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RGA No. 15001
3 November 2016

ADDENDUM NO. 3

LAKE FOREST SCHOOL DISTRICT
Lake Forest High School – Renovations
5423 Killens Pond Rd.
Felton, Delaware 19943

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BIDS DUE:

Wednesday, November 9, 2016 at 2:00 p.m.

LOCATION:

**Lake Forest School District
Central Business Office
5423 Killens Pond Rd.
Felton, Delaware 19943
Attn: Karl Stahre**

NOTICE TO ALL BIDDERS

1.0 GENERAL NOTES:

- 1.1 Bidders are hereby notified that this Addendum shall be and hereby becomes part of their Contract Documents, and shall be attached to the Project Manual for this project.
- 1.2 The following items are intended to revise and clarify the Drawings and Project Manual, and shall be included by the Bidder in their proposal.
- 1.3 Bidders shall verify that their Sub-bidders are in full receipt of the information contained herein.
- 1.4 A copy of the current bid set register is available upon request indicating individuals that have purchased project documents from R G architects.
- 1.5 All addenda will be sent out to the registered plan holders via email. Contractors are encouraged to keep an eye on their email accounts during the bidding periods for such updates. All interested parties are also encouraged to monitor www.mymarketplace.delaware.gov, where this project's cumulative solicitation documents are available for viewing.

2.0 Revisions to the SPECIFICATIONS

- 2.1 Replace Section 00 41 13 BID FORM in its entirety with specification section included with this addendum.
- 2.2 Specification Section 07 41 00, Paragraph 2.1.A.. Revise the basis of Design to read as follows:

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1. Manufacturer: MBCI
 2. Product: BattenLok HS 16" Metal Roof
 3. Color: Harbor Blue
- 2.3 Delete Specification Section 05 31 00 Steel Decking in its entirety.
- 2.4 Delete Specification Section 07 19 00 Water Repellents in its entirety.
- 2.5 Replace Section 07 21 00 THERMAL INSULATION in its entirety with specification section included with this addendum.
- 2.6 Add Specification Section 11 65 00 – TRACK AND FIELD EQUIPMENT, The entire specification section is included with this addendum.

3.0 Revisions to the DRAWINGS

- 3.1 Attached Sheet A80-1 Shall be included as part of Alternate #2.

4.0 QUESTIONS & ANSWERS

- Q.1. We cannot locate a drug testing affidavit in the project manual?
A. A revised bid form with drug testing affidavit is attached to this Addendum.
- Q.2. There are dugouts indicated on the civil drawings and a reference to see Architectural Drawings, however, we could not locate any dugout details in the architectural.
A. See attached sheet A80-1 – DUGOUT PLANS, SECTIONS & DETAILS. This work shall be included as part of Alternate Number 2.
- Q.3. Details are needed for Back Stops.
A. See Chain Link Backstop Detail, sheet CC-06.
- Q.4. Specifications are needed for Fencing.
A. See Chain Link Fence Detail, sheet CC-06.
- Q.5. For Alternate #1, on the CL-01 Landscape Plan there are 25 plants labeled "O" but no "O" identified in the planting schedule. Please advise.
A. Trees indicated with Label O shall be Sweetbay Magnolia. Size shall be in accordance with Appendix E, Table of Trees, of Chapter 187 of the Kent County Code.
- Q.6. Sheet CC02 – Video Inspection notes call for video inspection of "all piping". Does this pertain to new piping installation only or new and existing piping? Is this note required for the project? If so please clarify scope.
A. No video inspections are required for this job.
- Q.7. Alternate 2, specifications for signage are needed.
A. Signage is not part of this contract, and should be excluded from the bid.
- Q.8. Specifications are needed for Rubber Track.
A. Refer to sheet CC-04
- Q.9. Is there a Geo Report for the project or what topsoil thickness should we assume including inside the existing track?

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- A. A copy of the Geo Report is included with this addendum; however, the inside of the existing track is to become paved track surface or synthetic turf. No topsoil required. All other areas are to receive 6" Min. of topsoil, seeded, and mulched as discussed in construction note #9 on sheet CC-02.
- Q.10. Are we to assume a wet tap for the water line and what size is the new service?
- A. A wet tap would be preferable.
- Q.11. For sewer line tie in, is a saddle wye tie in acceptable?
- A. A saddle wye is acceptable.
- Q.12. Is there any curb work at the entrance?
- A. The only proposed curb is where the proposed front entrance walk ties into the existing sidewalk in front of the building.
- Q.13. Please clarify the hardware sets 3,2,5,15 noted in hardware specification as these are not noted on the door schedule?
- A. Door hardware sets 3, 2 & 5 are hardware sets for the future Agriscience Classroom building & not part of the Athletic Field House work. Hardware set 15 is used in the Athletic Field House work as noted on door schedule for openings 102B & 111B.
- Q.14. Agriscience pond, there is no outfall shown, but a detail for outlet structure is on the plan. Also for the collector drain what is the depth of stone required under the perforated ADS piping?
- A. The outfall structure shown on sheet CC-14 can be eliminated, as well as the trash rack detail on CC-17. The pond will overflow to a spill way (elevation 54.75) into the existing swale to the south.
- Q.15. The title sheet indicates CE-18 but none is included in the plans.
- A. There is no sheet CE-18 in the drawing documents. The CE-18 noted on the title sheet will be removed.
- Q.16. SS-101, Base Bid, can you confirm that the base bid does or does not include the joist and deck shown?
- A. The deck at the Agriscience Building is not part of this Bid submission. This Bid submission only involves the construction of the new foundation work for the Building. The Agriscience Building construction, including deck, will be part of separate Bid Package to be issued at a later date.
- Q.17. CE-02 indicates sidewalks to be demolished for addition, is this to be included in Alternate #1?
- A. No, these sidewalks shall remain. No removal is required.
- Q.18. CE-04 notes addition work and phasing, is this to be included in Alternate #1?
- A. Phase 1 as indicated in the Summary notes shall be omitted. There is no building addition being constructed. The site work at Central Elementary can be completed as a single phase.

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- Q.19. Is resilient floor tile and base to be used for flooring allowance only? We don't see where it is being used in the documents otherwise.
- A. Yes, it is only used as part of the allowance.
- Q.20. Sheet CE14 the bio area details do not list elevations to determine thickness of materials, please provide.
- A. Top Elevation = 52.00, 3" Mulch, 24" Bio-Media, and 12" Delaware #3 stone.
- Q.21. Is there new striping or curb work at the entrance road by new walks. (Reference plan CC07) Plan appears to indicate but nothing is called out.
- A. Provide 8' wide crosswalk striping, provide 3-8 curb with taper.
- Q.22. On sheet CE-14 Section A-A note says stone diaphragm and gives a size. I believe this may be the wrong detail. It appears the intent is to have stone from Elevation 52 up to Elev 54 on right side and Elev 55 on left?
- A. No stone diaphragm, 6" topsoil, seed and mulch.
- Q.23. Drawings show a roof drain detail but do not have any locations or qty. Please advise.
- A. No pop-up emitters, roof drains can splash to concrete splash blocks and runoff. See architectural plans for locations of roof drains
- Q.24. Please specify size of the new water service to the Agri- science Building.
- A. New water service is to be 1 1/2"
- Q.25. There is no information regarding existing topsoil depth on the drawings? For bidding purposes are we to assume 6"?
- A. Yes 6" topsoil, seed, and mulch per Construction Note #9 on Sheet CC-02.
- Q.26. Are we to use Building Wage Rates for the sitework portion of the agri science building or highway wage rates?
- A. The site work portion for the Agriscience Classroom, Base bid, site work, should use the HIGHWAY CONSTRUCTION Rates.
- Q.27. There is no discussion in the documents regarding the soil compaction testing and inspections. Who is responsible to provide this testing. If by contractor please include testing requirements for earthwork.
- A. Inspections shall be handled by the owner.
- Q.28. Sheet CC 13 please provide new dugout sizes and details.
- A. See attached sheet A80-1..
- Q.29. Please provide further description / detail for the lines shown in hatched area at the just outside of the north end zone.
- A. See attached specification section.
- Q.30. Are we to provide the building pad prep, SWM # 3 and grading shown around the proposed building as part of Alternate 1

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- A. The building addition is not being constructed, and the associated SWM #3 and grading shall be excluded from Alternate #1.
- Q.31. Dwg CN04 states Drive Aisle @ Central ES to be part of the base bid. Is this correct?
- A. Drive aisle is part of Alternate 1 work, not Base Bid work.
- Q.32. SWM # 1 Section A-A detail for the #3 stone layer the detail shows 1' deep however according the elevations this depth should be 3.75' Deep please confirm reference to 1' gravel diaphragm is incorrect for 3" stone in detail A-A.
- A. 3.75' is correct.
- Q.33. Is the GC providing scoreboards 1 and 2? If so please provide specifications and details.
- A. The scoreboards are not part of this project, however the electrical feed is part of the contract.
- Q.34. Spec section 051213 Architecturally Exposed Structural Steel Framing requires the fabricator and installer to be AISC certified. Can this requirement be waived so as long as the steel is fabricated and erected in accordance with AISC standards?
- A. Yes
- Q.35. Section 051213-1.5.D Mockups – will a mockup of a painted steel truss be required?
- A. No
- Q.36. Please clarify if the AESS trusses are to be galvanized and painted or just painted.
- A. Trusses shall be primed and painted
- Q.37. Will allowance 1 & 2 be a part of base bid?
- A. All allowances shall be included as part of the bas bid.

5.0 ATTACHMENT LIST:

- 5.1 Specification Section 00 41 13 - Bid Form
- 5.2 Specification Section 01 21 00 – Allowances
- 5.3 Specification Section 07 21 00 – Thermal Insulation
- 5.4 Specification Section 11 65 00 – Track and Field Equipment
- 5.5 Geotechnical Subsurface Exploration Report
- 5.6 Drawings Sheet A80-1 – Dugout Plans, Sections & Details – Alternate No. 2

End of Addendum No. 3

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BID FORM

ALLOWANCE ACKNOWLEDGEMENT

ALLOWANCE #1: We have included an allowance amount equal to \$20,000.00 for miscellaneous costs not identified on the bid documents. I/We have reviewed and familiarized ourselves with the requirements contained in Specification Section 01 21 00 Allowances.

Acknowledged by: _____

ALLOWANCE #2: We have included an allowance amount equal to \$20,000.00 for Flooring Replacement and Storefront modifications. I/We have reviewed and familiarized ourselves with the requirements contained in Specification Section 01 21 00 Allowances.

Acknowledged by: _____

ALLOWANCE #3: We have included an allowance amount equal to \$60,000.00 for Irrigation System. I/We have reviewed and familiarized ourselves with the requirements contained in Specification Section 01 21 00 Allowances.

Acknowledged by: _____

ADDENDA ACKNOWLEDGEMENT

By initialing next to each line below, I/We hereby acknowledge receipt of the following addenda, and further acknowledges that the information and changes in these Addenda has been taken into account, and the price(s) include any cost/schedule impact they may have.

<u>Addendum No.</u>	<u>Date Issued</u>	<u>#Pages</u>	<u>Confirmation of receipt</u>
1	25 Oct 2016	7	_____
2	1 Nov 2016	15	_____
3	3 Nov 2016	36	_____

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BID FORM

This bid shall remain valid and cannot be withdrawn for thirty (30) days from the date of opening of bids, and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid.

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

Should I/We be awarded this contract, I/We pledge to achieve substantial completion of all the work within _____ calendar days of the Notice to Proceed.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

(State of Corporation)

Business Address: _____

Witness: _____ By: _____
(SEAL) (Authorized Signature)

(Title)
Date: _____

ATTACHMENTS

- Sub-Contractor List
- Non-Collusion Statement
- Bid Security
- (Others as Required by Project Manuals)

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BID FORM

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 6962 (d)(10)b Delaware Code, the following sub-contractor listing must accompany the bid submittal. The name and address of the sub-contractor **must be listed for each category** where the bidder intends to use a sub-contractor to perform that category of work. In order to provide full disclosure and acceptance of the bid by the *Owner*, it is **required** that bidders list themselves as being the sub-contractor for all categories where he/she is qualified and intends to perform such work.

<u>Subcontractor Category</u>	<u>Subcontractor</u>	<u>Address (City & State)</u>	<u>Subcontractors tax payer ID # or Delaware Business license #</u>
1. Demolition	_____	_____	_____
2. Sitework	_____	_____	_____
3. Paving	_____	_____	_____
4. Fencing	_____	_____	_____
5. Turf Field Installer	_____	_____	_____
6. Track Surface Installer	_____	_____	_____
7. Masonry	_____	_____	_____
8. Roofing	_____	_____	_____
9. Mechanical	_____	_____	_____
10. Electrician	_____	_____	_____

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BID FORM

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date (*to the Office of Management and Budget, Division of Facilities Management*).

All the terms and conditions of (*Project or Contract Number*) have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE (TYPED): _____

AUTHORIZED REPRESENTATIVE (SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

E-MAIL: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20_____.

My Commission expires _____ NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

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BID FORM

**AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM**

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____, NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements governing allowances.
 - 1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.
 - 2. Any unused monies of the allowance shall be returned to the owner via a credit change order at the end of the project, and will be reflected in the final application for payment.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.
- C. Related Sections include the following:
 - 1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders for allowances.
 - 2. Division 01 Section "Unit Prices" for procedures for using unit prices.
 - 3. Division 01 Section "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.
 - 4. Divisions 02 through 49 Sections for items of Work covered by allowances.

1.3 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

- C. Purchase products and systems selected by Architect from the designated supplier.

1.4 SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.
- B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.5 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.6 LUMP-SUM ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner under allowance and shall include taxes, freight, and delivery to Project site.
- B. Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner under allowance shall be included as part of the Contract Sum and not part of the allowance.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1: Include an allowance entitled “General Owner’s Allowance”, in the amount of \$20,000. This allowance will be utilized by the owner for owner-elected changes to the work. Any or all unused allowance monies shall be returned to the owner via a credit change order at the end of the project. This allowance shall be carried as an individual line-item on the Applications for Payment.
- B. Allowance No.2: Include an allowance entitled “Storefront & Flooring Allowance”, in the amount of \$20,000.00. This allowance will be utilized for flooring replacement and storefront modifications. Any or all unused allowance monies shall be returned to the owner via a credit change order at the end of the project. This allowance shall be carried as an individual line-item on the Application for Payment.
- C. Allowance No.3: Include an allowance entitled “Irrigation System Allowance”, in the amount of \$60,000.00. This allowance will be utilized for installation of underground irrigation systems. Any or all unused allowance monies shall be returned to the owner via a credit change order at the end of the project. This allowance shall be carried as an individual line-item on the Application for Payment.

END OF SECTION 01 21 00

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1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Insulation under slabs-on-grade.
 - 2. Foundation wall insulation.
 - 3. Concealed building insulation.
- B. Related Sections include the following:
 - 1. Division 2 for insulated drainage panels.
 - 2. Division 3 cast-in-place concrete.
 - 3. Division 4 for insulation installed in cavity walls.
 - 4. Division 7 for insulation specified as part of roofing construction.
 - 5. Division 9 for insulation installed as part of metal-framed wall and partition assemblies.
 - 6. Division 15 mechanical system insulation.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: Full-size units for each type of exposed insulation indicated.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for insulation products.
- D. Research/Evaluation Reports: For foam-plastic insulation.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of building insulation through one source.
- B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1. Surface-Burning Characteristics: ASTM E 84.
2. Fire-Resistance Ratings: ASTM E 119.
3. Combustion Characteristics: ASTM E 136.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect plastic insulation as follows:
 1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
 2. Protect against ignition at all times. Do not deliver plastic insulating materials to Project site before installation time.
 3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

2 PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Extruded-Polystyrene Board Insulation:
 - a. Dow Chemical Company.
 - b. Owens Corning.
 - c. Tenneco Building Products.
 2. Extruded-Polystyrene Drainage Panels:
 - a. DiversiFoam Products.
 - b. Dow Chemical Company.
 - c. Owens Corning.
 3. Glass-Fiber Insulation:
 - a. CertainTeed Corporation.
 - b. Johns Manville Corporation.
 - c. Owens Corning.

2.2 INSULATING MATERIALS

- A. General: Provide insulating materials that comply with requirements and with referenced standards.
 - 1. Preformed Units: Sizes to fit applications indicated; selected from manufacturer's standard thicknesses, widths, and lengths.
- B. Extruded-Polystyrene Board Insulation: ASTM C 578, of type and density indicated below, with maximum flame-spread and smoke-developed indices of 75 and 450, respectively:
 - 1. Type IV, 1.60 lb/cu. ft. (26 kg/cu. m), unless otherwise indicated.
- C. Foil-Faced, Glass-Fiber Board Insulation: ASTM C 612, Type IA or Types IA and IB; faced on one side with foil-scrim-kraft or foil-scrim-polyethylene vapor retarder, with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; and of the following properties:
 - 1. Nominal density of 2.25 lb/cu. ft. (36 kg/cu. m), thermal resistivity of 4.3 deg F x h x sq. ft./Btu x in. at 75 deg F (29.8 K x m/W at 24 deg C).

2.3 AUXILIARY INSULATING MATERIALS

- A. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.

2.4 INSULATION FASTENERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
- B. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Adhesively Attached, Spindle-Type Anchors:
 - a. AGM Industries, Inc.; Series T TACTOO Insul-Hangers.
 - b. Eckel Industries of Canada Limited; Stic-Klip Type N Fasteners.
 - c. Gemco; Spindle Type.
 - 2. Anchor Adhesives:
 - a. AGM Industries, Inc.; TACTOO Adhesive.
 - b. Eckel Industries of Canada Limited; Stic-Klip Type S Adhesive.
 - c. Gemco; Tuff Bond Hanger Adhesive.
- C. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of thickness indicated securely in position indicated with self-locking washer in place; and complying with the following requirements:
 - 1. Plate: Perforated galvanized carbon-steel sheet, 0.030 inch (0.762 mm) thick by 2 inches (50 mm) square.

2. Spindle: Copper-coated, low carbon steel, fully annealed, 0.105 inch (2.67 mm) in diameter, length to suit depth of insulation indicated.
- D. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.

3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for Sections in which substrates and related work are specified and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of substances harmful to insulations or vapor retarders, including removing projections capable of puncturing vapor retarders or of interfering with insulation attachment.
- B. Close off openings in cavities receiving poured-in-place insulation to prevent escape of insulation. Provide bronze or stainless-steel screens (inside) where openings must be maintained for drainage or ventilation.

3.3 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice and snow.
- C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Water-Piping Coordination: If water piping is located on inside of insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.
- E. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.

3.4 INSTALLATION OF PERIMETER AND UNDER-SLAB INSULATION

- A. On vertical surfaces, set units in adhesive applied according to manufacturer's written instructions. Use adhesive recommended by insulation manufacturer.
 - I. If not indicated, extend insulation a minimum of 24 inches (610 mm) below exterior grade line.

3.5 INSTALLATION OF GENERAL BUILDING INSULATION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Seal joints between closed-cell (nonbreathing) insulation units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.
- C. Set vapor-retarder-faced units with vapor retarder to warm side of construction, unless otherwise indicated. Do not obstruct ventilation spaces, except for firestopping.
 - 1. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.
- D. Install mineral-fiber blankets in cavities formed by framing members according to the following requirements:
 - 1. Use blanket widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
 - 2. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping stapling flanges to flanges of metal studs.
- E. Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:
 - 1. Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application indicated.
 - 2. After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation below indicated thickness.
 - 3. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.
- F. Stuff glass-fiber, loose-fill insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).

3.6 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07210

SECTION 11 6500

PART 1 – GENERAL

1.01 SUMMARY

A. This section may include, but is not limited to the following track & field equipment:

1. Pole Vault Box and Lid.

B. Related Sections: Review Contract Documents for requirements that affect work of this section.

Specification sections that directly relate to work of this section include, but are not limited to:

Section 33 3000 – Site Improvements

Section 32 1826 - Synthetic Grass Surfacing

Section 32 1822 – Synthetic Athletic & Sports Surfacing

Section 12 9300 – Site Furnishings

Section 03 3000 – Cast-in-Place Concrete

1.02 SUBMITTALS

A. Product Data: Submit manufacturer's product literature, technical specifications, and other data required to demonstrate compliance with specified requirements for all athletic equipment.

1.03 QUALITY ASSURANCE

A. Fabrication and installation of site improvements by experienced craftsmen with excellent record of performance on completed projects of comparable size, scope, and quality.

B. All materials, hardware and furnishings shall be new, first quality.

1.04 FIELD MEASUREMENTS

A. Contractor shall verify position and layout of track and field equipment. Verify dimensions by field measurements.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers and product selections named are provided to establish the minimum standard and shall comply with NFHS requirements. Equipment shall be as manufactured by:

SportsEdge®

P.O. Box 837

259 Murdock Rd.

Troutman, NC 28166

P: 800-334-6057

www.sportsedge.com

2.02 TRACK AND FIELD EQUIPMENT

A. General: Provide equipment complying with NFHS and NCAA requirements.

B. Pole Vault Box with Cover:

1. Vault Box Model SE502, fabricated from 5052-H32 Grade aluminum, (1/4") .25" thick, folded to eliminate sharp edges. The box backstop is formed from (1/4") .25" Aluminum plate welded to the sides and bottom with one continuous weld along the outside edge. Outer side wings to anchor into the encasement concrete.

2. Vault Box Lid Model SE50201, manufactured from (1/4") .25" thick 6061-T6 aluminum plate, with two welded angle vertical supports to stiffen and support the lid the box.

PART 3: EXECUTION

3.03 INSTALLATION

A. All athletic equipment shall be installed as recommended by manufacturer's written directions, and as indicated on the drawings.

-- END OF SECTION --

GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND
ENVIRONMENTAL CONSULTANTS

A Practicing Geoprofessional Business Association Member Firm



May 15, 2016

R G Architects, LLC
200 West Main Street
Middletown, Delaware 19709

Attn: Mr. Robert A. Grove, A.I.A., Principal

Re: Subsurface Exploration
Lake Forest High School Elementary School
Felton, Kent County, Delaware

Gentlemen:

Per our agreement dated April 28, 2016, Geo-Technology Associates, Inc. (GTA) has performed a subsurface exploration for the proposed stormwater management devices to be installed in conjunction with the proposed renovations and additions at the Lake Forest High School in Felton, Delaware. Provided herein are the results of the subsurface exploration, infiltration testing, and recommendations for design and construction of the proposed stormwater management (SWM) facility at this site. Our scope of services consisted of performing three hand augers probe to evaluate the subsurface and groundwater conditions. GTA performed infiltration tests at 3 locations provided by Landmark Science & Engineering (Landmark) within the proposed SWM facility area. GTA was provided an *Infiltration Testing Plan*, dated January 21, 2015 for our use. This plan indicated the location of the existing structures and pavements, the existing topography, and the general area of the proposed stormwater management facility.

Site Description

The subject site is located along the north side of Killens Pond Road, west of Chimney Hill Road, Kent County, Delaware, as shown on the *Site Location Map, Figure 1*. Specifically, the subject site is located at 5407 Killens Pond Road in Felton, Delaware. At the time our exploration was performed, the site consisted of developed land with an existing 139,080 square foot school building, associated utilities and paved parking/driveways. The site is bound by wooded property and agricultural land to the north, east and west, and Killens Pond Road to the south. Based on a review of the referenced plans, topography at the site is nearly level to gently sloping with surface grades generally trending from northwest to southeast from about elevation (EL) 38 to 58, respectively.

Proposed Construction

We understand a new structure will be constructed north of the existing parking lot near the agricultural buildings and greenhouses. It appears that renovations will be performed to the

18 Boulden Circle, Suite 36, New Castle, Delaware 19720

(302) 326-2100

Fax: (302) 326-2399

◆Abingdon, MD ◆Baltimore, MD ◆Laurel, MD ◆Frederick, MD ◆Waldorf, MD ◆Sterling, VA ◆Fredericksburg, VA ◆Malvern, OH
◆Somerset, NJ ◆NYC Metro ◆Georgetown, DE ◆York, PA ◆Quakertown, PA ◆Towanda, PA ◆Charlotte, NC Raleigh, NC

Visit us on the web at www.gtaeng.com

grandstand at the existing football field. Site improvements will also include construction of a new stormwater management facility. GTA anticipates that best management practices for water quality and quantity management will be utilized to comply with DNREC and Kent County specifications and regulations. Information regarding the type or size of SWM facility was not provided for GTA's consideration; however, it is anticipated that recharge systems may be designed as closed infiltration, utilizing Storm Tech chambers, dry basins or similar devices. We understand that the SWM area will be sized according to the temporary storage requirements.

Geology

According to the *Geologic Map of Kent County Delaware* (DGS, 2007), published by the Delaware Geological Survey, the site vicinity is situated in the Coastal Plain Physiographic, which is characterized by undifferentiated and interlayered sedimentary deposits derived from eroded and transported rock formations to the north. Specifically, the map indicates that the site is underlain by the Pleistocene Age Colombia Formation consisting of yellowish to reddish-brown to brown, fine to coarse grained quartz sand with varying amounts of gravel and interbedded layers of clayey silt to sandy silt throughout.

The site soils are mapped as Fort Mott loamy sand (FmB) and Rosedale loamy sand (RoA) series soils per the USDA Web Soil Survey. The Fort Mott loamy soils are described as deep, well-drained soils, with a depth to groundwater greater than 80 inches. The Rosedale loamy soils are described as deep, well-drained soils, with a depth to groundwater ranging from 40 to 72 inches. Refer to the publications for additional information.

The Delaware Geological Information Resource (DGIR) map viewer <http://maps.dgs.udel.edu/dgir/> indicates the water table ranges from 9 to 16 feet below existing grades during the normal season and approximately 6 to 9 feet below existing grades during the wet season over the majority of the subject site area. According to the Summary of Water Conditions prepared by Delaware Geological Survey (DGS), December 2015 summary, the groundwater levels were up to 6 to 8 feet lower than the historic seasonal highs in Kent County at the time the subsurface exploration was performed. Refer to the publications for additional information.

Subsurface Exploration and Infiltration Testing

The subsurface exploration and infiltration testing were performed on April 29, 2016. The hand auger probes were excavated to depths ranging from approximately 7 to 9½ feet below the ground surface using hand auger equipment. The corresponding test logs are attached to this letter. An instrument survey for elevation or location was not performed at the test locations and the elevations indicated were interpolated from the site topography shown on the aforementioned *Infiltration Testing Plan* prepared by Landmark. Therefore, it should be understood that all elevations, as well as transitions in soil strata indicated on the auger probe logs, are approximate. Test locations are shown on the attached *Exploration Location Plan, Figure 2*. Infiltration testing was performed at the test depths indicated on the auger probe logs.

The hand auger probes generally confirmed the published geology, encountering soils of the Columbia Formation. Topsoil was encountered to be approximately 3 to 6 inches in thickness at the test locations. Underlying the topsoil, the auger probes generally encountered granular materials visually classified silty and clayey sands with lesser amounts of gravel and poorly-graded sands containing silt. Logs of the auger probes are included with this letter.

No water was observed within the hand auger probes throughout the depths explored. The holes were backfilled the same day for safety considerations, therefore, 24-hour water readings or short term water levels were not obtained. The results of the subsurface exploration are summarized on the attached auger probe logs. Although groundwater was not encountered during our exploration, seasonal fluctuations of several feet can occur with variations in precipitation throughout the year.

After observing the soil conditions to evaluate any limiting zones within the soil profile, off-set auger probes were excavated and infiltration testing was performed at depths of 5½ and 8 feet below ground surface. Given the anticipated depth of the proposed stormwater basin invert and the proximity to active school facilities, the infiltration testing at locations was performed using the borehole method. The borehole method consists of installing a solid, 4-inch diameter casing within a hand-auger advanced hole to the bottom of the borehole. A four-inch gravel layer was placed at the bottom of the casing to protect the subgrade soils from scouring and sediment. The holes were then pre-soaked over a one-hour period by filling the casing with 12 inches of water. After the pre-soak period, water was added in 24-inch increments, and water level measurements were taken at approximately 10 to 15 minute intervals over a two-hour period. The steady state values for the tests are recorded in the table below.

FIELD INFILTRATION TEST SUMMARY

Test Pit	Approximate Test Depth, feet (EL)	USCS Soil Description	Unfactored Field Infiltration Rate
IFT-1	8 (EL 47)	Poorly-graded SAND with Silt	6 inches per hour
IFT-2	5½ (EL 42.5)	Poorly-graded SAND with Silt	9 inches per hour
IFT-3	5½ (EL 42.5)	Poorly-graded SAND with Silt	10 inches per hour

Conclusions and Recommendations

The guidelines established in the Delaware Sediment and Stormwater program technical Document Article 3.06, Appendix 3.06.2. *A-1 Soil Investigation Procedures* indicate that the minimum infiltration rate for all runoff reduction and infiltration practices is 1 inch per hour. Also, a vertical separation of two (2) feet from the seasonal high groundwater elevation is required for all infiltration practices unless an underdrain is provided.

Unfactored field measured infiltration rates were measured to be 6 to 10 inches per hour. Due to silty and clayey soils encountered within the near surface materials, infiltration within the SWM area will be marginal within the upper 2 to 4 feet near at IFT-1. However, infiltration practices in these soils or at these depths may be feasible in these areas by over-excavation or replacement with open-graded aggregate, depending on final design and a review of the site conditions.

We recommend that a design infiltration rate of no more than 25 to 50 of the field measured rate for that test location and depth be used for the final design of the facility. We do not recommend averaging rates at various locations and applying the averaged rate to the site or per facility. This recommendation is based on the inherent problems associated with these systems as they become less permeable due to densification during construction and partial clogging or siltation occurring over time. Groundwater was not encountered during drilling and is not expected to be a problem during construction of the underground storage facilities.

Once the design of the facility has been completed, GTA should be provided the opportunity to review the plans to evaluate if the geotechnical issues have been addressed. Also, GTA should be provided the opportunity to review the facility subgrade during construction and perform additional field testing, if warranted. This is to observe compliance with the design concepts, specifications or recommendations, and to allow for field changes in the event that the soils conditions differ from that anticipated prior to that start of construction.

GTA recommends that the below grade facilities or stone trenches be excavated using a track-mounted excavator or other equipment which will generally eliminate the need to operate equipment directly on the subgrade. The subgrade should be founded in natural soils, and hand cleaned to remove any disturbed soil prior to placing the foundation stone or infiltration media. Based on the field explorations, the proposed below grade SWM facility subgrade should be designed with a bearing pressure of up to 3,000 psf. Additionally, depending on the type of system used, the below grade system may need to be backfilled using structural fill. Structural fill recommendations, if required for this project, can be provided once the system design is complete.

Limitations

This report, including all supporting logs, field data, field notes, calculations, estimates and other documents prepared by GTA in connection with this Project have been prepared in accordance with generally accepted engineering practice. All terms and conditions set forth in the Agreement and the General Provisions attached thereto are incorporated herein by reference. No warranty, express or implied, is made herein. Use and reproduction of this report by any other person without the expressed written permission of GTA is unauthorized and such use is at the sole risk of the user.

The analysis and recommendations contained in this report are based on the data obtained from limited observation and testing of the encountered materials. Hand auger probes indicate soil conditions only at specific locations and times and only at the depths penetrated. They do not necessarily reflect strata or variations that may exist between exploration locations. Consequently, the analysis and recommendations must be considered preliminary until the subsurface conditions can be verified by direct observation at the time of construction. If variations of subsurface conditions from those described in this report are noted during construction, recommendations in this report may need to be re-evaluated.

In the event that any changes in the nature, design, or location of the facilities are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report are verified in writing. Geo-Technology Associates, Inc. is not responsible for any claims, damages, or liability associated with interpretation of subsurface data or reuse of the subsurface data or engineering analysis without the expressed written authorization of Geo-Technology Associates, Inc.

We appreciate the opportunity to be of assistance on this project. Should you have questions, please contact our office at 302-326-2100.

Very truly yours,
GEO-TECHNOLOGY ASSOCIATES, INC.

Meghan Lester

Meghan Lester, P.E.
Principal



TK/ML/amd
160849

Attachments:

- ASFE Important Information Regarding Your Geotechnical Engineering Report
- Figure 1: Site Location Map
- Figure 2: Exploration Location Plan
- Notes for Exploration Logs
- Exploration Logs (IFT-1 through IFT-3)

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled.* No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be, and, in general, if you are the least bit uncertain about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.*

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may

perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old*.

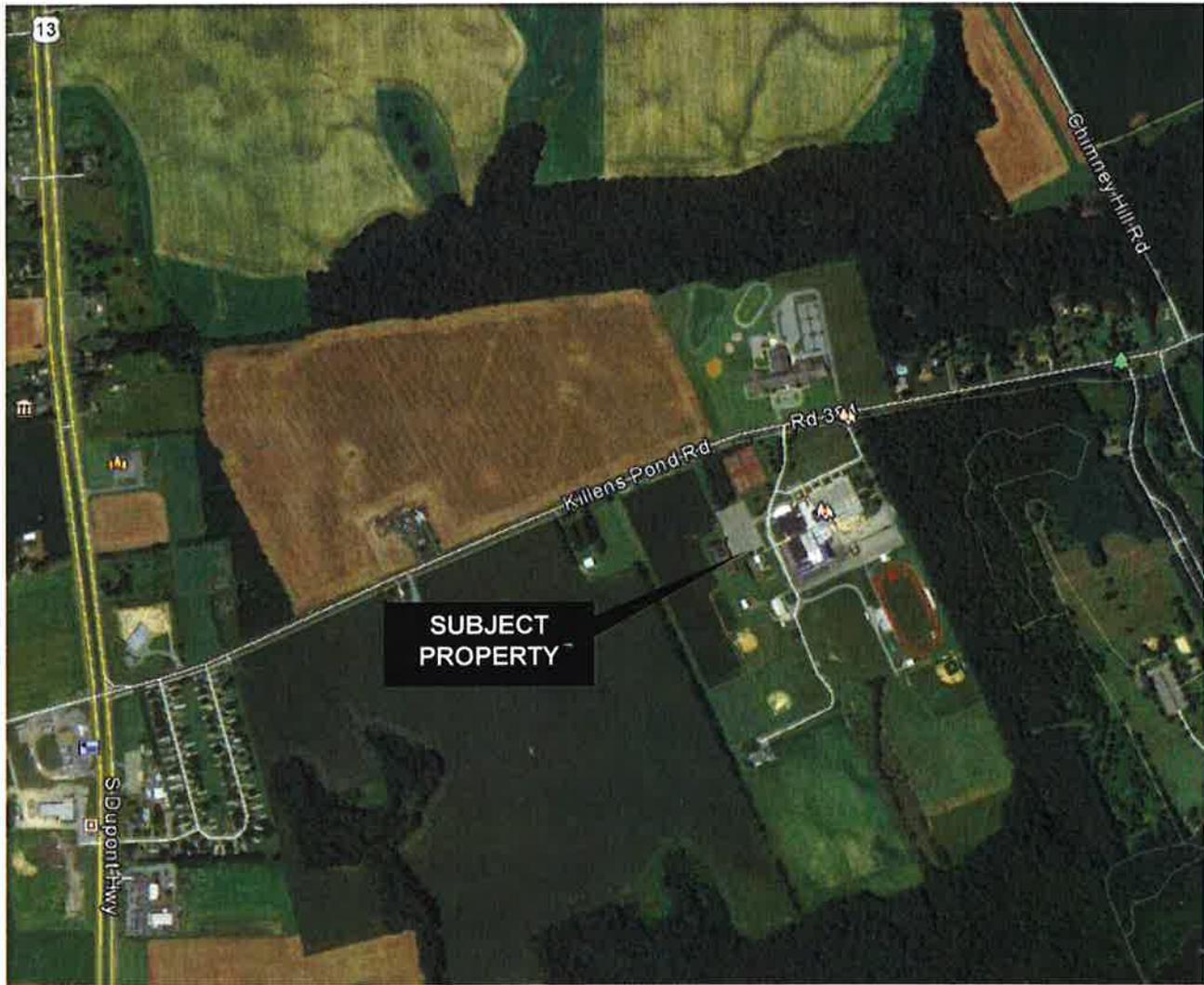
Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, *proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration*. Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. *Geotechnical engineers are not building-envelope or mold specialists*.



Telephone: 301/565-2733

e-mail: info@geoprofessional.org www.geoprofessional.org



Notes: (1) Layout was obtained from a Google Earth Imagery, dated July 9, 2015.
 (2) Site Location Plan should be read together with GTA Report #160849 for complete evaluation.



GEO-TECHNOLOGY ASSOCIATES, INC.
Geotechnical and Environmental Consultants
 18 Boulden Circle, Suite 36
 New Castle, Delaware 19720
 (302) 326-2100
 Fax (302) 326-2399

SITE LOCATION PLAN
 LAKE FOREST HIGH SCHOOL
 KENT COUNTY, DELAWARE

SCALE
 NTS

DATE
 MAY 2016

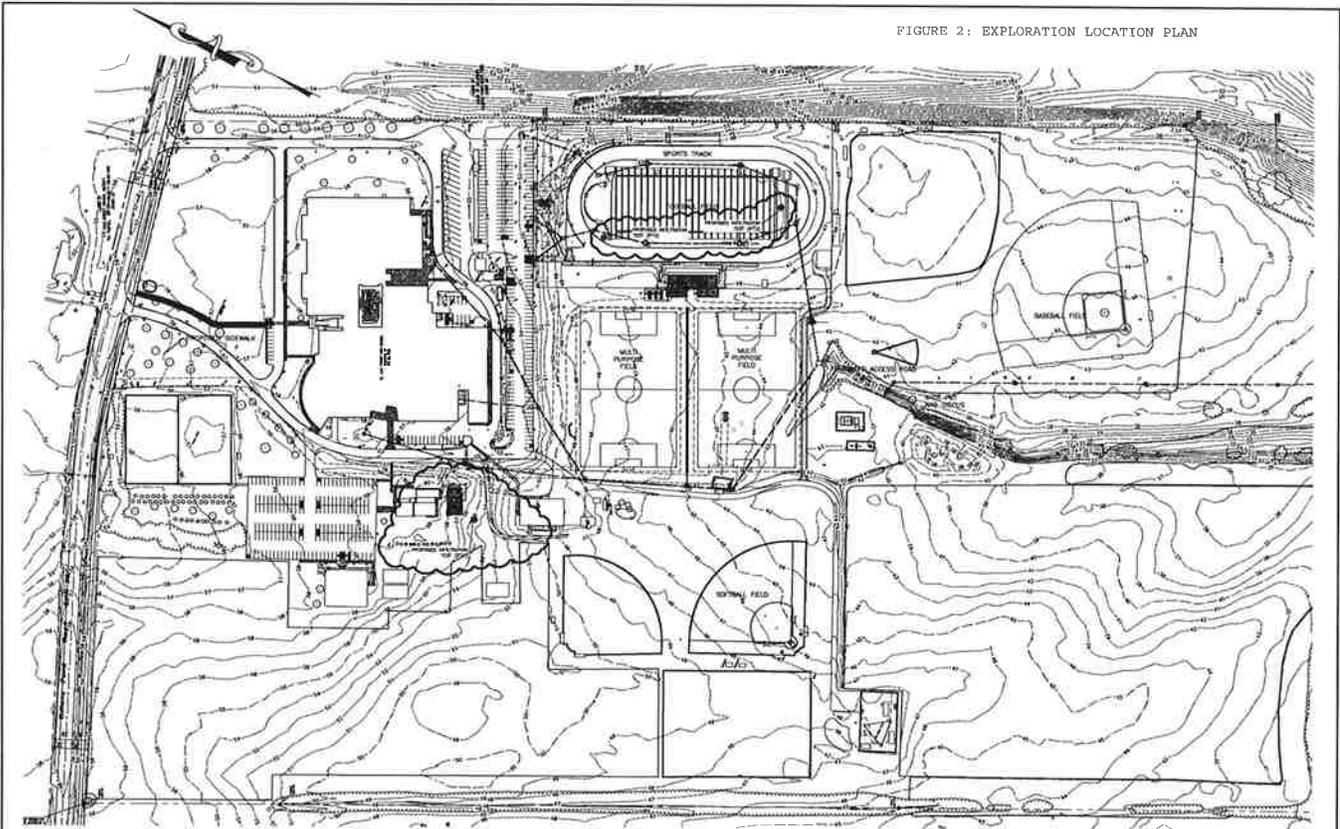
DRAWN BY
 GOOGLE

REVIEW BY
 ML

JOB NO.
 160849

FIGURE:
 1

FIGURE 2: EXPLORATION LOCATION PLAN



PLAN VIEW



R G Architects, LLC
 330 W. Main St., 366B Room, DE 19329
 302.376.5100 302.376.9451 Fax
 www.rgarchitects.net

FAO A ENGINEERING &



REQUIRED FOR:

PROJECT INFO:

LAKE FOREST
 HIGH SCHOOL
 RENOVATIONS

OWNER
 LAKE FOREST SCHOOL DISTRICT
 5423 KILLENS POND ROAD
 FELTON, DE 19931

SHEET INFO:

PROJECT NO: 1501
 DRAWN BY: RJS
 CHECKED BY: KSK
 SCALE:
 DATE: 21 JANUARY 2015

TITLE & NO.:

INFILTRATION
 TESTING PLAN

CO-02



Know what's below.
 Call before you dig.
 811
 1-800-4-A-DIG
 1-800-4-8-DIG
 1-800-4-8-DIG

NO.	DATE	BY

NOTES FOR EXPLORATION LOGS

KEY TO USCS TERMINOLOGY AND GRAPHIC SYMBOLS

MAJOR DIVISIONS (BASED UPON ASTM D 2488)			SYMBOLS	
			GRAPHIC	LETTER
COARSE - GRAINED SOILS	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% PASSING THE NO. 200 SIEVE)		GW
		GRAVELS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)		GP
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% PASSING THE NO. 200 SIEVE)		SW
		SANDS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)		SM
		SANDS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)		SC
		SANDS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)		GC
FINE - GRAINED SOILS	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50	SILT OR CLAY (<15% RETAINED THE NO. 200 SIEVE)		ML
		SILT OR CLAY WITH SAND OR GRAVEL (15% TO 30% RETAINED THE NO. 200 SIEVE)		CL
		SANDY OR GRAVELLY SILT OR CLAY (>30% RETAINED THE NO. 200 SIEVE)		OL
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50	SILT OR CLAY (<15% RETAINED THE NO. 200 SIEVE)		MH
		SILT OR CLAY WITH SAND OR GRAVEL (15% TO 30% RETAINED THE NO. 200 SIEVE)		CH
		SANDY OR GRAVELLY SILT OR CLAY (>30% RETAINED THE NO. 200 SIEVE)		OH
HIGHLY ORGANIC SOILS				PT

NOTE: DUAL SYMBOLS ARE USED TO INDICATE COARSE-GRAINED SOILS CONTAINING AN ESTIMATED 10% FINES BY VISUAL CLASSIFICATION OR WHEN THE SOIL HAS BETWEEN 5 AND 12 PERCENT FINES FROM LABORATORY TESTS; AND FOR FINE-GRAINED SOILS WHEN THE PLOT OF LIQUID LIMIT & PLASTICITY INDEX VALUES FALLS IN THE PLASTICITY CHART'S CROSSHATCHED AREA. RESULTS OF LABORATORY TESTING ARE USED TO SUPPLEMENT THE CLASSIFICATION OF THE SOILS BASED ON THE VISUAL-MANUAL PROCEDURES OF ASTM D2488.

ADDITIONAL TERMINOLOGY AND GRAPHIC SYMBOLS

ADDITIONAL DESIGNATION	DESCRIPTION		GRAPHIC SYMBOLS
	TOPSOIL		
	MAN-MADE FILL		
	GLACIAL TILL		
	COBBLES AND BOULDERS		
RESIDUAL SOIL DESIGNATION	DESCRIPTION	"N" VALUE	
	HIGHLY WEATHERED ROCK	50 TO 50/1"	
	PARTIALLY WEATHERED ROCK	MORE THAN 50 BLOWS FOR 1" PENETRATION, AUGER PENETRABLE	

COARSE-GRAINED SOILS (GRAVEL AND SAND)

DESIGNATION	BLOWS PER FOOT (BPF) "N"
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	>50

NOTE: "N" VALUE DETERMINED AS PER ASTM D1586

FINE-GRAINED SOILS (SILT AND CLAY)

CONSISTENCY	BPF "N"
VERY SOFT	<2
SOFT	2 - 4
MEDIUM STIFF	5 - 8
STIFF	9 - 15
VERY STIFF	16 - 30
HARD	>30

NOTE: ADDITIONAL DESIGNATIONS TO ADVANCE SAMPLER INDICATED IN BLOW COUNT COLUMN:
WOH = WEIGHT OF HAMMER
WOR = WEIGHT OF ROD(S)

SAMPLE TYPE

DESIGNATION	SYMBOL
SPLIT-SPOON	S-
SHELBY TUBE	U-
ROCK CORE	R-

WATER DESIGNATION

DESCRIPTION	SYMBOL
ENCOUNTERED DURING DRILLING	
UPON COMPLETION OF DRILLING	
24 HOURS AFTER COMPLETION	

NOTE: WATER OBSERVATIONS WERE MADE AT THE TIME INDICATED. POROSITY OF SOIL STRATA, WEATHER CONDITIONS, SITE TOPOGRAPHY, ETC. MAY CAUSE WATER LEVEL CHANGES.

LOG OF AUGER PROBE NO. IFT-1

Sheet 1 of 1

PROJECT: **Lake Forest High School SWM**
 PROJECT LOCATION: **Felton, Kent County, Delaware**
 CLIENT: **R G Architects**

PROJECT NO.: **160849**

DATE STARTED: **4/29/2016**
 DATE COMPLETED: **4/29/2016**
 CONTRACTOR: **GTA**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **53.0**
 DATUM: **Topo**
 LOGGED BY: **M. Millman**
 CHECKED BY: **M. Lester**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
52.8	0	SM		Topsoil +/- 3 inches Light brown, moist, Silty SAND	
50.9	2	SC		Brown, moist, Clayey SAND	
45.5	8	SP-SM		Orange, moist, Poorly-graded SAND with Silt	
43.0	10			Hand auger terminated at 9.5 feet. Dry after approximately 4 hours. Backfilled upon completion.	
	12				

NOTES: **Elevation and location should be considered approximate.**



GEO-TECHNOLOGY ASSOCIATES, INC.

18 Boulden Circle, Suite 36
 New Castle, DE 19720

LOG OF AUGER PROBE NO. IFT-1

Sheet 1 of 1

LOG OF AUGER PROBE NO. IFT-2

Sheet 1 of 1

PROJECT: **Lake Forest High School SWM**
 PROJECT LOCATION: **Felton, Kent County, Delaware**
 CLIENT: **R G Architects**

PROJECT NO.: **160849**

DATE STARTED: **4/29/16**
 DATE COMPLETED: **4/29/16**
 CONTRACTOR: **GTA**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **48**
 DATUM: **Topo**
 LOGGED BY: **M. Millman**
 CHECKED BY: **M. Lester**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 6 inches	
47.5		SM		Brown, moist, Silty SAND	
	2			Light brown, moist, Silty SAND	
43.5		SP-SM		Light brown, moist, Poorly-graded SAND with Silt	
41.0				Hand auger terminated at 7.0 feet. Dry after approximately 4 hours. Backfilled upon completion.	
	8				
	10				
	12				

NOTES: Elevation and location should be considered approximate.



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LOG OF AUGER PROBE NO. IFT-2

Sheet 1 of 1

LOG OF AUGER PROBE NO. IFT-3

Sheet 1 of 1

PROJECT: **Lake Forest High School SWM**
 PROJECT LOCATION: **Felton, Kent County, Delaware**
 CLIENT: **R G Architects**

PROJECT NO.: **160849**

DATE STARTED: **4/29/16**
 DATE COMPLETED: **4/29/16**
 CONTRACTOR: **GTA**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **47**
 DATUM: **Topo**
 LOGGED BY: **M. Millman**
 CHECKED BY: **M. Lester**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
46.5	0			Topsoil +/- 6 inches	
	2	SM		Brown, moist, Silty SAND	
	4			Brown, moist, Silty SAND with gravel	
42.5	6	SP-SM		Light brown, moist, Poorly-graded SAND with Silt and gravel	
40.0	8			Hand auger terminated at 7.0 feet. Dry after approximately 4 hours. Backfilled upon completion.	Set pipe at 5.5 feet for infiltration test.
	10				
	12				

NOTES: Elevation and location should be considered approximate.



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LOG OF AUGER PROBE NO. IFT-3

Sheet 1 of 1

