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March 2, 2012

VIA HAND DELIVERY

BOARD OF ZONING ADJUSTMENT
District of Columbia
CASE NO. 18308
EXHIBIT NO. 36

Meridith Moldenhauer, Chairperson
D.C. Board of Zoning Adjustment
441 4th Street, N.W.
Second Floor
Washington, D.C. 20001

Re: Board of Zoning Adjustment ("BZA") Case No. 18308 by the Bozzuto Development Company – Application for Modification to BZA Order Nos. 17723 and 17723A and Variance Relief for 460 New York Avenue, N.W. (Square 515N, Lot 828), Washington, D.C. (the "Property") – Post-Hearing Submission

Dear Chairperson Moldenhauer and Members of the Board:

In response to the requests for additional information by both the Board and the Office of Planning at the February 14, 2012 public hearing, the Bozzuto Development Company (the "**Applicant**") submits the following material in support of the requested variance relief.

I. Summary of the Exceptional Conditions at the Property Relating to the Section 2116.12 Variance Relief

The Property meets the "exceptional conditions" element of the variance test as the Board previously found in the approval of the variance relief in BZA Order Nos. 17723 and 17723A.

The unique exceptional conditions at the Property arise from a confluence of factors rather than a single situation or condition. In order to adaptively reuse the existing structure, the Applicant must work within the constraints of the existing building, including its relationship to the lot and the as-built façade. The existing building comprises the entirety of the site with three story façades built to all lot lines. The Applicant is retaining such facades after conversations with historic preservation staff.

Board of Zoning Adjustment
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The Property also has a unique and atypical lot configuration. As stated, the confluence of New York Avenue and L Street, N.W., creates a triangular lot shape that pinches the Property into a narrow point. The Property also has a small lot area, at 6,451 square feet.

In addition, the lot has an atypical degree of street frontage. As a result, the twenty foot setback of Section 2116.12 comprises the vast majority of the site. Such condition also creates complications to construct driveway and ramping that would allow an underground parking garage to be fully-compliant with the Zoning Regulations.

II. Information Relating to the Practical Difficulty Relating to the Section 2116.12 Variance Relief

In order to determine whether an applicant is subject to a practical difficulty, the BZA may consider "... a wide range of factors in determining whether there is an 'unnecessary burden' or 'practical difficulty.' Increased expense and inconvenience to applicants for a variance are among the proper factors for BZA's consideration." Gilmartin v. Bd. of Zoning Adj., 579 A.2d 1164, 1171 (D.C. 1990)) (citing Barbour v. D.C. Bd. of Zoning Adj., 358 A.2d 326, 327 (D.C. 1976)); see also Tyler v. D.C. Bd. of Zoning Adj., 606 A.2d 1362, 1367 (D.C. 1992). Other factors to be considered by the BZA include: "the severity of the variance(s) requested"; "the weight of the burden of strict compliance"; and "the effect the proposed variance(s) would have on the overall zone plan" Id. Thus, to demonstrate practical difficulty, the applicant must show that strict compliance with the regulations is burdensome, not impossible.

The practical difficulties justifying the Applicant's requested relief from Section 2116.12 are similar to those previously approved under BZA Order No. 17723 at the Property. However, the practical difficulties to strictly meet Section 2116.12 are more pronounced due to the additional information uncovered relating to the Property since the prior BZA approval.

a. Practical Difficulties Relating to Excavating Under the Existing Building Facades and the Small and Odd Shape of the Property

The Applicant hereby submits the report of its geotechnical engineer, Specialized Engineering, as Exhibit A. Such geotechnical report concludes that the combination of the geology of the Property and the complication created by the existing façade will result in great difficulties excavating the parking garage previously proposed by the Applicant (and approved under BZA Order Nos. 17723 and 17723A).

The parking garage previously-approved by BZA Order Nos. 17723 and 17723A is infeasible to construct for the proposed project. Previously, the development team did not have sufficient information to project the cost and difficulty relating to excavating the full parking garage, including the necessary vault space. With further design development, it became apparent that the prior proposal was too costly, in addition to being highly complicated. Such conclusions are described further in the affidavit of the Applicant, attached hereto as Exhibit B.

Due to the small lot and its odd shape, if a parking configuration includes ramping on the Property, the result is an inefficient parking garage. Such inefficiency has always been a concern of the development team, but with the inability to use vault space (per DDOT's request), such

inefficiency is even more acute. Due to the Property's small size and odd shape, a significant portion of Property would be utilized by ramping and other infrastructure. Since all parking and ramping must take place on private property, the portion of the garage space allocable to parking spaces greatly diminishes when ramping is included.

b. Practical Difficulties Locating the Mechanical Parking Below Grade

As requested, the Applicant and its design team have studied various alternatives to locating the mechanical parking at the first floor level which creates the need for the variance from Section 2116.12. As shown on the drawings attached as Exhibit C, the team studied five (5) different subgrade options and all present equivalent practical difficulties to the previously approved parking plan and greater practical difficulties to the currently proposed parking plan, including additional significant excavation costs, additional mechanical system costs, additional inefficient ramping, use of public vault space, and the difficulties associated with excavating under or adjacent to the existing walls of the structure without causing significant damage or cost. The costs associated with the additional excavation and structural work are described in the affidavit from the Applicant which is attached as Exhibit B. The higher costs below are generally due to the additional underpinning required by the deeper garages which result in further excavation, concrete walls, waterproofing, etc., and the greater degree of stabilization of the existing structure's walls required. All construction costs noted below are in addition to the estimated $1.6MM cost for the current partially above-grade, partially below-grade mechanical parking proposal.

Specifically, the following alternatives are included in the attached Exhibit C. Each alternative below includes the reasons that the Applicant did not select such option.

- Option 8 – This option employs a 25% ramp with "backhouse" services on the ground level. This proposal's construction cost is approximately $2.6MM higher than the current parking proposal.
    - This option does not create an active streetscape on New York Avenue. The option's ramping occupies a similar amount of street frontage on New York Avenue as does the proposed structured parking.
    - This option requires the use of vault space, which is opposed by DDOT.
    - Excavation for this option is extremely expensive and complicated, if not impossible, under the existing structure. Further, this option requires the excavation of the passenger elevator further into the ground.
    - This option generates a much higher ongoing operational cost (ie, vault rental and structural maintenance, etc.)
    - The 25% ramp is not practical, although it saves excavating an additional level. Even still, ramping is greatly inefficient on such small site.
    - "Backhouse" functions would be moved to the first floor since drive aisles would be moved to P1.

- Option 8a – This option is the same as Option 8, except the "backhouse" functions have moved from the first floor to an additional level of excavation. This proposal's construction cost is approximately $4.35MM higher than the current parking proposal.

    - This option is the most expensive option. It opens up more of the streetscape, but the cost is almost an entire new level of excavation.

    - This option has similar difficulties to Option 8, such as ramping inefficiency, the use of vault space, the lack of an active New York Avenue streetscape, and high ongoing operational costs.

- Option 9 – This option employs a 15% ramp with service uses located on first floor. This proposal's construction cost is approximately $3.7MM higher than the current parking proposal.

    - This option does not create an active streetscape on New York Avenue. The option's ramping occupies a similar amount of street frontage on New York Avenue as does the proposed structured parking.

    - This option requires the use of vault space, which is opposed by DDOT.

    - Excavation for this option is extremely expensive and complicated, if not impossible, under the existing structure. Further, this option requires the excavation of the passenger elevator further into the ground.

    - This option generates a much higher ongoing operational cost (ie, vault rental and structural maintenance, etc.)

    - This option's more gradual ramp requires excavating an additional level beyond Option 8, which increases cost.

    - The garage ramping is greatly inefficient on such small site.

    - Note: it would be possible to create an "Option 9a" to move "backhouse" services from the first floor to a newly excavated level, but the cost would be even higher. This would become the most expensive option.

- Option 10 – This option employs an all underground radial structured parking system, accessed by one main elevator space on the first floor. Cars would enter the garage from L Street to the elevator in middle of building. This proposal's construction cost is approximately $2.8MM higher than the current parking proposal.

    - This option creates a great deal of expense with the complicated sorting mechanical mechanism. Lateral movement in such systems adds significantly to the cost of such systems. This element alone adds approximately $1MM of the cost beyond the proposed system.

- This option creates the need to transfer structural loads from the middle of the site to the sides, which creates a great deal of expense.

- Significant excavation is still required, and therefore, the option would still have the attendant costs and construction complications.

- This option creates a potential queuing impact on L Street. It would potentially result in a number of cars "stacking up" into L Street when the garage elevator is in use.

- Since there is only one elevator to the parking levels, it could create a bottleneck if such elevator has operational issues.

- Option 11 – This option employs a freight elevator at southeast corner of site to access an all below grade structured parking garage. This proposal's construction cost is approximately $2MM higher than the current parking proposal.

    - This option has a similar impact on the New York Avenue and L Street streetscapes as the proposal (with "backhouse" uses on first floor).

    - This option is expensive due to the full excavation of a two level garage and additional pits. This scheme doubles the amount of excavation from the proposed scheme. Further, this option requires the excavation of the passenger elevator further into the ground.

    - This option moves the elevator core and stairs which has ripple effects throughout the design, leading to less efficient floor plates.

    - This option also creates structural difficulties with the existing facades since there is full excavation up to the lot lines.

    - This option likely creates turning radius problems since cars would enter the P1 level at a greater angle to their desired alignment than under other options.

    - This option creates a potential queuing impact on L Street. It would potentially result in a number of cars "stacking up" into L Street when the garage elevator is in use. The queuing impact of this scheme is potentially the worst of any scheme.

    - Since there is only one elevator to the parking levels, it could create a bottleneck if such elevator has operational issues.

    - Note: it would be possible to create an "Option 11a" to move "backhouse" services from the first floor to a newly excavated level, but the cost would be even higher.

As described and submitted during the February 14, 2012 hearing, the Applicant studied several additional above-grade options for the parking at the Project. Each was deemed infeasible and inefficient.

c. Information on the Market Demand for the Requested Amount of Parking

The Applicant utilized the services of three (3) residential market consultants to determine the feasibility of developing this project and the amount of parking the market would required. In addition to other information, the residential market consultants provided comparable data on other condo projects and the parking ratios in the area. Such information is as follows:

COMMUNITY	NUMBER OF UNITS	NUMBER OF PARKING SPACES	PARKING RATIO
Madrigal Lofts	259	304	1.2%
The Whitman	185	207	1.1%
Dumont	559	564	1.0%
Sonata	75	75	1.0%
1010 Mass	163	159	1.0%
Yale Steam Laundry	149	145	0.97%
Quincy Court	125	119	0.95%
400 Mass	256	238	0.93%
The L at CityVista	144	121	0.84%
The K at CityVista	292	237	0.81%
Quincy Park	90	70	0.78%
555 Mass Ave	246	176	0.72%
460 New York Ave	**63**	**36**	**0.57%**

As shown on the Applicant's affidavit attached as Exhibit B, based on the above information and other information from the market studies, the Applicant concluded that parking similar to the .57 parking space ratio proposed would be necessary for a successful condominium project at the Property.

It should also be noted that the Applicant would like to build the least amount of parking possible since constructing parking is expensive. The costs relating to the construction of parking cannot be recovered through the sale of parking spaces. The Applicant is already proposing the smallest amount of parking it believes feasible.

Additionally, the Applicant consulted with several banking sources to determine whether a reduction in parking would threaten the financial viability of the project. Such lenders indicated concern at the reduction of parking in the project. As the letter from M&T Bank, attached as Exhibit D indicates, if the parking ratio is reduced below that proposed, the Bank may be forced not to pursue the opportunity to finance what is already an extremely challenged project.

III. Summary of the Lack of Harm to the Public Good and Lack of Impairing the Intent of the Zone Plan Relating to the Section 2116.12 Variance Relief

The requested variance relief can be granted without substantial detriment to the public good and without impairing the intent, purpose, and integrity of the Zone Plan.

The Applicant is proposing a glass and light enclosure for each building opening on the first two levels that would hide the parking mechanisms and vehicles from public view. Therefore, pedestrians walking by the Project will not see or hear vehicles, or their tires, horns, or motors. Similarly, pedestrians will not be exposed to exhaust from such vehicles, since these parking mechanisms will be entirely enclosed. Since such spaces will be secured, they will not pose safety threats for the residents of the Project or passers-by. Since the vehicles are turned off prior to being "sorted" within the parking system, there will be no offensive headlight pollution into any adjacent properties or any adjacent traffic right-of-way.

Due to the focus on design for these parking structures, there will not be a negative effect on the aesthetics of the streetscape. On the contrary, the uniqueness of the parking systems and the integration of glass and light will all for an enhancement of the streetscape. As a result, the existence of these above-grade spaces will not create a "dead zone" in the streetscape. Instead, the design will be incorporated into the residential project and appear to be a cohesive part of the building.

The Applicant has investigated additional design treatment possibilities for the window and portions of the façade adjacent to the above-grade parking spaces. The team looked at additional creative solutions for streetscape design but ultimately concluded that these elements detracted from the design of the project. The Applicant's goal was to create a cohesive design where the first floor blended with the remainder of the project, rather than drawing additional attention to it. The project will already have two design elements – the existing restored 3 story façade and the new modern, glass and steel addition over such base. At the Office of Planning's suggestion, the Applicant will implement a unique obscuring glass in the window areas of the first floor spaces adjacent to the parking bays, similar to the design attached as Exhibit E. Further, the Applicant would not use frosted glass or a stamped pattern.

The Applicant believes that the difference between the impact of the proposed plan on the streetscape and the impact of the previously-approved plan on the streetscape is de minimis. Retail uses are not required on the Property and indeed the Property's lot size is too small to allow for the inclusion of retail space.

It should be noted that the District Department of Transportation supports the proposed parking approach, largely since DDOT now strongly disfavors the use of public vaults for parking. Also, the application request has been fully supported by the community. ANC 6C, the Mount Vernon Square Neighborhood Association ("**MVSNA**"), and a representative of ANC 2C expressed their support for the requested relief on the record.

IV. Reiteration of Flexibility Request

Given the difficulties associated with the construction on the site (as detailed above) and the installation of the parking mechanisms, the Applicant requests flexibility to make internal alterations to the structure, if necessary.

V. Alternative Relief

If the requested modification and new variance relief from Section 2116.12 are not approved by the Board, the Applicant requests an extension to BZA Order No. 17723A under 11 DCMR Section 3130 et. seq. and a waiver from 11 DCMR Sections 3130.6, including Section 3130.6(a), and 3130.7 to allow a second extension to an Order. Under 11 DCMR Section 3100.5, the BZA "may, for good cause shown, waive any of the provisions of [Chapter 31 of the Zoning Regulations] if, in the judgment of the Board, the waiver will not prejudice the rights of any party and is not otherwise prohibited by law." If the Board approves the Applicant's request at its March 13, 2012 public meeting, the Applicant withdraws this request. If approved, the Applicant would submit an application for building permits prior to the expiration date of BZA Order No. 17723A. If the Board disapproves the Applicant's request at its March 2, 2012 public meeting, the Applicant will provide additional information to justify this extension request.

VI. Conclusion

We greatly appreciate the opportunity to include additional information in the record for this case.

Sincerely,

Maureen E. Dwyer

Jeffrey C. Utz

Certificate of Service

I certify that on March 2, 2012, I delivered a copy of the foregoing document via hand delivery or first class mail to the addresses listed below.

Jeffrey C. Utz

Stephen Cochran (2 copies)
Office of Planning
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Washington, D.C. 20024

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November 3, 2011

BOZZUTO HOMES, INC.
7850 Walker Drive
Suite 400
Greenbelt, Maryland 20770

Attention: Mr. Duncan Slidell

Reference: Addendum No. 1
Preliminary Geotechnical Report
460 NEW YORK AVENUE, NW
Washington, D.C.
Specialized Engineering Project No. 063499

Dear Mr. Slidell:

Specialized Engineering has completed additional subsurface exploration and geotechnical evaluation for the **460 New York Avenue, N.W.** project in Washington, D.C. This addendum letter, with attachments, provides the findings of our additional exploration and our supplemental geotechnical evaluations and recommendations for your further evaluation of the project. You authorized the current study in accordance with our Proposal No. B11-8730, dated October 11, 2011. Our findings, evaluations, and recommendations are discussed in the sections that follow.

Background

In 2006 under Project No. 063499, Specialized Engineering conducted a preliminary geotechnical investigation for the 460 New York Avenue, N.W. project site and issued a **Preliminary Subsurface Exploration and Geotechnical Evaluation** report, dated November 20, 2006. For that preliminary study, Specialized Engineering considered demolition of the existing three-level parking garage at the site and construction of a totally new, 11-story residential structure that would include three garage levels below current grade levels at the approximate lowest level of the existing building. The maximum column loadings associated with the proposed construction were estimated to be on the order of 1,600 kips. The limited preliminary geotechnical investigation

study in 2006 included drilling four borings to depths of 60 ft below surface grades in accessible areas around the perimeter of the existing building, conducting limited laboratory testing of soil samples, and preparing a preliminary report of findings, evaluations, and recommendations. Based on consideration of the proposed construction described previously and the findings of the borings, Specialized Engineering recommended primary consideration of a mat foundation system, founded within the heavily over-consolidated Potomac Group soils at depths of approximately 30 ft below current grades and designed for a maximum allowable soil bearing pressure of 4 kips per square foot (ksf). Additional guidance was provided regarding below-grade wall and seismic design, as well as various construction considerations, including building demolition, excavation bracing, and groundwater control.

Current Proposed Development

Since the issue of our previous geotechnical report, the proposed development scheme has changed. Based on our recent conversations with you, the new development scheme involves construction of a new, 12-story, residential structure, including only one below-grade level. In addition, the exterior façade of the existing building is to be largely preserved, with the new structure constructed within the outer walls of the existing structure. We understand that the new construction generally will be structurally independent of the previous construction, with resulting vertical loads on the old building façade footings likely being reduced to the dead loads associated with the façade walls alone.

Architectural and structural information is very preliminary at this time; however, from our past experience, we anticipate that the lowest level of the new building will be will be approximately 10 ft to 12 ft below slab level of the existing building, and that the new structure will be mostly concrete-framed and column-supported, with maximum column loads on the order of 1,600 kips.

Current Scope of Services

The current geotechnical study included test pit excavation within the at-grade level of the existing building, with exposure of the existing building foundation conditions at two locations coordinated with the Structural Engineer. The purpose of the explorations was to verify the existing building foundation type (assumed to be spread footings), to determine approximate bearing levels for the existing foundations, and to determine the characteristics of the bearing materials. In addition, the current study was to include provision of supplementary geotechnical evaluations and recommendations, with

consideration of the changes proposed for the new construction versus the previously considered construction. The findings, evaluations, and recommendations of the current study were to be provided in a supplemental letter report.

Previous and Current Subsurface Exploration

For the previous study in 2006, four conventional borings were drilled to depths of 60 ft below current site grades. Rotary drilling methods were used and the field sampling and testing methods were conducted in general accordance with ASTM D-1586. The reader is referred to the previous Geotechnical Report for additional details regarding the drilling and sampling methods used

For the current study, two test pits were excavated inside the existing building at the grade-floor level, at locations coordinated with the Structural Engineer. Our Excavation Subcontractor removed portions of the existing concrete slab and then excavated the test pits using a small tracked excavator. A Specialized Engineering Geotechnical Engineer observed the excavation operations, prepared field logs and sketches of the conditions encountered, and collected representative soil samples considered pertinent to the investigation.

The locations of the test pits are shown on the attached Test Pit Location Plan, while details of findings at the two test pit locations are shown on the attached Test Pit Logs and Test Pit Profile Sketches. For additional information, we have included the Boring Location Plan and Boring Logs for the four previously drilled borings at the site and several reference sheets regarding the boring procedures and nomenclature.

The following subsections provide information regarding the subsurface conditions encountered during drilling and sampling of previous borings, as well as the recent findings of test pits. A subsection regarding area geology also is provided.

Area Geology

According to the *Geological Quadrangle Map of the Washington West Quadrangle* (USGS 1994), the site lies within the Coastal Plain Physiographic Province. The Coastal Plain Province is characterized by marine and non-marine sediments deposited during successive periods of fluctuating sea level and moving shorelines. The sediments generally thicken from west to east, toward the east coast. The uppermost sediments are generally comprised of inter-bedded layers of gravels, sands, clays, and silts.

The *Geological Quadrangle Map of the Washington West Quadrangle* indicates that the site geology to the depths sampled includes geologically very old Potomac Group sediments, overlain by geologically younger Pleistocene-aged alluvial terrace deposits.

The Potomac Group soils were deposited during the Cretaceous period, approximately 65 to 135 million years ago, and are comprised of non-marine flood plain deposits that characteristically transition rapidly, both horizontally and vertically, over short distances due to their depositional environment. The Potomac Group soils described as highly variable, intercalated sand, gravel, silt, and clay, with hematite-limonite cements. Sands and gravels are typically quartzose and well-rounded, and a buff kaolinitic clay-quartz silt matrix is common throughout the formation.

The Pleistocene-aged alluvial terrace deposits are described as interlayered clays, silts, sands and gravels, generally crudely to well bedded. Swamp deposits sometimes occur in this unit in the Lafayette Park area to the west of the site.

Subsurface Conditions from the Borings

A 3-inch to 4-inch thick concrete pavement section generally was encountered at the test boring locations. Man-placed fill materials occurred at or near surface grades and appeared to extend to maximum depths 8.5 ft below surface grades at the boring locations. Two natural soil strata of significance were found to underlie the man-placed fill materials and to extend down through the termination depths of the borings.

Man-Placed Fill

The man-placed fill had varying thicknesses in the range of 2.5 ft to 8.5 ft below current grades. The man-placed fill generally consisted of brown silty sand, with construction debris, including brick and wood, and trace amounts of gravel. Because of existing development, the occurrence of man-placed fill at other locations is anticipated.

The Standard Penetration Test N-values within the man-placed fill materials ranged from 2 blows per foot (bpf) to 8 bpf. Such N-values indicate relative densities ranging from very loose to loose for the fill materials. Because of the presence of deleterious materials in most of the boring soil samples and the absence of placement records, the existing fill is considered to be uncontrolled.

Natural Stratum I – Terrace Deposits

Natural soils of Stratum I were encountered below the man-placed fill at all test boring locations, and extended down to the Stratum II soils at depths of approximately 18.5 ft to 23.5 ft below current surface grades. The soils of Stratum I generally consist of orangish brown, dark brown, light brown, and dark gray sandy lean clay and sandy silt, having USCS Designations of CL and ML, or combinations thereof. The Standard Penetration Test N-values within the Stratum I soils varied from 3 bpf to 50 blows per 6-inches of penetration, indicating consistencies ranging from soft to hard for the cohesive soils and relative densities ranging from very loose to very dense for the non-cohesive soils. It should be noted that the consistency and relative density of these soils generally increased with depth as indicated by the increasing N values. Lower N-values in these soils generally occurred within the upper 8 ft of the subsurface, indicating that the upper portion of the stratum may represent geologically very recent alluvium.

Natural Stratum II – Potomac Group Soils

Natural Stratum II soils were encountered beneath the natural Stratum I soils in all of the test borings at depths of approximately 18.5 ft to 23.5 ft below current surface grades and extended down through the boring termination depths of 60 ft below the current surface grades. The soils of Stratum II generally consist of orangish brown, light gray, light greenish gray and dark gray interbedded sands, silty sands, clayey sands, silts, lean clays, and sandy lean clays, having USCS Designations of SW, SM, SC, CL, ML. N-values within the soils of the stratum varied from 13 bpf to 62 bpf, indicating consistencies ranging from stiff to hard for the cohesive soils and relative densities ranging from medium dense to very dense for the non-cohesive soils.

The subsurface conditions discussed above are of a generalized nature, provided to highlight the major soil strata encountered in the borings. The stratification lines shown on the test boring logs represent the conditions only at the actual test locations. Variations may occur and should be expected between boring locations. The stratification lines shown on the boring logs are estimates of the approximate boundaries between major soil types. The actual transitions between major soil types could be gradual and vary from those shown on the boring logs. The test boring logs should be reviewed for more specific information regarding the individual test locations.

Groundwater Conditions in Borings

Groundwater was encountered during the drilling operations in all test borings. Observed depths for water during the drilling operations varied from 6 ft to 34 ft below current surface grades, while observed depths to water 24-hours after completion of drilling operations in two of the borings were approximately 22 ft and 33 ft below current surface grades.

The groundwater levels were measured at the time of our field exploration activities. Fluctuations in groundwater levels could occur over time and should be anticipated.

Subsurface Conditions from the Test Pits

Test Pit TP1

Test pit TP1 was excavated in the eastern portion of the existing building to expose a spread footing foundation supporting an interior column. Below approximately 4 inches of concrete slab, the test pit excavation encountered existing man-placed fill that extended down to a depth of approximately 5.6 ft below the top-of-slab level. The fill materials were dark brown and black in color and consisted of silty sand soils mixed with brick debris. The fill materials were estimated to be in a moist condition and to have a loose relative density. Natural Sandy Lean CLAY (CL-ML) soils were encountered below the man-placed fill materials and extended down through the bottom level of the test pit at a depth of approximately 7 ft. The natural CL-ML soils were light brown in color and were estimated to be in a moist condition, with a medium stiff consistency.

The existing concrete column footing had an irregular and stepped cross-section, and a total thickness of approximately 5 ft – 8 inches. The base of the footing was located within the natural CL-ML soils at a depth of approximately 6 ft below the slab level.

Test Pit TP2

Test pit TP2 was excavated at the eastern building wall, immediately adjacent to an existing freight elevator at the northeast corner of the existing building. Below approximately 5 inches of concrete slab, the test pit encountered existing man-placed fill that extended down to a depth of approximately 6.5 ft below the top-of-slab level. The fill materials were dark brown and black in color and consisted of silty sand soils, mixed with brick, cinder, and shell debris. The fill materials were estimated to be in a moist condition and to have a loose relative density. Natural Silty SAND (SM) soils were encountered below the man-placed fill materials and extended down through the bottom level of the test pit at a depth of

approximately 9 ft. The natural SM soils were light brown in color and were estimated to be in a moist condition with loose to medium dense relative density.

The existing foundation wall above the concrete footing consisted of laid brick. The existing concrete wall footing had a base thickness of approximately 2 ft -10 inches, and extended laterally from the interior face of the wall approximately 1 ft - 6 inches. As the wall footing approached an existing column at the freight elevator and then turned approximately 90 degrees along the freight elevator, the footing appeared to maintain a similar lateral extension from the interior face of the wall. The base of the wall footing was located within the natural SM soils at a depth of approximately 9 ft below the slab level.

Groundwater Conditions in Test Pits

Free groundwater was not encountered during excavation of the test pits. We note that highest level observed for free groundwater in any of the previously drilled borings was at a depth of approximately 22 ft below current site grades.

Geotechnical Evaluation

Based on our understanding of the proposed residential building development and the results of the recent test pits and previous test borings, it is our opinion that the proposed residential building structure can be constructed as planned, provided that the evaluations and recommendations provided in this report are considered and are implemented as part of design and construction.

The test pits and borings show that man-placed fill materials and/or weak natural alluvial soils, characterized by N-values ranging between 3 bpf and 8 bpf, typically extend down to levels of approximately 8.5 ft below current surface grades. These materials are considered to be unsuitable for support of foundations for the proposed structure. Considering that the planned construction includes one basement level, the man-place fill materials will be removed.

The deeper natural Pleistocene-aged Terrace Deposit soils that occur between depths of approximately 8.5 ft and 23.5 ft below current surface grades generally exhibit N-values greater than and, as such, are considered suitable for support of lightly-loaded to moderately-loaded structures, using conventional shallow foundations. Because of their geologic age and deposition characteristics, however, the Pleistocene-aged Terrace Deposit soils sometimes can contain zones of weaker soils, such as the zone of Sandy SILT (ML) soils that was encountered between depths of approximately 13.5 ft and 23.5 ft in Boring B-2. These ML soils were found to have an average N-value of only 7 bpf and to contain trace amounts of organics, characteristics that might make them still

acceptable for support of some lightly-loaded to moderately-loaded structures, but with reduced allowable bearing pressures on the order of 2 ksf to 3 ksf.

Because soils similar to the Sandy SILT (ML) soils noted in the paragraph above could go undetected during construction of a conventional shallow foundation system, we are concerned about the use of conventional spread footingsto support the proposed relatively heavy-loaded residential structure at levels estimated to be 10 ft to 15 ft below current site grades. However, it is our opinion that the subsurface conditions at the site do not warrant consideration of deep pile or drilled pier foundation system for support of the proposed structure. Instead, we recommend consideration of a structural mat or a ground-improvement system, such as Rapid Impact Piers™ or Controlled Modulus Columns™, in conjunction with the use of a conventional shallow foundation system, to support the proposed new residential building, using allowable bearing pressures significantly greater than those available from the unimproved soils alone. Alternatively, a mat foundation should be adequate to support the proposed building since it would distribute the loading over a larger area reducing its intensity and by taking advantage of the stress relief due to the anticipated excavation of the below-grade parking level. Rapid Impact Piers™ ,Controlled Modulus Columns™ and a structural mat are further discussed in the **Recommendations** section.

Based on our site observations, the exterior walls of the existing building façade generally appear to be in good condition, suggesting that the current soil contact pressures below the footings are not overstressing the immediately supporting foundation soils to the point of causing excessive differential settlements and significant cracking in the walls. Considering these observations and the subsurface conditions such as the weak Sandy SILT (ML) soils (ML) layer in Boring B-2, careful consideration must be given to support or underpin the existing façade footings during the construction of the one below-grade level due to differences in levels between the bottoms of existing wall footings and the future finished floor grade for the lowest level of the new structure. This issue is further discussed in the **Recommendations** section.

The subsurface soil conditions are such that normal excavation and grading for the new construction generally can be conducted using conventional excavation and earth moving equipment, including dozers, pans, and excavator hoes. Of course, hoe rams and other more specialized equipment may be needed for breakup and removal of some hard materials, including existing building foundations.

During construction, some perched water could be encountered at levels above the indicated hydrostatic groundwater level. We anticipate that any such water can be easily controlled using conventional dewatering, including use of diversion ditches, interceptor drains, and sumps with pumps.

Recommendations

Many of the evaluations and recommendations presented in our previous Geotechnical Report remain valid for the currently proposed construction, including those regarding excavation bracing, site preparation and earthwork, below-grade walls, and seismic considerations. Some of our previous evaluations and recommendations regarding foundations are no longer are valid, and require amendment, because of the significant changes to planned foundation bearing levels. In addition, evaluations and recommendations regarding the possible need for underpinning existing building foundations now are warranted.

Foundation Considerations

Considering the proposed new construction and the variable shallower subsurface conditions indicated by borings and test pits, we consider it not feasible to use conventional shallow footings to support the proposed new building over the shallower natural soils, unless such foundation systems are used in conjunction with a proprietary ground-improvement system, such as the Rammed Aggregate Pier™ system or the Controlled Modulus Columns™ system. Use of one of these proprietary ground improvement systems should improve the general support capacity of the shallower site soils, minimizing the possibility of problems associated with undetected layers of problematic soil conditions, and as such, should permit the use of a much greater design soil bearing pressure to help reduce foundation sizes. The Rammed Aggregate Pier™ and Controlled Modulus Column™ systems utilize installation of high modulus aggregate and grout columns, respectively, to increase the support capacity of weaker shallow soils, so that a conventional shallow foundation system can be used. It is believed that both of these systems have the ability to improve the shallow soil conditions associated with weaker soils.

The Rammed Aggregate Pier™ system uses elements formed by building successive layers of densely compacted aggregate within a drilled or driven cavity. Layers of well-graded aggregate are compacted using high energy ramming impact actions to improve the strength and stiffness of the combined aggregate pier-soil system. Depending on the diameter and spacing of the Rammed Aggregate Pier™ elements, allowable composite bearing pressures in the range of 5 ksf to 7 ksf typically are provided. Because of the proprietary nature of the system, a Rammed Aggregate Pier™ licensee should be engaged to design a Rammed Aggregate Pier™ ground improvement system for the project.

The Controlled Modulus Column™ system uses a specially designed auger, powered by equipment with large torque capacity and high static down thrust, that displaces the soil laterally, with virtually no spoil or vibration. During the auger extraction process, a grout column is developed by pressure-grouting to

achieve a predetermined stiffness ratio with the surrounding soil. The result is a composite system consisting of grouted Controlled Modulus Column™ elements and surrounding soils. Depending on the Controlled Modulus Column™ spacing and size, allowable composite bearing pressures in the range of 4 ksf to 6 ksf typically are provided. Because of the proprietary nature of the system, a Controlled Modulus Column™ licensee should be engaged to design the Controlled Modulus Column™ ground improvement system for this project.

Conventional shallow footings supported on soils improved using ground improvement methods, such as Rammed Aggregate Piers™ or Controlled Modulus Columns™, typically are designed based on criteria that maximum total settlements and differential settlements between nearby structure components do not exceed 1 inch and ½ inch, respectively.

We anticipate that use of a ground improvement system as previously described should permit the use of conventional shallow footings. If footing sizes and reinforcement requirements are too great, then a structural mat foundation system can be considered as an alternate.

Because of the significant differences that likely will exist with regard to foundations for the existing building façade versus the foundations for the new structure, it will be necessary to provide adequate control joints between the old and new structural components to account for differential movements that are likely to occur between the structures.

Mat Foundation

Considering the soil and groundwater conditions encountered at site, the anticipated relatively high column loading and the proposed finished floor elevation of the lower parking level, conventional shallow spread footings are not feasible. However, a mat foundation should be adequate to support the proposed building since it would distribute the loading over a larger area reducing its intensity and by taking advantage of the stress relief due to the anticipated excavation of the below-grade levels.

Since the anticipated finished floor elevation of the one below-grade level is on the order of 14 feet below existing grades and assuming the foundation subgrade elevation to be 4 feet lower, the proposed buildings can be supported on a mat foundation at this elevation.

Based on our estimates of column loading and spacing, we anticipate the average contact pressure of the building mat foundation to be less than 3,000 pounds per square foot (psf). We recommend that the mat foundations be designed for a net allowable contact pressure not exceeding 3,000 pounds per square foot (psf). The bearing capacity is subject to observation and evaluation

of the subgrade soils by the Geotechnical Engineer of Record or his qualified representative prior to placement of the concrete working mat.

If the contact pressure as calculated by the Structural Engineer is different from the value assumed in this report, Specialized Engineering should be notified immediately so that the analyses and recommendations can be reviewed and/or revised as necessary.

Considering the characteristics of the bearing soils, we recommend that the mat foundation be designed utilizing a modulus of subgrade reaction, *ks*, based on that of an equivalent 12-inch square plate, *k1*, equal to 100 pci (pounds/square inch/inch). Careful consideration should be taken when determining the proper modulus of subgrade reaction to be input in software utilized to design the mat since the *ks* value depends on width, shape and depth of the loaded area. We suggest using a modulus of subgrade reaction not exceeding 70 pci for the mat design.

Settlement of the mat supporting the proposed building is estimated not to exceed one inch. It should be anticipated that some rebound of the subgrade soils may occur during excavation, however, recompression of the soils will take place as the building is constructed.

Underpinning Considerations

From our exploration results and other observations, the current bottom-of-footing levels for façade of the existing building are within natural soils that are providing adequate support for the applied loadings. However, the bottoms of these foundations are above the likely bottom-of-foundation level(s) for the new residential structure with the single, below-grade garage level. As a result, the wall footings supporting the existing building façade would require underpinning during the excavations and construction of the one below-grade level. In addition, the below-grade walls of the new residential structure should be designed to resist lateral surcharge pressure loadings associated with the existing façade wall footings and any other surcharge loading.

Excavation Bracing

The construction of one below-grade level would require an excavation on the order of 14 feet below existing surface grades, which requires supporting the lateral soil pressures. Structural design of the excavation support system, including preparation of the plans, is beyond the scope of this report and should be provided by the specialty contractor and his licensed structural engineer.

An excavation bracing system such as soldier piles and wood lagging is considered suitable for the excavation on this site. This type of wall is relatively

flexible, free draining and would require anchoring (tie-back pre-stressed soil anchors) or bracing (Wales and rakers, or struts). The location of wales, soldier beam spacing, and other structural considerations must be based on structural analysis. Soldier piles can be driven, or alternatively, the piles can be installed in pre-drilled holes, and the holes then filled with concrete. The possibility of encountering perched groundwater will require associated groundwater management and care when installing lagging. Piping and erosion can occur if saturated sandy soils are encountered. However, the design, installation and operation of the groundwater control system are usually the responsibility of the contractor.

Any surcharge load from adjacent structures, roadways, and properties should also be considered in the design. Soldier beams must penetrate a minimum of 5 feet below the lowest excavation levels. Soldier beams should not be spaced in excess of 8 feet, and wood lagging should not be less than 3 inches in unfinished thickness. If vibrations during soldier pile installation are a concern, then the soldier piles should not be driven, but instead should be installed in pre-drilled holes and the holes filled with low strength concrete.

Tiebacks or rakers and heel blocks may be used for lateral bracing of the sheeting, although tiebacks would be preferred because they provide clear, unhindered space for construction within the excavation. Typically, one to two tiers of tiebacks may be expected to be required depending on the depth of retained excavation, slopes above the sheeting, and any surcharge loading. We expect that tieback resistance will be derived from drilled and grouted anchors penetrating into the soils of Stratum I. Installation of tiebacks into existing fill soils will require reduction of anchor capacity, and re-grouting of tieback anchors. Each tieback should be proof-tested to 120 percent of the design load and locked off at about 80 percent of the design load. The maximum test load should be held for at least 5 minutes and until deflection readings indicate movements have essentially ceased. This testing should be performed after primary grouting for bond has set. The maximum stress at working load in tendons or bars should not exceed 60 percent of the yield strength of the steel. Performance testing should be performed on selected tiebacks.

The excavation support system should be designed to limit movements of the shoring system, and to limit potential damage to the adjacent streets, buildings, or utilities. Monitoring of lateral and vertical movements of the sheeting system should be performed on at least a weekly basis. A monitoring plan should be developed to monitor the lateral and vertical movements of adjacent streets and buildings. Furthermore, a precondition survey should be made prior to construction to document the condition of adjacent roadways and buildings. A specialty contractor who has a least five years experience in the design and construction of this particular work should carry out the design and installation of

the excavation support system. A registered Professional Engineer licensed to practice in the District of Columbia should seal the plans for the system.

Excavation and installation of the bracing system should be observed by Specialized Engineering to document details of the operation for record purposes. Surveying should be performed before and during excavation operations to monitor vertical movement of adjacent buildings and roadways.

Additional Subsurface Exploration

If the Client decides to move forward with the new proposed development, we suggest that additional borings be drilled within the footprint of the existing building once the major building demolition has occurred, but prior to the start of excavation for the garage level and new foundations. The additional borings typically would be drilled to depths of 30 ft, or less, below current grades to provide additional information regarding the shallower soil conditions, particularly, better definition of subsurface conditions that may require special treatment using the recommended ground improvement methods. The additional subsurface information might also bring to light other design and construction considerations needing to be addressed. Following the additional subsurface exploration, a supplemental letter report of findings, evaluations, and recommendations would be prepared and issued, with final recommendations to guide pertinent development considerations for the site.

Report Limitations

This report has been prepared for the exclusive use of Bozzuto Homes, Inc. and their Consultants, for specific application to the proposed **460 NEW YORK AVENUE, N.W.** project. Our professional services have been performed, our findings obtained, and our recommendation prepared in accordance with generally accepted engineering principles and practices. No warranty is either implied or expressed. Specialized Engineering assumes no responsibility for interpretations made by others based upon the work or recommendations made by us.

Specialized Engineering has based the evaluations and recommendations presented in this letter on the available subsurface information from limited borings and test pits, and on the design details furnished by Bozzuto Homes, Inc. and other Consultants for the project. Specialized Engineering should be made aware of pertinent changes to the project characteristics as project planning develops and of any significant deviations from the subsurface conditions described in this report, so that we can review the new information and determine whether changes to provided evaluations and recommendations are needed. If Specialized Engineering is not retained to perform these functions, we will not be

responsible for the impact of the changed conditions on the originally provided evaluations and recommendations.

Specialized Engineering should be retained to review pertinent portions of the final design drawings and specifications to check that our engineering evaluations and recommendations have been properly interpreted and incorporated into the final design documents. At that time it may be necessary for us to submit supplementary evaluations and recommendations.

Closure

We appreciate the opportunity to be of additional service on this project. Do not hesitate to contact us if you have questions regarding this letter report and/or require additional geotechnical input for the project.

Respectfully submitted,

Ira L. Helms, P.E., P.G.
Geotechnical Engineer

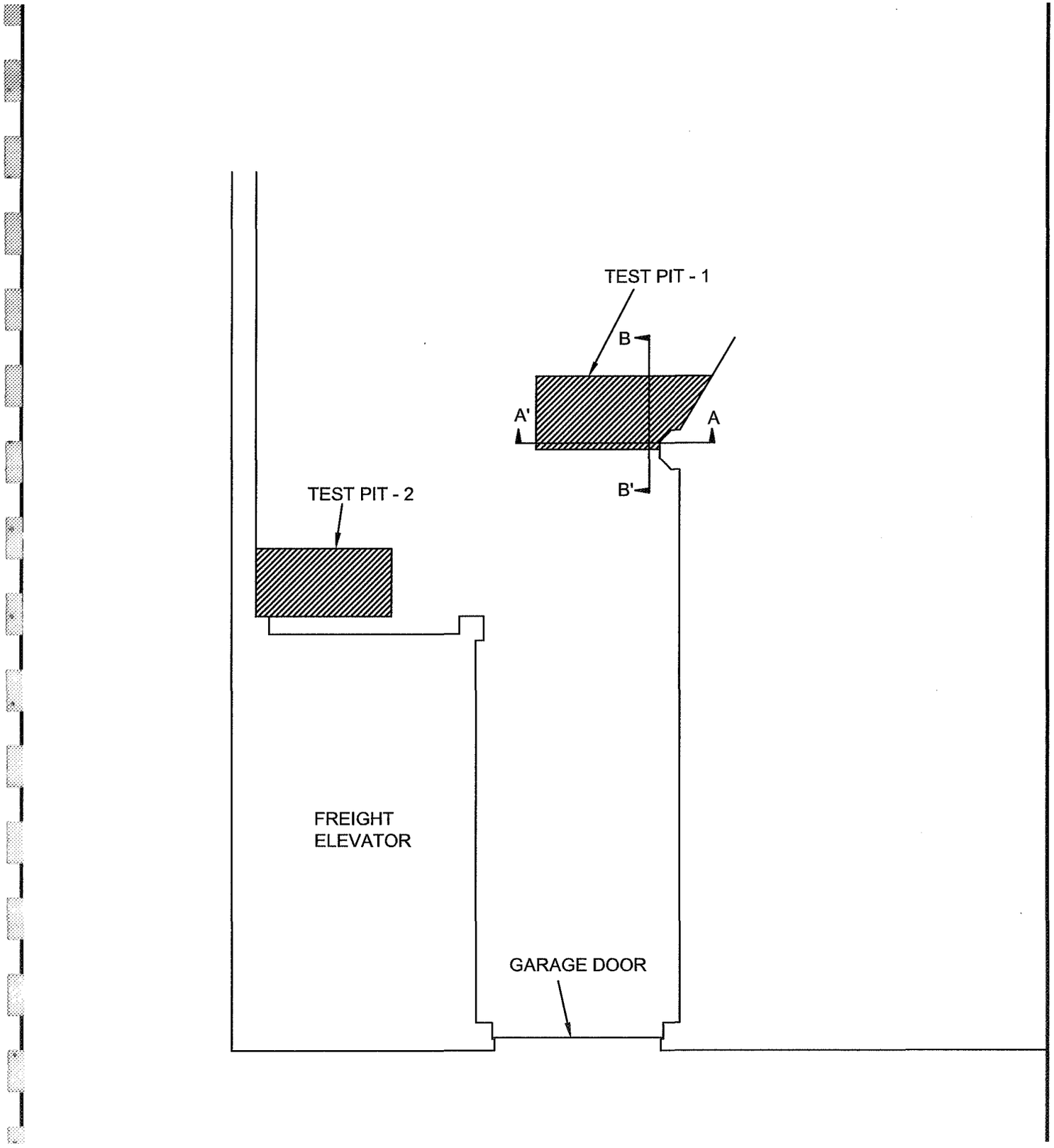
John D, Woodburn, P.E.
Principal

Charles R. Mitchell, P.E.
Principal

DISTRICT OF COLUMBIA
CHARLES R. MITCHELL
No. PE901790
REGISTERED
PROFESSIONAL ENGINEER

Enclosures
(1) Test Pit Location Plan
(2) Test Pit Logs
(3) Test Pit Profiles
(4) Boring Location Plan (from previous report, dated November 20, 2006)
(5) Test Boring Logs (from previous report, dated November 20, 2006)

Enclosure 1
Test Pit Location Plan


TEST PIT - 1
B
A'
A
B'
TEST PIT - 2
FREIGHT
ELEVATOR
GARAGE DOOR

Enclosure 2
Test Pit Logs

Construction Quality Control • Environmental Consulting
Geotechnical & Forensic Engineering

CLIENT Bozzuto Homes, Inc. **PROJECT NAME** 460 New York Avenue

PROJECT NUMBER 063499 **PROJECT LOCATION** Washington, DC

DATE STARTED 10/17/11 **COMPLETED** 10/17/11 **GROUND ELEVATION** _____ **TEST PIT SIZE** in.

EXCAVATION CONTRACTOR SC Excavating Inc. **GROUND WATER LEVELS:**

EXCAVATION METHOD Backhoe **AT TIME OF EXCAVATION** None

LOGGED BY _____ **CHECKED BY** I. Helms **AT END OF EXCAVATION** None

NOTES Backfilled Upon Completion **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION
					0.3 **CONCRETE (4")**
					FILL: dark brown and black silty sand, with brick and shell, moist, loose
2.5					
5.0					
					5.6
	GB S-1	100	MC=24.6% LL=24 PL=18		**SANDY SILTY CLAY**: light brown, moist, stiff, (CL-ML)
					7.0
					End of test pit at 7.0 feet.

Construction Quality Control • Environmental Consulting
Geotechnical & Forensic Engineering

CLIENT Bozzuto Homes, Inc. **PROJECT NAME** 460 New York Avenue

PROJECT NUMBER 063499 **PROJECT LOCATION** Washington, DC

DATE STARTED 10/17/11 **COMPLETED** 10/17/11 **GROUND ELEVATION** _____ **TEST PIT SIZE** in.

EXCAVATION CONTRACTOR SC Excavating Inc. **GROUND WATER LEVELS:**

EXCAVATION METHOD Backhoe **AT TIME OF EXCAVATION** None

LOGGED BY _____ **CHECKED BY** I. Helms **AT END OF EXCAVATION** None

NOTES Backfilled Upon Completion **AFTER EXCAVATION** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	TESTS	GRAPHIC LOG	MATERIAL DESCRIPTION
					0.4 **CONCRETE (5")**
					FILL: dark brown and black silty sand, with brick and shell, moist, loose
2.5					
5.0					
					6.5
					SILTY SAND: light brown, fine grained, moist, medium dense, (SM)
7.5	GB S-1	100	MC=19.8% LL=21 PL=19		
					9.0
					End of test pit at 9.0 feet.

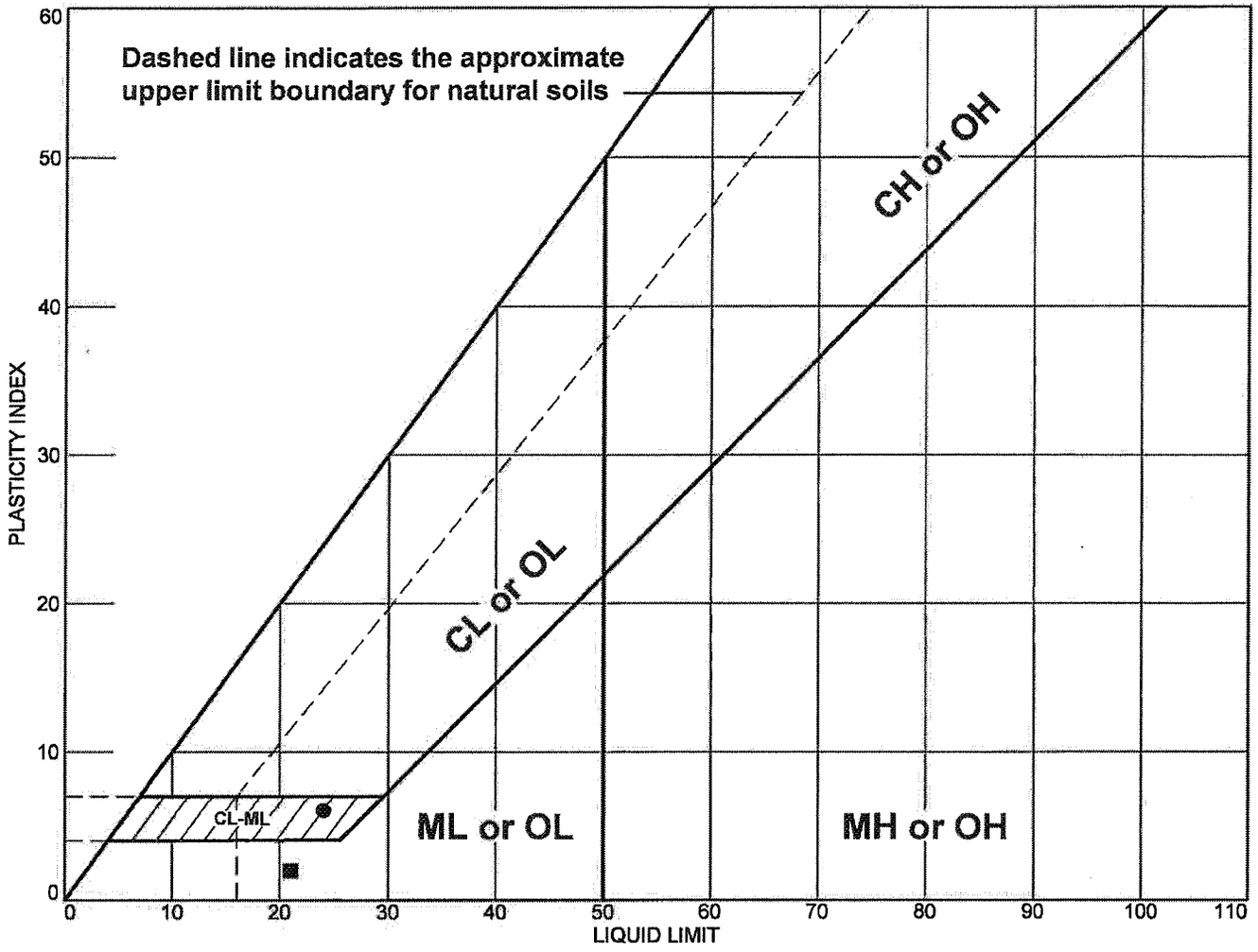
063499 TEST PIT LOGS.GPJ BOREHOLES.GDT 10/28/11

Construction Quality Control • Environmental Consulting
Geotechnical & Forensic Engineering

CLIENT Bozzuto Homes, Inc. **PROJECT NAME** 460 New York Avenue

PROJECT NUMBER 063499 **PROJECT LOCATION** Washington, DC

Borehole	Depth (ft)	Classification	Liquid Limit	Plastic Limit	Plasticity Index	Moisture Content (%)	% < #4 Sieve	% < #200 Sieve	Other Tests
TP-1	6.0	CL-ML	24	18	6	24.6	100	79.1	
TP-2	7.0	SM	21	19	2	19.8	100	36.8	



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	TP-1, S-1	24	18	6	99.1	79.1	CL-ML
■	TP-2, S-1	21	19	2	99.1	36.8	SM

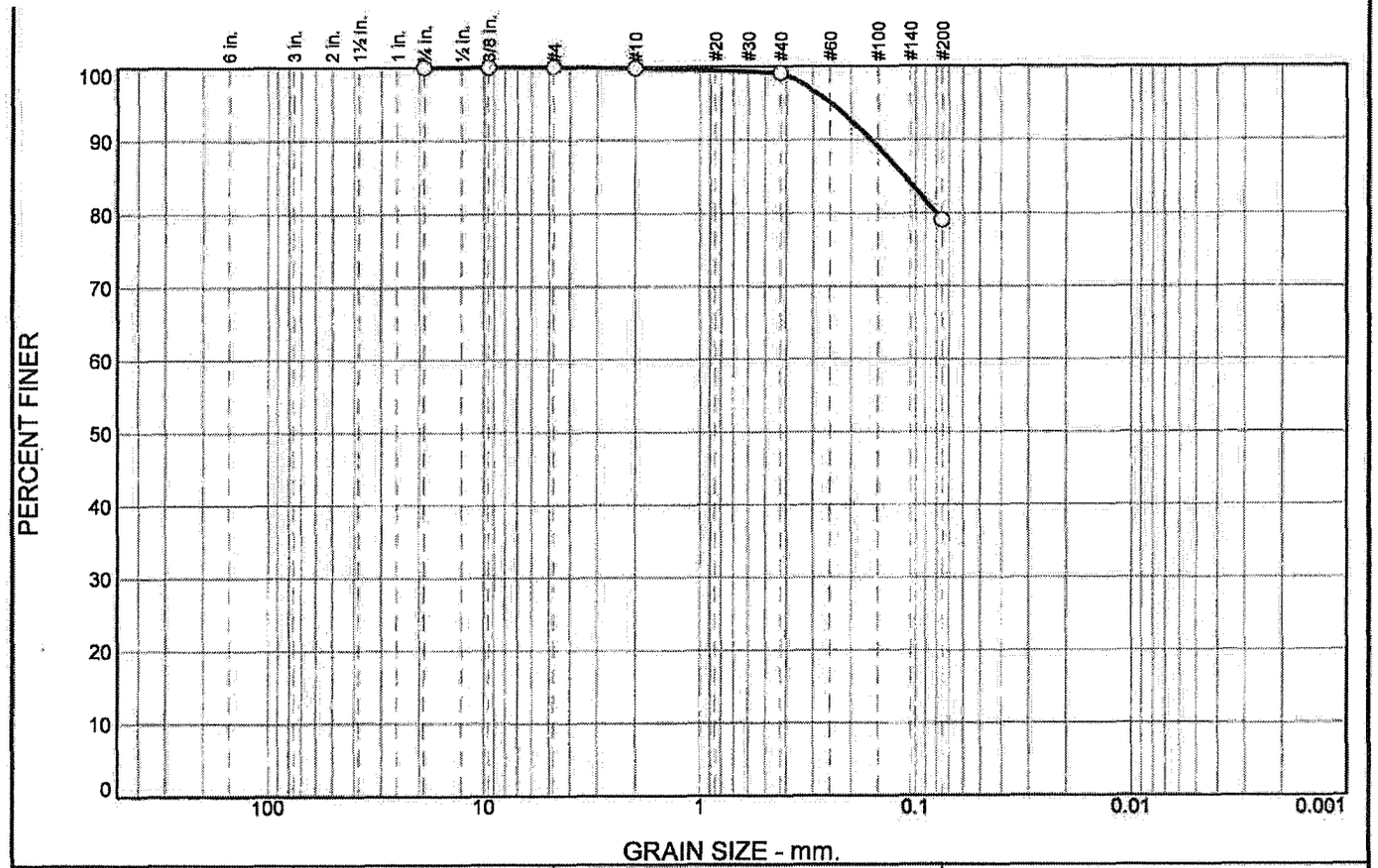
Project No. 063499 **Client:** Bozzuto Homes, Inc.

Project: 460 New York Avenue

● **Location:** TP-1 **Depth:** -6' **Sample Number:** S-1

■ **Location:** TP-2 **Depth:** -7' **Sample Number:** S-1

Remarks:



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	0.7	20.0	79.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4	100.0		
3/8	100.0		
#4	100.0		
#10	99.8		
#40	99.1		
#200	79.1		

* (no specification provided)

Material Description

TP-1, S-1

Atterberg Limits

PL= 18 LL= 24 PI= 6

Coefficients

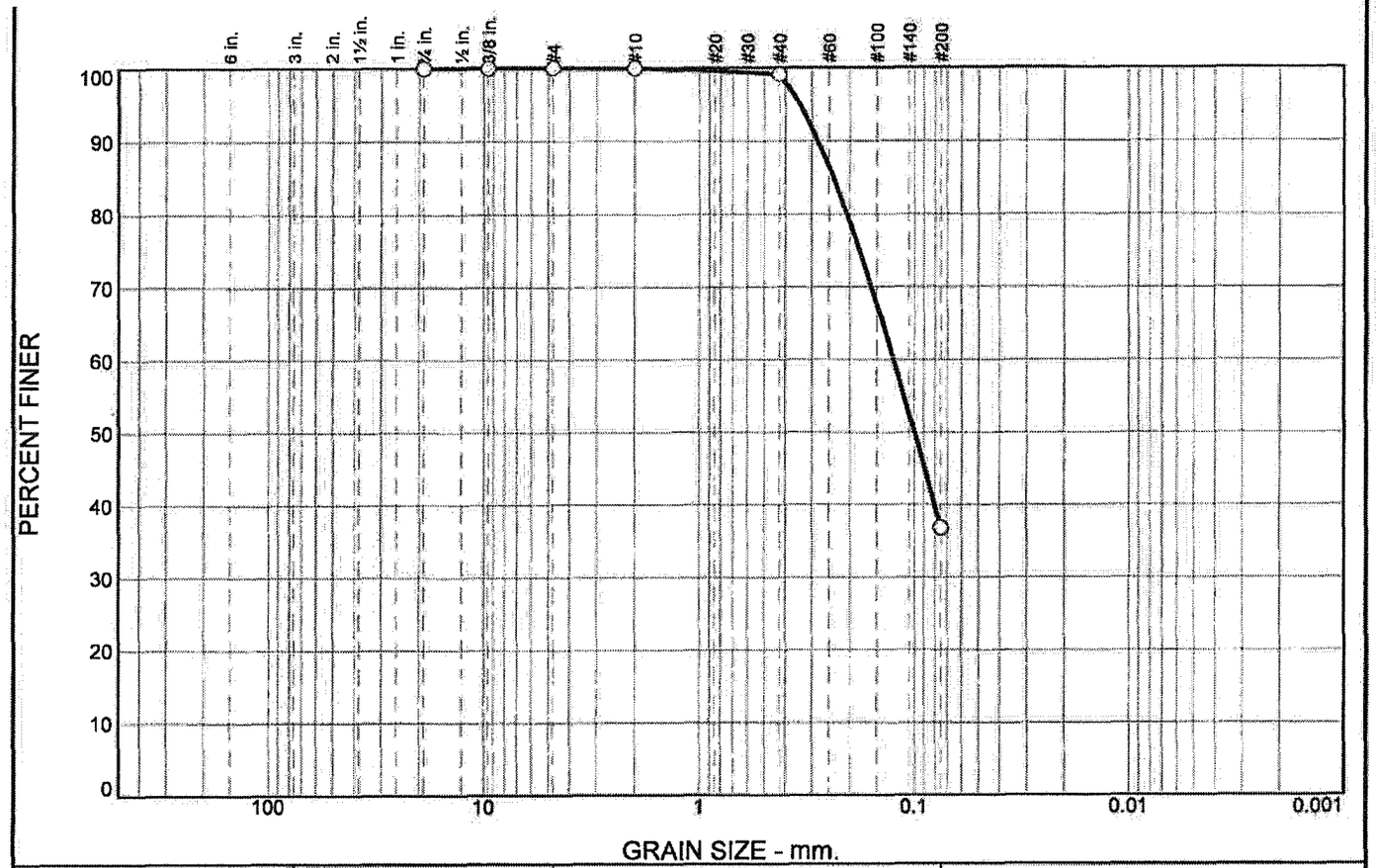
D_{90}= 0.1628 D_{85}= 0.1127 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL-ML AASHTO= A-4(3)

Remarks

Location: TP-1
Sample Number: S-1 **Depth:** -6' **Date:**



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.9	62.3	36.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4	100.0		
3/8	100.0		
#4	100.0		
#10	100.0		
#40	99.1		
#200	36.8		

* (no specification provided)

Material Description

TP-2, S-1

Atterberg Limits

PL= 19 LL= 21 PI= 2

Coefficients

D_{90}= 0.2824 D_{85}= 0.2396 D_{60}= 0.1254
D_{50}= 0.1001 D_{30}= D_{15}=
D_{10}= C_u= C_c=

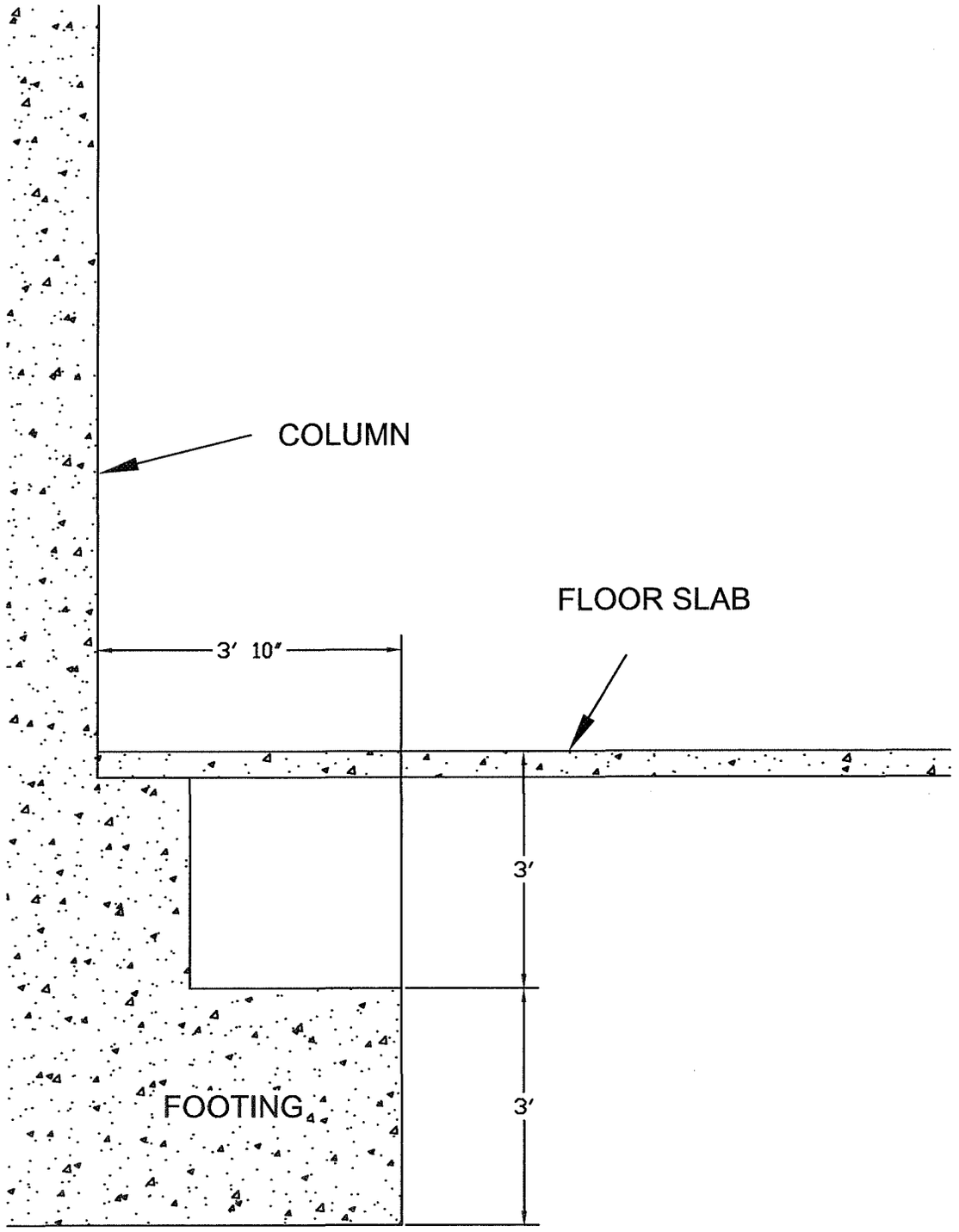
Classification

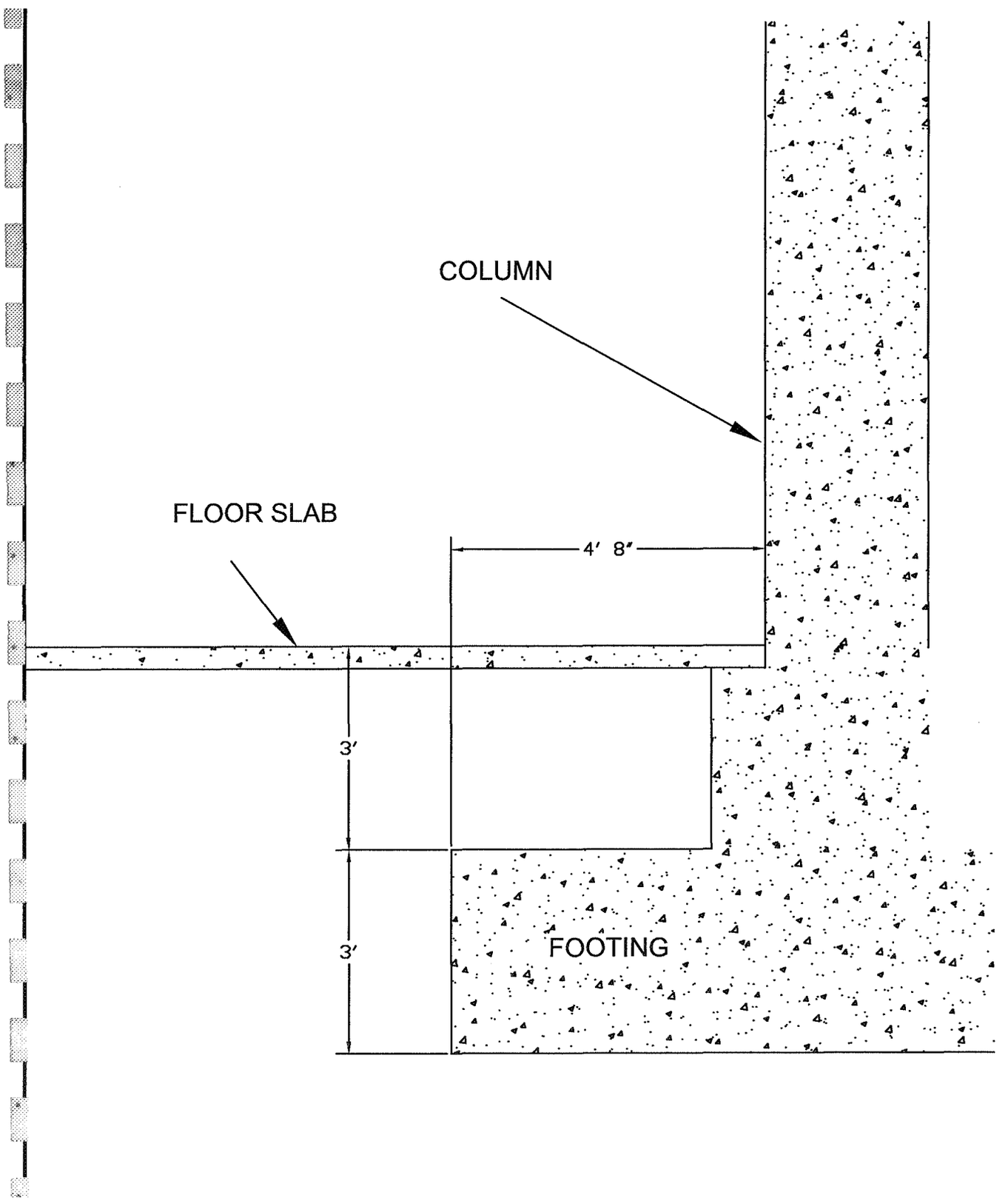
USCS= SM AASHTO= A-4(0)

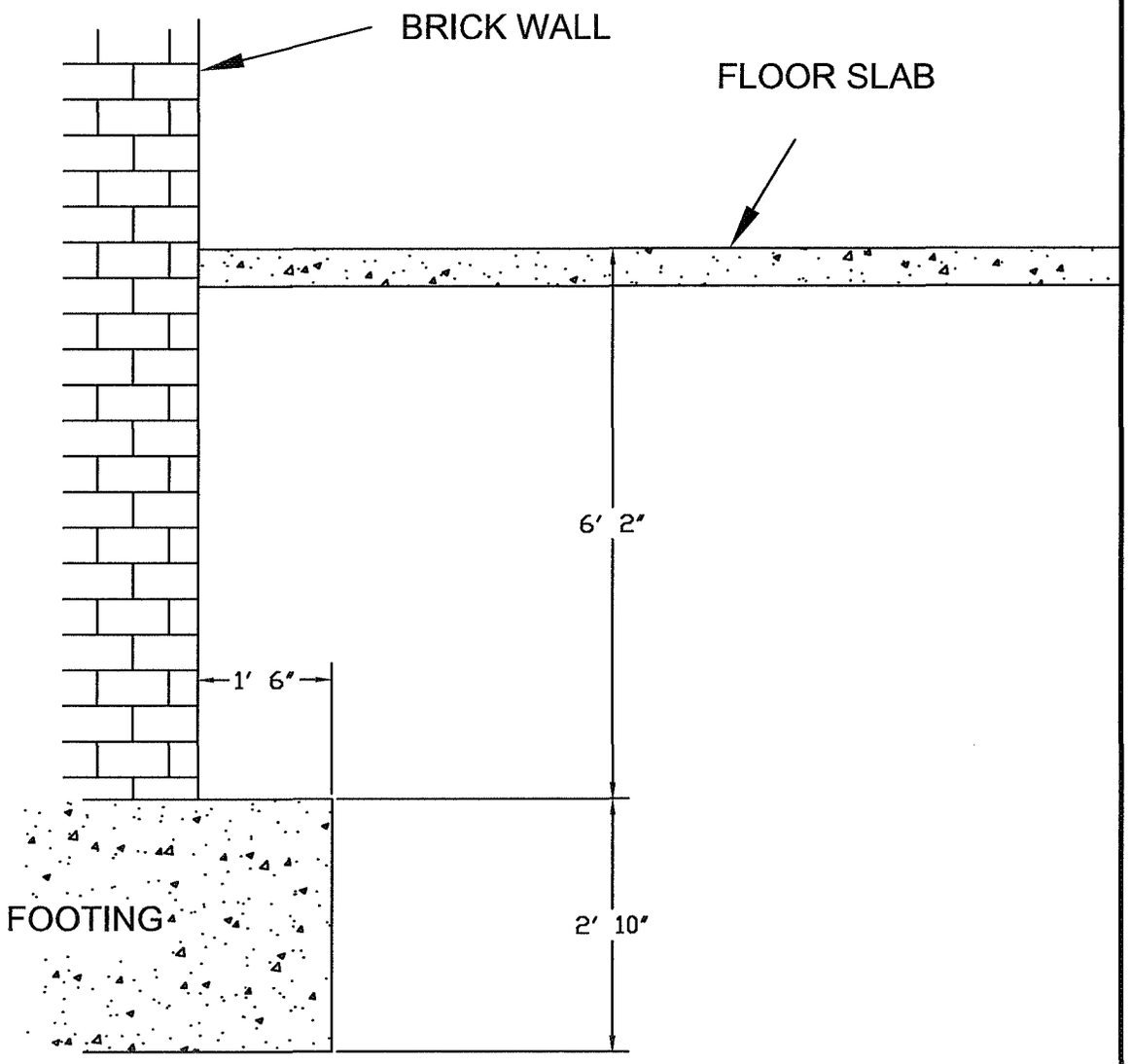
Remarks

Location: TP-2
Sample Number: S-1 **Depth:** -7' **Date:**

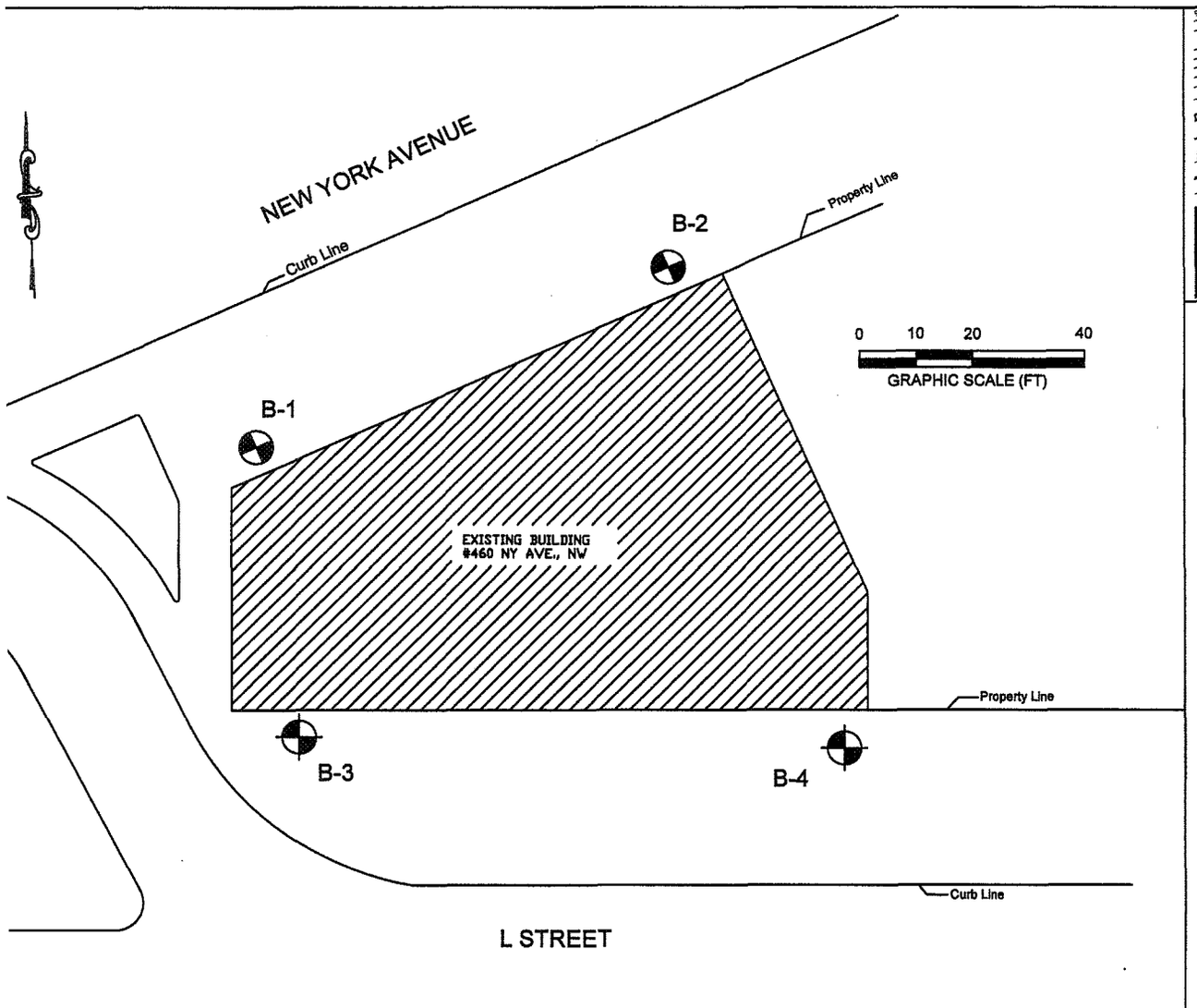
Enclosure 3
Test Pit Profiles


COLUMN
FLOOR SLAB
3′ 10″
3′
3′
FOOTING


COLUMN
FLOOR SLAB
4′ 8″
3′
3′
FOOTING

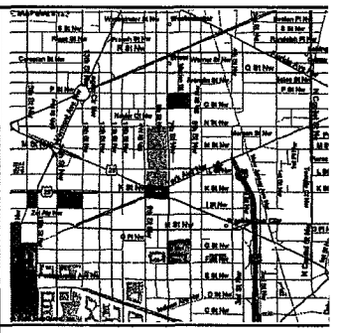

BRICK WALL
FLOOR SLAB
6′ 2″
1′ 6″
FOOTING
2′ 10″

Enclosure 4
Boring Location Plan



0 10 20 40

GRAPHIC SCALE (FT)



VICINITY MAP

LEGEND

= BORING LOCATION

460 NEW YORK AVENUE
SPECIALIZED ENGINEERING PROJECT NO.: 063499
460 NEW YORK AVENUE, NW
WASHINGTON, DC

SPECIALIZED ENGINEERING
Construction Quality Control/Environmental Consulting
Geotechnical & Forensic Engineering
7504 Connelley Drive, Suite Q, Hanover, Maryland 21076
Phone: 410-768-4800 Fax: 410-768-4803

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	11/17/08	ISSUED FOR USE	ELH	DRB	DRB

SCALE 1"=20' DESIGNED DRAWN: MAN

SPECIALIZED ENGINE
HANOVER, MD

BORING LOCATION

JOB NO. 063499

5 4 3 2 1

Enclosure 5
Test Boring Logs

NON COHESIVE SOILS (Silt, Sand, Gravel and Combinations)		COHESIVE SOILS (Clay, Silt and Combinations)	
Density	SPT Value	Consistency	SPT Value
Very Loose	4 blows/ft. or less	Very Soft	3 blows/ft. or less
Loose	5 to 10 blows/ft.	Soft	4 to 5 blows/ft.
Medium Dense	11 to 30 blows/ft.	Medium Stiff	6 to 10 blows/ft.
Dense	31 to 50 blows/ft.	Stiff	11 to 15 blows/ft.
Very Dense	51 blows/ft. or more	Very Stiff	16 to 30 blows/ft.
		Hard	31 blows/ft. or more

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

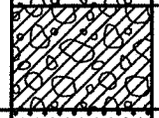
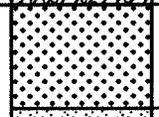
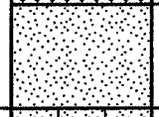
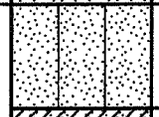
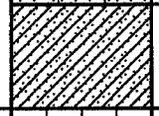
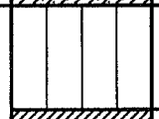
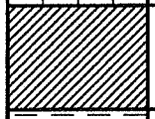
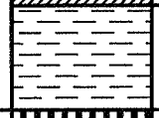
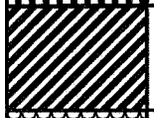
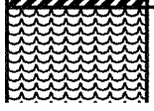
Classification on logs are made by visual inspection of samples.

Ground Water Observations were made at the times indicated. Porosity of soil strata, weather conditions, site topography, etc., should be expected to cause changes in the water levels indicated on the logs.

*Standard Penetration Test (SPT Value) – 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 into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and making the test are recorded for each 6.0 inches of penetration on the drill log (Example-6/8/9). The standard penetration test result, or N-value, can be obtained by adding the last two figures (i.e. 8 + 9 = 17 blows/ft.; ASTM D-1586-67).

Coarse-grained soils (more than half of material is larger than No. 200)	Gravels (more than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (little or no fines)	GW		Well-graded gravels, gravel-sand mixtures, little or no fines	$C_u = D_{60}/D_{10} > 4$ $C_c = 1 < D^2_{30}/D_{10} \times D_{60} < 3$	
			GP		Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW	
		Gravels with fines (appreciable amount of fines)	GM	$\frac{d}{u}$	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below A line or $I_p < 4$	Above A line with $4 < I_p < 7$ are borderline cases requiring use of dual symbols
			GC		Clayey gravels, gravel-sand-clay mixtures	Atterberg limits above A line with $I_p > 7$	
	Sands (more than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (little or no fines)	SW		Well-graded sands, gravelly sands, little or no fines	$C_u = D_{60}/D_{10} > 6$ $C_c = 1 < D^2_{30}/D_{10} \times D_{60} < 3$	
			SP		Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW	
		Sands with fines (appreciable amount of fines)	SM	$\frac{d}{u}$	Silty sands, sand-silt mixtures	Atterberg limits below A line or $I_p < 4$	Limits plotting in hatched zone with $4 \leq I_p \leq 7$ are borderline cases requiring use of dual symbols
			SC		Clayey sands, sand-clay mixtures	Atterberg limits above A line with $I_p > 7$	
Fine-grained soils (more than half of material is smaller than No. 200)	Silts and clays (liquid limit < 50)		ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity	1. Determine percentages of sand and gravel from grain-size curve. 2. Depending on percentages of fines (fraction smaller than 200 sieve size), coarse-grained soils are classified as follows: Less than 5% -GW, GP, SW, SP More than 12% - GM, GC, SM, SC 5 to 12% - Borderline cases requiring dual symbols	
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
			OL		Organic silts and organic silty clays of low plasticity		
	Silts and clays (liquid limit > 50)		MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts		
			CH		Inorganic clays of high plasticity, fat clays		
			OH		Organic clays of medium to high plasticity, organic silts		
	Highly organic soils		Pt		Peat and other highly organic soils		

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES		SM	SILTY SANDS, SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS

ENGINEERING
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CLIENT Bozzuto Homes, Inc. **PROJECT NAME** 460 New York Avenue
PROJECT NUMBER 063499 **PROJECT LOCATION** Washington D.C.
DATE STARTED 11/8/06 **COMPLETED** 11/8/06 **GROUND ELEVATION** _____ **HOLE SIZE** 7" In.
DRILLING CONTRACTOR Connelly and Associates Inc **GROUND WATER LEVELS:**
DRILLING METHOD HSA ▽ **AT TIME OF DRILLING** 33.0 ft
LOGGED BY R. Goldstein **CHECKED BY** I. Helms ▼ **AT END OF DRILLING** 38.0 ft
NOTES Cave In Depth Upon Completion: 16.0' **AFTER DRILLING** None

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft)	RECOVERY %	BLOW COUNTS (N VALUE)	% < #4 SIEVE	% < #200 SIEVE
			3" CONCRETE						
			FILL: brown silty sand, fine to coarse grained, trace gravel, very moist, very loose	SS 1	1.0 2.5	56	1-2-2 (4)		
			SANDY SILT: light orangish brown to tan, trace gravel, very moist, soft, (ML)	SS 2	2.5 4.0	78	2-2-3 (5)		
	5			SS 3	5.0 6.5	56	1-2-3 (5)	93.6	59.9
	10		**SANDY LEAN CLAY:** brown to gray, moist, very stiff, (CL)	SS 4	8.5 10.0	100	4-8-9 (17)		
	15		**SANDY LEAN CLAY:** dark grayish brown, trace organics, trace gravel, moist to very moist, stiff, (CL)	SS 5	13.5 15.0	100	4-6-9 (15)		
	20		gravel layer @ 19.0'	SS 6	18.5 20.0	56	23-10-3 (13)		
	25		**SAND:** light tan with orange, fine to coarse grained, trace gravel, trace silt, very moist, medium dense to dense, (SW-SM)	SS 7	23.5 25.0	100	8-11-12 (23)		
				SS	28.5	67	8-13-11	70.1	10.8

▲ SPT N VALUE ▲
PL MC LL
20 40 60 80

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CLIENT Bozzuto Homes, Inc. **PROJECT NAME** 460 New York Avenue

PROJECT NUMBER 063499 **PROJECT LOCATION** Washington D.C.

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft)	RECOVERY %	BLOW COUNTS (N VALUE)	% < #4 SIEVE	% < #200 SIEVE	▲ SPT N VALUE ▲ PL MC LL 20 40 60 80
			SAND: light tan with orange, fine to coarse grained, trace gravel, trace silt, very moist, medium dense to dense, (SW-SM) *(continued)*							
	40			SS 10	38.5 40.0	100	9-16-17 (33)			
	45		**SANDY LEAN CLAY:** greenish gray, very moist, very stiff, (CL)	SS 11	43.5 45.0	100	9-14-16 (30)			
	50		**SILTY SAND:** brownish orange, fine to coarse grained, trace gravel, very moist, medium dense to dense, (SM)	SS 12	48.5 50.0	100	10-15-17 (32)	94.5	39.6	
	55			SS 13	53.5 55.0	100	8-12-13 (25)			
	60		**SILT:** blueish gray, very moist, very stiff, (ML)	SS 14	58.5 60.0	100	10-10-17 (27)			H
			End of boring at 60.0 feet.							

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CLIENT Bozzuto Homes, Inc. **PROJECT NAME** 460 New York Avenue
PROJECT NUMBER 063499 **PROJECT LOCATION** Washington D.C.
DATE STARTED 11/7/06 **COMPLETED** 11/7/06 **GROUND ELEVATION** _____ **HOLE SIZE** 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc **GROUND WATER LEVELS:**
DRILLING METHOD HSA ▽ **AT TIME OF DRILLING** 34.0 ft
LOGGED BY R. Goldstein **CHECKED BY** I. Helms ▼ **AT END OF DRILLING** 40.0 ft
NOTES Cave In Depth Upon Completion: 41.5' ▽ **24hrs AFTER DRILLING** 22.0 ft

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft)	RECOVERY %	BLOW COUNTS (N VALUE)	% < #4 SIEVE	% < #200 SIEVE	▲ SPT N VALUE ▲ PL MC LL 20 40 60 80
			3" CONCRETE							
			FILL: brown silty sand, fine to coarse grained, trace gravel, moist, very loose to loose, trace glass present	SS 1	1.0 2.5	89	2-3-3 (6)			
				SS 2	2.5 4.0	100	2-2-2 (4)			
	5		**SANDY SILT:** light brown, trace gravel, moist to very moist, very soft to soft, (ML)	SS 3	5.0 6.5	89	1-1-2 (3)	94.3	58.5	
	10		**SANDY LEAN CLAY:** gray to brownish orange, moist, very stiff, (CL)	SS 4	8.5 10.0	100	3-10-14 (24)			
	15		**SANDY SILT:** dark gray to black, trace organics, trace gravel, very moist to wet, medium stiff, (ML)	SS 5	13.5 15.0	100	2-4-4 (8)	93.1	79.8	
	20		▼	SS 6	18.5 20.0	56	2-3-3 (6)			
	25		**CLAYEY SAND:** orangish brown to gray, fine to coarse grained, very moist, medium dense, (SC)	SS 7	23.5 25.0	89	8-12-11 (23)			
				SS	28.5	100	4-9-7	100.0	18	

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PROJECT NUMBER 063499 **PROJECT LOCATION** Washington D.C.

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft)	RECOVERY %	BLOW COUNTS (N VALUE)	% < #4 SIEVE	% < #200 SIEVE	▲ SPT N VALUE ▲ PL MC LL 20 40 60 80
			SILTY SAND: gray, fine to coarse grained, trace lignite, very moist, medium dense, (SM) *(continued)*							
	40		**SILTY SAND**: orangish brown, fine to coarse grained, very moist, medium dense, (SM)	SS 10	38.5 40.0	100	6-9-19 (28)			
	45		**SANDY LEAN CLAY**: gray to orangish brown, very moist, very stiff to hard, (CL)	SS 11	43.5 45.0	100	10-11-15 (26)			
	50			SS 12	48.5 50.0	100	9-15-16 (31)			
	55		**SILTY SAND**: orangish brown, fine to coarse grained, very moist, medium dense, (SM)	SS 13	53.5 55.0	100	4-8-10 (18)			
	60		**SILT**: blueish gray, very moist, very stiff, (ML)	SS 14	58.5 60.0	100	10-12-16 (28)			
			End of boring at 60.0 feet.							

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CLIENT Bozzuto Homes, Inc.
PROJECT NAME 460 New York Avenue
PROJECT NUMBER 063499
PROJECT LOCATION Washington D.C.
DATE STARTED 11/7/06 **COMPLETED** 11/7/06
GROUND ELEVATION _____ **HOLE SIZE** 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc
GROUND WATER LEVELS:
DRILLING METHOD HSA
AT TIME OF DRILLING 29.0 ft
LOGGED BY R. Goldstein **CHECKED BY** I. Helms
AT END OF DRILLING 37.0 ft
NOTES Cave In Depth Upon Completion: 23.0'
24hrs AFTER DRILLING None

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft)	RECOVERY %	BLOW COUNTS (N VALUE)	% < #4 SIEVE	% < #200 SIEVE	▲ SPT N VALUE ▲ PL MC LL 20 40 60 80
			3" CONCRETE							
			FILL: brown silty sand, fine to coarse grained, trace gravel, very moist, very loose, trace brick	SS 1	1.0 2.5	100	2-1-1 (2)			
			SANDY LEAN CLAY: gray to orange, trace gravel, moist to very moist, medium stiff to stiff, (CL)	SS 2	2.5 4.0	56	2-3-4 (7)			
	5			SS 3	5.0 6.5	100	1-2-3 (5)			
	10		petroleum odor @ 9.0'	SS 4	8.5 10.0	56	5-6-9 (15)	92.5	71.6	
	15			SS 5	13.5 15.0	89	15-25-17 (42)			
	20		**SILTY SAND:** light brown, fine to coarse grained, trace gravel, very moist, medium dense to dense, (SM)	SS 6	18.5 20.0	100	6-7-8 (15)			
	25			SS 7	23.5 25.0	89	9-11-14 (25)			
				SS	28.5	100	6-10-14			

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CLIENT Bozzuto Homes, Inc. **PROJECT NAME** 460 New York Avenue

PROJECT NUMBER 063499 **PROJECT LOCATION** Washington D.C.

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft)	RECOVERY %	BLOW COUNTS (N VALUE)	% < #4 SIEVE	% < #200 SIEVE	▲ SPT N VALUE ▲ PL MC LL 20 40 60 80
			SILTY SAND: light brown, fine to coarse grained, trace gravel, very moist, medium dense to dense, (SM) *(continued)*							
	40			SS 10	38.5 40.0	100	10-11-15 (26)			
	45		**CLAYEY SAND:** gray, fine to coarse grained, very moist, dense, (SC)	SS 11	43.5 45.0	100	11-18-23 (41)			
	50		**SILTY SAND:** brownish orange to tan, fine to coarse grained, trace gravel, very moist, dense, (SM)	SS 12	48.5 50.0	100	9-13-23 (36)	95.4	13.7	
	55		**SILT:** blueish gray, very moist, hard, (ML)	SS 13	53.5 55.0	100	9-14-17 (31)			
	60			SS 14	58.5 60.0	100	22-22-24 (46)			
			End of boring at 60.0 feet.							

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CLIENT Bozzuto Homes, Inc. **PROJECT NAME** 460 New York Avenue
PROJECT NUMBER 063499 **PROJECT LOCATION** Washington D.C.
DATE STARTED 11/6/06 **COMPLETED** 11/6/06 **GROUND ELEVATION** _____ **HOLE SIZE** 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc **GROUND WATER LEVELS:**
DRILLING METHOD HSA ▽ **AT TIME OF DRILLING** 6.0 ft
LOGGED BY R. Goldstein **CHECKED BY** I. Helms ▼ **AT END OF DRILLING** 45.0 ft
NOTES Cave In Depth Upon Completion: 48.0' ▼ **24hrs AFTER DRILLING** 33.0 ft

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft)	RECOVERY %	BLOW COUNTS (N VALUE)	% < #4 SIEVE	% < #200 SIEVE
			FILL: brown gravelly sand, fine to coarse grained, trace silt, moist to very moist, very loose to loose, trace brick	SS S-1	1.0 2.5	78	3-4-4 (8)		
				SS S-2	2.5 4.0	89	3-2-4 (6)		
	5		▽	SS S-3	5.0 6.5	11	1-1-2 (3)	60.7	1.6
			petroleum odor @ 6.5'						
			SANDY LEAN CLAY: brown, fine to coarse grained, moist, medium dense to very dense, (CL)	SS S-4	8.5 10.0	78	1-4-8 (12)		
	10								
				SS S-5	13.5 14.0	0	50/6"		
	15		hard augering @ 15.0'						
			SAND: orangish brown to tan, fine to coarse grained, trace silt, very moist, medium dense to very dense, (SW-SM)	SS S-6	18.5 20.0	67	8-6-9 (15)		
	20								
				SS S-7	23.5 25.0	83	8-8-12 (20)	100.0	10.7
	25								
				SS	28.5	89	8-8-12		

▲ SPT N VALUE ▲
PL MC LL
20 40 60 80
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CLIENT Bozzuto Homes, Inc. **PROJECT NAME** 460 New York Avenue

PROJECT NUMBER 063499 **PROJECT LOCATION** Washington D.C.

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft)	RECOVERY %	BLOW COUNTS (N VALUE)	% < #4 SIEVE	% < #200 SIEVE	▲ SPT N VALUE ▲ PL MC LL 20 40 60 80
			SAND: orangish brown to tan, fine to coarse grained, trace silt, very moist, medium dense to very dense, (SW-SM) *(continued)*							
	40			SS S-10	38.5 40.0	100	12-13-15 (28)			
	45		**SILTY SAND**: gray, fine to coarse grained, trace gravel, very moist, medium dense to very dense, (SM) ▼	SS S-11	43.5 45.0	89	10-16-21 (37)			
	50			SS S-12	48.5 50.0	100	15-30-32 (62)	90.8	13.9	
	55		**SILT**: gray, very moist, hard, (ML)	SS S-13	53.5 55.0	100	9-23-37 (60)			
	60			SS S-14	58.5 60.0	100	13-17-22 (39)			
			End of boring at 60.0 feet.							

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Important Information About Your

Geotechnical Engineering Report

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

The following information is provided to help you manage your risks.

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

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your

engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
The Best People on Earth

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017

Exhibit B to BZA Case No. 18308 Post-Hearing Submission
Affidavit of Duncan Slidell, Representative of the Bozzuto Development Company

The undersigned, being duly sworn according to law, deposes and says:

1. I am a Vice President / Director of Operations of at Bozzuto Homes, Inc., an affiliate of the Bozzuto Development Company ("**Applicant**"), the applicant under BZA Case Nos. 17723, 17723-A, and 18308.
2. Applicant is the contract purchaser of 460 New York Avenue, NW (the "**Property**") and has been periodically since 2007.
3. I am the Washington, DC-based Principal in Charge of the Property for the Applicant.
4. As Principal in Charge, I am responsible for efforts relating to designing, constructing, financing, and leasing the renovation and expansion of the building on the Property (the "**Project**").

Feasibility of prior design and other excavation

5. In 2008, the Applicant was contemplating an apartment project that included 84 residential units and 72 underground parking spaces, most of which were in the vault space. Such approach was approved by BZA Order Nos. 17723 and 17723-A. As with any project in the feasibility stages, there are a number of unknown factors that must be explored before ultimately determining whether that project might work as planned. One of the major challenges for the Property was the lack of critical information available related to the existing warehouse building and its underlying conditions. For instance, as-built architectural and structural drawings on the building did not exist. Without this information, it was not possible to determine the cost or feasibility of our original plan.
6. As the market collapsed in 2008 and throughout the recent economic malaise, the Applicant was not able to complete the costly and extensive work necessary to determine the feasibility of underground parking in the vault space. In fact, the Applicant's contract to purchase the Property lapsed during such time.
7. In the fall of 2011, the Applicant again put the Property under contract and restarted work on the feasibility studies related to the Project. After extensive testing and analysis, the Applicant gained a better understanding of the cost and structural implications of maintaining the existing façade while utilizing the vault for parking. As the Applicant priced a series of options for parking in the vault space, we realized that any solution involving the vault was not only cost prohibitive but also compromised the support of the existing façade. Our geotechnical reports indicate an additional risk if we were to dig at or below 33 feet where test borings reached groundwater. The prior approved plan and most subgrade parking options explored by the Applicant required excavation to or below such 33 foot point.
8. The base cost of construction and installation of the proposed parking solution is $1.6MM. All cost estimates shown on Exhibit C would be in addition to the base $1.6MM cost estimate for the parking proposal of BZA Case No. 18308. Any such

additional costs would make the proposed project financially infeasible.

Market studies revealing parking requirements

9. The Applicant commissioned three market studies with reputable third party consultants/sales agencies to gauge pricing and marketability of units, parking spaces, and other premiums. Given the proprietary nature of the reports the Applicant is not able to share this information publicly. However, we did include an exhibit that includes parking ratios for twelve comparable residential projects in the vicinity of the Property. Parking ratios for these projects varied from .72 to 1.2. This was an important factor in our decision to offer parking in our condominium building at .57. Based on the three market studies and the comparable parking ratios, the Applicant concluded that this is the minimum amount of parking possible to be provided for a successful project.
10. The provision of parking is "loss leader" for a project. The Applicant would not include parking in the Project, or any project, if it did not feel that such parking was mandated by the market.

Parking impact on financing of Project

11. Equally as important to the Applicant's decision to park the Project at a .57 ratio was the ability to get financing for our condominium project. Our banking sources have indicated to us that they would not look favorably upon a project with a parking ratio that is less than what we are currently planning. A letter from one such lender is attached ot the submission as Exhibit D. As such, the Applicant believe that a plan that eliminates parking or provides less parking than the current plan, presents both a market risk and a financing risk to the Project.

Conclusion

12. In conclusion, the Applicant believes that our current plan, which proposes approximately 36 parking spaces via a mechanical lift system, is the best solution for this project. It provides an efficient, cost effective and innovative solution to providing adequate parking within the severely constrained footprint of an existing warehouse building.

BOZZUTO DEVELOMPENT COMPANY

By: _____
Name: Duncan Slidell
Title: Vice President/Director of Operations

Subscribed and sworn to before me this 2nd day of March 2012.

_____
Notary Public

My Commission expires: 7/31/2015
[Notarial Seal]

JACQUELYN M. SLADE
Notary Public, District of Columbia
My Commission Expires 07-31-2015

New York Avenue | South Site Parking Study

Option 8: Parklift 413 (Wohr)
- Independent parking in 3 levels below grade with a pit
- 25% speed ramp
- 33 total parking spaces
- Alt Option 8a includes services located at Level P2

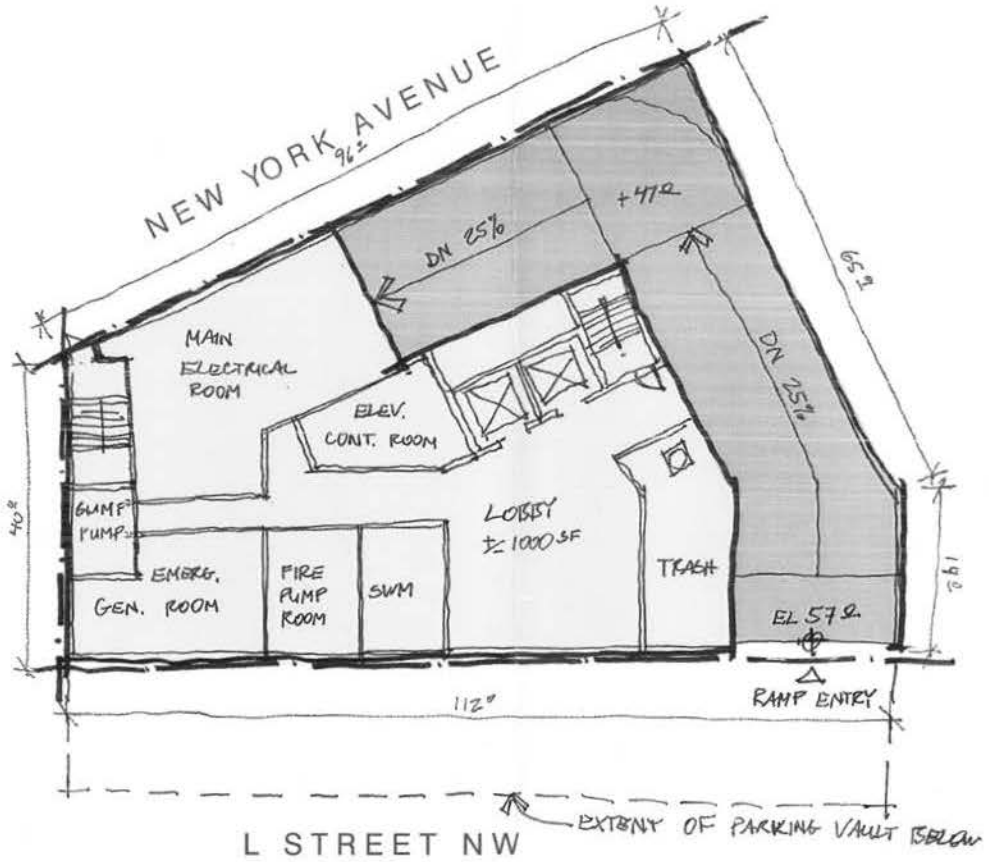
Option 9: Parklift 413 (Wohr)
- Independent parking in 3 levels below grade with a pit
- 15% speed ramp
- 33 total parking spaces

Option 10: Parksafe 585 (Wohr)
- Independent parking in 4 levels below grade with a pit
- 36 total parking spaces

Option 11: Parklift 413 (Wohr)
- Independent parking in 3 levels below grade with a pit
- Car Elevator accessed from L Street NW entrance

Options 8-11: Parklift 413 and Parksafe 585

February 21, 2012



Option 8 – Description of parking configuration: 25% ramp with services on the ground level; this proposal's construction cost would increase by $2.6MM.

a. Not an active streetscape on New York Avenue. Ramping occupies a similar amount of street frontage on New York Avenue as does the proposed structured parking.
b. Requires use of vault space which is opposed by DDOT.
c. Excavation is extremely expensive and complicated, if not impossible, under the existing structure.
i. Must excavate passenger elevator further into ground.
d. Much higher cost (vault rental and ongoing support)
e. 25% ramp is not practical (but it saves excavating an additional level). Even still, ramping greatly inefficient on such small site.
f. "Backhouse" functions would be moved to the first floor since drive aisles would be moved to P1.

Option 8: Combilift 413 (Wohr)

- Independent Parking in 3 levels with a pit
- Garage Entrance Elevation: +57'-0"
- 3 (3 grid systems) + 1 (2 grid system) x 3 levels = 33 total spaces
- Typical Floor (starting at 3rd floor)- 7 units/floor
- Assumes the transfer of some interior columns on this floor.
- Potential to retain existing perimeter columns- more accurate information is needed to confirm.

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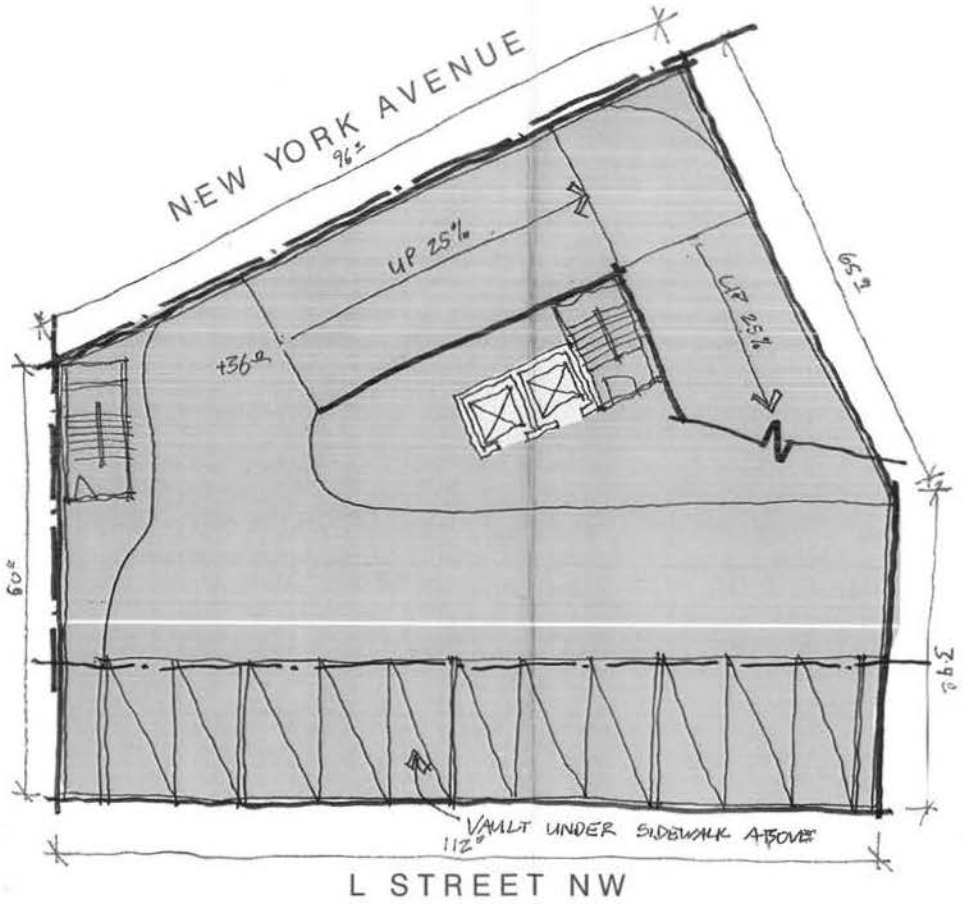

Option 8: Combilift 413 (Wohr)

- Independent Parking in 3 levels with a pit
- Garage Entrance Elevation: +57'-0"
- 3 (3 grid systems) + 1 (2 grid system) x 3 levels = 33 total spaces
- Typical Floor (starting at 3rd floor)- 7 units/floor
- Assumes the transfer of some interior columns on this floor.
- Potential to retain existing perimeter columns- more accurate information is needed to confirm.

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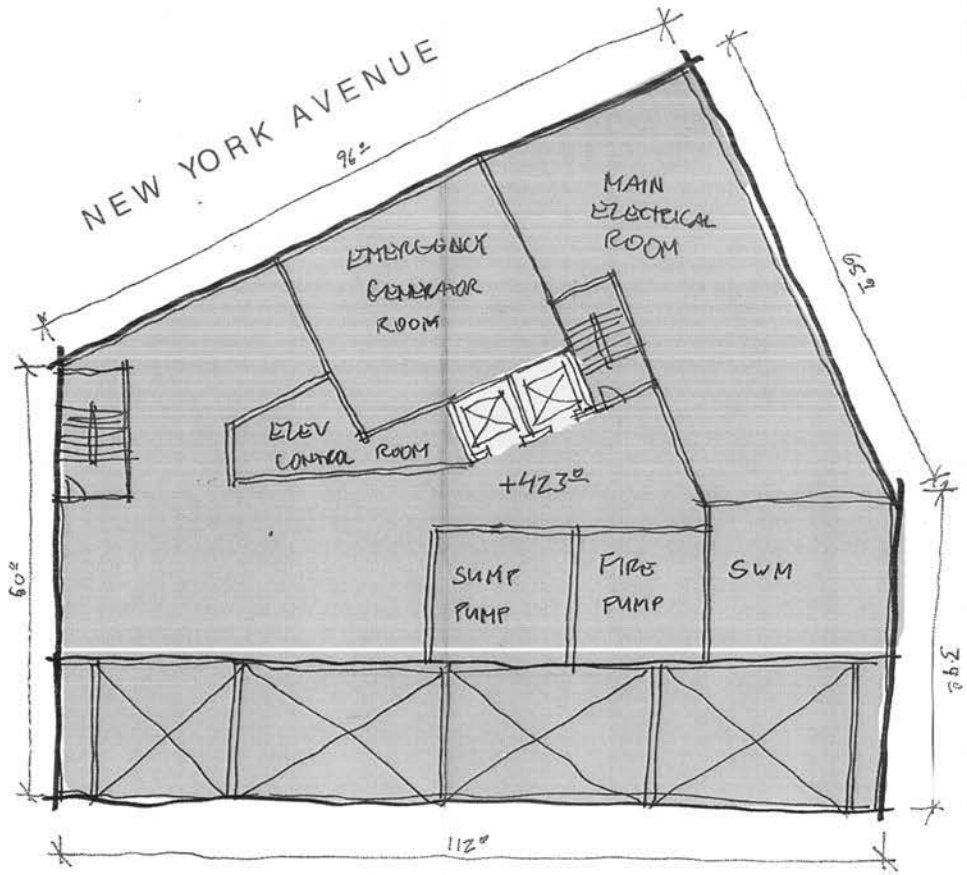

Option 8a – This option is the same as Option 8, except it shows the "backhouse" functions moved from the first floor to an additional level of excavation; this proposal's construction cost would increase by $4.35MM.

a. Most expensive option.
b. Similar ramping inefficiency, disallowed use of vault space and lack of an active New York Avenue streetscape as Option 8.
c. It opens up more of the streetscape, but the cost is almost an entire new level of excavation.

Option 8a: Combilift 413 (Wohr)

- Independent Parking in 3 levels with a pit
- Garage Entrance Elevation: +57'-0"
- 3 (3 grid systems) + 1 (2 grid system) x 3 levels = 33 total spaces
- Typical Floor (starting at 3rd floor)- 7 units/floor
- Assumes the transfer of some interior columns on this floor.
- Potential to retain existing perimeter columns- more accurate information is needed to confirm.

SCALE 1/16"=1' 0 4 8 16 ft

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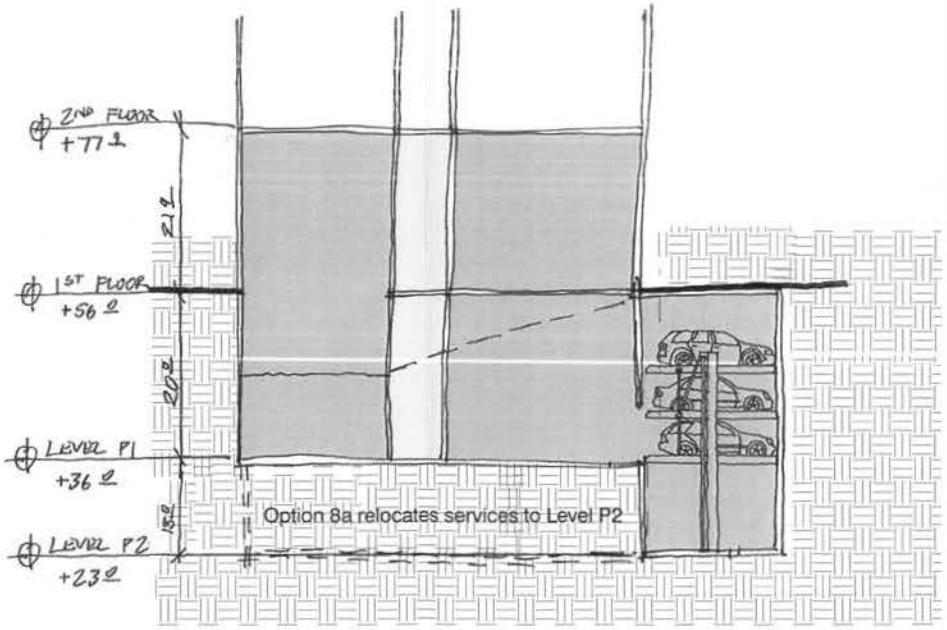

Option 8: Combilift 413 (Wohr)

- Independent Parking in 3 levels with a pit
- Garage Entrance Elevation: +57'-0"
- 3 (3 grid systems) + 1 (2 grid system) x 3 levels = 33 total spaces
- Typical Floor (starting at 3rd floor)- 7 units/floor
- Assumes the transfer of some interior columns on this floor.
- Potential to retain existing perimeter columns- more accurate information is needed to confirm.

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Option 9 – This option employs a 15% ramp with service uses located on first floor; this proposal's construction cost would increase by $3.7MM.

a. Not an active streetscape on New York Avenue. Ramping occupies a similar amount of street frontage on New York Avenue as does the proposed structured parking.
b. Requires use of vault space which is opposed by DDOT.
c. Excavation is extremely expensive and complicated, if not impossible, under the existing structure.
i. Must excavate passenger elevator further into ground.
d. Much higher cost (vault rental and ongoing support)
e. More gradual ramp requires excavating an additional level, increasing cost.
f. Ramping greatly inefficient on such small site.
g. Could also add another level to move services from first floor for even greater expense (this would become the most expensive option).

Option 9: Combilift 413 (Wohr)

- Independent Parking in 3 levels with a pit
- Garage Entrance Elevation: +57'-0"
- 3 (3 grid systems) + 1 (2 grid system) x 3 levels = 33 total spaces
- Typical Floor (starting at 3rd floor)- 7 units/floor
- Assumes the transfer of some interior columns on this floor.
- Potential to retain existing perimeter columns- more accurate information is needed to confirm.

SCALE 1/16"=1' 0 4 8 16 ft

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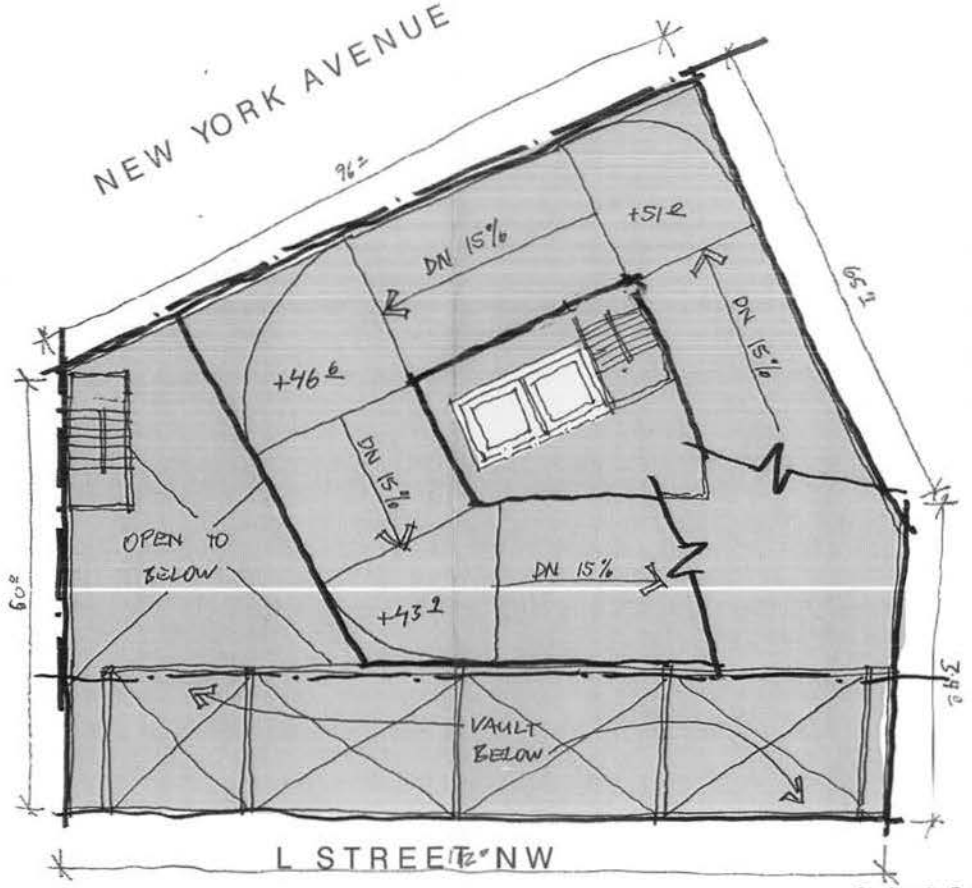

Option 9: Combilift 413 (Wohr)

- Independent Parking in 3 levels with a pit
- Garage Entrance Elevation: +57'-0"
- 3 (3 grid systems) + 1 (2 grid system) x 3 levels = 33 total spaces
- Typical Floor (starting at 3rd floor)- 7 units/floor
- Assumes the transfer of some interior columns on this floor.
- Potential to retain existing perimeter columns- more accurate information is needed to confirm.

SCALE 1/16"=1' 0 4 8 16 ft

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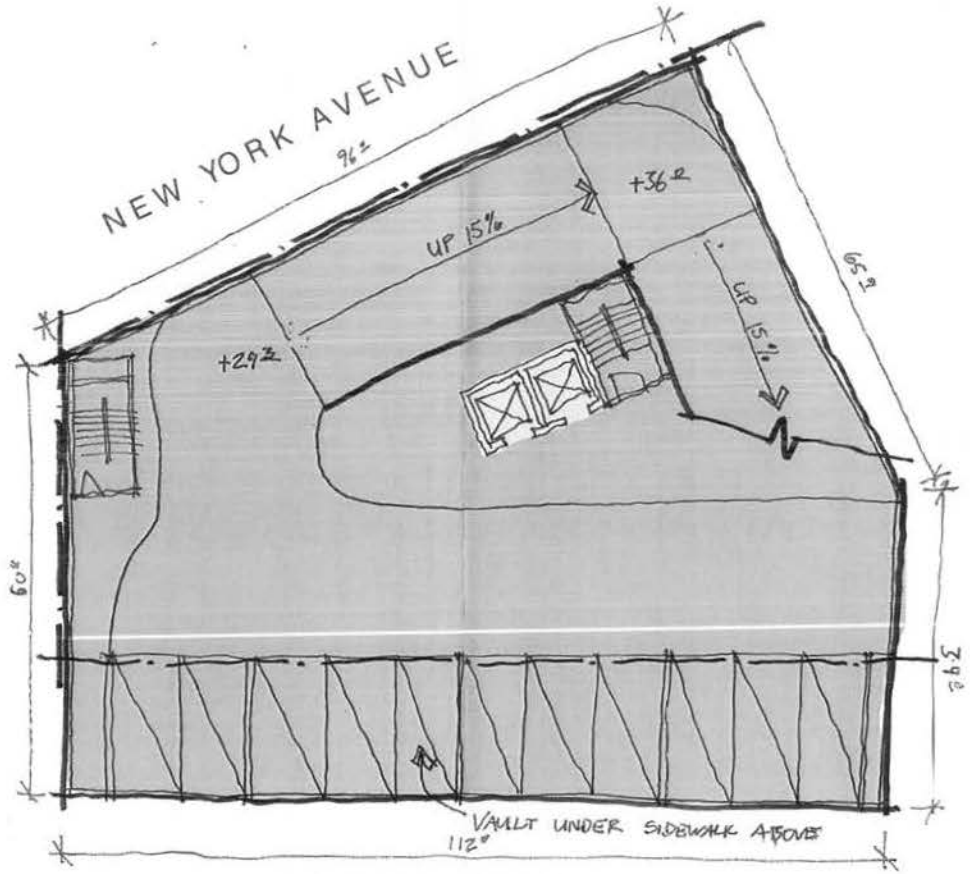

Option 9: Combilift 413 (Wohr)

- Independent Parking in 3 levels with a pit
- Garage Entrance Elevation: +57'-0"
- 3 (3 grid systems) + 1 (2 grid system) x 3 levels = 33 total spaces
- Typical Floor (starting at 3rd floor)- 7 units/floor
- Assumes the transfer of some interior columns on this floor.
- Potential to retain existing perimeter columns- more accurate information is needed to confirm.

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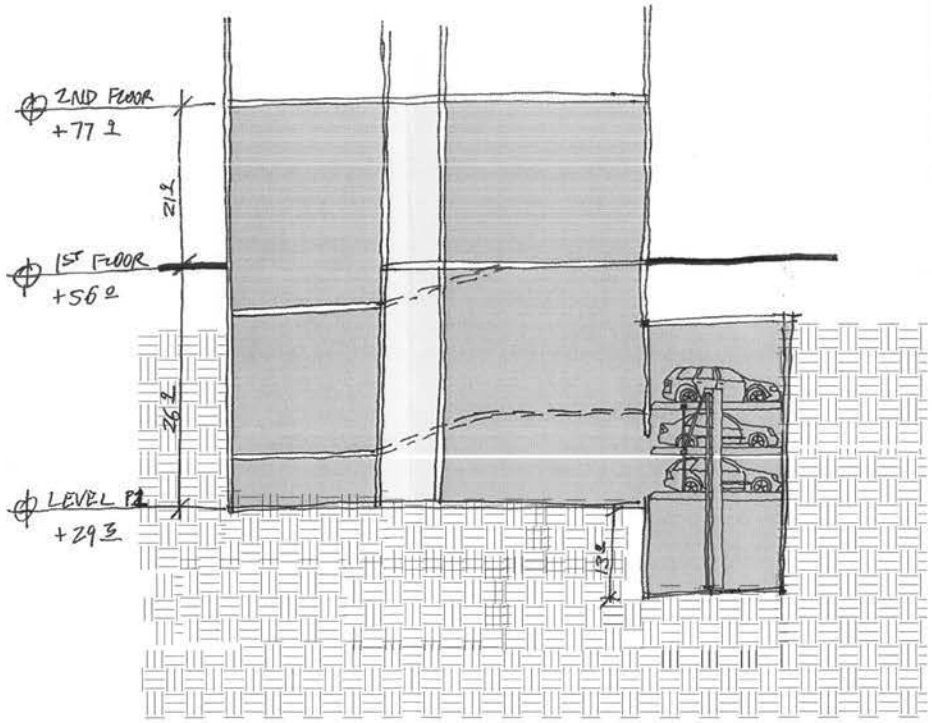

Option 9: Combilift 413 (Wohr)

- Independent Parking in 3 levels with a pit
- Garage Entrance Elevation: +57'-0"
- 3 (3 grid systems) + 1 (2 grid system) x 3 levels = 33 total spaces
- Typical Floor (starting at 3rd floor)- 7 units/floor
- Assumes the transfer of some interior columns on this floor.
- Potential to retain existing perimeter columns- more accurate information is needed to confirm.

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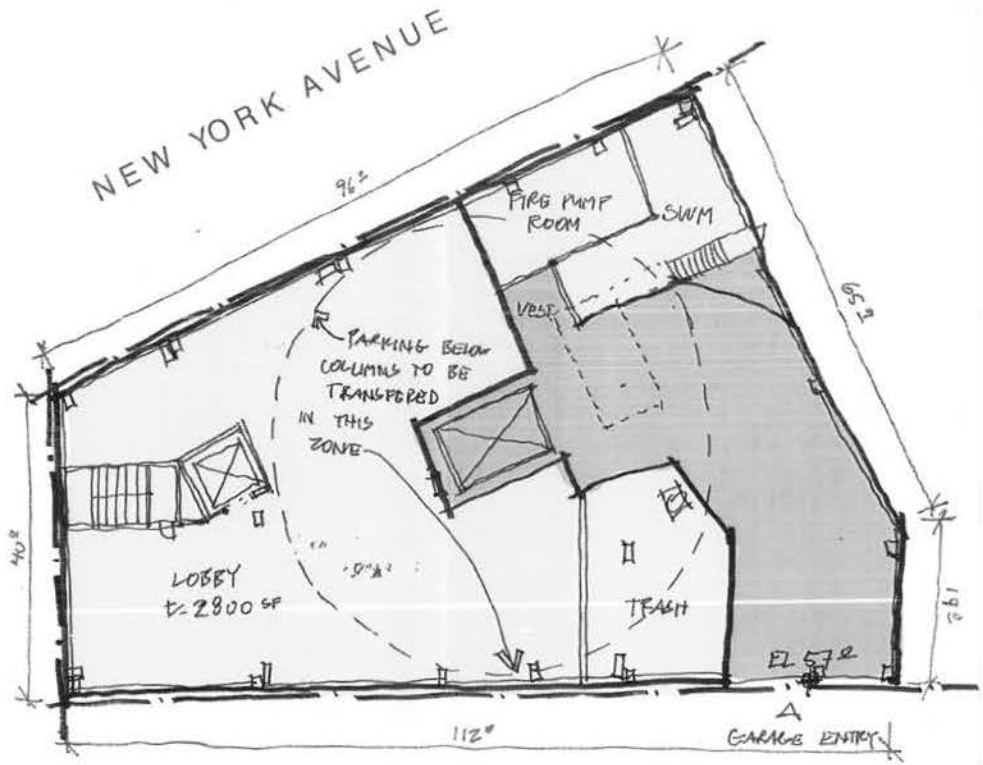

Option 10 – Radial structured parking all underground, accessed by one main elevator space on the first floor. Cars would access from L Street to elevator in middle of building. No vaul: space is utilized; this proposal's construction cost would increase by $2.8MM.

a. Queuing impact on L Street. This option would potentially result in a number of cars "stacking up" into L Street when the garage elevator is in use.
b. Great deal of expense with complicated sorting mechanical mechanism. Lateral movement adds a significant expense to mechanical system. This element adds approximately $1MM of the cost beyond the proposed system.
c. Transferring structural loads from the middle of the site to the sides creates a great deal of expense.
d. Only 1 elevator to parking levels so could create a bottleneck if elevator has operational issues.
e. Significant excavation still required.

Option 10: Parksafe 585 (Wohr)

- Independent Parking in 4 levels with a pit
- Garage Entrance Elevation: +57'-0"
- 8 radial system x 4 levels = 36 total spaces
- Typical Floor (starting at 3rd floor)- 7 units/floor
- Assumes the transfer of some interior columns on this floor.
- Potential to retain existing perimeter columns- more accurate information is needed to confirm.

SCALE 1/16"=1' 0 4 8 16 ft

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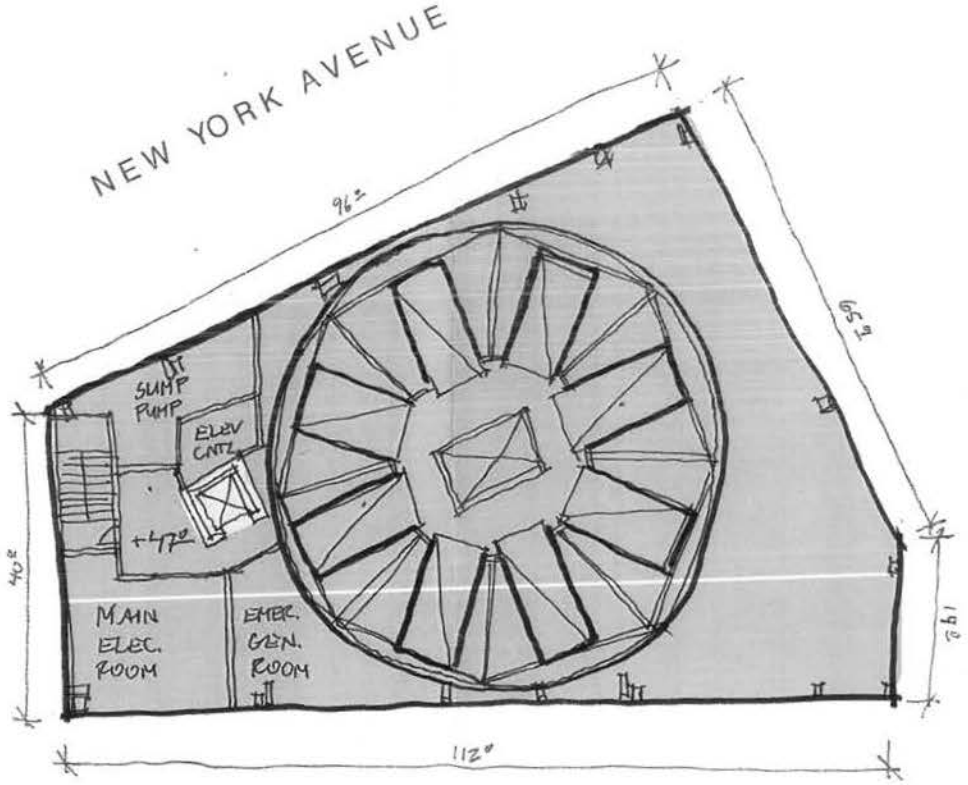

Option 10: Parksafe 585 (Wohr)

- Independent Parking in 4 levels with a pit
- Garage Entrance Elevation: +57'-0"
- 8 radial system x 4 levels = 36 total spaces
- Typical Floor (starting at 3rd floor)- 7 units/floor
- Assumes the transfer of some interior columns on this floor.
- Potential to retain existing perimeter columns- more accurate information is needed to confirm.

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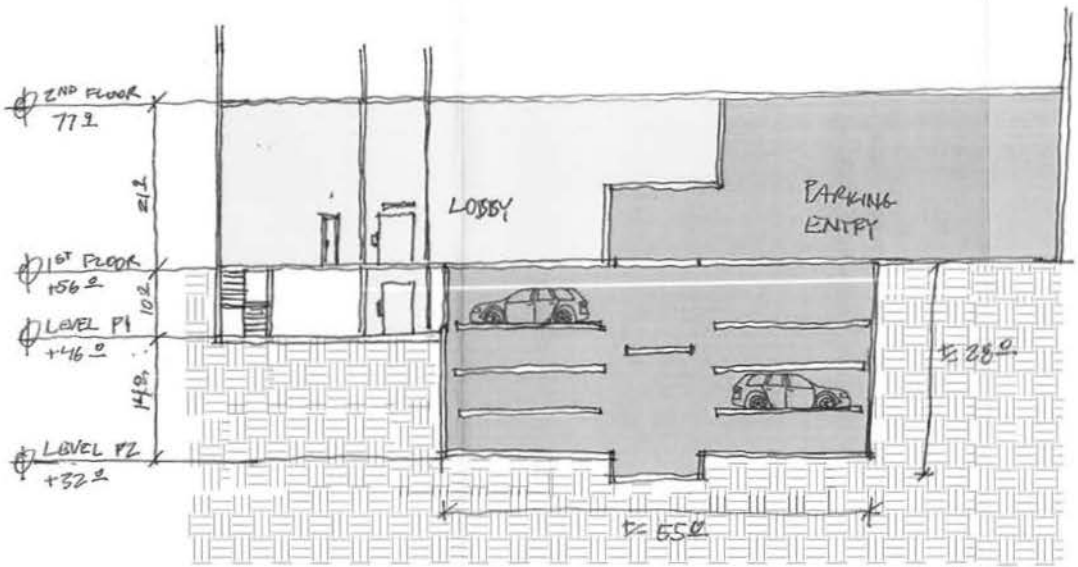

Option 10: Parksafe 585 (Wohr)

- Independent Parking in 4 levels with a pit
- Garage Entrance Elevation: +57'-0"
- 8 radial system x 4 levels = 36 total spaces
- Typical Floor (starting at 3rd floor)- 7 units/floor
- Assumes the transfer of some interior columns on this floor.
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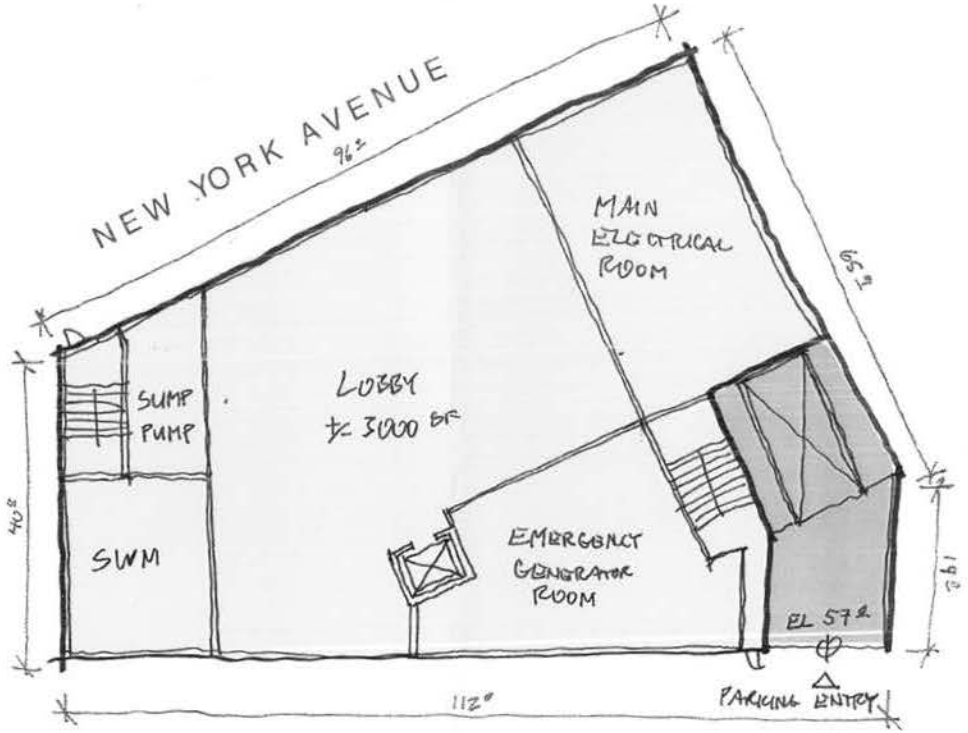

L STREET NW

Option 11 – Freight elevator at southeast corner of site; all parking in structured parking below grade, accessed at P1; this proposal's construction cost would increase by $2MM.

a. Similar impact on New York Avenue and L Street streetscapes as the proposal (with backhouse uses on first floor).
b. Queuing impact on L Street is worst of any scheme.
c. Only 1 elevator to parking levels so could create a bottleneck if elevator has operational issues.
d. Great deal of expense for full excavation of two level garage and additional pits.
e. Structural issues with full excavation up to lot lines.
f. Doubles the amount of excavation from the proposed scheme.
g. Turning radius problems likely.
h. Moves the elevator core and stairs which has ripple effects throughout the design, leading to less efficient floor plates.

Option 11: Combilift 413 (Wohr)

- Independent Parking in 3 levels with a pit
- Garage Entrance Elevation: +57'-0"
- 3 (3 grid systems) + 1 (2 grid system) x 3 levels = 33 total spaces
- Typical Floor (starting at 3rd floor)- 7 units/floor
- Assumes the transfer of some interior columns on this floor.
- Potential to retain existing perimeter columns- more accurate information is needed to confirm.

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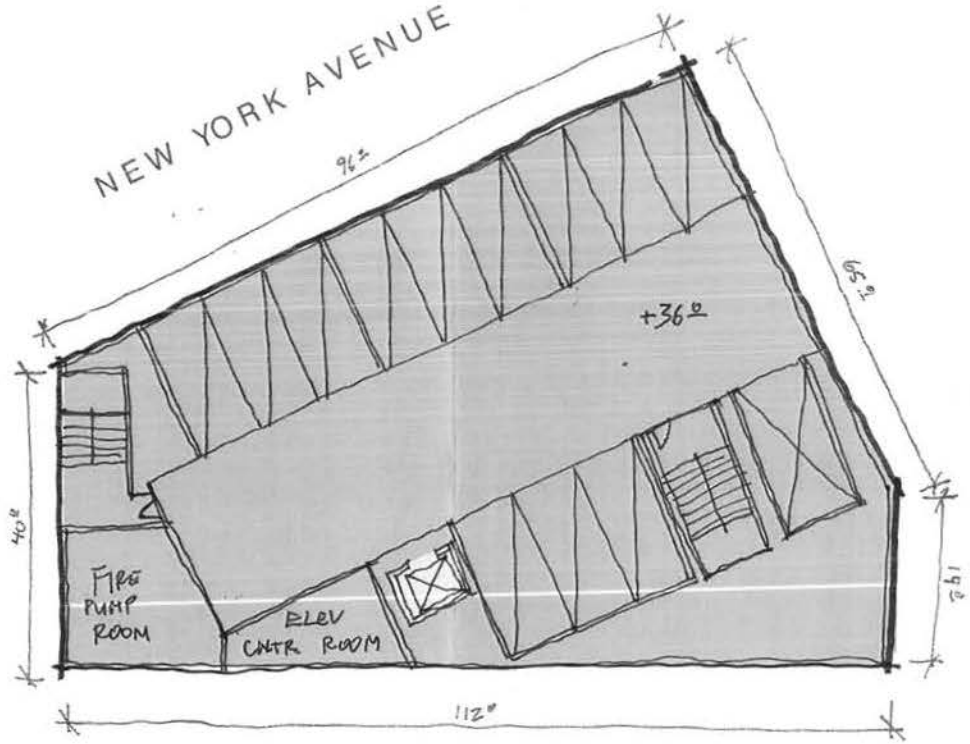

L STREET NW

Option 11: Combilift 413 (Wohr)

- Independent Parking in 3 levels with a pit
- Garage Entrance Elevation: +57'-0"
- 3 (3 grid systems) + 1 (2 grid system) x 3 levels = 33 total spaces
- Typical Floor (starting at 3rd floor)- 7 units/floor
- Assumes the transfer of some interior columns on this floor.
- Potential to retain existing perimeter columns- more accurate information is needed to confirm.

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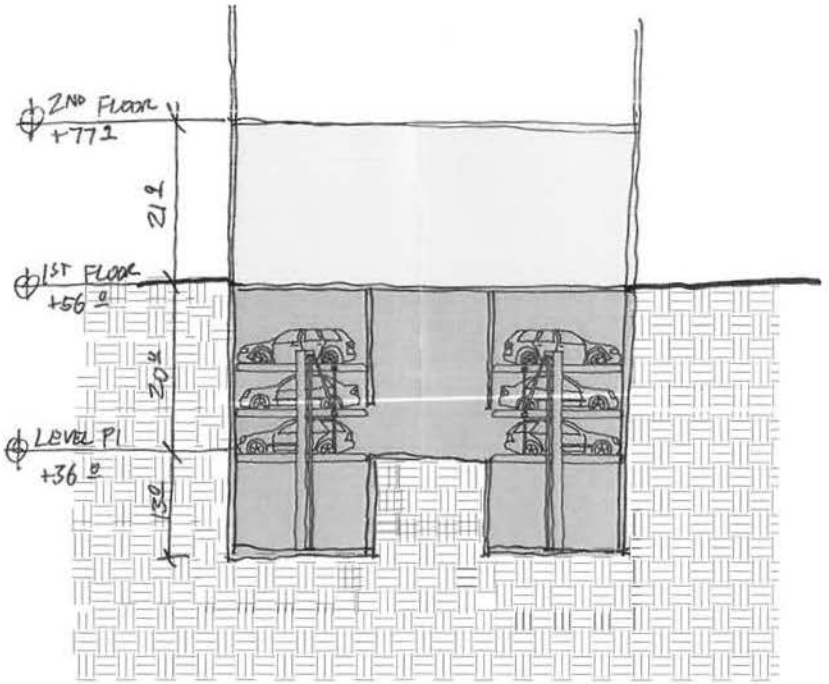

Option 11: Combilift 413 (Wohr)

- Independent Parking in 3 levels with a pit
- Garage Entrance Elevation: +57'-0"
- 3 (3 grid systems) + 1 (2 grid system) x 3 levels = 33 total spaces
- Typical Floor (starting at 3rd floor)- 7 units/floor
- Assumes the transfer of some interior columns on this floor.
- Potential to retain existing perimeter columns- more accurate information is needed to confirm.

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M&T Bank

February 24, 2012

Mr. Duncan Slidell
Bozzuto Homes
4750 Walker Drive , Suite 400
Greenbelt, MD 20770

Re: 460 New York Avenue Condominium Project

Dear Duncan:

On behalf of M&T Bank, thank you for the opportunity to provide financing for this 63 unit residential condominium project at 460 New York Avenue, located in the Mt. Vernon Triangle Neighborhood.

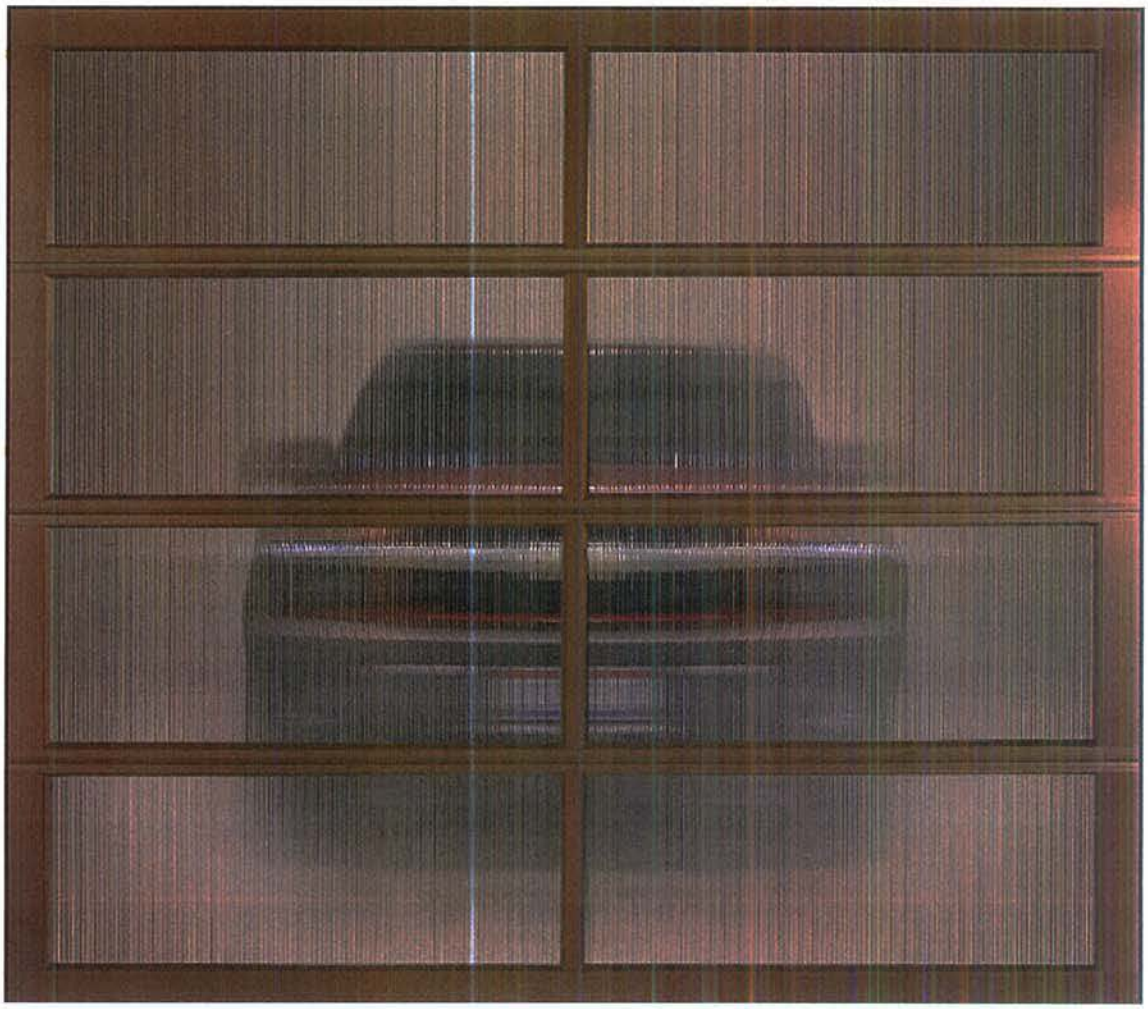
Notwithstanding a general bias against financing residential condominiums in this still challenged market, we find the location and the product mix to be very desirable.

That being said, one element of the proposed improvements that we find troublesome is the amount of parking being provided. We think it reasonable to assume that the demographic profile of purchasers of the studio units would not necessitate onsite parking, but we do think that for the larger sized units, potential purchasers would almost demand parking within the project, and not to provide adequate parking would turn potential purchasers away. You proposed to provide mechanical parking for a parking ratio of approximately 0.6. spaces per unit. If this ratio is reduced, M&T may be forced not to pursue this opportunity.

Please contact me at your earliest convenience so we can further discuss this project, specifically as it relates to the parking.

Again, thank you for this opportunity and we look forward to working with you on this and other projects.

Sincerely,

Tom Keigler

Thomas N. Keigler
Administrative Vice President & Group Manager
Commercial Real Estate Finance
M&T Bank