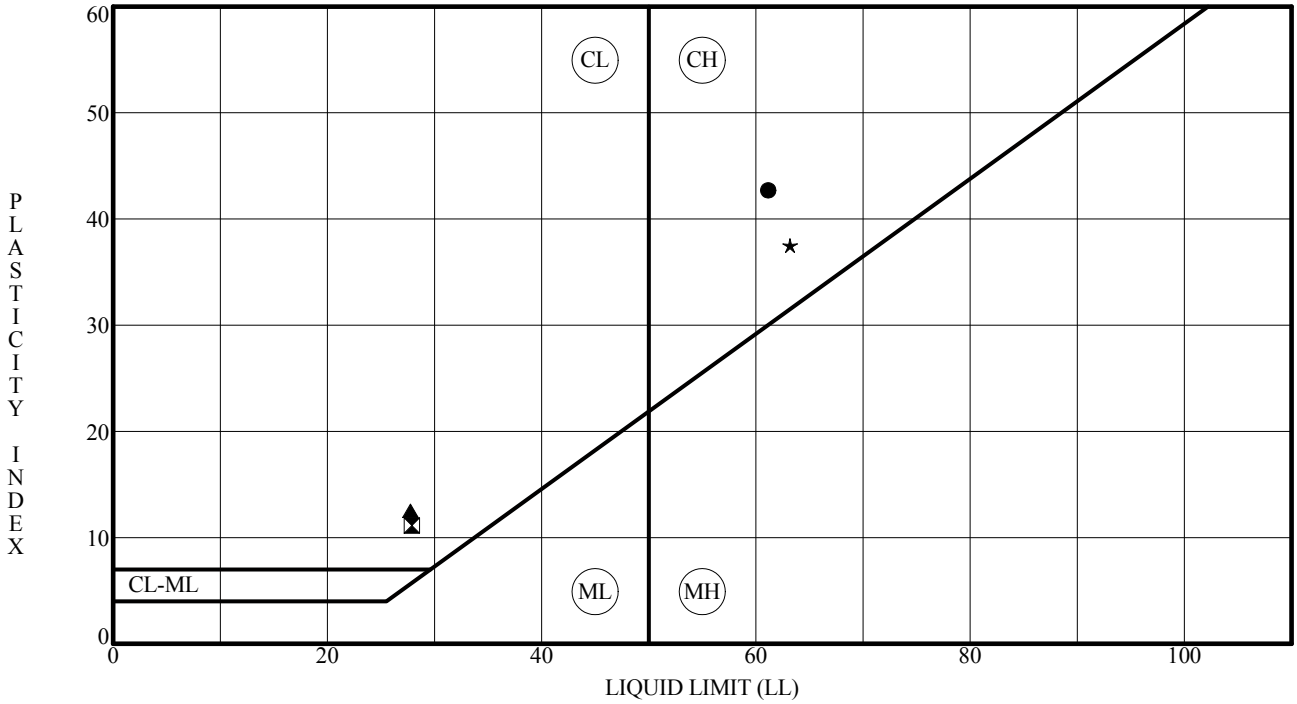
TESTING SUMMARY - STANDARD

PROJECT DUBLIN COFFMAN PARK & RECREATION AREA
LOCATION DUBLIN, OHIO
JOB NO. 1117-14-058A DATE 12/4/14

SUM REG

PLATE 19

ATTERBERG LIMITS' RESULTS - ASTM D4318

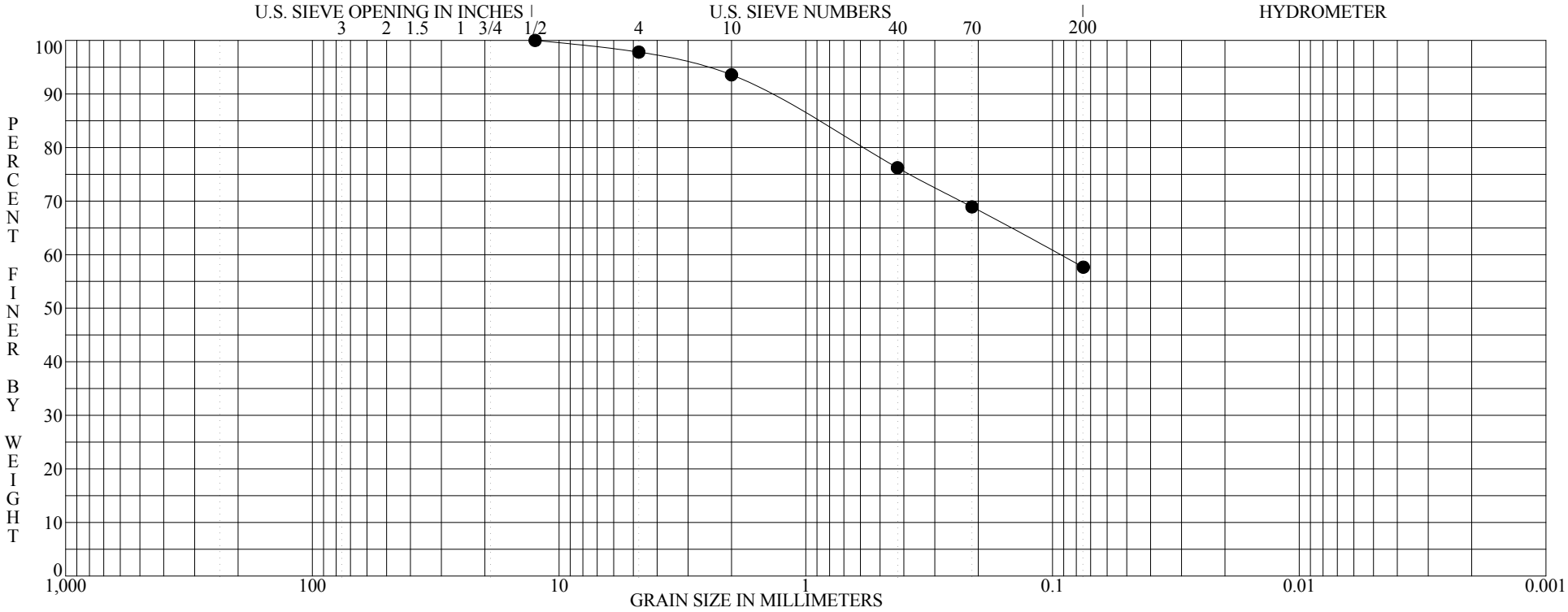


	Specimen Id.	Depth	MC	LL	PL	PI	Fines	ASTM Classification
●	**B-3**	**5.25**	**24**	**61**	**18**	**43**		
⧗	**B-5**	**5.25**	**19**	**28**	**17**	**11**	**57.7**	**SANDY LEAN CLAY CL**
▲	**B-13**	**5.25**	**19**	**28**	**15**	**13**		
★	**B-15**	**1.75**	**26**	**63**	**26**	**37**	**88.0**	**FAT CLAY CH**

PROJECT DUBLIN COFFMAN PARK & RECREATION AREA
LOCATION DUBLIN, OHIO
JOB NO. 1117-14-058A **DATE** 12/4/14

ALPI-REG

GRN-REG W/ASTM DESC.



BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		coarse	fine	coarse	medium	fine	

	Specimen Identification - Depth	Classification	MC%	LL	PL	PI	Cc	Cu
●	**B-5 S-2 4.5' to 5.4'**	**Brown mottled with gray silty clay "and" fine to coarse sand, trace fine gravel.**	**19**	**28**	**17**	**11**		
		SANDY LEAN CLAY CL						

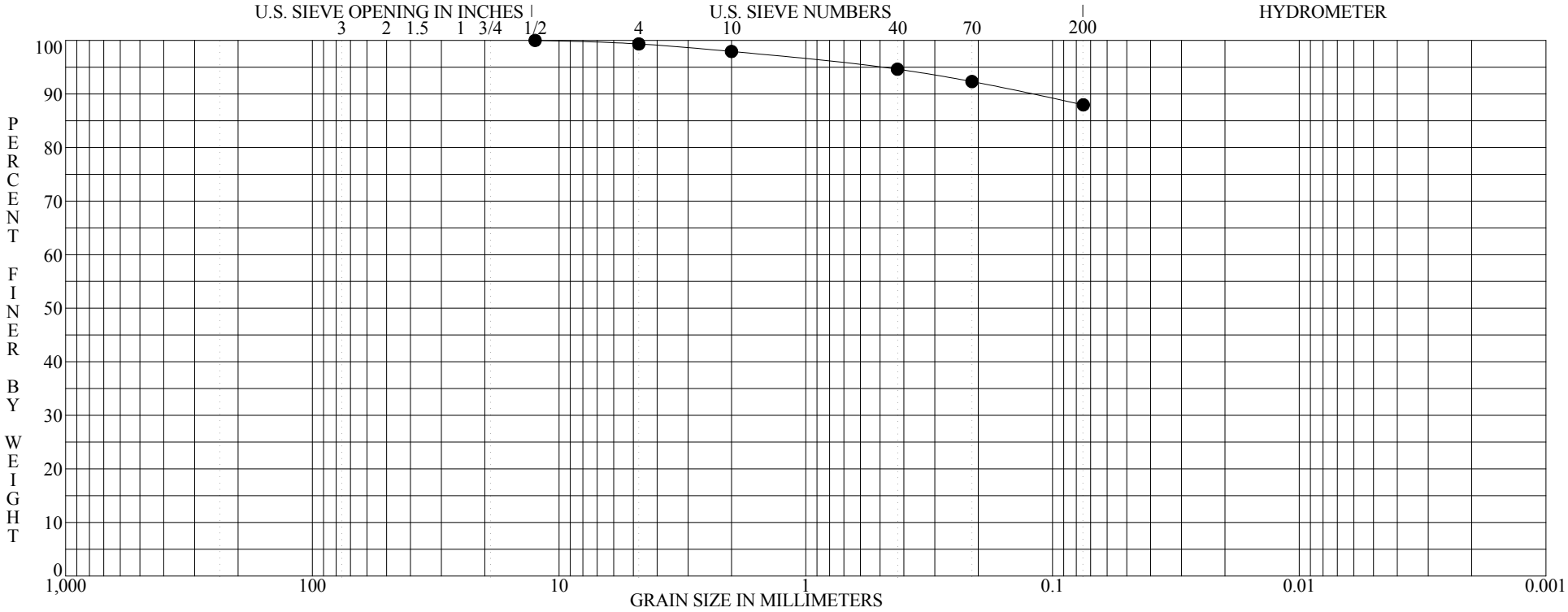
	Specimen Identification - Depth	D100	D95	D60	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-5 S-2 4.5' to 5.4'**	**12.5000**	**2.6706**	**0.0931**			**2.2**	**40.2**	**57.7**	

ASTM D422 | **GRADATION CURVE**

PROJECT: DUBLIN COFFMAN PARK & RECREATION AREA
LOCATION: DUBLIN, OHIO
JOB NO.: 1117-14-058A
DATE: 12/4/14

PLATE 21

GRN-REG W/ASTM DESC.



BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		coarse	fine	coarse	medium	fine	

	Specimen Identification - Depth	Classification	MC%	LL	PL	PI	Cc	Cu
●	**B-15 S-1 1.0' to 2.2'**	**Brown mottled with gray silty clay, little fine to coarse sand, trace fine gravel.**	**26**	**63**	**26**	**37**		
		FAT CLAY CH						

	Specimen Identification - Depth	D100	D95	D60	D50	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-15 S-1 1.0' to 2.2'**	**12.5000**	**0.5058**				**0.7**	**11.4**	**88.0**	

ASTM D422 | **GRADATION CURVE**

PROJECT: DUBLIN COFFMAN PARK & RECREATION AREA
LOCATION: DUBLIN, OHIO
JOB NO.: 1117-14-058A
DATE: 12/4/14

PLATE 22