KARL F. DEAN
MAYOR

METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY

Metropolitan Historic Zoning Commission
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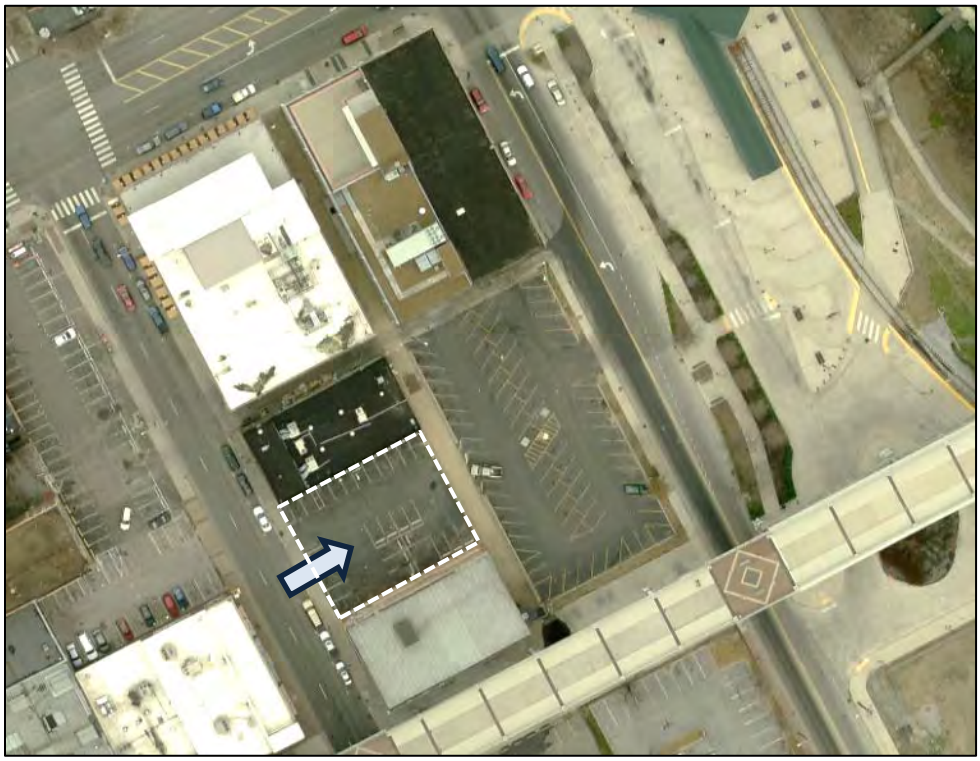
STAFF RECOMMENDATION
120 Second Avenue South
October 18, 2017

Application: New construction - infill
District: Broadway Historic Preservation Zoning Overlay
Council District: 19
Map and Parcel Number: 09306410100
Applicant: Mark Robin, Architect
Project Lead: Sean Alexander, sean.alexander@nashville.gov

Description of Project: The applicant is requesting a revision to the design of a six-story brick building that was approved in April of 2015, with revisions approved by the Commission in 2017. The applicant proposes to clad portions of the exterior walls with a material that has not been approved by the MHZC. **Recommendation Summary:** Staff recommends approval of a smooth finished EIFS on the 6th floor and disapproval of the Custom Brick EIFS finding that it does not meet section III.F.2 of the design guidelines for the Broadway Historic Preservation Zoning Overlay.	**Attachments** **A:** Photographs **B:** Elevations **C:** Dryvit Brochure **D:** Soils Report

Vicinity Map:

Aerial Map:



Applicable Design Guidelines:

III. New Construction

General Principles:
These guidelines shall apply only to the exteriors of buildings and to areas of lots visible from public rights-of-way.

The public facades – street related elevations – of proposals for new buildings shall be more carefully reviewed than other facades.

New construction should be consistent with existing buildings along a street in terms of height, scale, setback, and rhythm; relationship of materials, texture, details, and color; roof shape; orientation; and proportion and rhythm of openings.

Because new buildings usually relate to an established pattern and rhythm of existing buildings, the dominance of that pattern and rhythm must be respected and not disrupted.

New buildings must be constructed to a height that is compatible with the height of adjacent buildings.

Guidelines:

F. Relationship of Materials, Texture, Details, and Material Color

1. The relationship and use of materials, texture, details and material colors of a new building's public facades shall be visually compatible with or similar to those of adjacent buildings, or shall not contrast conspicuously.
2. Masonry materials were primarily used in the historic district, and should continue to be predominant.
   Contemporary materials may be used if they possess characteristics similar in scale, design, finish, texture, durability, and detailing to historic materials and meet *The Secretary's Standards*. Exterior Insulation Finish Systems and vinyl are not appropriate exterior materials.
3. Wood, brick, stone, and metal were used for window, door and storefront surrounds and should be used for new buildings.
4. Storefront façade materials may vary in keeping with the materials of the existing buildings. Stone, glazed tile, painted wood, and brick are all appropriate materials.
5. Tinted glass, reflective glass, or colored glass may not be used for windows.
6. Large expanses of featureless materials are not appropriate.
7. The color of new building materials should be compatible with historic buildings within the district.

Background: 120 Second Avenue South is currently a vacant parcel. A three-story building which had housed a variety of wares and stores over the years once stood on the lot.

The MHZC approved a proposal to construct a new six-story building on the lot in April of 2015, with revisions approved by the Commission in 2017.

Analysis and Findings: The applicant proposes to clad portions of the exterior walls with a material that has not been approved by the MHZC.

Materials & Lighting:
The front, rear and portions of the side facades of the building will be clad with traditional red brick.

The 6th floor is proposed to be clad with a smooth Exterior Insulation and Finish System (EIFS). The design guidelines specifically list EIFS as an inappropriate material; however, it has been approved in the past for trim located well above the street. The material proposed has a "limestone textured acrylic finish" that will match the limestone on the front façade in terms of "color, texture and tooling." Staff finds the material to be appropriate for the 6th floor because of the minimally visible location, the material closely resembles true masonry, and because the majority of the 6th floor is glazing. The material use is similar to what has been approved in the past.

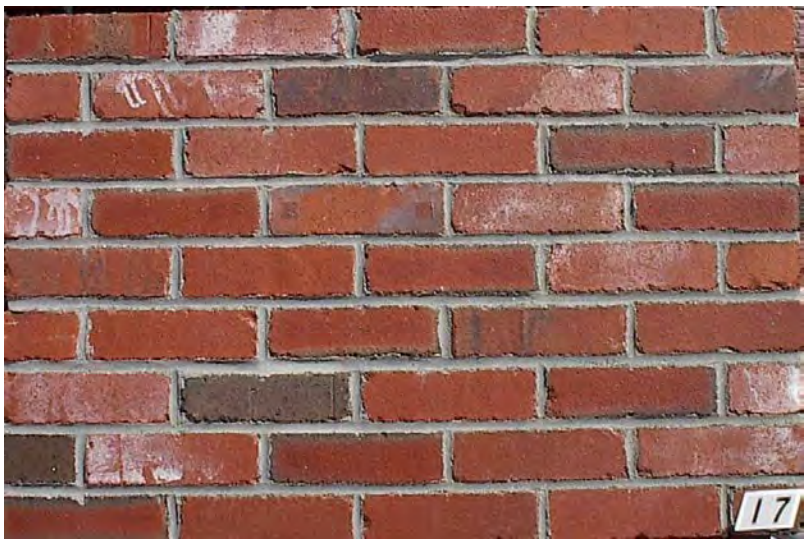
The applicant proposes that the exposed left and right side facades, with the exception of the 6th floor noted previously, are to be clad in "Dryvit" brand EIFS with a "Custom Brick" finish. Because of the proposed primary use of the material, it does not meet the design guidelines which specifically call out EIFS as an inappropriate material.

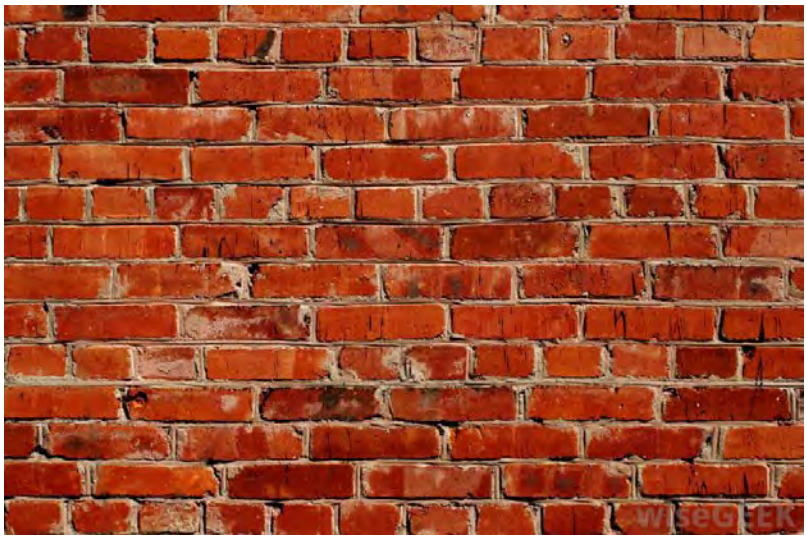
The MHZC has a policy for reviewing new materials to ensure that they meet section III.F of the design guidelines. This guideline allows for "contemporary materials" if they "possess characteristics similar in scale, design, finish, texture, durability and detailing to historic materials." The primary considerations are the appearance and function of the requested material. Other important considerations include the availability and quality of historic materials, the availability of knowledgeable craftsmen and laborers, safety and sustainability concerns, and cost (short term and long term).

Staff evaluated the Newbrick Dryvit and made the following observations:

Appearance (Is the look of the material compatible with the historic context)
While manufactured to be uniform in size and shape, natural inclusions in the raw clay and irregularities in kiln firing results in variations in the texture and color of every brick. Additionally, the nature of laying bricks by hand results in inevitable differences in brick placement and mortar profiles. These inherent qualities are essential to maintaining the man-made appearance of traditional masonry.

Although the Dryvit samples exhibit colors and coursing similar to brick with mortared joints, when viewed in a larger surface the differences become more evident. Walls clad with the material appear unnaturally homogenous and flat. Limitations in the size of the foam backing also results in expansion seams in the surface not typical of traditional masonry walls. In this application, the faux brick will be directly abutting the real brick, further enhancing the difference between the two. Staff finds that the appearance of the proposed material does not sufficiently replicate that of historic brick and does not meet section III.F for a contemporary material possessing the same finish, texture and detailing as historic brick.





Figures 1-3: Top is an example of the proposed material. Middle is an example of newly manufactured brick and bottom is historic brick. Both the newly manufactured and historic brick have imperfections in the tooling, color and texture that are not evident in the proposed material.

Function (Is the durability and workability comparable to that of historic materials?)
The manufacturer describes the product as durable and repairable, and as having a thirty (30) year life span. No other data on durability or workability has been provided, although the manufacturer does offer a ten (10') year warranty on the material and finish color.

Brick has a proven record of longevity and workability, evidenced by several brick buildings in downtown Nashville older than one hundred (100) years, with a handful nearly two hundred (200) years old. The primary period of development for historic buildings on Second Avenue was 1870-1900, with brick as the dominant material on nearly all of them. If properly constructed and not compromised by later alteration or painting, brick walls do not require much maintenance. When needed it is relatively easy to remove and repoint deteriorated mortar.

The workability of the proposed material is not the same as brick. When brick and/or mortar is damaged it can either be repaired in place or small portions replaced and tooled to match the existing. In the case of the EIFS material, if there is damage the entire panel of faux brick would need to be replaced, rather than a simple mortar repair or single brick replacement, assuming that the exact material is still being manufactured. (The Dryvit website provides information for small repairs; however, it appears to be for EIFS that has one finish rather than the faux brick product.)

Staff finds that the durability and workability of the proposed material does not sufficiently replicate that of historic brick and does not meet section III.F of the design guidelines.

Availability and quality of historic materials
If an historic material is no longer available, or it cannot be practically produced with the characteristic features of the historic context, then a substitute material may be appropriate. Brick is widely available, and can be easily acquired in innumerable sizes, colors, and textures such that a suitable selection could be easily found.

Availability of knowledgeable craftsmen and laborers
If no local persons skilled and experienced with a traditional material are available, then a substitute material may be appropriate. There are many masons in the area who work regularly with brick.

Safety and sustainability
If using an historic material would create a potential life safety hazard or an environmental concern, using a substitute material may be appropriate. For example, asbestos and lead were often used in the construction of buildings historically, but those materials are not used today having been found to present dangers unknown at the time. Using new materials as a substitute for those materials would be appropriate.

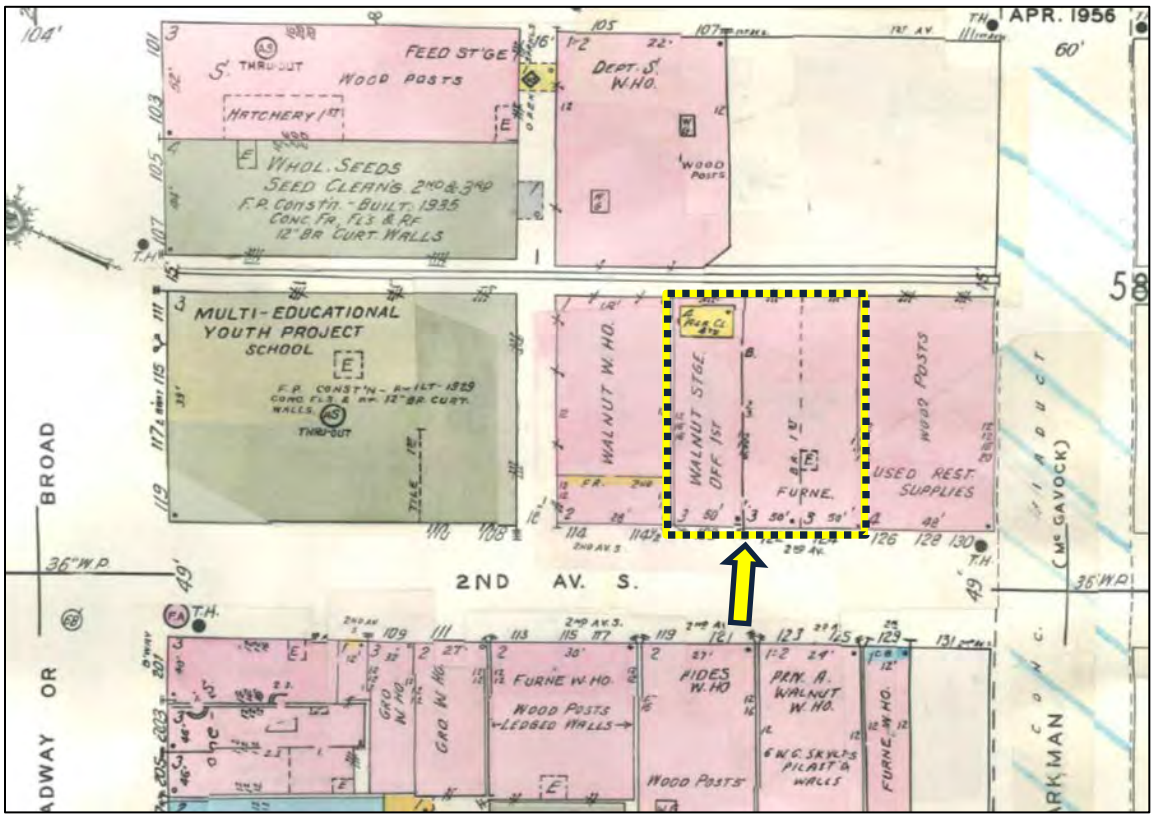
Brick, however, is inert and is not known to pose any health or environmental dangers. Furthermore, masonry walls are known to be good insulators and can absorb heat in the

daytime and radiate it in the evening, helping to regulate the temperature of a building and lower energy cost and consumption.

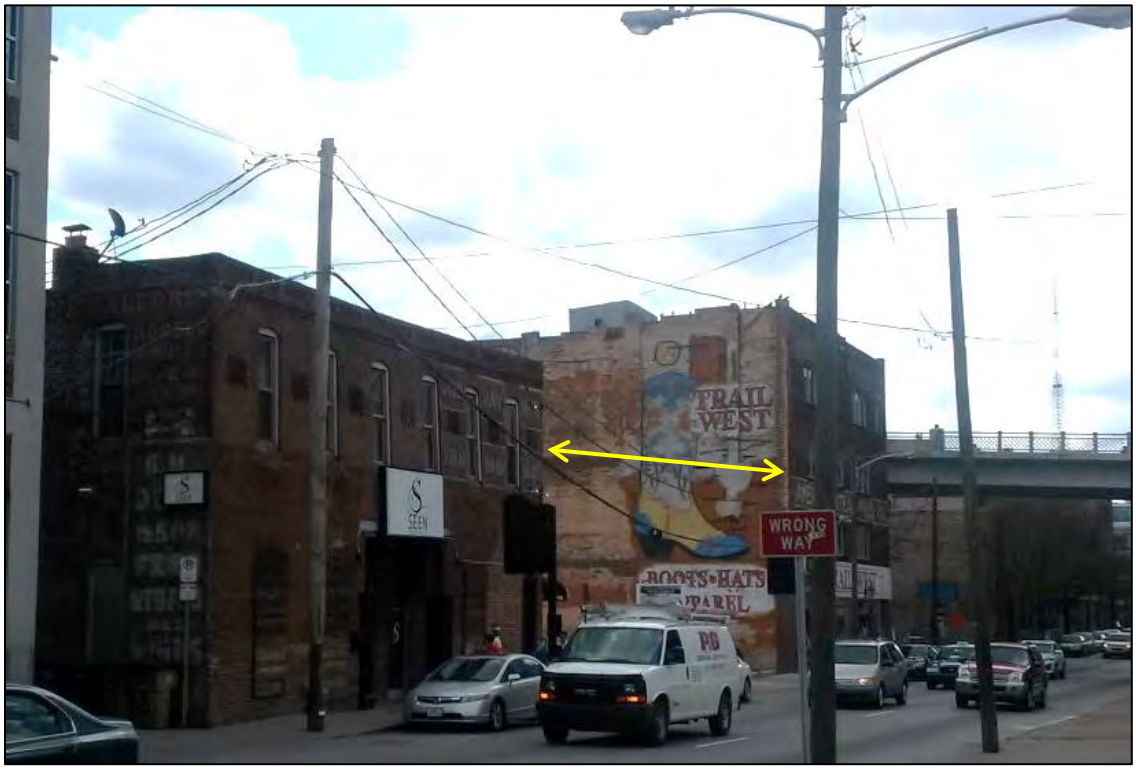
Staff finds that the environmental qualities of the proposed material do not sufficiently replicate that of historic brick.

Cost (short term, long term)
If the cost of producing or acquiring a traditional material is prohibitively expensive, then a substitute material may be appropriate. Brick is readily available and is used regularly on buildings throughout Nashville. The applicant has not demonstrated that brick or another traditional material cannot be used.

Recommendation: Staff recommends approval of a smooth finished EIFS on the 6th floor and disapproval of the Custom Brick EIFS finding that it does not meet section III.F.2 of the design guidelines for the Broadway Historic Preservation Zoning Overlay.



1957 Sanborn Map Detail



120 Second Avenue South, showing location of proposed new building.

120 Second Avenue South, taken from First Avenue South.

Photograph “062614 (9)” provided by applicant.

Photograph “072012 (5)” provided by applicant.

Photograph “CB” provided by applicant.

Photograph “Germantown Bldg. C” provided by applicant.

Photograph “IMG_2080” provided by applicant.

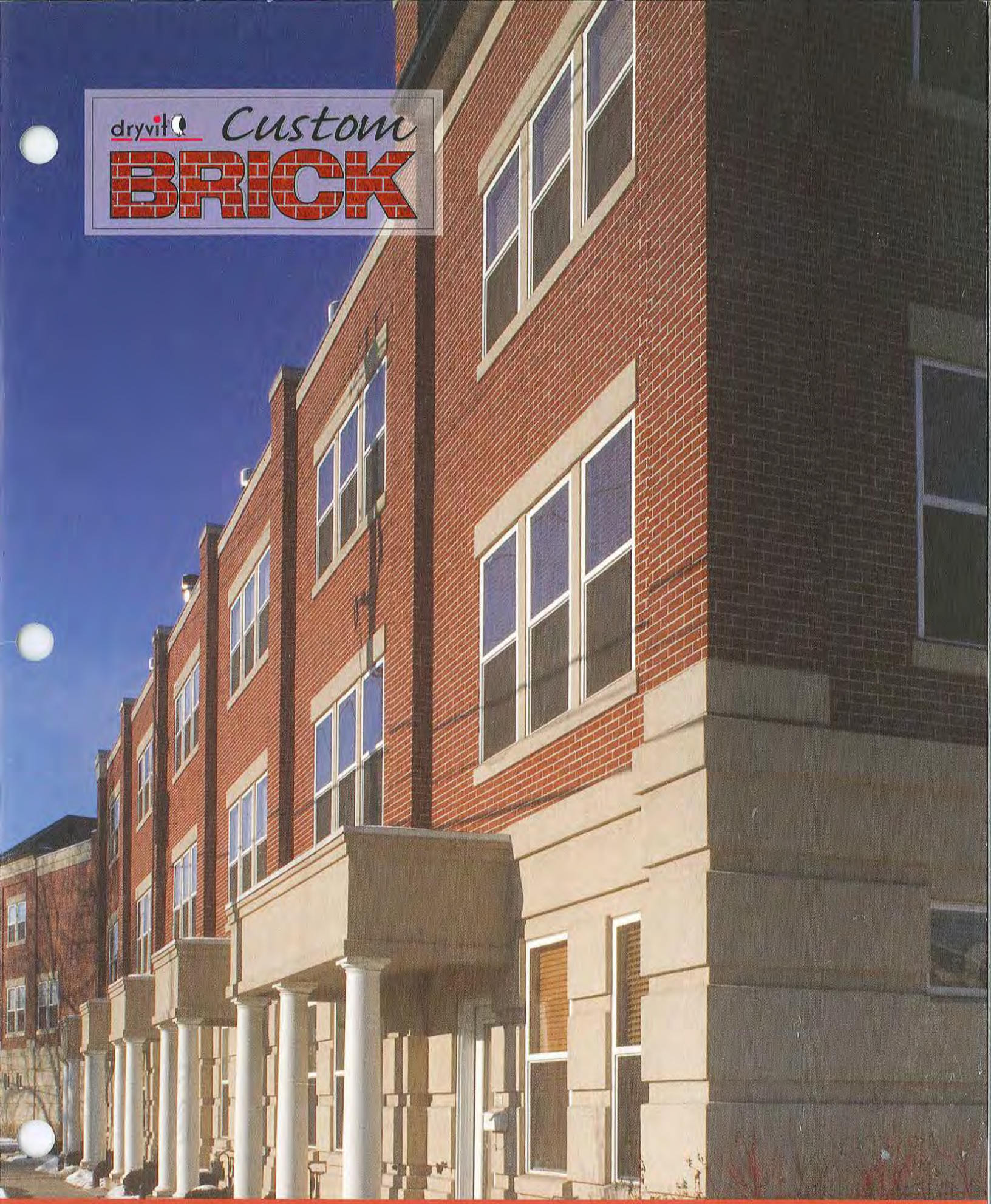
Photograph “IMG_2085” provided by applicant.

Photograph “Kingston 5” provided by applicant.

Photograph “Misc Pics 107” provided by applicant.

Photograph “Misc Pics 108” provided by applicant.

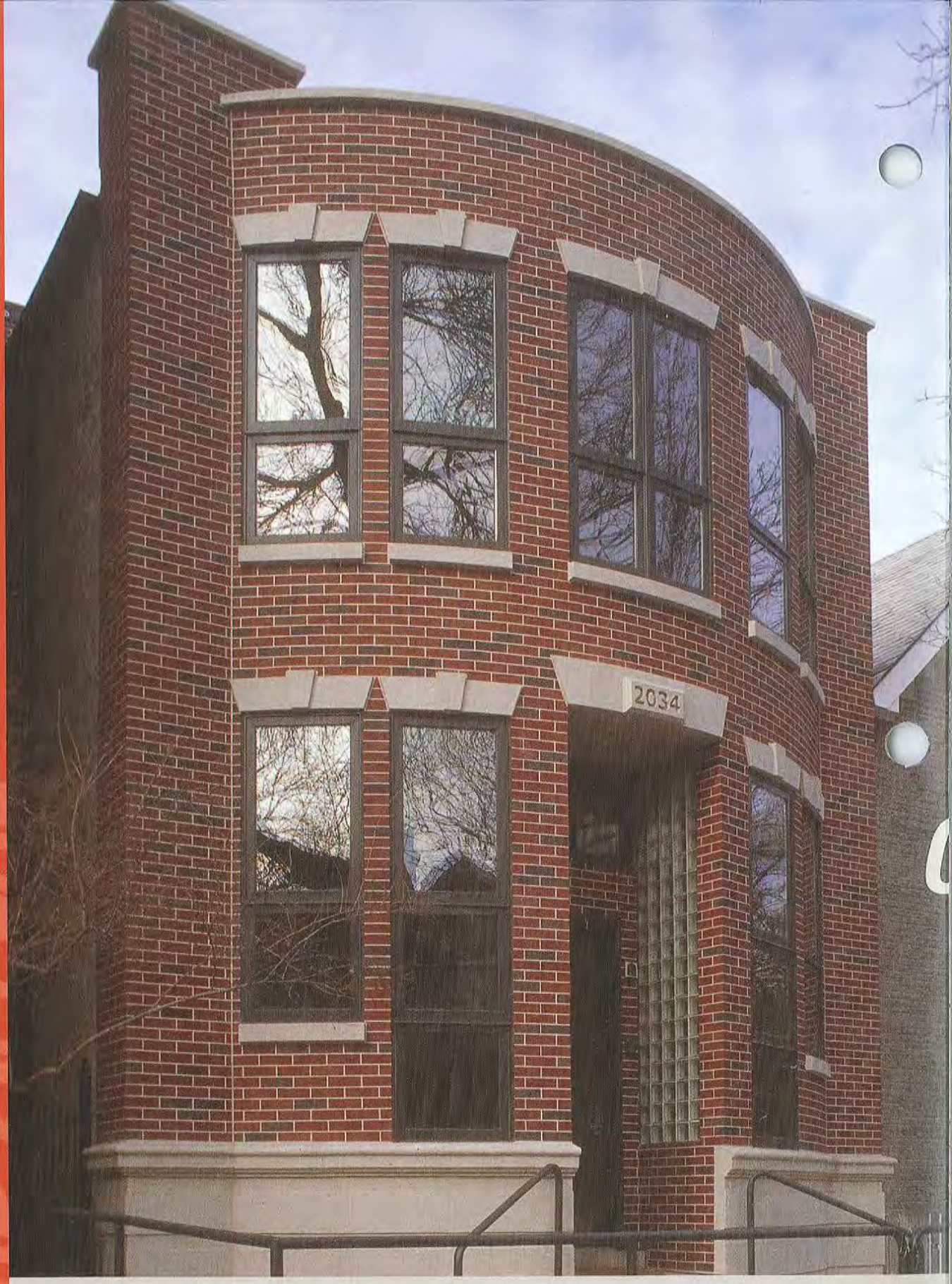
dryvit Custom BRICK



DS227

Private Residence, Chicago, IL
"Custom Brick transformed this once-dour townhouse into a high-end luxury home with dazzling curb appeal."

CURB APPEAL

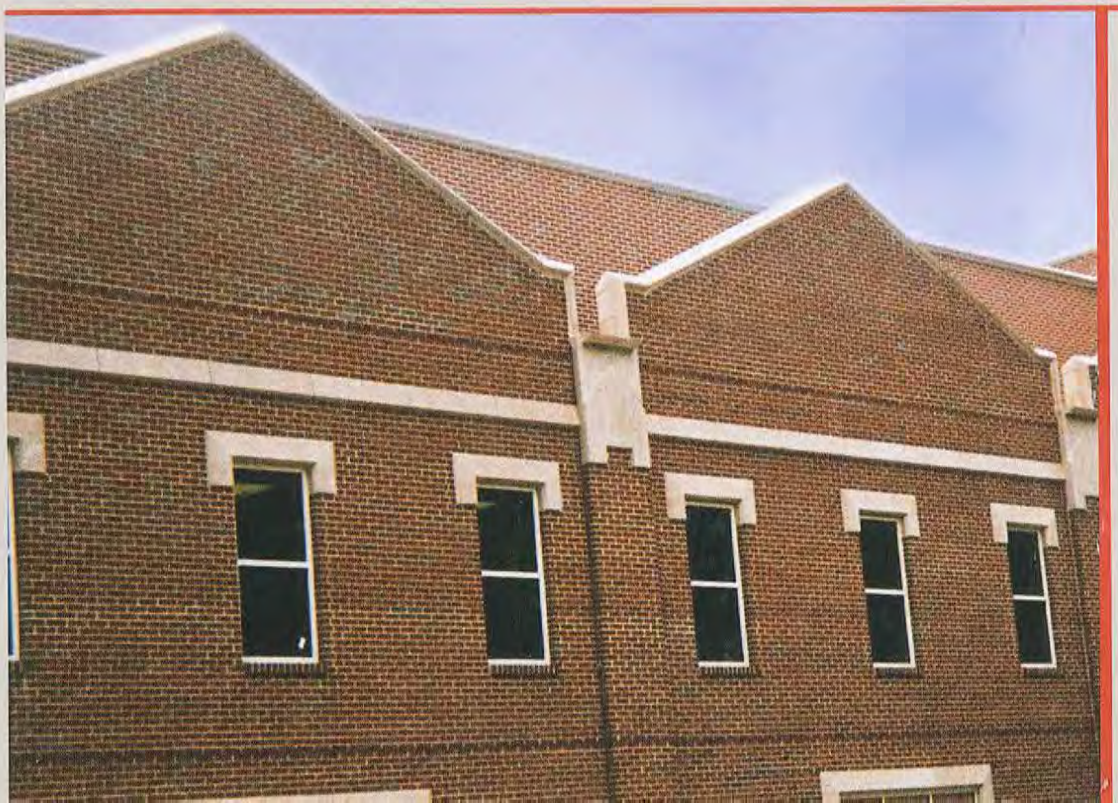


Cover:
Brown Street Station Condominiums
Forest Park, IL
"We wanted an antique brick look that you just couldn't get in this area without paying a fortune and waiting forever to get it. Custom Brick provided a perfect, and accessible, solution."

Isringhausen Imports
Springfield, IL
"The owner liked this renovated showroom so much he decided to re-clad his other brick building with Custom Brick because it looked better than the original brick."

RENOVAT

COLOR



Vanderbilt University
Nashville, TN
"The roof of the more than 150 year-old structure required a unique HVAC screen wall solution that could match the building's brick exterior. Custom Brick was the answer."

Private Residence
Ashland, NE
"The unmatched energy efficiency of the Dryvit system resulted in a savings of more than 20 percent to the homeowner."

TION

ENERGY

The Venetian
Resort Hotel Casino
Las Vegas, NV
"The ability to precisely match centuries-old Italian brick styles added to the authenticity of one of the world's most aesthetically pleasing casinos."

DESIGN

Second National Bank
Arcanum, OH
"The choice of Custom Brick — instead of tuckpointing the old, painted brick exterior — saved the owner more than $85,000."

COST

Dormitory — University of Nevada, Reno
"Being a college dorm that would serve college kids for decades, durability was essential. Custom Brick provided the durability the university needed at a cost and in a look they desired."

LIGHTWEIGHT

TIME

Marriott Residence Inn
Salt Lake City, UT
"Getting the unique clay brick color and style the owner wanted would have delayed the project for weeks. Custom Brick provided the desired look and was available within days."

Legacy Village Shopping Center
Lyndhurst, OH
"The lightweight Custom Brick solution permitted the architect to create decorative chimneys that could never have been accomplished using heavy clay brick."

DETAIL

To read complete case studies on the projects featured in this brochure, please visit www.dryvit.com/casestudies.asp

Benefits of the Custom Brick finish:

Better Value — Lower installed and 30-year life cycle.

Lighter Weight — Approximately 1/35th the weight of clay brick.

Greater Design Freedom — Ultimate flexibility with color, texture and shapes.

Unrivaled Energy Efficiency — A Dryvit system is up to 84% more energy efficient according to a study conducted by the Oak Ridge National Laboratory.

For more information call 1-800-556-7752, visit your local Dryvit distributor or visit us on the web at **www.dryvit.com**.

Dryvit Systems, Inc. is certified to ISO 9001:2000 standards, the worldwide common denominator for product consistency and excellence. This certification helps identify Dryvit as the recognized leader in EIFS technology.

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GEOTECHNICAL ENGINEERING STUDY

120 SECOND AVENUE BUILDING
Nashville, Tennessee

AG & E FILE NUMBER: 2013-078

Prepared By
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Prepared for
Mark L. Robin Architecture
127 2nd Ave, N
Nashville, Tennessee 37201

February 5, 2014

American Geotechnical and Environmental, Inc.

February 5, 2014

Mr. Mark Robin
Mark L. Robin Architecture
127 2nd Ave, N
Nashville, Tennessee 37201

RE: Geotechnical Engineering Study
120 Second Avenue Building
Nashville, Tennessee
AG & E File Number: 2013-078

Dear Mr. Robin:

In compliance with your recent request, we have completed a geotechnical engineering study for the above referenced project. It is our pleasure to transmit five (5) copies of our written report of the results of this study.

This report represents the results of our findings, an engineering interpretation of these findings with respect to the available project characteristics, and recommendations to aid design and construction of foundations, floor slabs, and other earth related phases of the project. We will store the samples for 30 days after which time they will be discarded unless you request otherwise.

If you should have any questions concerning this or any other matter, please feel free to contact us at your convenience. It has been a pleasure working with you on this project.

Respectfully Submitted,

AMERICAN GEOTECHNICAL & ENVIRONMENTAL, INC.

Robert T. Stickney, P.E.
President

Enclosure

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GEOTECHNICAL ENGINEERING STUDY

120 SECOND AVENUE BUILDING
NASHVILLE, TENNESSEE

AG & E File Number 2013-078

1.0 INTRODUCTION

This report presents the results of a geotechnical engineering study for the proposed 120 Second Avenue Building to be constructed in Nashville, Tennessee. This study was performed for the architect, Mark L. Robin Architecture, in accordance with our signed proposal dated December 11, 2013.

The scope of geotechnical services provided for this project includes the following:

- Performing a field study of the subsurface soil by the drilling of six (6) exploratory test borings and,
- The review of available geologic and soil survey maps of the general region, and
- Performing appropriate laboratory tests of selected samples obtained from this site.

The purpose of this study was to determine the types of subsoils present at the proposed site and to evaluate their suitability for support of the proposed building foundations. Included with these services are comments and recommendations relative to the design and construction of the building foundations and floor slabs for this project.

2.0 SITE AND PROJECT CHARACTERISTICS

The proposed project is planned for construction at 120 Second Avenue South on the eastern side of the road. As seen in the attached photographs, the project site is currently being used as a parking lot between the Trail West and the Seen Buildings. Joe's Crab Shack is across the street. The ground surface is covered with asphalt and gently slopes to the northwest with a total relief of about 1.5 feet.

Preliminary design plans indicate the proposed project will include the construction of a three (3) story building that will have a 100 feet by 80 wide building footprint. Maximum column and wall loads have been estimated to not exceed 750 kips and 10 kips per lineal foot respectively. The building is proposed to be a slab-on-grade structure with an option to build a partial basement.

3.0 GENERAL SUBSURFACE CONDITIONS

Using standard rotary drill equipment, AG & E drilled six (6) exploratory test borings for this study. These test borings were performed within the proposed building area as shown on Figure 1. After completion of our field study, the soil samples were returned to our soil mechanics laboratory for analysis and testing.

The elevations noted on Figure 2 in the Appendix, the Subsurface Fence Diagram, are interpolated from the topographic survey prepared by Barge Waggoner Sumner & Cannon, Inc. The subsurface soil profile and groundwater conditions are described in detail on the boring logs in the Appendix to this report, but in general terms consist of the following.

3.1 Subsurface Profile

The surface of the proposed construction site is covered with an asphalt pavement. The pavement section includes 4 inches of asphalt over 3 inches of base stone. Beneath the asphalt is a fill material that includes dark brown silty clays and sandy silty clays that are mixed with some brick fragments and gravel. Each test boring encountered auger refusal at depths ranging from 3.3 to 15.0 feet below the existing ground surface. Borings No. 1, 3, and 6 are believed to have met with auger refusal on a slab of concrete while the remaining test boring encountered large pieces of rock or other building debris buried in this fill.

Boring No. 2 was able to penetrate the fill at a depth of 8.0 feet. We re-mobilized the drill rig to the site to re-drill Borings 3 and 4. Each of these test borings penetrated the fill at respective depths of 8.0 and 6.0 feet. The natural soils have a black to dark brown color with a silty clay texture that contains some fine grained sand. These soils exhibit a stiff consistency Standard Penetration Values (N-Values) ranging from 11 to 27 blows per foot. The higher N-Values over 50 blows per foot are due to thin layers of limestone rock that are interbedded with dark brown silty clay. Each of

these test borings, Borings No. 2, 3A, and 4A, encountered auger refusal at depths of 13.5 to 15.0 feet.

Auger refusal was encountered at each test boring between the depths of 3.0 to 15.0 feet. The auger refusal depths are summarized below in Table No. 1.

Table No. 1

AUGER REFUSAL DEPTH

Boring No.	Approx. Surface Elevation*	Approx. Refusal Elevation	Depth to Refusal (ft)
B- 1	417.1	414.1	3.0**
B- 2	416.8	401.8	15.0
B- 3	416.6	413.6	3.0**
B- 3A	416.6	403.0	13.6
B- 4	416.5	407.5	7.0**
B- 4A	416.5	403.0	13.5
B- 5	416.8	410.8	6.0**
B- 6	417.0	413.6	3.4**

* - Surface elevations are interpolated from topographic survey
** - Auger refusal was within the fill

Auger refusal appears to have occurred within obstructions within the fill materials at each test boring location. Auger refusal is defined as the depth below the ground surface at which a test boring can no longer be advanced with the soil drilling technique being used. In an area of uncontrolled fill, it is not uncommon to find boulders or large fragments of man-made debris in which the augers can refuse on. Rock core sampling is generally required to determine the character and continuity of the auger refusal material and these factors must be considered when evaluating the depth to auger refusal in those test borings that are not cored.

Rock core sampling was performed at Boring No. 2 to better explore the auger refusal material at this location. The bedrock samples were obtained using standard NX - sized diamond bit rock coring equipment in general accordance with ASTM procedure D-2113. It appears the initial auger refusal material was a limestone rock

floater as sound limestone rock was encountered at a depth of 17.1 feet. The limestone rock has a medium to dark gray color with some thin shale partings. The limestone is coarse grained and thin to thick bedded.

The sample recovery and Rock Quality Designation (RQD) in part, evaluate the characteristics of the bedrock. The sample recovery is an indicator of refusal above sound bedrock, voids within the limestone bedrock, floaters and other uneven weathering. The sample recovery at this boring ranges from 57 percent in the upper 5 feet to 100 percent from 20 to 25 feet below the ground surface. The Rock Quality Designation (RQD) also describes the quality of the bedrock encountered. The RQD is based on a modified core recovery procedure which is obtained by summing the total length of core recovered, but only counting those pieces of core which are hard and sound, and that are twice as long or longer than the diameter of the core. The quality of the core samples obtained is very poor to fair with RQD values of 36 to 78 percent.

An unconfined compressive strength test was performed on a selected rock sample at a depth of 17.5 feet in accordance with ASTM D-7012. The compressive strength of the rock is 10,780 pounds per square inch (psi).

A review of published geologic information for this quadrant indicates that the site is underlain by the Bigby-Cannon Limestone of the Ordovician Period. This formation consists of 3 facies or sections; the Cannon Limestone, the Dove-Colored limestone and the Bigby Limestone. Based on the rock samples obtained, the site appears to be underlain by the Bigby Limestone. The rock core sampling indicates the site is underlain by the Bigby Limestone facies.

3.2 Groundwater Conditions

Observations concerning groundwater were made during and at completion of the test boring operations. Groundwater was noted on upon the completion of drilling at Borings No. 3A and 4A at respective depths of 13.0 and 13.2 feet. In cohesive soils such as those present at this site, the true static groundwater level can fluctuate widely. Pockets of groundwater perched within the fill should also be anticipated.

Any water encountered during the construction of this project will be the result of water bearing pervious seams, and/or a perched water table condition. Conventional dewatering methods such as pumping from sumps should prove to be adequate for any excavation for this site.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based upon our analysis of the soil conditions, the preliminary design details, and the design assumptions previously outlined, the following conclusions and recommendations were developed. If the project characteristics are changed from those assumed herein, our recommendations should be reviewed to see if any modifications are needed.

4.1 Building Foundation Recommendations

Our field and laboratory tests indicate the fill materials and the natural soils on this site are not suitable for the support of the proposed building foundation loads. Therefore the use of conventional shallow foundations or even a mat foundation system is not practical because of the subsurface profile and the close proximity of the existing buildings on the adjacent lots. The load distribution of the foundation loads at shallow depths and the marginal support characteristics of the fill and natural soil indicate a shallow foundation system may impose additional settlement onto these adjacent structures. Therefore, we recommend the use of a deep foundation system that will transfer the building loads to the limestone bedrock.

We recommend the building foundations be designed using one of the following options.

4.1.1 Micropile Foundation System

A micropile system that is drilled through the existing fill and natural soil to bear within the sound limestone rock can be used to support the structure. Micropiles are relatively small diameter drilled and grouted piles that derive their support capacity through the bond between the grout and the limestone rock. Their installation generally includes rotary/percussion drilling to advance a casing to the surface of the limestone rock. Then drill rods are advanced through the casing and into the limestone rock to the design bearing

depth. When the design depth is achieved, the drill rods are removed and the micropile is set through the casing to the bottom of the drilled hole. The inner pipe as well as the annulus between the inner pipe and the rock (the bond zone) is filled with grout. Additional grout is pumped through the casing during the outer casing withdrawal to protect the micropile from corrosion.

We recommend the micropiles be designed using an allowable rock/grout interface adhesion of 100 pounds per square inch (psi) within the limestone bedrock. Adhesion to the overburden soil and fill should be ignored. The actual adhesion of the installed micropile can be affected by cracks, joints, fracturing and other secondary structures in the rock. Therefore, these adhesion values will need to be confirmed using load tests. Sound bedrock can be expected at depths of 15 to 17 feet below the existing ground surface.

Due to the relatively limited lateral capacity of micropiles, caissons may be required. Lateral forces can be transmitted from the structure to the soil by passive pressure on the below-grade pile caps utilizing an equivalent fluid density of 110 pounds per cubic-foot providing that these structural elements are designed to resist these pressures.

4.1.2 Drilled Pier Foundation System

As an alternate, end bearing drilled piers (or caissons) embedded into the limestone rock can be considered. We recommend the drilled piers be embedded a minimum distance of 1.5 feet into sound limestone rock. The piers can be dimensioned for an allowable end bearing pressure of 80 kips per square feet (ksf) with a minimum shaft diameter of 30 inches.

We also recommend the drilling contractor be prepared to provide temporary casing to control any groundwater that may seep into each excavation above the bedrock and to prevent caving during the pier installation. The layers of

thin limestone found from a depth of 15.0 to 17.1 feet at Boring No. 2 also indicate some of the piers will need to be probed to a depth of 10.0 feet below the bottom elevation to be sure they are supported on sound limestone. Sound rock that is suitable for the support of the proposed foundation loads is defined as less than a cumulative total of 6 inches of voids within the 10.0 feet probe hole.

It may be necessary to install the piers with casing which can be removed as the concrete is placed. The use of casing not only provides protection for any workmen who might enter the shaft for proper cleaning, installation and inspection; but it also prevents loose soil materials from falling into the wet concrete and creating weak planes and voids or covering the bearing stratum prior to placement of the concrete. A minimum shaft diameter of 30 inches is recommended to provide adequate space for workmen entering the shaft.

The Site Class Definition from Table 1613.5.2 in the 2006 International Building Code is Site Class B.

4.2 Floor Slabs

Due to the presence of the uncontrolled fill materials and their inherent compressibility, we recommend the existing fill materials be undercut a minimum of 2.0 feet below the proposed subgrade elevation of the floor slab. The undercut excavation should then be backfilled with a properly placed and compacted crushed limestone fill as outlined in Section 5.0 of this report.

The slabs can be designed as a fully ground supported slab (structurally independent of any building footings or walls) and should be appropriately reinforced to support the proposed loads. This will minimize the possibility of cracking and displacement of the floor slabs because of differential movements between the slab and the foundation as the foundations will be supported by the bedrock. Although the movements are estimated to be within tolerable limits for structural safety, such movements could be detrimental to the slabs if they are rigidly connected to the foundation.

The slabs should be dimensioned using a modulus of subgrade reaction equal to 125 pounds per cubic inch (pci) and should be appropriately reinforced to support the proposed loads. The floor slabs for the building should be supported on a 4 inch compacted layer of free draining, granular subbase material. The purpose of this layer is to help distribute concentrated loads and equalize moisture conditions beneath the slab. If the final grade is within or above the depth of any topsoil, loose or miscellaneous fill material, or loose natural soil, we recommend these undesirable materials be removed from the slab areas prior to placing of the slabs or any compacted fills to support the slabs. All excavations and filling should be conducted in accordance with our enclosed recommendations in Section 5.0.

4.3 Basement Discussion and Recommendations

The plans for the building are not finalized and there may be an option to build a partial basement beneath the structure. The building of a full basement may not be economically feasible as it will require the construction of an excavation bracing system that will be capable of preventing any differential settlement in the adjacent buildings. This type of excavation bracing system typically includes the installation of a soldier beam and lagging wall system with tiebacks that extend beyond the property line. Therefore, the basement walls will likely be offset into the building limits by about 10 feet so the need for any excavation bracing can be eliminated.

The excavation through the fill materials will likely encounter large pieces of concrete and/or rock that will result in a laid back and uneven excavation slope. The recommended backslope for the fill materials is 1.5 horizontal to 1 vertical.

The basement floor slab will be at Elevation 406 to 407. The top of the limestone rock ranges from Elevation 400 to 403. The minimum depth of installation for either of the deep foundation systems discussed above is about 8 feet. Therefore, the basement wall foundations will need to be undercut either to the top of the weathered bedrock surface at Elevation 403.0 or to the top of the sound limestone rock at Elevation 400.0. The groundwater encountered in Borings No. 3A and 4A, however, indicates the contractor will need to be prepared to brace these excavations as needed. We anticipate the undercut sidewalls will experience some sloughing and/or cave-in.

The undercut excavation can then be backfilled to the design bottom of footing elevation with a flowable fill concrete that has a minimum compressive strength of 700 pounds per square inch (psi). The wall foundations can be dimensioned using a net allowable soil bearing pressure of up to 3,000 pounds per square foot (psf) should they bear upon the top of the weathered bedrock at Elevation 403. Should the excavation extend to the top of the sound limestone rock at Elevation 400, these foundations can be designed for a net allowable bearing pressure of up to 40,000 psf.

The Site Class Definition from Table 1613.5.2 in the 2006 International Building Code is Site Class B.

The magnitude of lateral earth pressure against the basement walls is dependent on the method of backfill placement, the type of backfill soil, drainage provisions and whether or not the wall is permitted to yield after placement of the backfill. It has been demonstrated that, when a wall is held rigidly against horizontal movement, the lateral pressure against the wall is greater than the "active" earth pressure. Therefore, rigid walls should be designed for higher, "at-rest" pressures (K_o), while yielding walls can be designed for active pressures (K_a).

For the non-yielding basement walls, a coefficient of earth pressure at-rest (K_o) of 0.4 is recommended for use with granular backfill behind the wall for drainage purposes. The basement walls should be designed for a lateral equivalent fluid pressure of 45 pounds per cubic foot (pcf) plus the live loads from the first floor slab. Good waterproofing of the walls and the positive drainage of any groundwater away from the wall must be included with the granular backfill. The granular fill should conform to the Tennessee Department of Transportation (TDOT) "Standard Specifications for Road and Bridge Construction", for a No. 67 stone gradation. The use of this granular fill will serve to remove groundwater that can flow through these soils before it can reach those soils supporting the house and possibly causing a reduction in the shear strength of the soil. We presume gravity drainage of any basement wall drains is not available on this site, so a sump pump will need to be installed.

We recommend the equipment utilized for the compaction of the backfill materials consist of small plate compactors. All heavy equipment, including compaction equipment, should not be allowed closer to the wall (horizontal distance) than the vertical distance from the backfill surface to the bottom of the wall. If it is desired to use heavier compaction equipment adjacent to the below grade wall, we recommend this office be contacted to determine the resulting earth pressures.

The subgrade materials that will support the basement floor currently appear they will be suitable for this purpose. The alluvial origin of the soil and the groundwater encountered in Borings No. 3A and 4A indicates these soils may easily deteriorate during construction before the floor slab is built. Therefore, it may be necessary to support the floor slab with 12 or more inches of gravel to replace any softened soil.

There is a possibility of a higher groundwater table than what was observed in the test borings that may enter the building though the basement slab. We recommend the following to control the groundwater beneath the floor slab.

1. Grade the subgrade of the floor slab in such a way as to provide positive drainage to the location of the sump pump installed for the foundation drains.

2. The floor slab-on-grade is to be supported by a minimum of 12 inches of free draining gravel, such as No. 67 gravel. We also recommend the installation of a 4 inch slotted PVC pipe near the middle of the floor area that is connected to the sump pit. This piping will help to remove groundwater as it enters the gravel bed. The piping is to be supported by 2 inches of the gravel. The 12 inches of stone will provide for sufficient storage of any groundwater as it flows to the perforated pipe and out of the building

3. Properly compact the gravel with a medium sized vibratory plate compactor.

4. Install a taped vapor barrier on top of the gravel for the concrete slabs to bear upon.

5.0 RECOMMENDED EARTHWORK PROCEDURES

5.1 Excavation

We do not anticipate any difficulty will be experienced in excavating the fill and natural soils on this site with conventional equipment and methods. All excavations should be properly braced or laid back to meet applicable Occupational Safety and Health Administration (OSHA) requirements. Specifically, OSHA classifies the fill soils as Type C soils. OSHA regulations require the sideslopes of any excavation to be properly braced or laid back on a sideslope of 1.5 horizontal to 1 vertical (1.5:1). The natural soils are classified as Type B soils where the sideslopes of any excavation be properly braced or laid back on a sideslope of 1:1.

5.2 Fill and Compaction

Any fill that will be placed on this site will be placed either as backfill material against the walls or to support the floor slabs. We recommend these fill materials include the use of crushed limestone products as recommended in Section 4.0.

Compaction equipment and techniques will be dependent on the type of material being used as a fill. A vibratory type compactor such as a drum roller or a small vibratory plate compactor will be required on any granular materials trucked in as fill. We recommend all fill materials supporting footings, floor slabs and pavements be compacted to 95 percent of the Standard Proctor maximum dry density (ASTM D-698).

We recommend this firm be retained to perform continuous review of any construction of the soils related phases of this project. Otherwise, we assume no responsibility for construction compliance with the design concepts, specifications, or our recommendations.

6.0 LIMITATIONS OF STUDY

Our recommendations for this report were developed utilizing subsurface information obtained from the test borings performed. At this time, we would like to point out that exploratory test borings only depict the subsurface conditions at the specific location and time at which they were made. The subsurface conditions at other locations on the site may differ from those occurring at the test boring locations; however, only minor variations that can readily be evaluated and adjusted for during construction are expected.

The conclusions and recommendations herein have been based upon the available subsurface information and the assumptions previously stated and the preliminary design details furnished by the architect of the proposed project. We recommend that we be given the opportunity to review the final design plans and specification as they relate to the recommendations presented in this report. The purpose of this review is to determine that the conclusions and recommendations presented herein have been properly incorporated into the final design. Any revision in the plans for the proposed structure from those anticipated in this report should also be brought to the attention of the geotechnical engineer so that he may determine whether any changes in the foundation recommendations are necessary. Unanticipated conditions encountered during construction of the project should be reported to this office in order to provide timely recommendations to solve the problems encountered.

The scope of our services does not include any environmental assessment or investigation for the presence of absence of hazardous or toxic materials in the soil, groundwater or surface water within or beyond the site studied. Any statements in this report or on the test boring logs regarding odors, staining of soils or other unusual conditions observed are strictly for the information of our client.

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practice. This company is not responsible for the conclusions, opinions, or recommendations made by others based upon the data included herein.

APPENDIX

Photographs

Figure 1 - Boring Location Plan

Figure 2 - Subsurface Fence Diagram

Logs of Test Boring

Field Classification System for Soil Exploration

Important Information About Your Geotechnical Engineering Report

View from the middle of the lot on Second Avenue

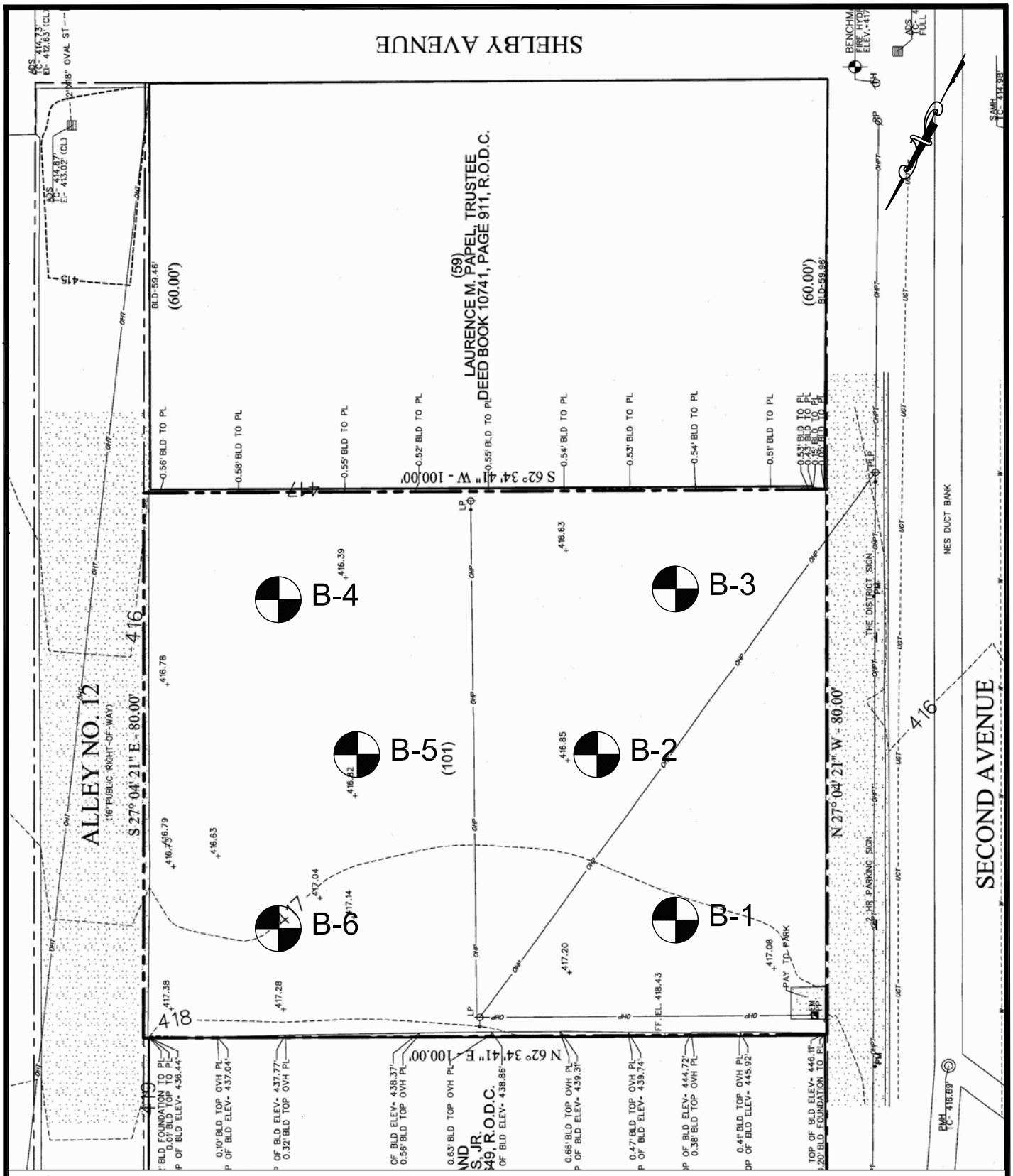
View from the northeast corner of the lot

PHOTOGRAPHS

120 Second Avenue Building
Nashville, Tennessee

PROJECT NO.: **2013-078**

AG&E



Test Boring Location

BORING LOCATION PLAN

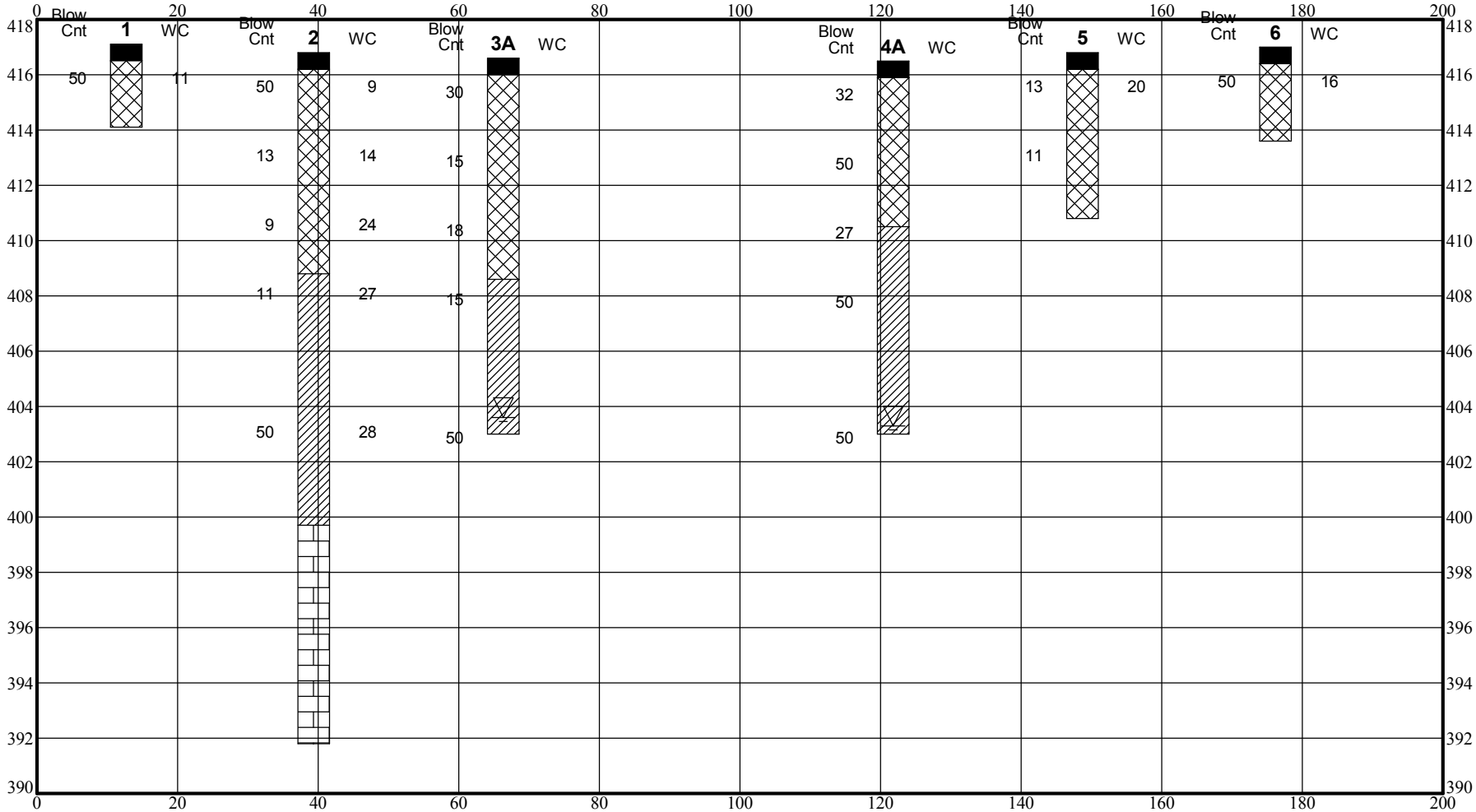
120 Second Avenue Building
Nashville, Tennessee

PROJECT NO. 2013-078

SCALE 1" = 20'

FIGURE NO. 1

AG&E



Boring	North	East	Elev.	Depth
1	135.0	50.0	417.1	3.0
2	110.0	60.0	416.8	25.0
5	110.0	95.0	416.8	6.0
6	135.0	105.0	417.0	3.4
3A	85.0	50.0	416.6	13.6
4A	85.0	105.0	416.5	13.5

NOTE - Fence diagram graphics match the graphics shown on the boring logs.

DISTANCES:

Beginning	0.0
Ending	200.0

VIEWING ANGLES (degrees):

Horizontal	0.0
Vertical	0.0

Position	North	East
Left, Front	144.21	40.50
Right, Front	156.78	114.69
Left, Back	144.21	40.50
Right, Back	156.78	114.69

SUBSURFACE FENCE DIAGRAM

120 Second Avenue Building

Nashville, Tennessee

PROJECT #	DATE	FIGURE
2013-078	**Jan 14**	**2**

American Geotechnical and Environmental, Inc.

LOG OF TEST BORING

Client	Mark Robin Architecture	Boring #	1
Architect/Engineer		Job #	2013-078
Project Name	120 Second Avenue Building	Drawn By	RTS
Project Location	Nashville, Tennessee	Approved By	RTS

DRILLING AND SAMPLING INFORMATION

Date Started	12/19/13	Hammer Wt.	140 lbs.
Date Completed	12/19/13	Hammer Drop	30 in.
Drill Foreman	SOUTH BROS	Spoon Sampler O.D.	2 in.
Inspector		Rock Core Dia.	in.
Boring Method	HSA	Shelby Tube O.D.	in.

TEST DATA

SOIL CLASSIFICATION / SURFACE ELEVATION - 417.1	STRATUM DEPTH	DEPTH SCALE	LITH-OLOGY	SAMPLE NO.	SAMPLE TYPE	Standard Penetration Test N. Blows/Ft.	Unconfined Compressive Strength Tons/Ft.^{2}	Pocket Penetrometer Tons/Ft.^{2}	Natural Dry Density lbs/cu. ft.	Water Content %	Atterberg Limits LL - Liquid Limit PL - Plastic Limit
4 inches Asphalt, 3 inches Aggregate Base	0.6 / 416.5										
FILL - Dark brown silty clay, with some gravel, sand and some bricks, moist.	3.0 / 414.1			1	SS	50/0.1				11.2	
Test boring discontinued at 3.0 feet at auger refusal.		5									
		10									
		15									
		20									
		25									

SAMPLER TYPE

SS - DRIVEN SPLIT SPOON
ST - PRESSED SHELBY TUBE
CA - CONTINUOUS FLIGHT AUGER
RC - ROCK CORE

GROUND WATER DEPTH

AT COMPLETION Dry FT.
AFTER FT.
WATER ON RODS FT.

BORING METHOD

HSA - HOLLOW STEM AUGERS
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVING CASING
RW - ROTARY WASH

American Geotechnical and Environmental, Inc.

LOG OF TEST BORING

Client	Mark Robin Architecture	Boring #	2
Architect/Engineer		Job #	2013-078
Project Name	120 Second Avenue Building	Drawn By	RTS
Project Location	Nashville, Tennessee	Approved By	RTS

DRILLING AND SAMPLING INFORMATION

Date Started	12/19/13	Hammer Wt.	140 lbs.
Date Completed	12/19/13	Hammer Drop	30 in.
Drill Foreman	SOUTH BROS	Spoon Sampler O.D.	2 in.
Inspector		Rock Core Dia.	in.
Boring Method	HSA	Shelby Tube O.D.	in.

TEST DATA

SOIL CLASSIFICATION / SURFACE ELEVATION - 416.8	STRATUM DEPTH	DEPTH SCALE	LITH-OLOGY	SAMPLE NO.	SAMPLE TYPE	Standard Penetration Test N. Blows/Ft.	Unconfined Compressive Strength Tons/Ft.^{2}	Pocket Penetrometer Tons/Ft.^{2}	Natural Dry Density lbs/cu. ft.	Water Content %	Atterberg Limits LL - Liquid Limit PL - Plastic Limit
4 inches Asphalt, 3 inches Aggregate Base	0.6 / 416.2										
FILL - Layers of dark brown silty clay and dark brown clayey sand, with some gravel and some bricks, moist to very moist.				1	SS	50\0.4'				9.4	
				2	SS	13				13.7	
		5									
				3	SS	9				24.4	
	8.0										
Black to dark brown silty clay, with some fine grained sand and thin layers of limestone below 15.0 feet, moist to very moist, stiff.	408.8			4	SS	11				26.8	
		10									
				5	SS	50/0.4'				28.4	
		15									
	17.1										
Medium to dark gray limestone, coarse grained, thin to thick bedded.	399.7			6	RC		10780	Rec=57%			RQD=36%
		20									
				7	RC			Rec=100%			RQD=78%
	25.0	25									
Test boring discontinued at 25.0 feet.	391.8										

SAMPLER TYPE

- SS - DRIVEN SPLIT SPOON
- ST - PRESSED SHELBY TUBE
- CA - CONTINUOUS FLIGHT AUGER
- RC - ROCK CORE

GROUND WATER DEPTH

- ▽ AT COMPLETION Dry FT.
- ▼ AFTER FT.
- WATER ON RODS FT.

BORING METHOD

- HSA - HOLLOW STEM AUGERS
- CFA - CONTINUOUS FLIGHT AUGERS
- DC - DRIVING CASING
- RW - ROTARY WASH

American Geotechnical and Environmental, Inc.

LOG OF TEST BORING

Client	Mark Robin Architecture	Boring #	3
Architect/Engineer		Job #	2013-078
Project Name	120 Second Avenue Building	Drawn By	RTS
Project Location	Nashville, Tennessee	Approved By	RTS

DRILLING AND SAMPLING INFORMATION

Date Started	12/19/13	Hammer Wt.	140 lbs.
Date Completed	12/19/13	Hammer Drop	30 in.
Drill Foreman	SOUTH BROS	Spoon Sampler O.D.	2 in.
Inspector		Rock Core Dia.	in.
Boring Method	HSA	Shelby Tube O.D.	in.

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION - 416.6	STRATUM DEPTH	DEPTH SCALE	LITH-OLOGY	SAMPLE NO.	SAMPLE TYPE	Standard Penetration Test N. Blows/Ft.	Unconfined Compressive Strength Tons/Ft.^{2}	Pocket Penetrometer Tons/Ft.^{2}	Natural Dry Density lbs/cu. ft.	Water Content %	Atterberg Limits LL - Liquid Limit PL - Plastic Limit
4 inches Asphalt, 3 inches Aggregate Base	0.6 416.0										
FILL - Dark brown silty clay, with some gravel, sand and some bricks, moist.	3.0 413.6			1	SS	50/0.1'				11.9	
Test boring discontinued at 3.0 feet at auger refusal.		5 10 15 20 25									

SAMPLER TYPE

SS - DRIVEN SPLIT SPOON
ST - PRESSED SHELBY TUBE
CA - CONTINUOUS FLIGHT AUGER
RC - ROCK CORE

GROUND WATER DEPTH

AT COMPLETION Dry FT.
AFTER FT.
WATER ON RODS FT.

BORING METHOD

HSA - HOLLOW STEM AUGERS
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVING CASING
RW - ROTARY WASH

American Geotechnical and Environmental, Inc.

LOG OF TEST BORING

Client	Mark Robin Architecture	Boring #	3A
Architect/Engineer		Job #	2013-078
Project Name	120 Second Avenue Building	Drawn By	RTS
Project Location	Nashville, Tennessee	Approved By	RTS

DRILLING AND SAMPLING INFORMATION

Date Started	1/17/14	Hammer Wt.	140 lbs.
Date Completed	1/17/14	Hammer Drop	30 in.
Drill Foreman	SOUTH BROS	Spoon Sampler O.D.	2 in.
Inspector		Rock Core Dia.	in.
Boring Method	HSA	Shelby Tube O.D.	in.

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION - 416.6	STRATUM DEPTH	DEPTH SCALE	LITH-OLOGY	SAMPLE NO.	SAMPLE TYPE	Standard Penetration Test N. Blows/Ft.	Unconfined Compressive Strength Tons/Ft.^{2}	Pocket Penetrometer Tons/Ft.^{2}	Natural Dry Density lbs/cu. ft.	Water Content %	Atterberg Limits LL - Liquid Limit PL - Plastic Limit
4 inches Asphalt, 3 inches Aggregate Base	0.6 416.0										
FILL - Layers of dark brown silty clay and dark brown clayey sand, with some gravel and some bricks; moist to very moist.				1	SS	30					
				2	SS	15					
		5		3	SS	18					
	8.0 408.6										
Black to dark brown silty clay, with some fine grained sand, moist to very moist, stiff.				4	SS	15		3.0			
		10									
	13.6 403.0			5	SS	50/0.1'					
Test boring discontinued at 13.6 feet at auger refusal.		15									
		20									
		25									

SAMPLER TYPE

SS - DRIVEN SPLIT SPOON
ST - PRESSED SHELBY TUBE
CA - CONTINUOUS FLIGHT AUGER
RC - ROCK CORE

GROUND WATER DEPTH

▽ AT COMPLETION 13.0 FT.
▼ AFTER FT.
WATER ON RODS FT.

BORING METHOD

HSA - HOLLOW STEM AUGERS
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVING CASING
RW - ROTARY WASH

American Geotechnical and Environmental, Inc.

LOG OF TEST BORING

Client	Mark Robin Architecture	Boring #	4
Architect/Engineer		Job #	2013-078
Project Name	120 Second Avenue Building	Drawn By	RTS
Project Location	Nashville, Tennessee	Approved By	RTS

DRILLING AND SAMPLING INFORMATION

Date Started	12/19/13	Hammer Wt.	140 lbs.
Date Completed	12/19/13	Hammer Drop	30 in.
Drill Foreman	SOUTH BROS	Spoon Sampler O.D.	2 in.
Inspector		Rock Core Dia.	in.
Boring Method	HSA	Shelby Tube O.D.	in.

TEST DATA

SOIL CLASSIFICATION / SURFACE ELEVATION - 416.5	STRATUM DEPTH	DEPTH SCALE	LITH-OLOGY	SAMPLE NO.	SAMPLE TYPE	Standard Penetration Test N. Blows/Ft.	Unconfined Compressive Strength Tons/Ft.^{2}	Pocket Penetrometer Tons/Ft.^{2}	Natural Dry Density lbs/cu. ft.	Water Content %	Atterberg Limits LL - Liquid Limit PL - Plastic Limit
4 inches Asphalt, 3 inches Aggregate Base	0.6 / 415.9										
FILL - Dark brown silty clay, with some gravel, sand and some bricks, moist.				1	SS	9				16.9	
				2	SS	50/0.2'				18.3	
		5									
	7.0			3	SS	12				16.2	
Test boring discontinued at 7.0 feet at auger refusal.	409.5										
		10									
		15									
		20									
		25									

SAMPLER TYPE

SS - DRIVEN SPLIT SPOON
ST - PRESSED SHELBY TUBE
CA - CONTINUOUS FLIGHT AUGER
RC - ROCK CORE

GROUND WATER DEPTH

▽ AT COMPLETION Dry FT.
▼ AFTER FT.
WATER ON RODS FT.

BORING METHOD

HSA - HOLLOW STEM AUGERS
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVING CASING
RW - ROTARY WASH

American Geotechnical and Environmental, Inc.

LOG OF TEST BORING

Client	Mark Robin Architecture	Boring #	4A
Architect/Engineer		Job #	2013-078
Project Name	120 Second Avenue Building	Drawn By	RTS
Project Location	Nashville, Tennessee	Approved By	RTS

DRILLING AND SAMPLING INFORMATION

Date Started	1/17/14	Hammer Wt.	140 lbs.
Date Completed	1/17/14	Hammer Drop	30 in.
Drill Foreman	SOUTH BROS	Spoon Sampler O.D.	2 in.
Inspector		Rock Core Dia.	in.
Boring Method	HSA	Shelby Tube O.D.	in.

TEST DATA

SOIL CLASSIFICATION SURFACE ELEVATION - 416.5	STRATUM DEPTH	DEPTH SCALE	LITH-OLOGY	SAMPLE NO.	SAMPLE TYPE	Standard Penetration Test N. Blows/Ft.	Unconfined Compressive Strength Tons/Ft.^{2}	Pocket Penetrometer Tons/Ft.^{2}	Natural Dry Density lbs/cu. ft.	Water Content %	Atterberg Limits LL - Liquid Limit PL - Plastic Limit
4 inches Asphalt, 3 inches Aggregate Base	0.6 415.9										
FILL - Layers of dark brown silty clay and dark brown clayey sand, with some gravel and some bricks; moist to very moist.				1	SS	32					
				2	SS	50/0.2'					
		5									
	6.0 410.5										
Black to dark brown silty clay, with some fine grained sand, very moist, stiff.				3	SS	27					
				4	SS	50/0.2'					
		10									
	13.5 403.0			5	SS	50/0.0'					
Test boring discontinued at 13.5 feet at auger refusal.		15									
		20									
		25									

SAMPLER TYPE

SS - DRIVEN SPLIT SPOON
ST - PRESSED SHELBY TUBE
CA - CONTINUOUS FLIGHT AUGER
RC - ROCK CORE

GROUND WATER DEPTH

AT COMPLETION 13.2 FT.
AFTER FT.
WATER ON RODS FT.

BORING METHOD

HSA - HOLLOW STEM AUGERS
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVING CASING
RW - ROTARY WASH

American Geotechnical and Environmental, Inc.

LOG OF TEST BORING

Client	Mark Robin Architecture	Boring #	5
Architect/Engineer		Job #	2013-078
Project Name	120 Second Avenue Building	Drawn By	RTS
Project Location	Nashville, Tennessee	Approved By	RTS

DRILLING AND SAMPLING INFORMATION

Date Started	12/19/13	Hammer Wt.	140 lbs.
Date Completed	12/19/13	Hammer Drop	30 in.
Drill Foreman	SOUTH BROS	Spoon Sampler O.D.	2 in.
Inspector		Rock Core Dia.	in.
Boring Method	HSA	Shelby Tube O.D.	in.

TEST DATA

SOIL CLASSIFICATION / SURFACE ELEVATION - 416.8	STRATUM DEPTH	DEPTH SCALE	LITH-OLOGY	SAMPLE NO.	SAMPLE TYPE	Standard Penetration Test N. Blows/Ft.	Unconfined Compressive Strength Tons/Ft.^{2}	Pocket Penetrometer Tons/Ft.^{2}	Natural Dry Density lbs/cu. ft.	Water Content %	Atterberg Limits LL - Liquid Limit PL - Plastic Limit
4 inches Asphalt, 3 inches Aggregate Base	0.6 / 416.2										
FILL - Dark brown silty clay, with some gravel, sand and some bricks, moist.				1	SS	13				19.7	
				2	SS	11					
	6.0 / 410.8	5									
Test boring discontinued at 6.0 feet at auger refusal.		10									
		15									
		20									
		25									

SAMPLER TYPE

SS - DRIVEN SPLIT SPOON
ST - PRESSED SHELBY TUBE
CA - CONTINUOUS FLIGHT AUGER
RC - ROCK CORE

GROUND WATER DEPTH

AT COMPLETION Dry FT.
AFTER FT.
WATER ON RODS FT.

BORING METHOD

HSA - HOLLOW STEM AUGERS
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVING CASING
RW - ROTARY WASH

American Geotechnical and Environmental, Inc.

LOG OF TEST BORING

Client	Mark Robin Architecture	Boring #	6
Architect/Engineer		Job #	2013-078
Project Name	120 Second Avenue Building	Drawn By	RTS
Project Location	Nashville, Tennessee	Approved By	RTS

DRILLING AND SAMPLING INFORMATION

Date Started	12/19/13	Hammer Wt.	140 lbs.
Date Completed	12/19/13	Hammer Drop	30 in.
Drill Foreman	SOUTH BROS	Spoon Sampler O.D.	2 in.
Inspector		Rock Core Dia.	in.
Boring Method	HSA	Shelby Tube O.D.	in.

TEST DATA

SOIL CLASSIFICATION / SURFACE ELEVATION - 417.0	STRATUM DEPTH	DEPTH SCALE	LITH-OLOGY	SAMPLE NO.	SAMPLE TYPE	Standard Penetration Test N. Blows/Ft.	Unconfined Compressive Strength Tons/Ft.^{2}	Pocket Penetrometer Tons/Ft.^{2}	Natural Dry Density lbs/cu. ft.	Water Content %	Atterberg Limits LL - Liquid Limit PL - Plastic Limit
4 inches Asphalt, 3 inches Aggregate Base	0.6 / 416.4										
FILL - Dark brown silty clay, with some gravel, sand and some bricks, moist.	3.4			1	SS	50/0.4'				15.6	
Test boring discontinued at 3.4 feet at auger refusal.	413.6	5									
		10									
		15									
		20									
		25									

SAMPLER TYPE

SS - DRIVEN SPLIT SPOON
ST - PRESSED SHELBY TUBE
CA - CONTINUOUS FLIGHT AUGER
RC - ROCK CORE

GROUND WATER DEPTH

AT COMPLETION Dry FT.
AFTER FT.
WATER ON RODS FT.

BORING METHOD

HSA - HOLLOW STEM AUGERS
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVING CASING
RW - ROTARY WASH

American
Geotechnical and
Environmental, Inc.

FIELD CLASSIFICATION SYSTEM FOR SOIL EXPLORATION

NON COHESIVE SOILS
(Silt, Sand, Gravel and Combinations)

DENSITY

Very Loose	- 5 blows/ft. or less
Loose	- 6 to 10 blows/ft.
Medium Dense	-11 to 30 blows/ft.
Dense	-31 to 50 blows/ft.
Very Dense	-51 blows/ft. or more

RELATIVE PROPORTIONS

Descriptive Term	Percent
Trace	1 - 10
Little	11 - 20
Some	21 - 35
And	36 - 50

PARTICLE SIZE IDENTIFICATION

Boulders	-8 inch diameter or more
Cobbles	-3 to 8 inch diameter
Gravel	-Coarse - 1 to 3 inch
	Medium - 1/2 to 1 inch
	Fine - 1/4 to 1/2 inch
Sand	-Coarse - 0.6 mm to 1/4 inch (dia. of pencil lead)
	Medium - 0.2 mm to 0.6 mm (dia. of broom straw)
	Fine - 0.05mm to 0.2 mm (dia. of human hair)
Silt	-0.06 mm to 0.002 mm (cannot see particles)

COHESIVE SOILS
(Clay, Silt and Combinations)

CONSISTENCY

Very Soft	- 3 blows/ft. or less
Soft	- 4 to 5 blows/ft.
Medium Stiff	- 6 to 10 blows/ft.
Stiff	-11 to 15 blows/ft.
Very Stiff	-16 to 30 blows/ft.
Hard	-31 blows/ft. or more

PLASTICITY

Degree of Plasticity	Plasticity Index
Low	0 - 7
Medium	8 - 22
High	over 22

Classification on logs are made by visual inspection in general accordance with the Unified Classification System.

Standard Penetration Test - Driving a 2.0 " O. D., 1 3/8" I. D., sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30.0 inches. It is customary to drive the spoon 6.0 inches to seat the sampler into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and making the tests are recorded for each 6.0 inches of penetration on the field drill log (Example 6/4/6). On the report log, the Standard Penetration Test result (N value) is normally presented and consists of the sum of the last penetration counts (i.e. N = 4 + 6 = 10 blows/ft.).

Strata Changes - in the column "Soil Descriptions" on the drill log the horizontal lines represent strata changes. A solid line (--------) represents an actually observed strata change, a dashed line (-- -- --) represents an estimated strata change.

Groundwater observations were made at the time indicated. Porosity of soil strata, weather conditions, site topography, etc., may cause changes in the water level readings indicated on the logs.

IMPORTANT INFORMATION
ABOUT YOUR
GEOTECHNICAL ENGINEERING REPORT

More construction problems are caused by site subsurface conditions than any other factor. As troublesome as subsurface problems can be, their frequency and extent have been lessened considerably in recent years, due in large measure to programs and publications of ASFE/ The Association of Engineering Firms Practicing in the Geosciences.

The following suggestions and observations are offered to help you reduce the geotechnical-related delays, cost-overruns and other costly headaches that can occur during a construction project.

A GEOTECHNICAL ENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

A geotechnical engineering report is based on a subsurface exploration plan designed to incorporate a unique set of project-specific factors. These typically include: the general nature of the structure involved, its size and configuration; the location of the structure on the site and its orientation; physical concomitants such as access roads, parking lots, and underground utilities, and the level of additional risk which the client assumed by virtue of limitations imposed upon the exploratory program. To help avoid costly problems, consult the geotechnical engineer to determine how any factors which change subsequent to the date of the report may affect its recommendations.

Unless your consulting geotechnical engineer indicates otherwise, *your geotechnical engineering report should not be used*:

- When the nature of the proposed structure is changed, for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one;
- when the size or configuration of the proposed structure is altered;
- when the location or orientation of the proposed structure is modified;
- when there is a change of ownership, or
- for application to an adjacent site.

Geotechnical engineers cannot accept responsibility for problems which may develop if they are not consulted after factors considered in their report's development have changed.

MOST GEOTECHNICAL "FINDINGS" ARE PROFESSIONAL ESTIMATES

Site exploration identifies actual subsurface conditions only at those points where samples are taken, when they are taken. Data derived through sampling and subsequent laboratory testing are extrapolated by geotechnical engineers who then render an opinion about overall subsurface conditions, their likely reaction to proposed construction activity, and appropriate foundation design. Even under optimal circumstances actual conditions may differ from those inferred to exist, because no geotechnical engineer, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than a report indicates. Actual conditions in areas not sampled may differ from predictions. *Nothing can be done to prevent the unanticipated, but steps can be taken to help minimize their impact.* For this reason, *most experienced owners retain their geotechnical consultants through the construction stage*, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

SUBSURFACE CONDITIONS CAN CHANGE

Subsurface conditions may be modified by constantly-changing natural forces. Because a geotechnical engineering report is based on conditions which existed at the time of subsurface exploration, *construction decisions should not be based on a geotechnical engineering report whose adequacy may have been affected by time.* Speak with the geotechnical consultant to learn if additional tests are advisable before construction starts.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical report. The geotechnical engineer should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

GEOTECHNICAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND PERSONS

Geotechnical engineers' reports are prepared to meet the specific needs of specific individuals. A report prepared for a consulting civil engineer may not be adequate for a construction contractor, or even some other consulting civil engineer. Unless indicated otherwise, this report was prepared expressly for the client involved and expressly for purposes indicated by the client. Use by any other persons for any purpose, or by the client for a different purpose, may result in problems. *No individual other than the client should apply this report for its intended purpose without first conferring with the geotechnical engineer. No person should apply this report for any purpose other than that originally contemplated without first conferring with the geotechnical engineer.*

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a geotechnical engineering report. To help avoid these problems, the geotechnical engineer should be retained to work with other appropriate design professionals to explain relevant geotechnical findings and to review the adequacy of their plans and specifications relative to geotechnical issues.

BORING LOGS SHOULD NOT BE SEPARATED FROM THE ENGINEERING REPORT

Final boring logs are developed by geotechnical engineers based upon their interpretation of field logs (assembled by site personnel) and laboratory evaluation of field samples. Only final boring logs customarily are included in geotechnical engineering reports. *These logs should not under any circumstances be redrawn* for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process. Although photographic reproduction eliminates this problem, it does nothing to minimize the possibility of contractors misinterpreting the logs during bid preparation. When this occurs, delays, disputes and unanticipated costs are the all-too-frequent result.

To minimize the likelihood of boring log misinterpretation, *give contractors ready access to the complete geotechnical engineering report* prepared or authorized for their use. Those who do not provide such access may proceed under the *mistaken* impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes which aggravate them to disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY

Because geotechnical engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against geotechnical consultants. To help prevent this problem, geotechnical engineers have developed model clauses for use in written transmittals. These are *not* exculpatory clauses designed to foist geotechnical engineers' liabilities onto someone else. Rather, they are definitive clauses which identify where geotechnical engineers' responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your geotechnical engineering report, and you are encouraged to read them closely. Your geotechnical engineer will be pleased to give full and frank answers to your questions.

OTHER STEPS YOU CAN TAKE TO REDUCE RISK

Your consulting geotechnical engineer will be pleased to discuss other techniques which can be employed to mitigate risk. In addition, ASFE has developed a variety of materials which may be beneficial. Contact ASFE for a complimentary copy of its publications directory.

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ASFE THE ASSOCIATION OF ENGINEERING FIRMS PRACTICING IN THE GEOSCIENCES

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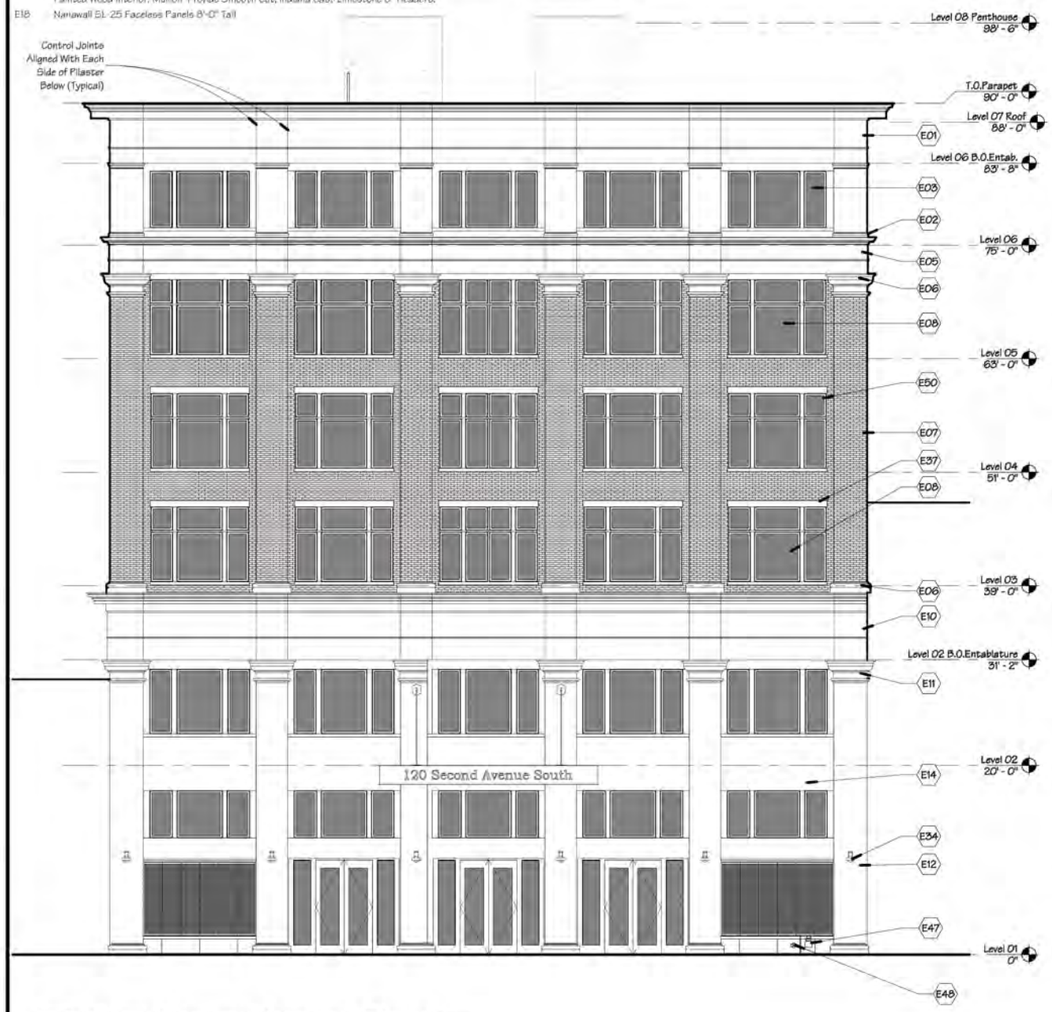
0788/3M

Keynote - Elevations

Key	Keynote Text
E01	Continuous Dryvit, Lymestone Textured Acrylic Finished Entablature Including Cornice, Frieze, And Architrave. On Front And Rear Facades This Topmost Cornice Is To Overhang 2'-0" And Down Lighting Is To Be Provided. On Both Side Elevations Hold Cornice Tight. Match Building Base Limestone In Color, Texture, And Tooling.
E02	Dryvit, Lymestone, Textured Acrylic Finished Pilasters, Capitals, And Bases On Sixth Floor. Match Building Base Limestone In Color, Texture, And Tooling.
E03	Aluminum Clad Exterior, Painted Wood Interior, 6'-0" Tall, Fixed Window System With Low E-366, Insulated Glass. Provide Flanking 24" Units With Center 60" Unit. Separate Units With 6" Exterior Aluminum Cladding And Painted Wood Interior Mullion. Provide Smooth Cut, Indiana Cast Limestone 8" Headers And 4" Sills.
E05	Continuous Dryvit, Lymestone Textured Acrylic Finished Entablature Including Cornice, Frieze, And Architrave. Hold Cornice Tight To Building On All Sides. Match Building Base Limestone In Color, Texture, And Tooling.
E06	Dryvit, Lymestone Textured Acrylic Finished Capitals And Bases With Brick Veneer Shafts. Match Building Base Limestone In Color, Texture, And Tooling
E07	Brick Veneer Wall Construction On Third, Fourth, And Fifth Floors Front And Rear Facades With Colored Mortar And 3/8" Concave, Tooled Joints. Provide Relief Angles, Control Joints, And Flashing With Weep Holes.
E08	Aluminum Clad Exterior, Painted Wood Interior 8'-0" Tall Window System With 2'-4" Tall Transoms Above 5'-8" Windows With Low E-36 Insulated Glass. Provide Flanking 24" Casement Units With Opening Restricted To 4" With Center Fixed 60" Unit. Separate Units With 6" Exterior Aluminum Cladding And Painted Wood Interior Mullion. Provide Smooth Cut, Indiana Cast Limestone 8" Headers And 4" Sills, Unless Noted Otherwise.
E09	Center Bay Only Provide Aluminum Clad Exterior, Painted Wood Interior, 8'-0" Tall, Window System With 2'-4" Tall Transoms Above 5'-8" Windows With Low E-36 Insulated Glass. Provide Flanking 24" Wide Casement Units With Opening Restricted To 4" With Center Two 30" Fixed Units. Separate Two 30" Units With 6" Exterior Aluminum Cladding And Painted Wood Interior Mullion. Matching Jamb And Mull Between Casement And Fixed Unit Is To Be Sized To Fit. Provide Smooth Cut, Iidiana Cast Limestone 8" Headers And 4" Sills.
E10	Arcuestone Finished Entablature Including Cornice, Frieze, And Architrave. On Front And Rear Facades This Cornice Is To Overhang 2'-0" And Down Lighting Is To Be Provided. Match Building Base Limestone In Color, Texture, And Tooling.
E11	Smooth Cut Gray Indiana Limestone Capitals And Bases. At Bases And Shaft Bottom Use Dolomitic Limestone Matching Building Limestone In Color, Texture, And Tooling.
E12	Slotted, Smooth Cut, Gray Indiana Limestone Above Dolomitic Limestone Pedestal. Attach Panels With Stainless Steel Anchors. Use Matching Mortar.
E13	Aluminum Clad Exterior, Painted Wood Interior, 7'-0" Tall, Fixed Window System With Low E-366, Insulated Glass. Provide Flanking 24" Units With Center 60" Unit. Separate Units With 6" Exterior Aluminum Cladding And Painted Wood Interior Mullion. Provide Smooth Cut, Indiana Cast Limestone 8" Headers And 4" Sills.
E14	Slotted, Smooth Cut, Gray Indiana Limestone Panels With Stainless Steel Anchors. Use Matching Mortar.
E15	Hinges To Be Retractable, Marquee With Anodized Metal Fascia Panel. Cut Of Building Address And Back Light Through Translucent Panel Concealed In Canopy.
E16	Aluminum Clad Exterior, Painted Wood Interior, 5'-0" Tall, Fixed Transom Window System With Low E-366, Insulated Glass.. Providing Flanking 24" Units With Center Twin 30" Unit. Separate Flanking Units For Double Center Units With 6" Exterior Aluminum Cladding And Painted Wood Interior. Mullion Provide Smooth Cut, Indiana Cast Limestone 8" Headers.
E18	Nanawall SL-25 Faceless Panels 8'-0" Tall

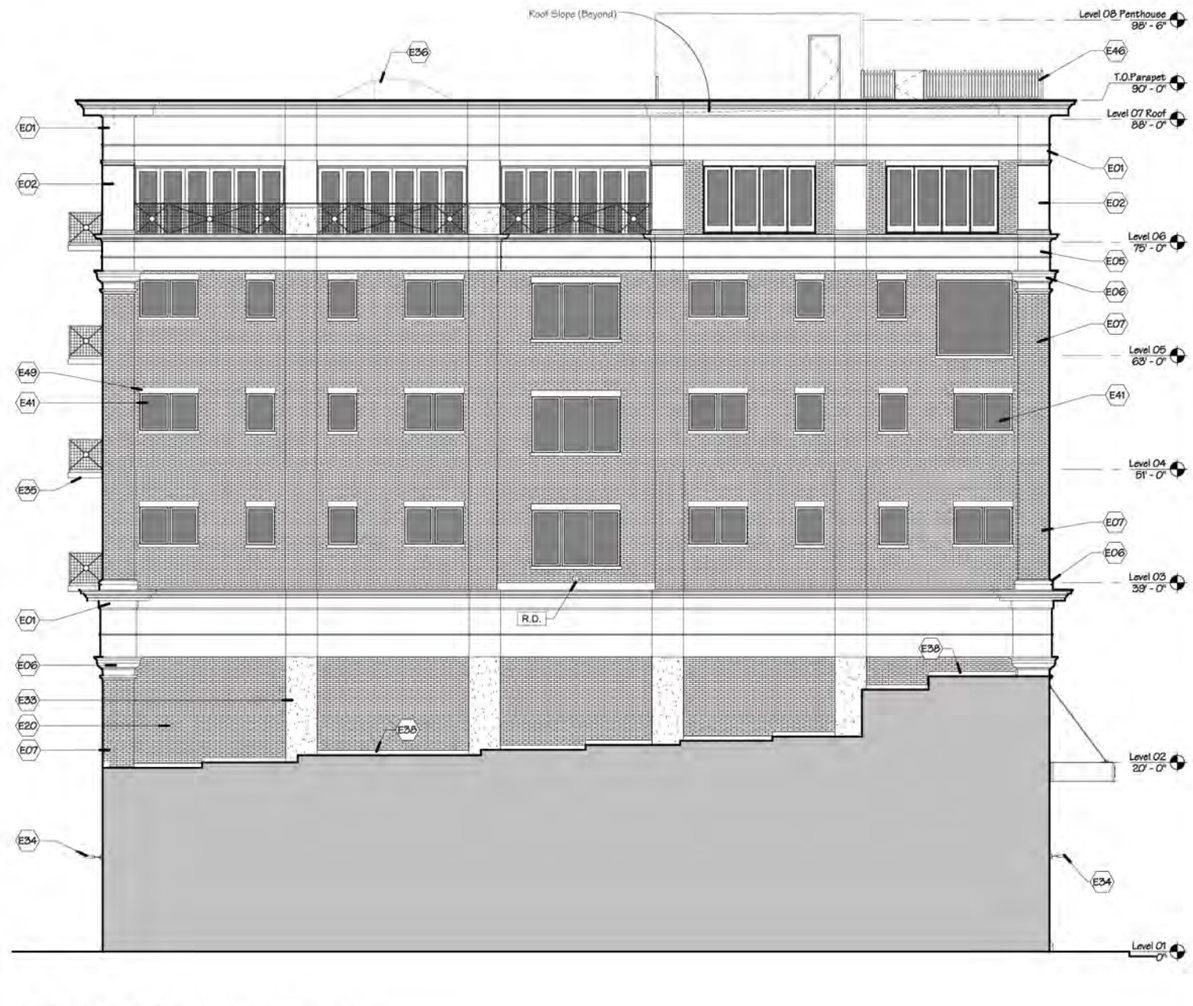
Keynote - Elevations

Key	Keynote Text
E19	Slotted Cut Polished Granite Slabs Attached With Stainless Steel Anchors And Matching Mortar.
E20	Dryvit, Custom Brick Pattern, EIFS Finish. Provide Expansion Joints And Control Joints Where Ever Needed.
E22	Brick Veneer Construction Turning 3'-4" From Front &/Or Rear Facades.
E23	Architectural Guard Rail System With 2" Square Post Framing And 4" X 4" Metal Net Behind 1" Flat Plates With 8" Diameter Center Medallion With 2" Half Sphere. Weld And Powder Coat Paint.
E24	This Line Connects The Approximate Low Point To The Approximate Height Points Along The Neighboring Wall. Actual Top Of Wall Is To Be Determined By The Contractor. Provide A Continuous Flashing System Where New Wall Reaches Top Of Neighboring Building.
E28	4'-0" Tall Anodized Aluminum Louver With Bird Screen Where Serving As Outlet For Mechanical Venting. In Trash Room Provide Thermostatically Controlled Fan With Override Switch Behind Louver.
E29	8" Bent Metal Cladding To Match Window Frame Finish. Use Window Cladding Trim If Possible.
E30	Three Equal, Aluminum Clad Exterior, Painted Wood Interior, 6'-0" Tall, Fixed Windows With Lowe 366, Insulated Glass. Provide Smooth Cut, Indiana Cast Limestone 8" Headers And 4" Sills.
E31	Aluminum Clad Exterior, Painted Wood Interior, 8'-0" Tall And Four 36" Wide Fixed Window Units With Lowe 366, Insulated Glass. Provide Smooth Cut, Indiana Cast Limestone 8" Headers And 4" Sills.
E32	Aluminum Clad Exterior, Painted Wood Interior, 8'-0" Tall, Bi-Folding Door System With Low E-366, Insulated Glass.
E33	Dryvit, Lymestone Textured Acrylic Finished Raised Pilasters.
E34	Exterior Wall Sconce Light Fixture By Manufacturer "Architectural Area Light", Model FMLSX-FM-30LED-BW
E35	Cantilevered Reinforced Concrete Balcony With Tile Finish Floor Over Bond-Break Drainable Underlayment. Finish Slab Edge Faces With Dryvit, Lymestone Finish Material.
E36	Self-Supporting Hip-Roofed Skylight On Minimum 1'-0" High Roofing Curb
E37	Limestone Header (Typical)
E38	Wall-To-Roof Flashing Over Existing Parapet.
E39	Aluminum Transom Panel To Match Window Systems Color And Finish
E40	Concrete Filled, Steel Bollard, Painted "Yellow"
E41	Aluminum Clad Exterior, Painted Wood Interior, 8'-0" Tall French Double Door System With Low-E 366, Insulated Glass With Flanking Sidelite 24" Wide, And Aluminum Clad Mullions 5" Wide.
E43	Metal, Overhead Coiling Door, Color To Match Window Frames
E45	Dryvit Veneer Finish Over Core Shaft Walls
E46	4'-0" High, Black, Aluminum Security Fence Anchored To Roof
E47	Gas Meter Service Entry
E48	Siamese Fire Connection
E49	Projected Jackarch Header. EIFS Limestone Finish (Typical)
E50	Fixed Transom Picture Window, With Low E-36 Insulated Glazing



1 West (Second Avenue) Elevation

0 4' 8' 16'



2 North (Left Side) Elevation

0 4' 8' 16'

Not For Construction - 50% Construction Documents

DATES & REVISIONS

REVIEW: 28 February 2017

BROADWAY LOFTS

120 SECOND AVENUE SOUTH
NASHVILLE, TENNESSEE 37201

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SHEET NUMBER

A2.0

Exterior Elevations

Keynote - Elevations

Key	Keynote Text
E01	Continuous Dryvit, Lymestone Textured Acrylic Finished Entablature Including Cornice, Frieze, And Architrave. On Front And Rear Facades This Topmost Cornice Is To Overhang 2'-0" And Down Lighting Is To Be Provided. On Both Side Elevations Hold Cornice Tight. Match Building Base Limestone In Color, Texture, And Tooling.
E02	Dryvit, Lymestone, Textured Acrylic Finished Pilasters, Capitals, And Bases On Sixth Floor. Match Building Base Limestone In Color, Texture, And Tooling.
E03	Aluminum Clad Exterior, Painted Wood Interior, 6'-0" Tall, Fixed Window System With Low E-366, Insulated Glass. Provide Flanking 24" Units With Center 60" Unit. Separate Units With 6" Exterior Aluminum Cladding And Painted Wood Interior. Mullion Provide Smooth Cut, Indiana Cast Limestone 8" Headers And 4" Sills.
E05	Continuous Dryvit, Lymestone Textured Acrylic Finished Entablature Including Cornice, Frieze, And Architrave. Hold Cornice Tight To Building On All Sides. Match Building Base Limestone In Color, Texture, And Tooling.
E06	Dryvit, Lymestone Textured Acrylic Finished Capitals And Bases With Brick Veneer Shafts. Match Building Base Limestone In Color, Texture, And Tooling
E07	Brick Veneer Wall Construction On Third, Fourth, And Fifth Floors Front And Rear Facades With Colored Mortar And 3/8" Concave, Tooled Joints. Provide Relief Angles, Control Joints, And Flashing With Weep Holes.
E08	Aluminum Clad Exterior, Painted Wood Interior 5'-0" Tall Window System With 2'-4" Tall Transoms Above 5'-8" Windows With Low E-36 Insulated Glass. Provide Flanking 24" Casement Units With Opening Restricted To 4" With Center Fixed 60" Unit. Separate Units With 6" Exterior Aluminum Cladding And Painted Wood Interior Mullion. Provide Smooth Cut, Indiana Cast Limestone 8" Headers And 4" Sills, Unless Noted Otherwise.
E09	Center Bay Only Provide Aluminum Clad Exterior, Painted Wood Interior, 8'-0" Tall, Window System With 2'-4" Tall Transoms Above 5'-8" Windows With Low E-36 Insulated Glass. Provide Flanking 24" Wide Casement Units With Opening Restricted To 4" With Center Two 30" Fixed Units. Separate Two 30" Units With 6" Exterior Aluminum Cladding And Painted Wood Interior Mullion. Matching Jamb And Mull Between Casement And Fixed Units Is To Be Sized To Fit. Provide Smooth Cut, Indiana Cast Limestone 8" Headers And 4" Sills.
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E12	Slotted, Smooth Cut, Gray Indiana Limestone Above Dolomitic Limestone Pedestal. Attach Panels With Stainless Steel Anchors. Use Matching Mortar.
E13	Aluminum Clad Exterior, Painted Wood Interior, 7'-0" Tall, Fixed Window System With Low E-366, Insulated Glass. Provide Flanking 24" Units With Center 60" Unit. Separate Units With 6" Exterior Aluminum Cladding And Painted Wood Interior. Mullion Provide Smooth Cut, Indiana Cast Limestone 8" Headers And 4" Sills.
E14	Slotted, Smooth Cut, Gray Indiana Limestone Panels With Stainless Steel Anchors. Use Matching Mortar.
E15	Hinged To Be Retractable, Marquee With Anodized Metal Fascia Panel. Cut Of Building Address And Back Light Through Translucent Panel Concealed In Canopy.
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E31	Aluminum Clad Exterior, Painted Wood Interior, 8'-0" Tall And Four 36" Wide Fixed Window Units With Lowe 366, Insulated Glass. Provide Smooth Cut, Indiana Cast Limestone 8" Headers And 4" Sills.
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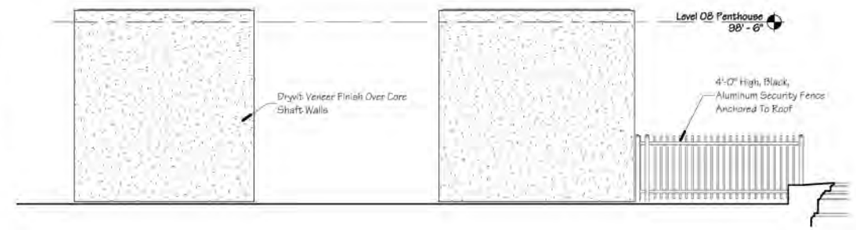
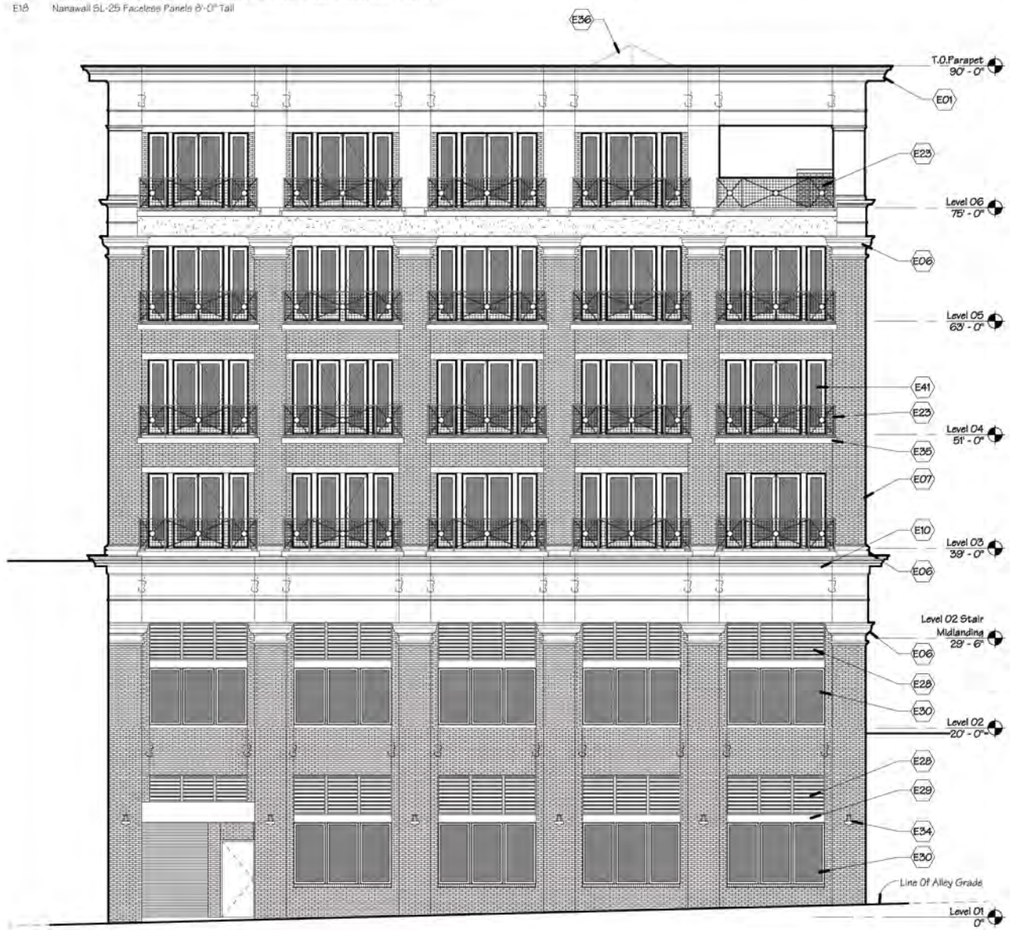
E43	Metal, Overhead Coiling Door, Color To Match Window Frames
E45	Dryvit Veneer Finish Over Core Shaft Walls
E46	4'-0" High, Black, Aluminum Security Fence Anchored To Roof
E47	Gas Meter Service Entry
E48	Siamese Fire Connection
E49	Projected Jackarch Header, EIFS Limestone Finish (Typical)
E50	Fixed Transom Picture Window, With Low E-36 Insulated Glazing



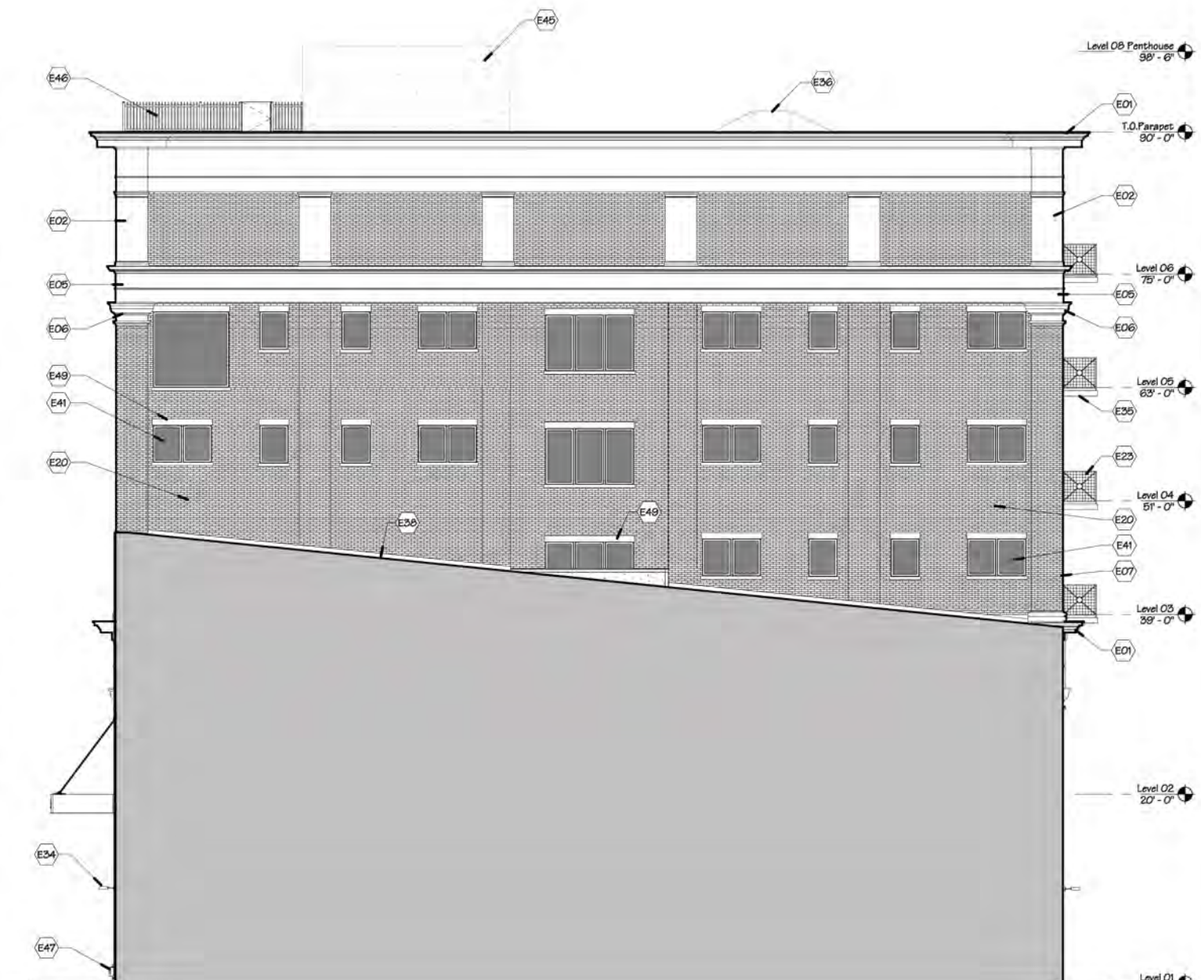
3 Elevation Penthouses East Wall

0 2' 4' 8'



1 East (Alley) Elevation

0 4' 8' 16'



2 South (Right Side) Elevation

0 4' 8' 16'

Not For Construction - 50% Construction Documents

DATES & REVISIONS

REVIEW: 28 February 2017

BROADWAY LOFTS

120 SECOND AVENUE SOUTH
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SHEET NUMBER

A2.1

Exterior Elevations