ENVIRONMENTAL IMPACT ASSESSMENT

PREPARED FOR THE DAILY LOCAL TOWNHOMES SITE LOCATED IN EAST BRADFORD TOWNSHIP, CHESTER COUNTY, PA

PREPARED BY ESE CONSULTANTS, INC.

12/20/2018

REVISED 1/13/2020

PROJECT SUMMARY

This Environmental Impact Assessment was prepared in accordance with a Conditional Use submission for the Daily Local Townhomes site located at the corner of Strasburg Road and Bradford Avenue in East Bradford Township, Chester County, Pennsylvania. The project site is the former location of the Daily Local Newspaper. The property is being considered for redevelopment with a residential townhome use. The subject site is approximately six (6) acres with an existing single-story building of approximately 25,000 S.F. in the center of the parcel surrounded by paved loading and parking areas. The site was originally developed in 1970 and has been without a tenant since about 2017. Due to the topography, the property has proven to be a challenging location for retail commercial uses. The proposed residential re-development of the site attempts to fulfill two significant needs and goals identified in the Township Comprehensive Plan: to provide higher density housing attractive to multiple generations and to improve pedestrian connectivity with the adjacent retail areas in East Bradford and the Borough of West Chester.

The applicant, Toll Brothers Inc., is proposing to redevelop the property with a townhome use, a conditional use permitted in the C-2 zoning district in which the subject parcel resides. The proposed development would result in (56) townhome residences. The site will feature approximately 2-3 acres of open space of which will be devoted to buffering adjacent properties, stormwater management and community spaces for future homeowners. The following exhibits are attached for reference:

- Pennsylvania Natural Diversity Inventory (PNDI) report
- Report of Preliminary Geotechnical Exploration by David Blackmore & Associates, Inc.
- Photo Location Map with corresponding photos of site prepared by ESE Consultants, Inc.
- Visual Impact Analysis Exhibit prepared by ESE Consultants, Inc.
- Municipal Services Map prepared by ESE Consultants, Inc.
- Wetland certification prepared by ESE Consultants, Inc.

Daily Local Townhomes Site: Environmental Impact Assessment

Per §115-51 of the Township of East Bradford Zoning Code.

A. Identification and Inventory of Site Features:

1) Water:

Surface Water: The project site lies within the Brandywine Creek East Branch Watershed and the Taylor Run Minor Watershed, which are a part of the larger Christina River Basin. The Pennsylvania Department of Environmental Protection (PADEP) Chapter 93 (Water Quality Standards) indicates the designated use of Taylor Run as *TSF trout stocking*. It should be noted that Taylor Run does not flow through or adjacent to the site and has been designated as *impaired* by the PADEP "Integrated Water Quality Report, 2016." There are no streams, creeks or direct hydrologic connections to Taylor Run on or adjacent to the subject property, therefore no riparian buffers are required on site. Based on FEMA flood map panel 42029C0210G dated 9/29/2017, floodplain or flood hazard areas do not exist on site. The site also does not lie within the Scenic River Boundary.

Ground Water: The national aquifer designation for this site and surrounding area is in Piedmont and Blue Ridge crystalline-rock aquifers and the Felsic Gneiss, Hornblende-Bearing local aquifer according to the USGS Aquifer Map for Pennsylvania. There are no existing residential wells located on site. Well CH-12, located west of the project site, listed a depth to groundwater of 32.27' according to the USGS National Water Information System dated 11-20-18. Test borings were performed on the subject property and ground water was not encountered at the maximum 24-foot depth. A Preliminary Geotechnical report has been completed; the results are attached at the end of this report.

2) Soils & Land:

The site is not located within the Agriculture Security Area based on the East Bradford Township Agricultural Resources Map. According to the National Resources Conservation Service web soils survey the site consists of the following soils:

- Urban land-Gladstone complex (UrlB): Urban lands: classified as pavement, buildings and other artificially covered areas. Gladstone: Very deep, well drained soils, formed in local colluvium and residuum weathered from granite and gneiss. Not classified as prime farmland.
- Urban land-Udorthents, schist and gneiss complex (UUgD): Urban lands: classified as pavement, buildings and other artificially covered areas. Schist and gneiss: Moderately deep, well drained, graded areas of schist and/or gneiss. Not classified as prime farmland.
- Udorthents, schist and gneiss (UdsB): Moderately deep, well drained, graded areas of schist and/or gneiss. Not classified as prime farmland.
- Gladstone (GdB): Very deep, well-drained soil derived from residually weathered granitic gneiss. Classified as prime farmland. *

Of the 1.8 acres of Gladstone soils listed as prime farmland on site, 1.3 acres are proposed to be disturbed. Due to the sloping conditions of the site, this small area is not ideal for production agriculture since most farm machinery couldn't accommodate the slopes.

Overall, the site has approximately 40 feet of elevation change from the higher southern end of the site to the lower northern end of the site along Strasburg Road. An average 7-9% natural slope appears to have existed across the site prior to the current development. Approximately .49 acres of man-made prohibitive slope, and .37 acres of man-made steep slope were created as a result of the former development of the existing building and associated loading and parking areas. These manmade steep slopes are proposed to be eliminated.

3) Woodlands & Forest:

Most of the project site has been altered from its natural vegetation conditions. Approximately 1.41 acres of area classified as woodlands exist along the southern and western perimeters of the site. This area is made up predominately of mature white pines. The southeastern corner of the property contains a small pocket of maple trees, most ranging from 8-14 inches in caliper.

White pines: Southern and Western Property lines

Standalone shade trees: (2) 28” caliper sugar maples near the existing entrance along Strasburg Road. These have been heavily trimmed due to proximity to adjacent power lines.

The portion of the site where building faces Bradford Avenue has a small area of maintained landscape beds consisting of several crabapple trees, several maple trees, foundation shrub plantings and seasonal perennial/annual beds.

There are several small wooded and/or tree mass areas located behind the existing building. These consist of several evergreen pine trees and maple trees.

All other areas on site are maintained lawn.

Approximately .80 acres of area classified as woodland is being disturbed. (107) Trees are identified as exceeding twelve (12) inches at breast height (dbh) on site. A total of 62 of these trees are proposed to be removed. A breakdown of the tree species to be removed is as follows:

White Pine (*Pinus strobus*): 46

Sugar Maple (*Acer saccharum*):15

Crabapple (Malus sp.): 2

4.) Biota:

Given the proximity of the site to surrounding urbanized and suburban development, site fauna expected to reside on or use this site as part of their range could include: rabbit, raccoon, squirrel, fox, deer, and skunk. A review from the Pennsylvania Natural Diversity Index (PNDI) for this site came back clean indicating that there are no rare, threatened or endangered species habitats within the site. The PNDI report for this site is attached at the end of this report for reference.

5.) Known Environmental Impact:

No known environmental impacts currently exist on site.

6.) Township Environmental Inventory Map:

The Township Engineer has informed the applicant that no such map exists therefore this section has been omitted.

7.) Existing Conditions Plan:

The attached exhibit titled "Existing Conditions Plan" shows all relevant existing features on the subject property.

8.) Environmental Compliance:

The approved plan will comply with all tree removal, tree replacement, buffer planting, and stormwater basin planting requirements per the township code. Upon completion of a grading and stormwater plan during the preliminary plan submission stage, a chart will be shown on the plans to indicate the number of trees being removed and the number of compensatory trees that will be planted as replacements. Preliminary estimates have been provided on the attached "Illustrative Landscape Plan."

B. General Existing Character of the Site:

As previously mentioned in this report, the project site is currently zoned for commercial use and has previously been developed and used as such for at least the past 48 years. This site has not been identified as having historical significance or for preservation of open space nor can significant environmental features be found on site. The site has been identified as an important location for continued commercial and/or residential use within the community. Existing conditions for stormwater runoff do not indicate any need for water quality measures. The site currently lacks pedestrian facilities along both the Strasburg Road and Bradford Avenue frontages.

C. Stormwater Design:

Peak Runoff Rate Control:
Per the East Bradford Township Subdivision Ordinance, the reductions shown in the table below have been applied to the overall site. The post-developed flows will be reduced to less than the pre-developed flows at all the study points. The rainfall intensities for these events were gathered from NOAA data. The calculations were done using the SCS/TR-55 method to generate the flows.

Design Storm Post-Developed	Design Storm Pre-Developed
2-year	2-year
5-year	5-year
10-year	10-year
25-year	25-year
50-year	50-year
100-year	100-year

The *'Daily Local Townhomes– Watershed Summaries'* table, found on Sheet 4 of 4 in the Conditional Use submission, summarizes the peak runoff rates and reductions for each point of interest. As demonstrated in the table, the post-developed peak rate has been reduced per the above table for the overall site. Each basin is assumed to have 2.0 in/hr of infiltration, and testing will be performed at a future date in conjunction with the full design.

Impervious Surfaces:
For the stormwater management calculations, the proposed impervious areas shown on the plans are assumed to be the final impervious areas. The total impervious area for the site equals about 2.0 acres in the existing condition and 3.2 acres in the proposed condition.

Water Quality Management:
To provide for water quality on-site, infiltration facilities are proposed in the northeast and northwest corners of the site. Other best management practices (BMP's), both structural and non-structural, may be used in accordance with the East Bradford Ordinance to meet the water quality requirements of the township. Potential BMPs include, but are not limited to, snouts, vegetated swales, dry wells, and reforestation through tree plantings.

Post-Developed vs. Pre-Developed Runoff Volumes:
As required by the National Pollutant Discharge Elimination System (NPDES) stormwater program, the post-developed 2-year storm runoff volume must not exceed the pre-developed 2-year storm runoff volume. Twenty percent of the existing impervious cover and all pervious areas except woods has been assumed to be meadow in the existing condition.

D. Proposed Development Plan Summary & Visual Analysis:

The Conditional Use Plan submitted with this environmental impact assessment features 56 proposed townhomes (single-family attached homes) that are alley-loaded, with garages at the rear of the homes and front doors facing existing frontage roads. The proposed plan promotes both environmental and community improvement goals identified in the East Bradford Township Comprehensive Plan.

The proposed homes are terraced into the existing slope of the site, and oriented with front doors facing the adjacent streets to provide a visually pleasing and pedestrian-friendly streetscape along Bradford Road and Strasburg Avenue. Sidewalks are proposed along both street frontages, where there currently are no sidewalks. The site access points have been relocated to align with existing adjacent streets to minimize vehicular conflicts. The intersection of Strasburg Road and Bradford Avenue has been identified as an area in the East Bradford Comprehensive Plan that would benefit from improved pedestrian access. The proposed project will provide needed improvements at this intersection in a visually pleasing way.

The proposed plan will also provide stormwater and landscaping improvements that will enhance the environment. The applicant has identified potentially suitable locations for stormwater management areas as denoted on the plan and will ensure that the proposed stormwater management facilities result in no net gain in post-development runoff. The applicant will apply best management practices to ensure the protection of the local watershed and negate any potential impact on properties and receptors downstream. A portion of the existing vegetation is proposed to be removed but it will be replaced and enhanced with more species diversity to create a year-round aesthetically pleasing buffer along the western and southern property lines. Additional vegetation such as shade trees, street trees and foundation plantings are proposed internally within the community to create a highly functional and visually pleasing environment. Pedestrian-scaled landscaping is proposed along Strasburg Road and Bradford Avenue, which currently does not exist.

The attached exhibit titled “Photo Location Map” and corresponding photos provide a visual analysis of the existing conditions of the site. Also included is an exhibit that shows the potential impact of changes proposed at the intersection of Strasburg Road and Bradford Avenue.

E. Existing Services Map:

The attached exhibit titled “Existing Services Map” shows the locations of the existing services that are expected to serve the site.

F. Positive & Negative Impact Assessment:

The benefits of residential redevelopment of the subject site, which is currently underutilized and does not provide community benefits, will outweigh any temporary impacts to the site during development. Since the site contains very limited areas of environmentally sensitive lands and has previously been developed there is an opportunity to improve upon environmental impacts with the application of current best management practices. Removal of existing trees (approximately .8 acres) is being proposed, which may temporarily disturb habitat and decrease soil stabilization. These impacts will be mitigated with new tree and shrub plantings meeting all township requirements for required buffer plantings, tree replacement and soil stabilization. The end result will be a more diverse and improved vegetative environment.

Disturbance of steep slopes is also proposed. The existing on-site areas classified as steep/prohibited slopes were created as a result of the prior development. The re-grading and elimination of these steep slopes allows for the natural slope to be restored and integrated into the proposed development. All unbuilt areas of the site will then be stabilized and planted with appropriate vegetative cover. Undeveloped areas of agricultural soils are proposed to be planted with an increased variety of evergreen, deciduous and understory plantings creating a visual buffer.

An increase of about 1.2 acres of additional impervious is proposed on site. Existing impervious and site drainage is site currently handled through a series of storm inlets. Proposed new stormwater management facilities will reduce peak volume runoff and increase water quality.

The positive impacts of the development outlined in sections above include: increased pedestrian mobility with addition of sidewalks; visual continuity with surrounding residential uses, with front doors facing existing roads; improved landscaping and restoration of natural habitats; restored natural slopes; and potential improvements in stormwater and groundwater quality in keeping with current best management practices.

Negative Impact Description, Identification & Remedies:

	IMPACT IDENTIFICATION	DESCRIPTION OF ENVIRONMENTAL IMPACT	PROPOSED REMEDY
1.	REMOVAL OF TREES/WOODLAND	POTENTIAL FOR HABITAT LOSS, DECREASE IN SOILS STABILIZATION	PROPOSED TREE REPLACEMENT
2.	DISTURBANCE OF MAN-MADE STEEP SLOPES	EXISTING MAN-MADE STEEP SLOPES TO BE ELIMINATED	PROPOSED REGRADING TO INTEGRATE NEW STRUCTURES INTO THE SLOPING TOPOGRAPHY
3.	DISTURBANCE OF PRIME AG SOILS	LOSS OF AGRICUTURAL OPPORTUNITIES	UNDEVELOPED AREAS OF AG SOILS TO BE PLANTED WITH AN INCREASED VEGETATIVE COVER.
4.	INCREASE IN IMPERVIOUS SURFACE	INCREASE IN STORMWATER RUNOFF	PROPOSED BASINS/BMPS FOR VOLUME RUNOFF AND WATER QUALITY

G. Wetlands Report:

A site evaluation was performed which determined that no areas identified as wetlands or waterways exist on site. A certification is provided and included at the end of this report.

H. Certification Statement:

I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is to the best of my knowledge and belief, true, accurate, and complete.

Emily Stewart, RLA, AICP

Michael Warrick, CPSS

John Baionno, P.E.

1. PROJECT INFORMATION

Project Name: **Daily Local (West Chester Towns)**
Date of Review: **10/15/2018 11:32:35 AM**
Project Category: **Development, Residential, Subdivision containing more than 2 lots and/or 2 single-family units**
Project Area: **6.57 acres**
County(s): **Chester**
Township/Municipality(s): **EAST BRADFORD; WEST CHESTER**
ZIP Code: **19382**
Quadrangle Name(s): **WEST CHESTER**
Watersheds HUC 8: **Brandywine-Christina**
Watersheds HUC 12: **Lower East Branch Brandywine Creek**
Decimal Degrees: **39.958463, -75.619048**
Degrees Minutes Seconds: **39° 57' 30.4683" N, 75° 37' 8.5738" W**

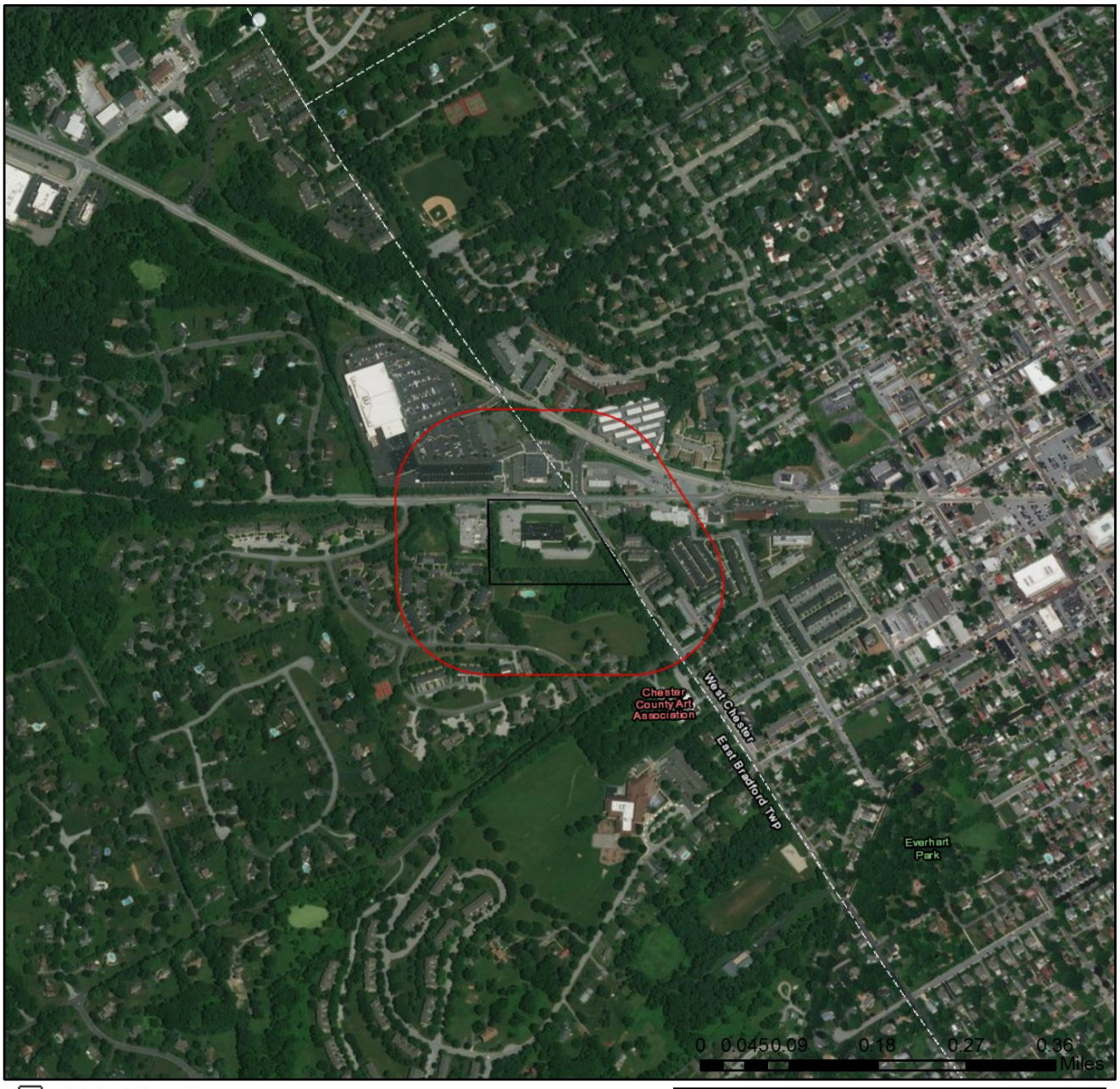
2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate no known impacts to threatened and endangered species and/or special concern species and resources within the project area. Therefore, based on the information you provided, no further coordination is required with the jurisdictional agencies. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

Note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 must comply with the bog turtle habitat screening requirements of the PASPGP.

Daily Local (West Chester Towns)



Project Boundary

Buffered Project Boundary

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

Daily Local (West Chester Towns)

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Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS,

RESPONSE TO QUESTION(S) ASKED

Q1: The proposed project is in the range of the Indiana bat. Describe how the project will affect bat habitat (forests, woodlots and trees) and indicate what measures will be taken in consideration of this. Round acreages up to the nearest acre (e.g., 0.2 acres = 1 acre).
Your answer is: The project will affect 1 to 39 acres of forests, woodlots and trees.

Q2: Is tree removal, tree cutting or forest clearing of 40 acres or more necessary to implement all aspects of this project?
Your answer is: No

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission
RESPONSE:
No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources
RESPONSE:
No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission
RESPONSE:
No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

U.S. Fish and Wildlife Service
RESPONSE:
No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq. is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
NO Faxes Please

PA Fish and Boat Commission
Division of Environmental Services
595 E. Rolling Ridge Dr., Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name: MARK R. ZARNOWSKY, PE
Company/Business Name: ESE CONSULTANTS, INC
Address: 250 GIBRALTAR ROAD, STE. 2E
City, State, Zip: HORSHAM, PA 19044
Phone:(215) 293-5411 Fax:(215) 293-5488
Email: mzarnowsky@eseconsultants.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

applicant/project proponent signature

10/15/18
date

Providing Innovative Solutions to Subsurface Problems Since 1985

DAVID BLACKMORE & ASSOCIATES, INC.
GEOTECHNICAL & ENVIRONMENTAL ENGINEERS

REPORT OF PRELIMINARY GEOTECHNICAL EXPLORATION

Proposed Apartment Complex
W. Strasburg Road & N. Bradford Avenue
West Chester, PA

PREPARED FOR

TOLL APARTMENT LIVING
250 Gibraltar Road, 3 West
Horsham, PA 19044

PROJECT 4898G1R1
May 10, 2017

DAVID BLACKMORE AND ASSOCIATES, INC.
3335 WEST RIDGE PIKE
POTTSTOWN, PENNSYLVANIA 19464
(610) 495-6255

Mr. Brian D. McCree, PE
Vice President

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APPENDIX

EXECUTIVE SUMMARY

Purpose

This preliminary exploration was completed to evaluate the subsurface conditions and their effect upon the proposed site development. This exploration focused on the proposed 4 to 5 story apartment building with connected 4 level parking garage. The building floor area is approximately 79,800 SF. Also, included in this exploration are associated paved parking and driveway areas.

Scope

A total of six (6) borings were completed at the subject site. Three (3) borings were completed within the planned parking area maximum depth of 24.42 feet and the remaining three (3) borings were completed within the proposed apartment building footprint to a maximum depth of 22 feet. The test borings were located in the field by DBA personnel using a preliminary site plan overlaid on an aerial photograph showing the existing site conditions. The test borings were drilled by our subcontractor, The Corcoran Drilling Company, under the direction of DBA personnel. Site design was underway during the implementation of our exploration. Therefore, final site design may vary from the preliminary design used to complete this exploration. A copy of the site plan used for our exploration which has been annotated with our test boring locations is included in the appendix of this report.

Findings

The results of our exploration indicate the presence of the following subsurface conditions:

- Limited area of existing fill soils
- Loose/soft surface soil strata
- Potential for large boulders within the soil profile

Test boring B5 completed at the northeastern corner of the site indicated the presence of approximately 2.5 feet of existing fill, which was found to be a relatively clean, loose soil deposit. Similarly, the upper 2 to 4 feet of the virgin soil profile (Stratum I) was found to be relatively soft/loose across the site. Thick (11 to 12 inch) deposits of topsoil were encountered at the southern end of the parcel in borings B1 and B2. Bedrock was encountered at the eastern end of the parcel in borings B3 and B5 at depths ranging from 16'7" to 17'2' below existing grade. Based on the planned building grade, bedrock is not anticipated to impact the planned site grading activity. Note: Although not encountered in the test borings completed, the underlying geologic formation has a propensity for large boulders within the overlying soil mantle.

Recommendations:

Our preliminary exploration indicates that the site conditions are suitable for the support of the proposed structure. A shallow foundation system with slab on grade construction is anticipated to be feasible. Supplemental exploration work will be required in order to finalize foundation recommendations including final allowable bearing capacity and foundation bearing elevations.

1. INTRODUCTION

David Blackmore and Associates, Inc. (DBA) has completed the preliminary geotechnical exploration of the subject site in accordance with our Proposal 4898G1P1, dated March 24 2017. This exploration was completed to evaluate the existing subsurface conditions and their effect upon the proposed site development. Specifically, DBA has provided preliminary recommendations regarding the following:

- Foundation support of the structure and slabs, including anticipated soil bearing pressures, bearing elevations, foundation design recommendations, and anticipated settlement for shallow foundations,
- Alternate foundation systems (if required),
- Depth to material requiring rock excavation methods for removal, if encountered,
- Depth to and management of groundwater for design of structures and pavements, if encountered
- Relative elevations of surface and subsurface features,
- Fill and compaction criteria,
- Pavements and floor slabs,
- Lateral earth pressures for retaining walls, and
- General geotechnical related construction procedures.

The following section (2. PROPOSED CONSTRUCTION) summarizes the information available to DBA regarding the proposed site development. This report has been prepared based on the proposed construction. Changes to the proposed construction may require alterations to this report or additional investigative work. DBA should be notified of significant changes to the proposed construction.

2. PROPOSED CONSTRUCTION

The proposed construction consists of a 4 to 5 story apartment building with connected 4 level parking garage. The building floor area is approximately 79,800 SF. The apartment building construction is anticipated to consist of wood framing on concrete slab on grade. The parking garage construction is anticipated to consist of pre-cast concrete plank supported on cast

in place concrete framing. The anticipated maximum column loads were not provided. However, based on the anticipated construction and in order to develop the following scope of work the maximum column loads for the proposed apartment building is 300 kips and the maximum anticipated column load for the parking garage in 950 kips. The apartment building finished floor is anticipated to range from 400 feet to 411 feet as the building is to be constructed to roughly match the existing site grade changes

3. GEOTECHNICAL EXPLORATION

A total of six (6) borings were completed at the subject site. Three (3) borings were completed within the planned parking area maximum depth of 24.42 feet and the remaining three (3) borings were completed within the proposed apartment building footprint to a maximum depth of 22 feet.

The test borings were located in the field by DBA personnel using a preliminary site plan overlaid on an aerial photograph showing the existing site conditions. The test borings were drilled by our subcontractor, **The Corcoran Drilling Company**, under the direction of DBA personnel.

All test boring logs and a test boring location plan are included in the appendix of this report.

4. GEOTECHNICAL BACKGROUND

4.1 SITE DESCRIPTION

The subject site is located on the southwest corner of the intersection of W. Strasburg Road (PA Route 162) and North Bradford Avenue which currently contains a single-story office building utilized by the Daily Local Newspaper. The site slopes downward in a generally south to north direction from an approximately high elevation of 428 feet along the southern property boundary

to an approximate low elevation of 390 along the route 162 frontages at the north end of the parcel.

A photocopy of the USGS Topographical Map, West Chester Quadrangle, indicating the site is included as Figure I.

4.2 GEOLOGY

Available geological sources indicate the site is underlain by Pyroxene Bearing Felsic Gneiss (fgp). This formation consists of light buff to light pink; fine to medium grained rock composed of quartz, microcline, hornblende and occasional biotite. This rock is highly resistant to weathering, and is slightly weathered to a shallow depth. Fractures/joints within this rock have an irregular pattern are moderately to poorly formed, are widely to moderately spaced, steeply dipping to vertical and open.

A photocopy of the USGS Geological Map of the West Chester Quadrangle, indicating the site is included as Figure II.

4.3 SOILS

Soil records indicate the site soils to be of the Urban land-Gladstone complex (UrlB), Urban land-Udorthents, schist and gneiss complex (UugD) and the Gladstone gravelly loam (GdB). These soil types and the on-site variations are described below:

> *Urban land-Gladstone complex, 0 to 8 percent slopes(UrlB):* This miscellaneous land type consists of areas in which the soil profile has been destroyed or covered over by earthmoving activity associated with urban or industrial development. Due to this disturbance, the soil profile can be variable. However, it typically includes a gravelly loam surface layer over a gravelly clay loam and gravelly loam that transitions into bedrock. The soils parent material consists of local colluvium and residuum weathered from granite and gneiss. These soils were mapped across the central portion of the property.

Urban land-Udorthents, schist and gneiss complex, 8 to 25 percent slopes (UugD): This miscellaneous land type consists of areas in which the soil profile has been destroyed or covered over by earthmoving activity associated with urban or industrial development. Due to this disturbance, the soil profile can be variable. However, it typically includes a loam surface layer over a silty clay loam that transitions into bedrock. The soils parent material consists of graded areas of schist and/or gneiss. These soils were mapped across the northern portion of the property.

Gladstone gravelly loam, 3 to 8 percent slopes (GdB): This soil type consists of a loamy colluvium derived from granite and gneiss and/or loamy residuum weathered from granite and gneiss. The typical profile includes gravelly loam over a sandy clay loam with a sandy loam below which transitions into decomposed bedrock. This soil type was mapped along the south side of the parcel.

A photocopy of the soil map created using the USDA Natural Resource Conservation Service website, indicating the site is included as Figure III.

5. LABORATORY TESTING

Representative soil samples taken during the field exploration were tested in DBA's laboratory for basic engineering properties. The laboratory testing consisted of classification of soil samples for engineering purposes. The laboratory testing included Particle Size Analysis (ASTM D442), Plastic and Liquid Limits (ASTM D4318), and Natural Moisture Content (ASTM D2216). The Unified Soil Classification System (USCS) was used to assign group symbols and group names to the soils tested.

A summary of the test results is provided in Table I. A photocopy of the particle size analysis results and the plastic and liquid limit analysis results are included in the appendix of this report.

6. SUBSURFACE CONDITIONS

The results of the drilling program revealed a fairly consistent subsurface profile. The following strata can describe a typical soil profile.

Stratum IF: 2.5' 'thick; Existing fill consisting of orange brown fine sand and silt. This stratum is considered to be a relatively clean, localized loose fill deposit that was encountered at the northeast corner of the parcel in boring B5 only.

Stratum I: 0.5' to 8.5' thick; Orange brown fine sand and silt with a trace to some gneiss fragments within the lower portion of this stratum. This stratum is was found to be generally soft/loose with SPR values ranging from 4 B/F to 23 B/F. The elevated blow counts were limited to the lower portion of this stratum at boring B6 completed at the northwestern end of the site. The average SPR value is 9 B/F. This stratum was encountered in each of the boring completed.

Stratum II: 11.3' to over 22 feet thick; Multi-colored weathered/ decomposed gneiss. This stratum is considered to be medium dense to dense with SPR values ranging from 8 B/F to 50 blows per 3-inch penetration. The average SPR value for this stratum is 27 B/F. This stratum was encountered within each of the test borings completed.

Bedrock: Gneiss bedrock was encountered at the eastern end of the site in test borings B3 and B5 at depths ranging from 16'7" to 17'2" below existing grade. The maximum elevation at which rock was encountered is 392.13 at boring B3 at the eastern end of the proposed parking garage.

Groundwater[2]: Groundwater was not encountered in test borings completed.

NOTES:

1. SPR = the Standard Penetration Resistance or number of blows required of a 140-pound hammer dropping 30", to drive a 2" OD split spoon sampler one foot.

2. The groundwater information provided is based on conditions encountered during the drilling program. Seasonal fluctuations in the groundwater table are to be expected.

7. GEOTECHNICAL ANALYSIS AND RECOMMENDATIONS

The results of our exploration indicate the presence of the following subsurface conditions:

- Limited area of existing fill soils
- Loose/soft surface soil strata
- Potential for large boulders within the soil profile

Test boring B5 completed at the northeastern corner of the site indicated the presence of approximately 2.5 feet of existing fill, which was found to be a relatively clean, loose soil deposit. Similarly, the upper 2 to 4 feet of the virgin soil profile (Stratum I) was found to be relatively soft/loose across the site. Thick (11 to 12 inch) deposits of topsoil were encountered at the southern end of the parcel in borings B1 and B2. Bedrock was encountered at the eastern end of the parcel in borings B3 and B5 at depths ranging from 16'7" to 17'2' below existing grade. Based on the planned building grade, bedrock is not anticipated to impact the planned site grading activity. Note: Although not encountered in the test borings completed, the underlying geologic formation has a propensity for large boulders within the overlying soil mantle.

Our preliminary exploration indicates that the site conditions are suitable for the support of the proposed structure. A shallow foundation system with slab on grade construction is anticipated to be feasible. Supplemental exploration work will be required in order to finalize foundation recommendations including final allowable bearing capacity and foundation bearing elevations.

7.1 SITE PREPARATION

All deleterious materials including topsoil, root mass, trees and vegetation, asphalt and other materials determined in the field by the Geotechnical Engineer to be unsuitable shall be removed from all structural areas (buildings,

pavements, and walkways) prior to placement of *structural fill*. Recycling of the asphalt and underlying stone can be accomplished on site if the asphalt is milled to a maximum 1 inch particle size and the material is used in the upper fill zones of pavement areas only. This fill is not suitable for other structural areas. Due to the soft/loose surface conditions encountered across the parcel, the proof rolling procedure described in section 7.3 SLAB ON GRADE and 7.5 PAVEMENTS AND WALKWAYS will be critical. Undercutting and/or stabilization shall be anticipated. Such work would be best accomplished during the summer months when the potential for detrimental weather conditions is lessoned.

7.2 FOUNDATIONS

Foundations shall bear on the undisturbed soils of Stratum I which have been improved/densified through the proof rolling operation described in Section 7.3, Stratum II, or on *structural fill*. Soft conditions encountered during foundation construction shall be excavated and replaced with structural fill. Refer to Section 7.7, Fill and Compaction Criteria. Foundations shall not bear on the existing fill soils of Stratum IF.

Our preliminary findings suggest that foundations shall be designed for a maximum soil bearing capacity of 3.0 KSF on Stratum I, and the upper portion of Stratum II, or *structural fill*. Should an increase in bearing capacity be required for the proposed parking garage, the foundations may be lowered deeper into the decomposed/weathered gneiss (Stratum II) where it is anticipated that a bearing capacity on the range of 4 -5 KSF may be used[1]. Foundation settlements for the

[1] Note: in order to establish final allowable bearing capacities and required foundation depths for design, additional test borings will be warranted. Such work should be delayed until the final building configuration and anticipated loading is established.

bearing capacities provided herein are to be within a tolerance of one inch total and one half inch differential. It is anticipated that the bulk of this settlement will take place during the construction period. Settlements of this magnitude are within normal construction tolerances. In the event, more stringent settlement tolerances are required a reduction of the allowable bearing capacity and/or a change in depth to bearing strata may be required.

To protect against differential settlements, foundations shall not be placed intermittently on soils and boulders. Small boulders encountered within or directly beneath the footing bearing surface shall be removed and replaced with *structural fill*. Larger boulders shall either be fully or partially removed and replaced with *structural fill*. Trench excavation through areas containing boulders may require substantial over-excavation to facilitate boulder removal. Partial removal can be completed by splitting or hammering to a minimum of 12" below the footing bottom elevation. Boulder protrusion into the bottom or side of the proposed footing is not an acceptable condition. Boulders can be dislodged in bulk excavations.

Should foundation excavation encounter hard bedrock, the foundation is to be undercut a minimum of 12 inches. The undercut area is to be backfilled with a *structural fill* or a low strength flowable fill (max 500 psi) "cushioning" layer to limit the potential for differential foundation settlement and the development of stress concentrations caused by rock protrusion.

NOTE: Foundations planned to bear intermittently on strata provided with different bearing capacities shall be designed using the lowest bearing capacity provided in order to limit potential differential settlements.

Exterior foundations or foundations in unheated areas shall be provided a minimum of 36" compacted soil cover above the footing bottom for frost protection.

The variable soil conditions noted make it imperative that full-time Quality Control services are provided for all Geotechnical phases of this project.

7.2.1 SEISMIC SITE COEFFICIENT

A review of Section 1613.5.5 of the International Building Code (IBC 2015 edition)/ASCE 7 and the existing soil profile indicates that a site class C should be used in the design of the proposed structure for seismic load resistance.

7.3 SLAB ON-GRADE

The site grading design has yet to be finalized. However, it is anticipated that the proposed finish floor elevation will roughly follow the existing grades ranging from 400.0 feet at the northern end of the site to 422.0 feet at the southwestern end of the site.

Prior to the placement of fill the exposed slab subgrade areas shall be proof rolled with a heavy smooth drum roller (minimum 15-ton static weight) to detect the presence of loose or soft zones. This proof rolling operation shall be performed in the proposed fill areas under the supervision of the Geotechnical Engineer. Proof rolling of the subgrade shall also be performed in the cut areas when the required grades have been achieved and immediately prior to pouring the floor slab. Loose or soft zones detected during the proof rolling operation shall be repaired to the satisfaction of the Geotechnical Engineer. Due to the presence of 2 to 4 feet of existing loose/soft surface soils across the parcel, undercutting and stabilization shall be anticipated. The extent of such activity is anticipated to be limited if site grading work is completed during a period of warm dry weather conditions.

Based on the soil type encountered, standard penetration testing of the existing slab subgrade, and provided that all structural fill will be placed in accordance with the fill and compaction criteria set forth in Section 7.6, an estimated modulus of subgrade reaction of 125 psi/inch may be used for the design of slab sections. Should an increased modulus of subgrade reaction be required for the proposed design it is recommended that field or laboratory testing be completed to establish specific modulus values.

All slab subgrade areas shall be evaluated by the Geotechnical Engineer prior to pouring the slab so that repair can be completed. It is recommended that the slab be poured under roof during periods of harsh weather.

A smooth drum roller shall be made available to seal the subgrade in the event of predicted precipitation.

7.4 BACKFILL OF FOUNDATION AND UTILITY TRENCHES

All foundation and utility trenches shall be backfilled with *structural fill*, under the supervision of a Geotechnical Engineer (Refer to Section 7.6, Fill and Compaction Criteria). Deep utility excavations (>15 feet below existing grade) may encounter bedrock and or dense weathered rock.

7.5 PAVEMENTS AND WALKWAYS

Pavement and sidewalk areas shall be prepared in a manner similar to the slab on-grade areas. A minimum of 8 inches of crushed aggregate base shall be used beneath exterior pavements due to the frost heave potential of the subgrade soils. The pavement subgrade shall be graded to drain water from beneath the pavement system to prevent ponding and subsequent pumping of silty subgrade soils.

For pavement design a preliminary estimated California Bearing Ratio (CBR) Value of 4.0 may be used for stabilized subgrade areas consisting of on-site sandy silt (Stratum I) and sandy silts (Stratum II) or Structural fill selected and placed in accordance with Section 7.6 of this report. Should anticipated heavy duty pavement requirements or other project conditions require final site specific CBR values DBA can complete field and/or laboratory CBR testing of proposed subgrade soils at the client's request.

7.6 FILL AND COMPACTION CRITERIA

Fill supporting slabs, pavements, and foundations is considered herein to be *structural fill*. *Structural fill* shall be placed on an approved, proof rolled, nonyielding, level subgrade, in lifts not exceeding 8 inches (loose thickness), unless otherwise directed by the Geotechnical Engineer. *Structural fill* shall be maintained nominally at *Optimum Moisture Content* (ASTM D-698) and uniformly compacted to the percentages of *Maximum Dry Density* (ASTM D-698) provided in Table III - Compaction Criteria.

Suitable *structural fill* shall consist of clean soils without deleterious inclusions. On-site soils identified as Stratum I and Stratum II are acceptable for use as *structural fill* if given the opportunity to dry and the soils are maintained nominally at *Optimum Moisture Content*. Samples retrieved from the upper 5 feet of the subgrade indicated moisture contents ranging from 12 to 34 percent. The optimum moisture content for compaction of these soils is estimated to range between 15 and 18 percent. Therefore, a significant portion of these near surface soils will require aeration and drying prior to re-use as structural fill, which is best accomplished in the summer months. Specific moisture content test results and associated depths are indicated on the test boring logs in the appendix of this report.

Borrow fill shall be clean well-graded soils with good strength characteristics with a maximum particle size of 3 inches and containing not more than 20% silt/clay (by weight). Samples of on-site or borrow sources of fill shall be submitted to the Geotechnical Engineer for testing at least 1 week before use on site. A minimum of 65 lbs. or two (2) five-gallon buckets is required for testing.

7.7 LATERAL EARTH PRESSURES - RETAINING WALLS

The retaining/loading dock walls of the structure, if proposed, should be designed for an at rest condition (Ko). The foundations and walls must be fully drained to relieve potential hydrostatic pressure. A foundation/wall drainage system is recommended. Soil backfill around the basement walls shall be well compacted and should consist of granular soils to prevent the trapping of water.

Retaining walls outside the structure which are free to rotate should be similarly designed except with an active earth pressure as opposed to Ko condition. Soil parameters used to establish the effective fluid pressures (excluding hydrostatic loads) and some additional parameters which may be used in the design of a retaining wall system are summarized in the following table:

SOIL PROPERTIES FOR DETERMINATION OF LATERAL LOADS

Parameter	Stratum I	Stratum II
Angle of Internal Friction, ϕ	28 degrees	30 degrees
Moist unit weight, γ_m	125 pcf	120 pcf
Active Earth Pressure Coefficient, K_a	0.36	0.33
Passive Earth Pressure Coefficient, K_p	2.77	3.03
At Rest Earth Pressure Coefficient, K_o	0.53	0.50
Soil/Mass concrete interface friction Angle, δ	22 degrees	24 degrees

8. QUALITY CONTROL

This report was prepared to provide design criteria for the design team. DBA assumes that Geotechnical and Construction Quality Control Services will be provided in order to implement the recommendations provided herein and to identify unanticipated or changed conditions. The Geotechnical Engineer's representative should review the consistency and texture of the exposed soils with the conditions encountered by this exploration as described herein. Since localized loose and yielding subgrade conditions may be encountered between test locations, provisions for the undercutting and subsequent replacement of these materials should be anticipated in the construction documents. The environmental quality of the subgrade soils was not reviewed as part of this evaluation. All materials generated by grading and excavation shall be managed in accordance with regulatory requirements.

DBA can provide a contract for Geotechnical and Construction Quality Control Services (Special Inspections), as required. A pre-work meeting with the design professionals, contractors, and the Geotechnical Engineer is strongly recommended.

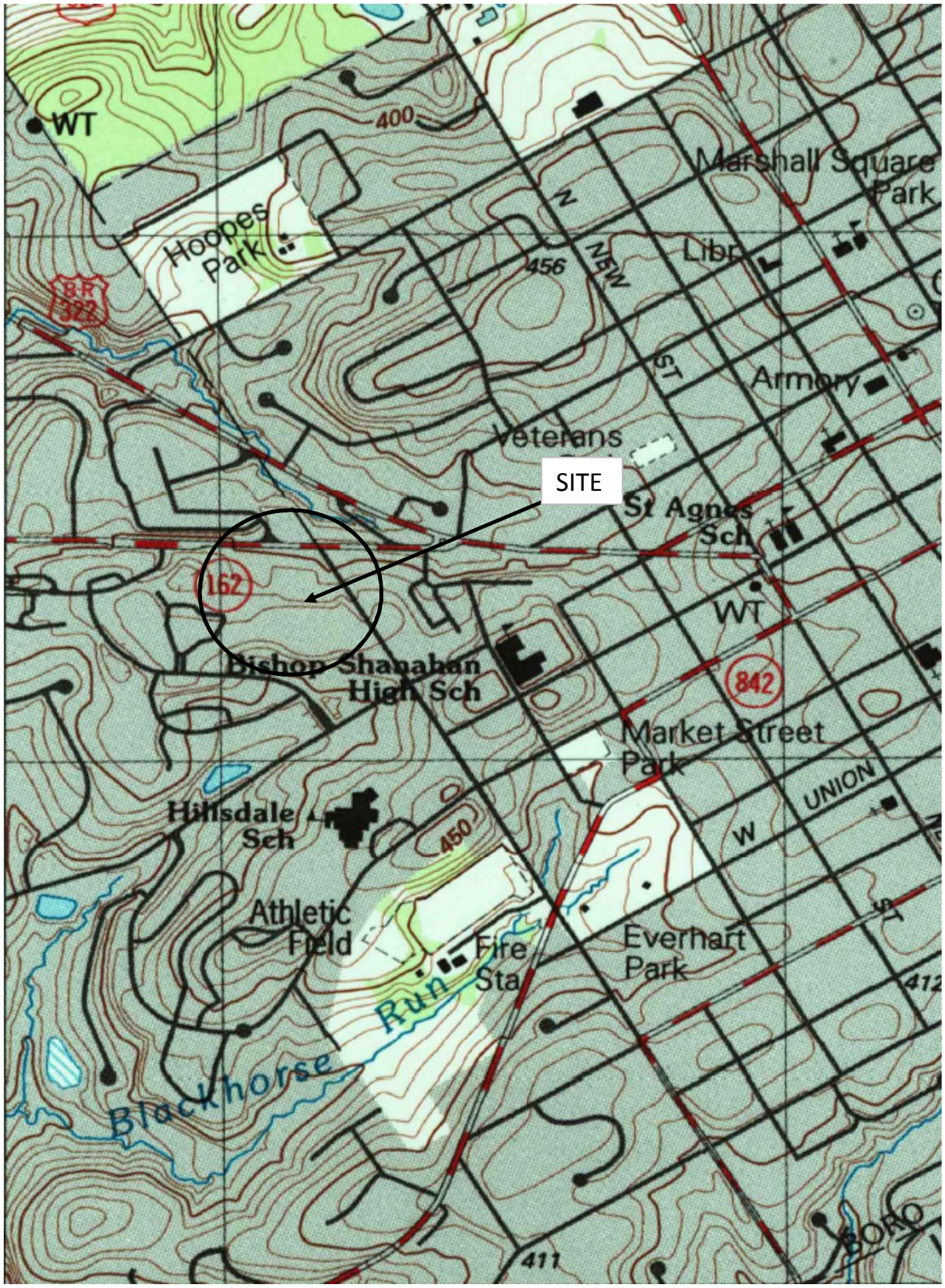
9. LIMITATIONS

Services performed by DBA, including the Geotechnical Exploration, report, and any subsequent construction monitoring have been or will be conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. No other warranty or guarantee is indicated or intended in this report or any opinion, document or otherwise stated.

The recommendations included herein are based on the conditions encountered by the test borings performed at the subject site. It is noted that, although soil quality has been inferred from the interpolation of the site sampling data, subsurface conditions beyond the test borings are, in fact, unknown. As a result,

these recommendations may require modifications based on the conditions encountered and exposed during construction excavation. Should any conditions encountered during construction differ from those described in the report, this office should be notified immediately in order to review and possibly modify the recommendations included in this report.

FIGURES AND TABLES



GEOTECHNICAL & ENVIRONMENTAL ENGINEERS
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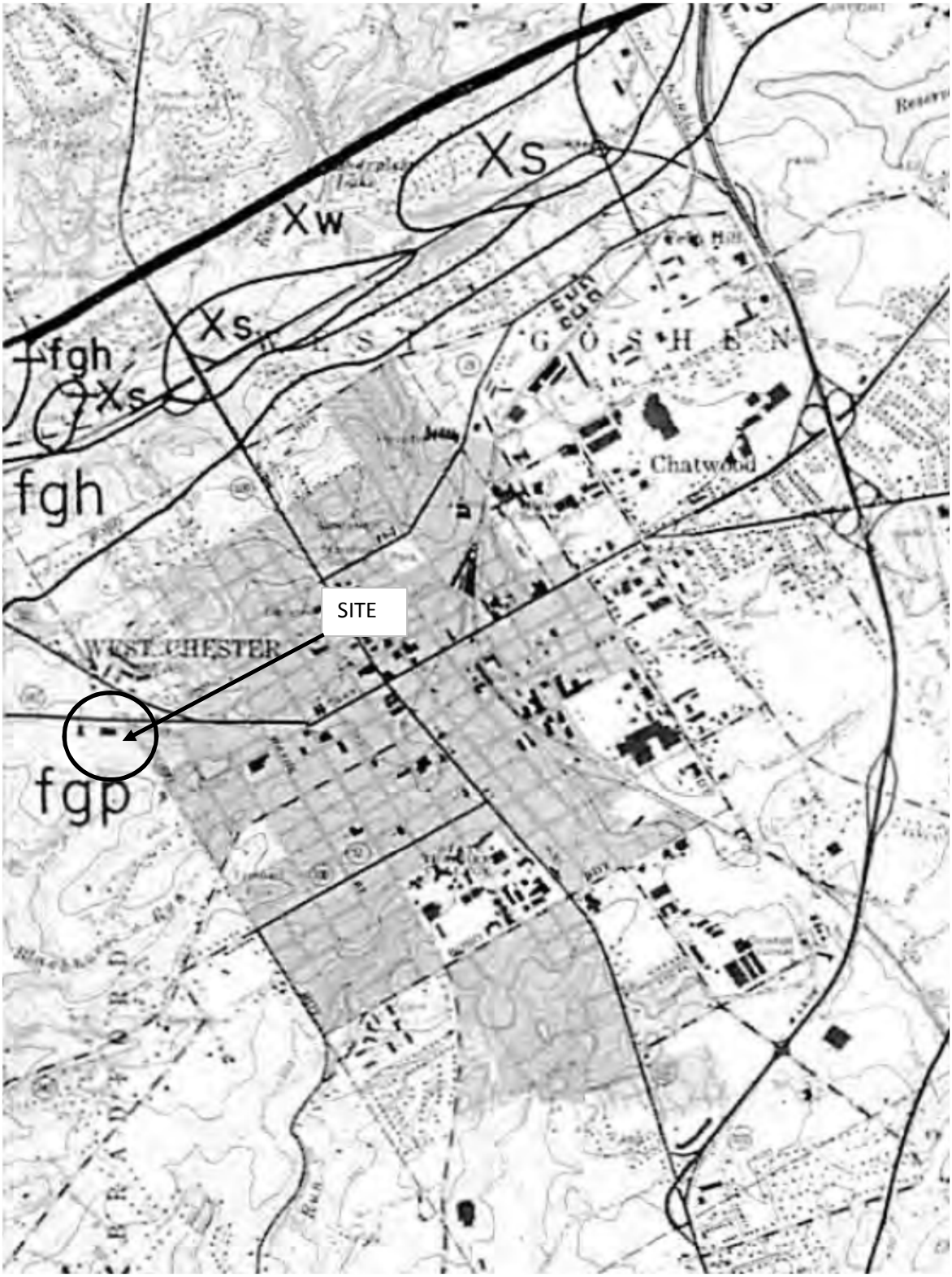
Project 4898G1

Figure I

SITE LOCATION & TOPOGRAPHY

U.S.G.S. 7.5 Minute Topographic Quadrangle
West Chester Quadrangle



KEY

fgp-Felsic Gneiss - pyroxene bearing

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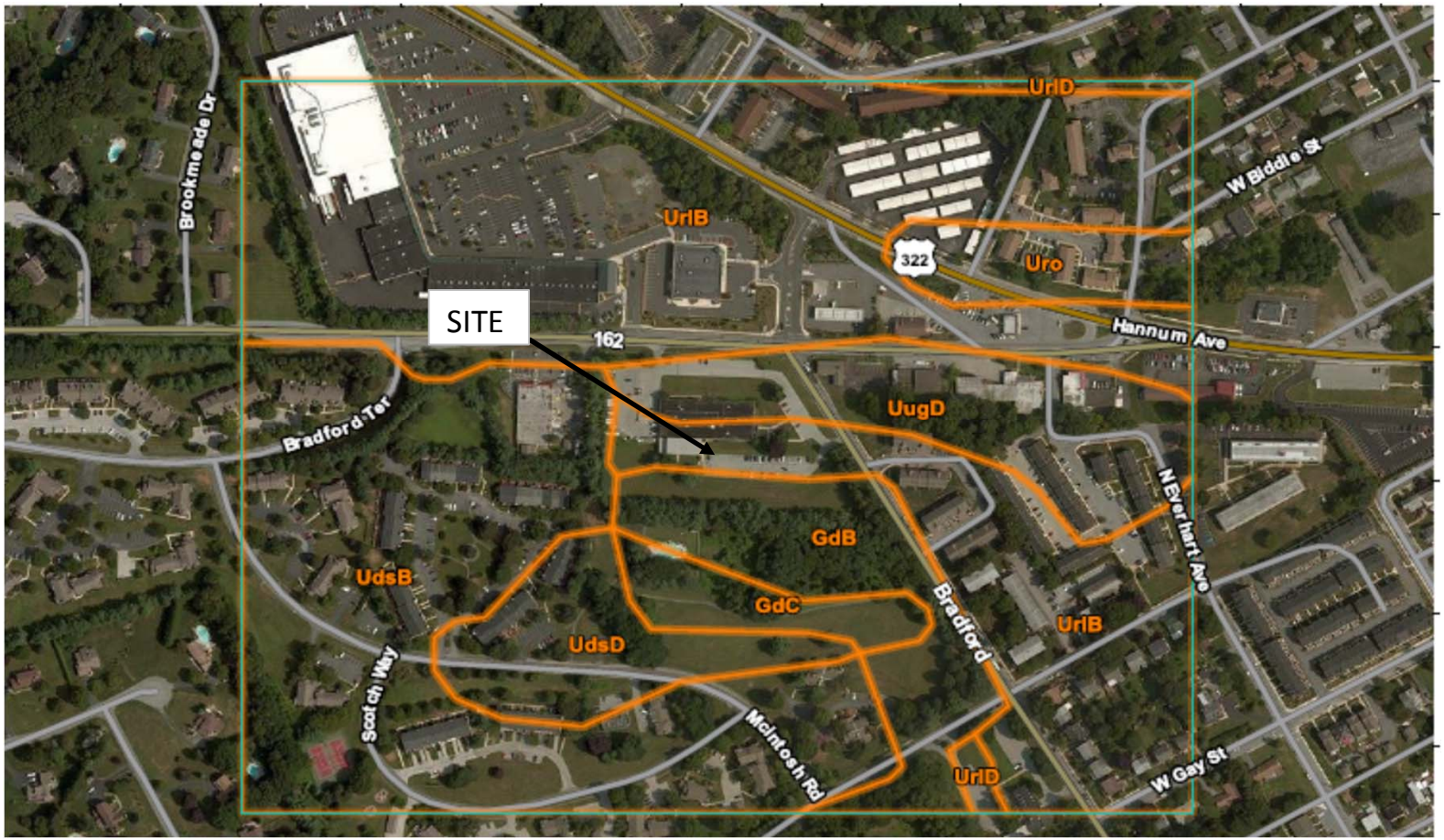
Project 4898G1

Figure II

SITE GEOLOGY

USGS Geologic Quandrangle Mapping

West Chester Quadrangle



KEY

Gladstone gravelly loam, 3 to 8 percent slopes (GdB)

Urban land-Gladstone complex, 0 to 8 percent slopes (UrlB)

Urban land-Udorthents, schist and gneiss complex, 8 to 25 percent slopes (UugD)

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Figure III

Soils

Soil Mapping via USDA Natural Resources Conservation Service

TABLE I
LABORATORY TEST RESULTS

BORING #	B1 B2	B3	B6
SAMPLE #	S-1 S-1	S-1 S-2	S-1 S-2
DEPTH	2'-4' 2'-4'	2'-4' 4'-6'	2'-4' 4'-6'
STRATUM	I	II	I
NMC* (%)	34.3 29.4	5.8 6.0	26.2 18.4

* NMC = Natural Moisture Content

SOIL PARTICLE SIZE DISTRIBUTION

SIEVE #	PERCENT PASSING BY WEIGHT		
1.5	100	100	100
3/4"	100	86.9	100
3/8"	99.1	73.3	98.6
4	97.5	61.0	97.0
10	95.6	48.2	95.1
40	77.2	26.7	88.4
100	58.5	17.7	80.7
200	42.4	12.5	74.4

ATTERBERG LIMIT ANALYSIS

LL*	N/A	N/A	N/A
PL*	N/A	N/A	N/A
PI*	N/A	N/A	N/A

* LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index

USCS CLASSIFICATION

Eng. Class.	SM	SM	ML
Descr.	silty sand	silty sand w/gravel	silt with sand

TABLE I (CONT'D)
LABORATORY TEST RESULTS

BORING #	B4	B5
SAMPLE #	S-1	S-1
DEPTH	2'-4'	2'-4'
STRATUM	I	I
NMC* (%)	12.08	17.74

* NMC = Natural Moisture Content

TABLE II
APPROXIMATE ROCK ELEVATIONS

Boring Number	Surface Elevation	Depth to Dense Weathered Rock[1]	Dense Weathered Rock Elevation	Depth to Bedrock[2]	Bedrock Elevation
B1	416.62 feet	>20 feet	<396.62 feet	NE	N/A
B2	423.46 feet	>20 feet	<403.46 feet	NE	N/A
B3	408.71 feet	10.25 feet	308.46 feet	16.58 feet	392.13 feet
B4	406.48 feet	15.25 feet	391.23 feet	>24.42 feet	<382.06 feet
B5	396.19 feet	16.0 feet	380.19 feet	17.17 feet	379.02 feet
B6	396.83 feet	>22 feet	<374.83 feet	NE	N/A

NOTES:
Surface elevations at each boring location were determined in the field using an elevation of 393.0 at the existing storm inlet grate located within the northwestern portion of the existing parking lot. Note: this grate elevation was approximated, this boring surface elevation shall be updated once a site survey is completed and the actual grate elevation is determined.

[1] As determined by drilling difficulty and Standard Penetration Resistance data.
[2] As determined by auger refusal.

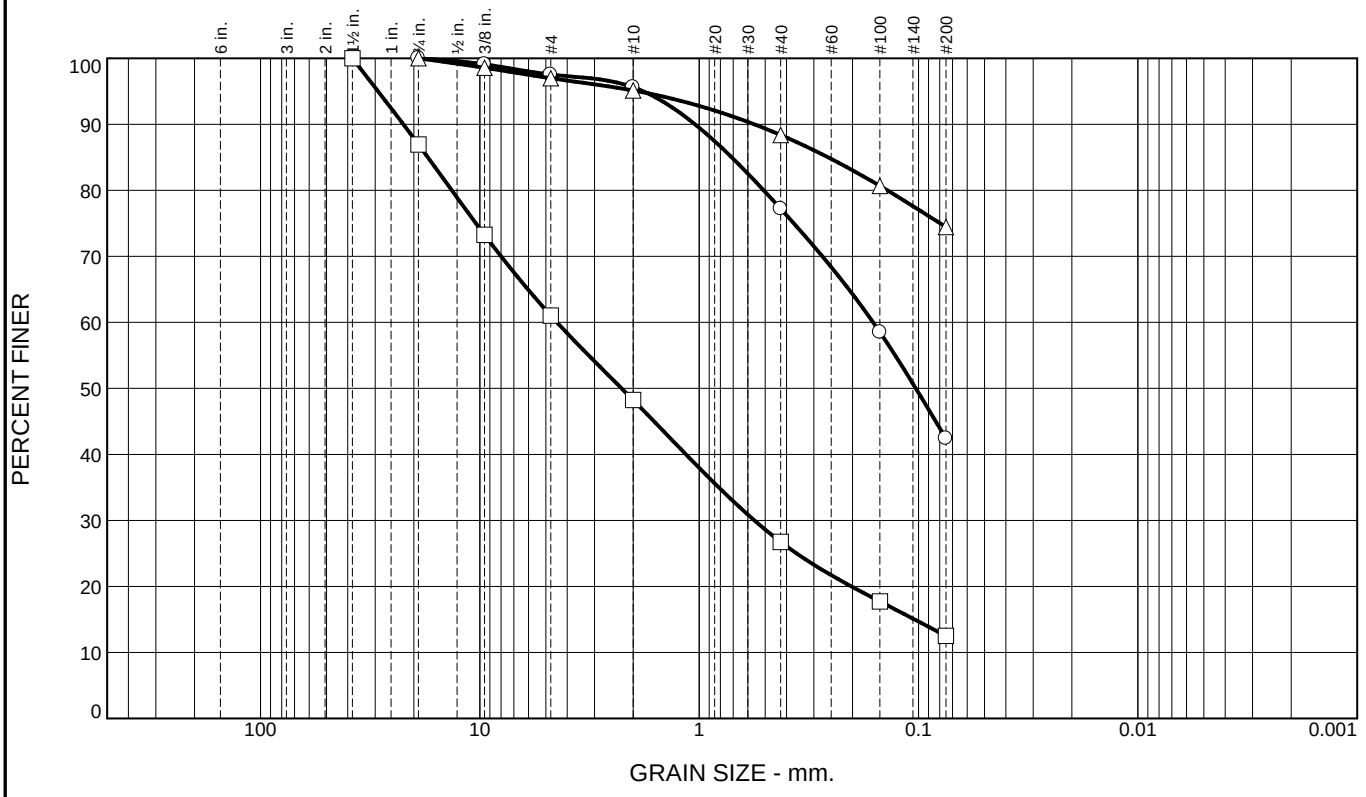
TABLE III
COMPACTION CRITERIA

LOCATION	PERCENT COMPACTION (ASTM-D698)
Foundations	98%
Floor Slabs	98%
Pavements	95%
Berms (non-structural)	93%

APPENDIX

SOIL PARTICLE SIZE ANALYSIS RESULTS

Particle Size Distribution Report



	+3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○	0.0	2.5	55.1	42.4		SM	A-4(0)	NP	NP
□	0.0	39.0	48.5	12.5		SM	A-1-a	NP	NP
△	0.0	3.0	22.6	74.4		ML	A-4(0)	NP	NP

SIEVE inches size	PERCENT FINER ○	□	△
1.50		100.0	
.75	100.0	86.9	100.0
.375	99.1	73.3	98.6
	GRAIN SIZE		
D_{60}	0.1611	4.4500	
D_{30}		0.5603	
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○	□	△
#4	97.5	61.0	97.0
#10	95.6	48.2	95.1
#40	77.2	26.7	88.4
#100	58.5	17.7	80.7
#200	42.4	12.5	74.4

Material Description

○ Orange brown silty sand (Stratum I)

□ Silty sand with gravel (weathered gneiss - Stratum II)

△ Orange brown silt with sand (Stratum I)

REMARKS:

○ NMC B1-S1: 34.3%
B2-S1: 29.4%

□ NMC B3-S1: 5.8%
B3-S2: 6.0%

△ NMC B6-S1: 26.2%
B6-S2: 18.4%

○ Source of Sample: B1 & B2 Depth: 2'-4' Sample Number: B1S1 & B2S1

□ Source of Sample: B3 Depth: 2'-6' Sample Number: S1-S2

△ Source of Sample: B6 Depth: 2'-6' Sample Number: S1-S2

DBA DAVID BLACKMORE & ASSOCIATES, INC.
GEOTECHNICAL & ENVIRONMENTAL ENGINEERS

Client: Toll Brothers Apartment Living

Project: West Chester Parcel, 4-5 Story Apartment Complex

Project No.: 4898G1 Plate

TEST BORING LOGS

DAVID BLACKMORE & ASSOCIATES, INC.
Geotechnical & Environmental Engineers
Phone: 610-495-6255 Fax: 610-495-7353
www.dbaengineering.com

Boring Number : B1

Project : New 4-5 Story Apartment Complex
Location: West Strasburg Road and North Bradford Avenue
Twp/City/State: West Chester Borough/Chester Co/PA
Drilling Contractor : Corcoran Drilling Co.
X Coordinate (ft) : 0 Y Coordinate (ft) : 0
Drilling Method #1 : 6" DIA Solid Augers from 0' to 18'
Drilling Method #2: 2" OD Split Spoon Sampler from 18' to 20'

Project Number : 4898G1
Date Drilled : 4/7/16
Inspected by : ZMH
Boring Depth: 20'
Ground Surface Elevation (ft msl) : 416.62
Water Level - Immediate (ft bgs) : DRY (5 min)
Water Level -Static (ft bgs): DRY (6 hrs)

DEPTH BELOW	WATER LEVEL	LITHOLOGY: LITHOLOGIC SYMBOL	LITHOLOGY: GEOLOGIC DESCRIPTION OF SOIL AND ROCK STRATA	LITHOLOGY: DEPTH (FT)	LITHOLOGY: ELEVATION	SAMPLING DATA: NUMBER	SAMPLING DATA: SPT DATA	SAMPLING DATA: SPT Value
			Topsoil (11")	0.92	415.70			
			Stratum I Orange brown and brown slightly micaceous fine sand and silt	4.17	412.45	S-1*	1-3-2-2	5
			Stratum II Multi-colored weathered gneiss			S-2	3-3-5-5	8
						S-3	6-7-7-6	14
						S-4	4-5-8-11	13
						S-5	5-6-9-15	15
						S-6	15-16-23-30	39
			Boring Terminated	20.00	396.62			

Water Content: 5 10 20 30 40 50
SPT GRAPH (Blows Per Foot): 1 — 100

The boring results represent subsurface conditions at the boring locations only and are not necessarily representative of conditions at other locations. Water levels are taken at the time of drilling and are not indicative of seasonal variations in the ground water level. NR = No Recovery, S =Split Spoon sample(2" O.D.), C=Rock Coring Run.

DAVID BLACKMORE & ASSOCIATES, INC.
Geotechnical & Environmental Engineers
Phone: 610-495-6255 Fax: 610-495-7353
www.dbaengineering.com

Boring Number : B2

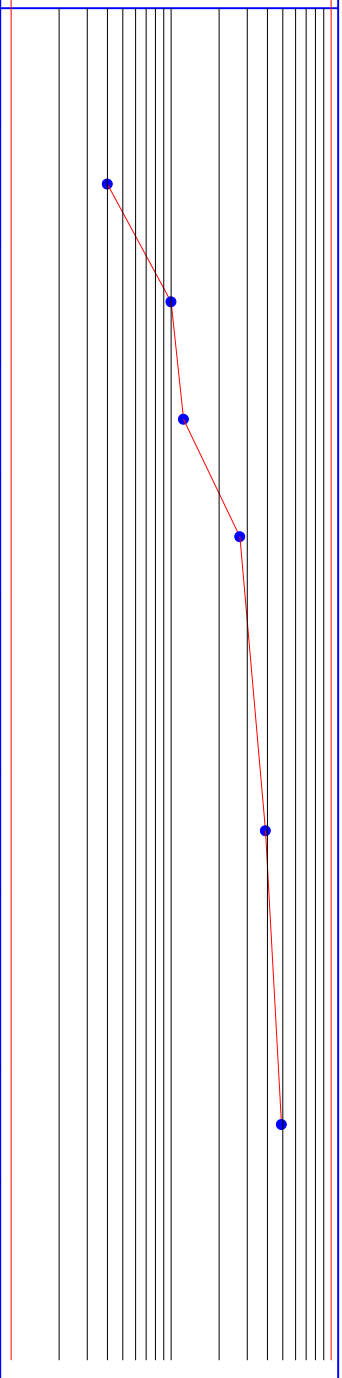
Project : New 4-5 Story Apartment Complex
Location: West Strasburg Road and North Bradford Avenue
Twp/City/State: West Chester Borough/Chester Co/PA
Drilling Contractor : Corcoran Drilling Co.
X Coordinate (ft) : 0 Y Coordinate (ft) : 0
Drilling Method #1 : 6" DIA Solid Augers from 0' to 18'
Drilling Method #2: 2" OD Split Spoon Sampler from 18' to 20'

Project Number : 4898G1
Date Drilled : 4/7/16
Inspected by : ZMH
Boring Depth: 20'
Ground Surface Elevation (ft msl) : 423.46
Water Level - Immediate (ft bgs) : DRY (5 min)
Water Level -Static (ft bgs): DRY (7 hrs)

DEPTH BELOW	WATER LEVEL	LITHOLOGY: LITHOLOGIC SYMBOL	LITHOLOGY: GEOLOGIC DESCRIPTION OF SOIL AND ROCK STRATA	LITHOLOGY: DEPTH (FT)	LITHOLOGY: ELEVATION	SAMPLING DATA: NUMBER	SAMPLING DATA: SPT DATA	SAMPLING DATA: SPT Value
0			Topsoil (12")	1.00	422.46			
			Stratum I Orange brown and brown slightly micaceous fine sand and silt			S-1*	1-2-2-3	4
				5.00	418.46	S-2	3-5-5-6	10
			Stratum II Multi-colored weathered gneiss			S-3	4-5-7-9	12
						S-4	12-14-13-12	27
						S-5	8-13-16-21	39
						S-6	31-23-26-27	49
				20.00	403.46			
			Boring Terminated					

Water Content: 5 10 20 30 40 50

SPT GRAPH (Blows Per Foot): 1 – 100



The boring results represent subsurface conditions at the boring locations only and are not necessarily representative of conditions at other locations. Water levels are taken at the time of drilling and are not indicative of seasonal variations in the ground water level. NR = No Recovery, S =Split Spoon sample(2" O.D.), C=Rock Coring Run.

DAVID BLACKMORE & ASSOCIATES, INC.
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www.dbaengineering.com

Boring Number : B3

Project : New 4-5 Story Apartment Complex
Location: West Strasburg Road and North Bradford Avenue
Twp/City/State: West Chester Borough/Chester Co/PA
Drilling Contractor : Corcoran Drilling Co.
X Coordinate (ft) : 0 Y Coordinate (ft) : 0
Drilling Method #1 : 6" DIA Solid Augers from 0' to 16'7"
Drilling Method #2:

Project Number : 4898G1
Date Drilled : 4/7/16
Inspected by : ZMH
Boring Depth: 16.58'
Ground Surface Elevation (ft msl) : 408.71
Water Level - Immediate (ft bgs) : DRY (5 min)
Water Level -Static (ft bgs): DRY (3 hrs)

DEPTH BELOW	WATER LEVEL	LITHOLOGY: LITHOLOGIC SYMBOL	LITHOLOGY: GEOLOGIC DESCRIPTION OF SOIL AND ROCK STRATA	LITHOLOGY: DEPTH (FT)	LITHOLOGY: ELEVATION	SAMPLING DATA: NUMBER	SAMPLING DATA: SPT DATA	SAMPLING DATA: SPT Value
			Topsoil (6")	0.50	408.21			
			Stratum I	1.00	407.71			
1.0			Orange brown and brown slightly micaceous fine sand and silt					
2.0								
			Stratum II					
3.0			Multi-colored weathered gneiss			S-1	6-15-16-18	31
4.0								
5.0						S-2	29-38-40-47	78
6.0								
7.0								
8.0								
9.0								
						S-3	7-41-50/3"	100
10.0			***Notes:*** *Very Hard Choppy Augering from 10.25' to 11.5'*					
11.0			*Fairly Easy Augering from 11.5' to 13'*					
12.0			*Hard Augering from 13'*					
13.0			*Very Hard Augering from 16'*					
14.0						S-4	50/4"	100
15.0								
16.0				16.58	392.13			
17.0			Auger Refusal on Gneiss Bedrock					

SAMPLING DATA: Water Content — 5 10 20 30 40 50

SAMPLING DATA: SPT GRAPH (Blows Per Foot) — 1 to 100

The boring results represent subsurface conditions at the boring locations only and are not necessarily representative of conditions at other locations. Water levels are taken at the time of drilling and are not indicative of seasonal variations in the ground water level. NR = No Recovery, S =Split Spoon sample(2" O.D.), C=Rock Coring Run.

DAVID BLACKMORE & ASSOCIATES, INC.
Geotechnical & Environmental Engineers
Phone: 610-495-6255 Fax: 610-495-7353
www.dbaengineering.com

Boring Number : B4

Project : New 4-5 Story Apartment Complex
Location: West Strasburg Road and North Bradford Avenue
Twp/City/State: West Chester Borough/Chester Co/PA
Drilling Contractor : Corcoran Drilling Co.
X Coordinate (ft) : 0 Y Coordinate (ft) : 0
Drilling Method #1 : 6" DIA Solid Augers from 0' to 24'
Drilling Method #2: 2" OD Split Spoon Sampler from 24' to 24'5"

Project Number : 4898G1
Date Drilled : 4/7/16
Inspected by : ZMH
Boring Depth: 24.42'
Ground Surface Elevation (ft msl) : 406.48
Water Level - Immediate (ft bgs) : DRY (5 min)
Water Level -Static (ft bgs): DRY (4 hrs)

DEPTH BELOW	WATER LEVEL	LITHOLOGY: LITHOLOGIC SYMBOL	LITHOLOGY: GEOLOGIC DESCRIPTION OF SOIL AND ROCK STRATA	LITHOLOGY: DEPTH (FT)	LITHOLOGY: ELEVATION	SAMPLING DATA: NUMBER	SAMPLING DATA: SPT DATA	SAMPLING DATA: SPT Value
0.0			Topsoil (6")					
			Stratum I					
			Orange brown and brown slightly micaceous fine sand and silt	2.42	404.06			
3.0						S-1	4-8-10-7	18
			Stratum II					
			Multi-colored weathered gneiss					
5.0						S-2	18-23-13-12	36
10.0						S-3	12-18-22-27	40
14.0						S-4	14-41-50/3"	100
15.0			***Notes:*** *Fairly Hard Augering from 15.25'*					
19.0						S-5	31-50/5"	100
24.0						S-6	50/5"	100
				24.42	382.06			
25.0			Boring Terminated					

Water Content: 5 10 20 30 40 50

SPT GRAPH (Blows Per Foot): 1 — 100

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DAVID BLACKMORE & ASSOCIATES, INC.
Geotechnical & Environmental Engineers
Phone: 610-495-6255 Fax: 610-495-7353
www.dbaengineering.com

Boring Number : B5

Project : New 4-5 Story Apartment Complex
Location: West Strasburg Road and North Bradford Avenue
Twp/City/State: West Chester Borough/Chester Co/PA
Drilling Contractor : Corcoran Drilling Co.
X Coordinate (ft) : 0 Y Coordinate (ft) : 0
Drilling Method #1 : 6" DIA Solid Augers from 0' to 17'2"
Drilling Method #2:

Project Number : 4898G1
Date Drilled : 4/7/16
Inspected by : ZMH
Boring Depth: 17.17'
Ground Surface Elevation (ft msl) : 396.19
Water Level - Immediate (ft bgs) : DRY (5 min)
Water Level -Static (ft bgs): DRY (2 hrs)

DEPTH BELOW	WATER LEVEL	LITHOLOGY: LITHOLOGIC SYMBOL	LITHOLOGY: GEOLOGIC DESCRIPTION OF SOIL AND ROCK STRATA	LITHOLOGY: DEPTH (FT)	LITHOLOGY: ELEVATION	SAMPLING DATA: NUMBER	SAMPLING DATA: SPT DATA	SAMPLING DATA: SPT Value
			Topsoil (6")	0.50	395.69			
1.0			**Stratum IF** FILL consisting of brown and orange brown micaceous fine sand and silt with occasional gneiss fragments					
2.0								
3.0				3.00	393.19	S-1	2-2-2-7	4
4.0			**Stratum I** Orange brown and brown slightly micaceous fine sand and silt					
5.0				5.50	390.69	S-2	2-3-3-5	6
6.0			**Stratum II** Multi-colored weathered gneisss					
7.0						S-3	7-9-10-11	19
8.0								
9.0								
10.0								
11.0						S-4	12-13-13-14	26
12.0								
13.0								
14.0			***Notes:*** *Hard Augering from 16'* *Very Hard Augering from 17'*					
15.0						S-5	28-50/5"	100
16.0								
17.0				17.17	379.02			
18.0			Auger Refusal on Gneiss Bedrock					

Water Content: 5 10 20 30 40 50

SPT GRAPH (Blows Per Foot): 1 — 100

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DAVID BLACKMORE & ASSOCIATES, INC.
Geotechnical & Environmental Engineers
Phone: 610-495-6255 Fax: 610-495-7353
www.dbaengineering.com

Boring Number : B6

Project : New 4-5 Story Apartment Complex
Location: West Strasburg Road and North Bradford Avenue
Twp/City/State: West Chester Borough/Chester Co/PA
Drilling Contractor : Corcoran Drilling Co.
X Coordinate (ft) : 0 Y Coordinate (ft) : 0
Drilling Method #1 : 6" DIA Solid Augers from 0' to 20'
Drilling Method #2: 2" OD Split Spoon Sampler from 20' to 22'

Project Number : 4898G1
Date Drilled : 4/7/16
Inspected by : ZMH
Boring Depth: 22.00'
Ground Surface Elevation (ft msl) : 396.83
Water Level - Immediate (ft bgs) : DRY (5 min)
Water Level -Static (ft bgs): DRY (1 hrs)

DEPTH BELOW	WATER LEVEL	LITHOLOGY: LITHOLOGIC SYMBOL	LITHOLOGY: GEOLOGIC DESCRIPTION OF SOIL AND ROCK STRATA	LITHOLOGY: DEPTH (FT)	LITHOLOGY: ELEVATION	SAMPLING DATA: NUMBER	SAMPLING DATA: SPT DATA	SAMPLING DATA: SPT Value
			Topsoil (6")	0.50	396.33			
			Stratum I Orange brown fine sand and silt					
						S-1	1-2-2-2	4
						S-2	4-10-12-16	22
				6.00	390.83			
			Orange brown and gray slightly micaceous fine sand and silt with occasional gneiss fragments.			S-3	8-11-12-15	23
				9.00	387.83			
			Stratum II Multi-colored weathered gneisss					
						S-4	4-4-6-9	10
			Notes: *Samples S1 through S3 were very moist.* *Sample S4 was moist.*					
						S-5	6-7-10-14	17
						S-6	16-18-19-22	37
				22.00	374.83			
			Boring Terminated					

Water Content: 5 10 20 30 40 50

SPT GRAPH (Blows Per Foot): 1 — 100

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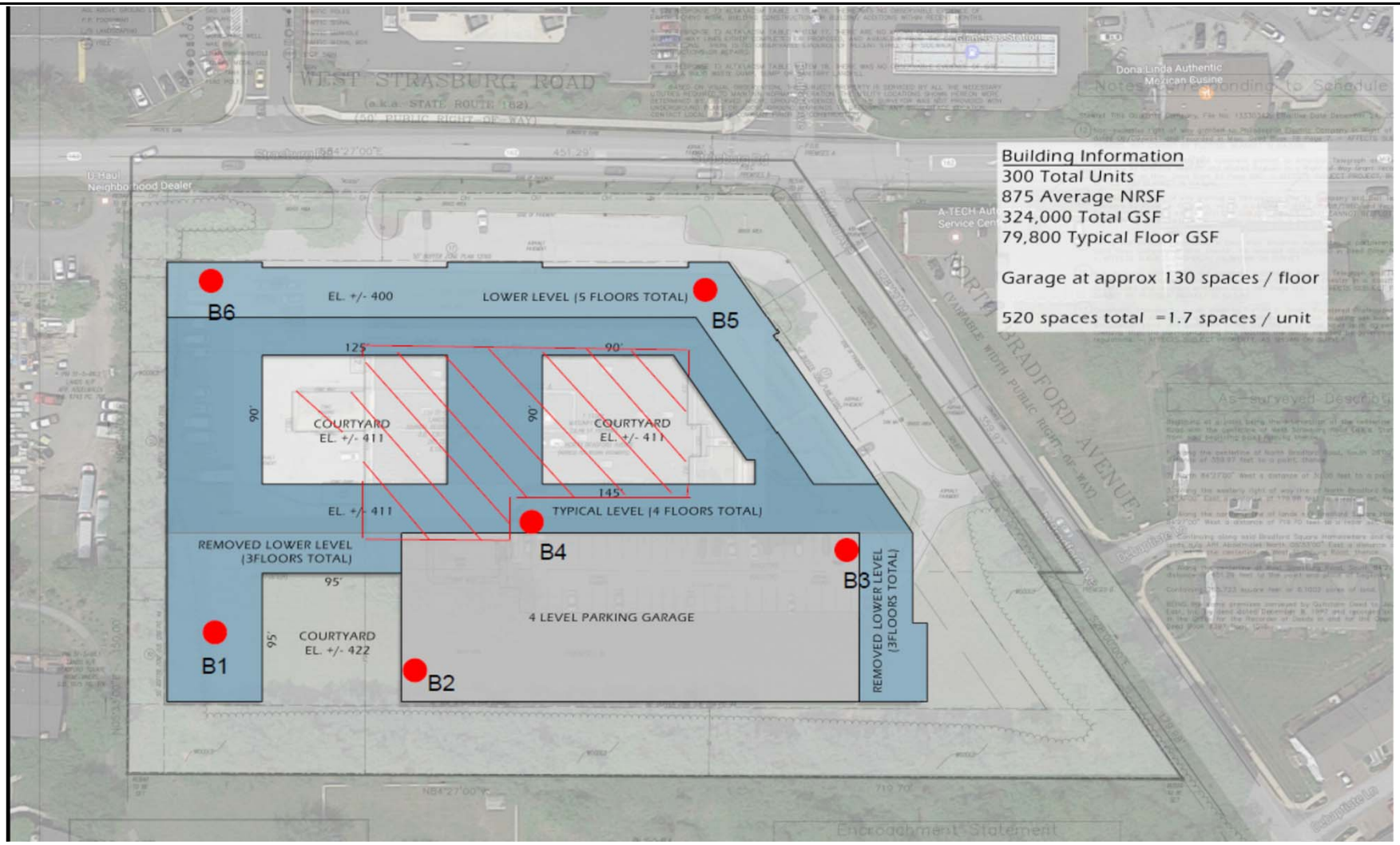
TEST BORING LOCATION PLAN



KEY

● Test Boring Location

GEOTECHNICAL & ENVIRONMENTAL ENGINEERS
DAVID BLACKMORE & ASSOC., INC.
3335 West Ridge Pike
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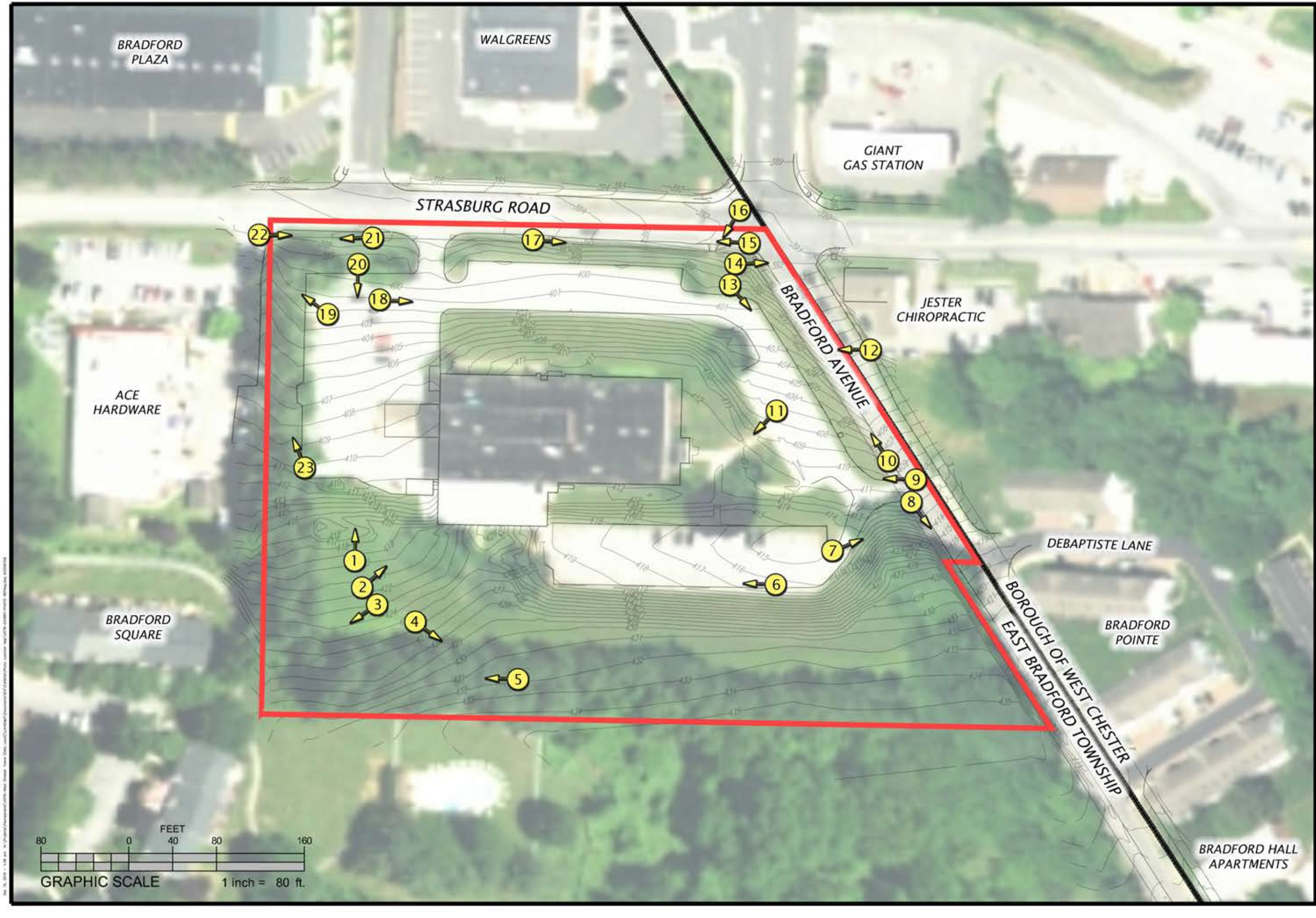
Telephone: (610) 495-6255 FAX: (610) 495-7353

Project 4898G1R1

TEST BORING LOCATION PLAN
Proposed Apartment Complex
W. Strasbug Road and N. Bradford Avenue
West Chester, PA



ESE PLANNING

DAILY LOCAL TOWNHOMES

PHOTO LOCATION MAP

EAST BRADFORD TOWNSHIP, CHESTER COUNTY, PA

EIA REPORT
2018.12.20

PHOTO LOCATIONS:

LOCATION 1

LOCATION 2

LOCATION 3

LOCATION 4

LOCATION 5

LOCATION 6

LOCATION 7

LOCATION 8

LOCATION 9

LOACTION 10

LOCATION 11

LOCATION 12

LOCATION 13

LOCATION 14

LOCATION 15

LOCATION 16

LOCATION 17

LOCATION 18

LOCATION 19

LOCATION 20

LOCATION 21

LOCATION 22

LOCATION 23

LOCATION 24

ESE PLANNING

DAILY LOG LOCAL TOWNHOMES

VISUAL IMPACT EXHIBIT

EAST BRADFORD TOWNSHIP, CHESTER COUNTY, PA

EIA REPORT
2018.12.20

EMERGENGY SERVICES:

1. LIBERTY AMBULANCE
2. CHESTER COUNTY HOSPITAL
3. GOOD FELLOWSHIP AMBULANCE EMS
4. FIRST WEST CHESTER FIRE CO.
5. WEST CHESTER POLICE DEPT.

EDUCATIONAL SERVICES:

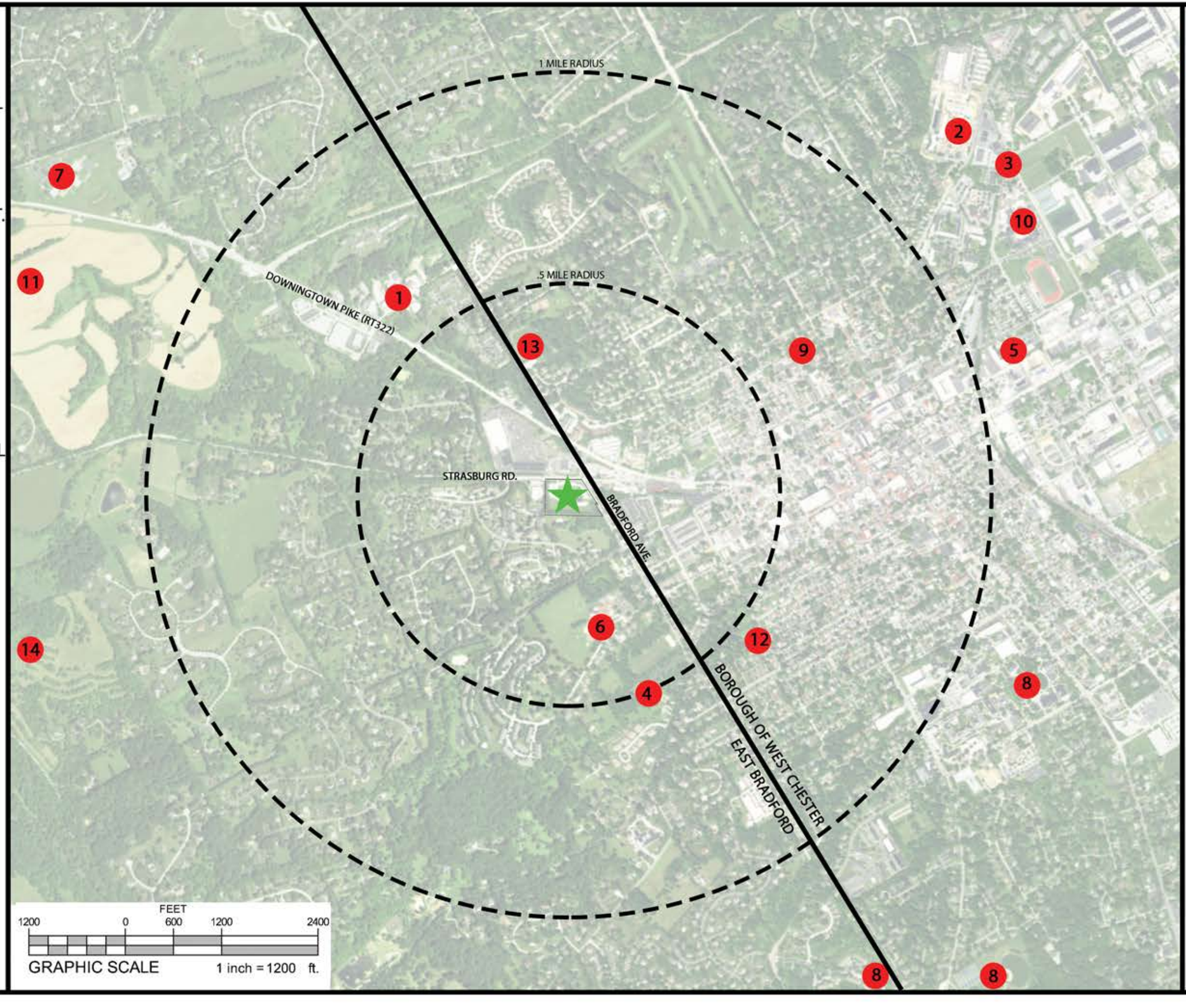
6. HILLSDALE ELEMENTARY
7. EAST BRADFORD ELEMENTARY
8. WEST CHESTER UNIVERSITY
9. WEST CHESTER PUBLIC LIBRARY
10. HENDERSON HIGH SCHOOL

PARKS AND RECREATION:

11. BRANDYWINE PARK
12. EVERHART PARK
13. HOOPES PARK
14. STROUD PRESERVE

UTILITIY SERVICES:

WATER: AQUA PA
SEWER: TBD
ELECTRIC: TBD



ESE PLANNING

DAILY LOCAL TOWNHOMES

MUNICIPAL SERVICES MAP

EAST BRADFORD TOWNSHIP, CHESTER COUNTY, PA

NORTH

EIA REPORT
2018.12.20

ESE CONSULTANTS
ENGINEERING · PLANNING · SURVEYING · ENVIRONMENTAL

December 13, 2018

Mr. Andrew Semon
Division President
Toll Brothers, Inc.
250 Gibraltar Road
Horsham, PA 19044

SUBJECT: West Chester Towns (aka Daily Local Property)
Parcel#: 51-5-86.2; TBI# 4576
East Bradford Township, Chester County, PA
Wetland/waters Review

Dear Mr. Semon,

An ESE Consultants, Inc. (ESE) Professional Wetland Scientist (PWS) conducted a site evaluation at the above referenced site on December 7, 2018. The site consists of approximately six (6) acres and includes a vacant commercial building and various site improvements. ESE has determined that the site consists of uplands and there are no wetlands nor waterways within the site boundary that would be regulated by Section 404 of the Clean Water Act and Chapter 105 (Dam Safety and Waterway Management), as regulated by the Army Corps of Engineers and PADEP, respectively.

Should you require any further information, or if we can be of further service, please do not hesitate to contact me.

Sincerely,
ESE Consultants, Inc.

Michael Warrick

Michael Warrick, PWS, CPSSC