

Attachment E
Correspondence from
the Applicant to adjoining property owners

Pereira, Sandra

From: Craig Kazanjian <craig@kazbrothers.com>
Sent: Tuesday, April 04, 2017 3:53 PM
To: Pereira, Sandra
Cc: 'Harris, Robert R.'; 'Phil Isaja'; klauretti; 'Neil Patel'
Subject: Bradford - East Path to Park
Attachments: Path response ltr Orion - Lang.pdf

Sandra,

As discussed in DRC this morning, I sent 4 certified letters to the owners necessary to create a path along Norbeck Road to the East Norbeck Park:

- 3201 Norbeck Rd. – Jackson
- 3207 Norbeck Rd. – Speiser
- 3209 Norbeck Rd. – Flores
- 3213 Norbeck Rd. – Orion / Lang

Attached here is a return letter from 3213 (Orion / Lang), which indicates they are not willing to dedicate right-of-way or grant a public use easement. I also received a phone call from Mr. Orion in which expressed the same position. (this same letter was sent to all the owners)

If I receive any other responses, I will forward those as well. This email and attached letter address Condition 17 from the Preliminary Plan Resolution.

If you have any questions, or need any additional information, please let me know.

Craig

Craig C. Kazanjian
Kaz Brothers, L.C.
14660 Rothgeb Drive, Suite 201
Rockville, MD 20850
Work 301-438-2211
Cell 301-370-8513
Fax 301-438-3625

www.kazbrothers.com

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KAZ DEVELOPMENT, LLC

March 21, 2017

Cottrell Orion / June Lang
3213 Norbeck Road
Silver Spring, MD 20906

RE: Shared Use Path – Dedication of Right-of-Way or Granting of Easement

Dear Cottrell Orion / June Lang,

Our company is managing the development of the Bradford's Landing project, a new residential subdivision to be developed next to the existing Norbeck Crossing project.

As a part of the development, Maryland National Park & Planning Commission has asked us to explore the possibility of connecting a hiker/ biker asphalt path from the new subdivision to the existing East Norbeck Park. The proposed path, would run along Norbeck Road across the front of your property and connect all the way to the Park from our development site. We cannot currently extend this path across your property, because there is no dedicated right-of-way on your property.

This letter is to ask if you are amenable to either (i) dedicating a portion of your property for public right-of-way, or (ii) placing a "public use easement" across your property. This would allow us to build the path, and allow for the public to traverse your property in the designated area in order to access the park.

Please see the enclosed map exhibit, which shows the proposed layout of the path, how it would cross your property, and how much property would be needed for right-of-way or for an easement.

Below I have placed two signature blocks which indicate whether or not you would be willing to entertain dedicating of a portion of your property for right-of-way, or granting a public use easement across your property. Please sign where appropriate, and mail back in the envelope provided.

Thank you for your consideration in this matter.


Craig Kazanjian
Project Manager

☐ I **AM** willing to explore the dedication of public right-of-way, or providing a public use easement on my property for the construction of a Hiker/ Biker Path on my property.

Signature _____

☒ I **AM NOT** willing to explore the dedication of public right of way, or providing a public use easement on my property for the construction of a Hiker/ Biker Path on my property.

Signature 

14660 ROTHGEB DRIVE, SUITE 201

ROCKVILLE, MD 20850

OFFICE: (301) 438-2211

WWW.KAZBROTHERS.COM

FAX: (301) 438-3625



KAZ DEVELOPMENT, LLC

March 21, 2017

Mabel D Jackson ET AL
3201 Norbeck Road
Silver Spring, MD 20906

RE: Shared Use Path – Dedication of Right-of-Way or Granting of Easement

Dear Mabel D Jackson ET AL,

Our company is managing the development of the Bradford's Landing project, a new residential subdivision to be developed next to the existing Norbeck Crossing project.

As a part of the development, Maryland National Park & Planning Commission has asked us to explore the possibility of connecting a hiker/ biker asphalt path from the new subdivision to the existing East Norbeck Park. The proposed path, would run along Norbeck Road across the front of your property and connect all the way to the Park from our development site. We cannot currently extend this path across your property, because there is no dedicated right-of-way on your property.

This letter is to ask if you are amenable to either (i) dedicating a portion of your property for public right-of-way, or (ii) placing a "public use easement" across your property. This would allow us to build the path, and allow for the public to traverse your property in the designated area in order to access the park.

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Thank you for your consideration in this matter.

Craig Kazanjian
Project Manager

☐ I **AM** willing to explore the dedication of public right-of-way, or providing a public use easement on my property for the construction of a Hiker/ Biker Path on my property.

Signature _____

☐ I **AM NOT** willing to explore the dedication of public right of way, or providing a public use easement on my property for the construction of a Hiker/ Biker Path on my property.

Signature _____

14660 ROTHGEB DRIVE, SUITE 201

ROCKVILLE, MD 20850

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WWW.KAZBROTHERS.COM

FAX: (301) 438-3625



KAZ DEVELOPMENT, LLC

March 21, 2017

Mitchell H Speiser
3207 Norbeck Road
Silver Spring, MD 20906

RE: Shared Use Path – Dedication of Right-of-Way or Granting of Easement

Dear Mr. Speiser,

Our company is managing the development of the Bradford's Landing project, a new residential subdivision to be developed next to the existing Norbeck Crossing project.

As a part of the development, Maryland National Park & Planning Commission has asked us to explore the possibility of connecting a hiker/ biker asphalt path from the new subdivision to the existing East Norbeck Park. The proposed path, would run along Norbeck Road across the front of your property and connect all the way to the Park from our development site. We cannot currently extend this path across your property, because there is no dedicated right-of-way on your property.

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Thank you for your consideration in this matter.

Craig Kazanjian
Project Manager

☐ I **AM** willing to explore the dedication of public right-of-way, or providing a public use easement on my property for the construction of a Hiker/ Biker Path on my property.

Signature _____

☐ I **AM NOT** willing to explore the dedication of public right of way, or providing a public use easement on my property for the construction of a Hiker/ Biker Path on my property.

Signature _____



KAZ DEVELOPMENT, LLC

March 21, 2017

Manuel A Flores ET AL
3209 Norbeck Road
Silver Spring, MD 20906

RE: Shared Use Path – Dedication of Right-of-Way or Granting of Easement

Dear Manuel A Flores ET AL,

Our company is managing the development of the Bradford's Landing project, a new residential subdivision to be developed next to the existing Norbeck Crossing project.

As a part of the development, Maryland National Park & Planning Commission has asked us to explore the possibility of connecting a hiker/ biker asphalt path from the new subdivision to the existing East Norbeck Park. The proposed path, would run along Norbeck Road across the front of your property and connect all the way to the Park from our development site. We cannot currently extend this path across your property, because there is no dedicated right-of-way on your property.

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Thank you for your consideration in this matter.

Craig Kazanjian
Project Manager

☐ I **AM** willing to explore the dedication of public right-of-way, or providing a public use easement on my property for the construction of a Hiker/ Biker Path on my property.

Signature _____

☐ I **AM NOT** willing to explore the dedication of public right of way, or providing a public use easement on my property for the construction of a Hiker/ Biker Path on my property.

Signature _____



KAZ DEVELOPMENT, LLC

March 21, 2017

Cottrell Orion / June Lang
3213 Norbeck Road
Silver Spring, MD 20906

RE: Shared Use Path – Dedication of Right-of-Way or Granting of Easement

Dear Cottrell Orion / June Lang,

Our company is managing the development of the Bradford's Landing project, a new residential subdivision to be developed next to the existing Norbeck Crossing project.

As a part of the development, Maryland National Park & Planning Commission has asked us to explore the possibility of connecting a hiker/ biker asphalt path from the new subdivision to the existing East Norbeck Park. The proposed path, would run along Norbeck Road across the front of your property and connect all the way to the Park from our development site. We cannot currently extend this path across your property, because there is no dedicated right-of-way on your property.

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Thank you for your consideration in this matter.

Craig Kazanjian
Project Manager

☐ I **AM** willing to explore the dedication of public right-of-way, or providing a public use easement on my property for the construction of a Hiker/ Biker Path on my property.

Signature _____

☐ I **AM NOT** willing to explore the dedication of public right of way, or providing a public use easement on my property for the construction of a Hiker/ Biker Path on my property.

Signature _____

Attachment F

Correspondence from Department of
General Services on Easement Agreement

Pereira, Sandra

From: Ossont, Greg <Greg.Ossont@montgomerycountymd.gov>
Sent: Friday, May 26, 2017 9:21 AM
To: Pereira, Sandra
Cc: Warner, Ronnie; Brenneman, Cynthia; Krasnow, Rose
Subject: Bradford's Landing (Site Plan No. 820170060)

Sandra,

I am writing to you to let you know that the County is actively proceeding with the creation of an easement over the property the County owns between the Bradford's Landing subdivision and Norbeck Local Park. Consistent with the developer's commitment, we are proceeding with the creation of easements from the County to the developer and Park & Planning that would allow for the trail to be built by the Bradford's Landing applicant and then controlled by Park & Planning for long term care and maintenance. The preparation of these documents are typically a bit slow, but we see no impediments to the proposal and are working actively to complete the arrangements as quickly as possible. We have no objection to this Site Plan being heard by the Planning Board in June. If you require something additional from the County, please let me know.

Have a good weekend.

Greg

Greg Ossont
Deputy Director
Department of General Services
240-777-6192
greg.ossont@montgomerycountymd.gov

Attachment G
Other Agencies Correspondence

820170060 Bradford's Landing

Contact: Sam Farhadi at 240 777-6333

We have reviewed site plan files:

"07-SITE-820170060-001.pdf V9" uploaded on/ dated **"5/23/2017"** and
"07-SITE-820170060-004.pdf V10" uploaded on/ dated **"5/23/2017"** and

The following needs to be condition of the certified site plan:

1. Proposed storm drain system, drainage crossings through sidewalks, easements and associated landscaping will be reviewed at the time of ROW permit.



Department of Permitting Services
Fire Department Access and Water Supply Comments

DATE: 01-May-17
TO: Keely Lauretti
Loiederman Soltesz Associates, Inc
FROM: Marie LaBaw
RE: Bradford Landing
820170060

PLAN APPROVED

1. Review based only upon information contained on the plan submitted **01-May-11** Review and approval does not cover unsatisfactory installation resulting from errors, omissions, or failure to clearly indicate conditions on this plan.
2. Correction of unsatisfactory installation will be required upon inspection and service of notice of violation to a party responsible for the property.

From: Craig Kazanjian
To: [Pereira, Sandra](#)
Subject: FW: Responses 2
Date: Friday, May 05, 2017 9:25:34 AM
Attachments: [Path response ltr Orion - Lang.pdf](#)

Responses with SHA emails below

From: Craig Kazanjian [mailto:craig@kazbrothers.com]
Sent: Tuesday, April 18, 2017 10:09 AM
To: 'Keely Lauretti, RLA' <klauretti@solteszco.com>
Subject: Responses 2

Provide status update on coordination items:

1. offsite path connections to Local Park

A path has been provided at the top of the project which connects to the East Norbeck Park bridge. A second access point is shown through the Pepco property. Paperwork has been submitted to Pepco requesting an easement for this path.

2. pedestrian improvements along Norbeck Rd.

A sidewalk section connecting Norbeck Crossing and Bradford's Landing is shown on our submitted SHA Entrance Plan. In a prior meeting, SHA said they would entertain this connection, but it would be fully reviewed as part of the entrance plan.

SHA will not entertain construction of a path from Bradford's Landing to East Norbeck Park along Norbeck Road. There is not enough SHA right-of-way for the path, and the proximity to the road creates an unsafe condition, which SHA is unwilling to approve or maintain. (SEE SHA EMAIL BELOW WITH SAME STATEMENT)

Letters were sent by the developer to the property owners along the proposed path requesting additional right-of-way or an easement for the path. All letters were certified mail. Developer received one phone call and one letter (attached here) in which the owners rejected the requests.

3. Village Green design, construction, and maintenance on Greenbriar's property.

The unified Recreation Area as currently designed has been submitted to CalAtlantic, and they are receptive to the design. We are currently awaiting a signed Memorandum of Understanding from CalAtlantic which outlines the basic terms of the proposed Recreation Area.

SHA Emails:

Gentlemen,

Please see below. SHA will not entertain a plan to add sidewalk along the east gap to the park since there is not an opportunity to create a buffer or to add curb. If you need additional information or would like to discuss further please let me know.

Thank you

Erica

...Presently mobile

Begin forwarded message:

From: William Gover <wgover@sha.state.md.us>
Date: January 17, 2017 at 1:49:16 PM EST
To: Erica Rigby <ERigby@sha.state.md.us>
Cc: Kwesi Woodroffe <kwoodroffe@sha.state.md.us>
Subject: RE: Sidewalk Question

We cannot have a sidewalk at grade adjacent to the roadway. There must be a buffer or a curb.

John

-----Original Message-----

From: Erica Rigby
Sent: Tuesday, January 17, 2017 1:44 PM
To: William Gover <wgover@sha.state.md.us>
Cc: Kwesi Woodroffe <kwoodroffe@sha.state.md.us>
Subject: Sidewalk Question

Can you confirm that we would not entertain a sidewalk adjacent to the roadway with no buffer at the same grade? We would require curb, correct?

Erica

...Presently mobile

Craig C. Kazanjian
Kaz Brothers, L.C.
14660 Rothgeb Drive, Suite 201
Rockville, MD 20850
Work 301-438-2211
Cell 301-370-8513
Fax 301-438-3625

Pereira, Sandra

From: Brandon Fritz <BFritz@solteszco.com>
Sent: Wednesday, May 03, 2017 5:41 PM
To: Pereira, Sandra; 'Andrew.Kohler@montgomerycountymd.gov'
Cc: Craig Kazanjian; Phil Isaja; klauretti
Subject: RE: 820170060 - Bradford's Landing

All,

The SWM design is consistent with the concept that was approved on November 18, 2016. We have performed a value engineering analysis on the storm drain system to reduce the number of manholes and length of pipe, but the number and location of the swm facilities is the same as what was shown on the concept.

Thank you,

Brandon J. Fritz, PE
Project Manager

SOLTESZ

Engineering // Environmental Sciences // Surveying // Planning
2 Research Place, Suite 100
Rockville, MD 20850
P 301.948.2750
www.solteszco.com

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From: Keely Lauretti, RLA
Sent: Wednesday, May 3, 2017 10:21 AM
To: Brandon Fritz <BFritz@solteszco.com>; Phil Isaja <pisaja@solteszco.com>
Subject: FW: 820170060 - Bradford's Landing

From: Pereira, Sandra [<mailto:sandra.pereira@montgomeryplanning.org>]
Sent: Wednesday, May 03, 2017 10:18 AM
To: Keely Lauretti, RLA <klauretti@solteszco.com>
Cc: Craig Kazanjian <craig@kazbrothers.com>; andrew.kohler@montgomerycountymd.gov
Subject: FW: 820170060 - Bradford's Landing

Keely,

Per the correspondence below, please confirm if anything changed in the plans affecting SMW since the November 18, 2016, SWM concept approval.

Thanks,
Sandra

From: Kohler, Andrew [<mailto:Andrew.Kohler@montgomerycountymd.gov>]
Sent: Tuesday, May 02, 2017 11:08 AM
To: Pereira, Sandra <sandra.pereira@montgomeryplanning.org>
Subject: RE: 820170060 - Bradford's Landing

Sandra,

The November 18, 2016 letter is the only approval I have. It is also the last time the plan came through my office. If the engineer changed something from the November 2016 approval, they would need to submit a revision (or reconfirmation depending on the changes) to the Stormwater Management Concept. The engineer could answer that if something has changed.

Let me know if you have any further questions.

Thanks,
Andrew

From: Pereira, Sandra [<mailto:sandra.pereira@montgomeryplanning.org>]
Sent: Monday, May 01, 2017 4:09 PM
To: Kohler, Andrew <Andrew.Kohler@montgomerycountymd.gov>
Subject: 820170060 - Bradford's Landing

Hi Andrew,

For Bradford's Landing Site Plan (820170060), please confirm if we need a reconfirmed SWM concept approval letter. So far, we have received the one approved with the Preliminary Plan 120170060 on Nov 18, 2016.

Thanks in advance,
Sandra

Sandra Pereira, RLA
Area 3 Acting Supervisor

M-NCPPC Montgomery County Planning Department
8787 Georgia Avenue, Silver Spring, MD 20910
phone (301) 495-2186 :: fax (301) 495-1306
sandra.pereira@montgomeryplanning.org





DEPARTMENT OF PERMITTING SERVICES

Isiah Leggett
County Executive

Diane R. Schwartz Jones
Director

November 18, 2016

Ms. Lori Walter
Soltesz
2 Research Blvd.
Rockville, MD 20850

Re: **STORMWATER MANAGEMENT CONCEPT**
Request for Bradford's Landing
Preliminary Plan #: NA
SM File #: 282158
Tract Size/Zone: 28.74
Total Concept Area: 28.74
Watershed: Northwest Branch

Dear Lori:

Based on a review by the Department of Permitting Services Review Staff, the Combined Stormwater Management Concept/Site Development Stormwater Management Plan for the above mentioned site is **acceptable**. The Stormwater Management Concept proposes to meet required stormwater management goals via 100yr quantity control pond, MicroBioretention, Enhancement of some MicroBioretention for recharge credit, Planters Boxes, and Drywells.

The following **items** will need to be addressed **during** the final stormwater management design plan stage:

1. A detailed review of the stormwater management computations will occur at the time of detailed plan review.
2. An engineered sediment control plan must be submitted for this development.
3. All filtration media for manufactured best management practices, whether for new development or redevelopment, must consist of MDE approved material.
4. Landscaping shown on the approved Landscape Plan as part of the approved Site Plan are illustrative purpose only and may be changed at the time of detailed plan review of the Sediment Control/Storm Water Management plans by the Mont. Co. Department of Permitting Services, Water Resources Section.
This list may not be all-inclusive and may change based on available information at the time.

Payment of a stormwater management contribution in accordance with Section 2 of the Stormwater Management Regulation 4-90 **is not required**.

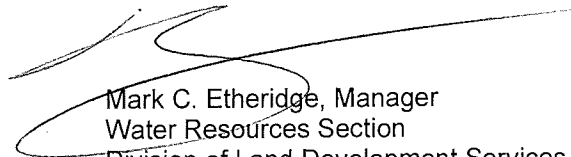
This letter must appear on the sediment control/stormwater management plan at its initial submittal. The concept approval is based on all stormwater management structures being located outside of the Public Utility Easement, the Public Improvement Easement, and the Public Right of Way unless specifically approved on the concept plan. Any divergence from the information provided to this office; or additional information received during the development process; or a change in an applicable

Ms. Lori Walter
November 18, 2016
Page 2 of 2

Executive Regulation may constitute grounds to rescind or amend any approval actions taken, and to reevaluate the site for additional or amended stormwater management requirements. If there are subsequent additions or modifications to the development, a separate concept request shall be required.

If you have any questions regarding these actions, please feel free to contact me at 240-777-6340.

Sincerely,



Mark C. Etheridge, Manager
Water Resources Section
Division of Land Development Services

MCE: me WJM

cc: C. Conlon
SM File # 282158

ESD Acres:	28.74
STRUCTURAL Acres:	0.00
WAIVED Acres:	0.00

Attachment H
Community Coordination

Steven D. Mann
3205 Norbeck Rd
Silver Spring, MD 20906

March 02, 2017

Mr. Robert Hubbell
President
Brookfield Washington, LLC
3201 Jermantown Rd
Suite 150
Fairfax, VA 22030

Dear Mr. Hubbell,

I am writing you to notify Brookfield Washington, LLC (the Bradford's Landing builder) that I do not object to the Bradford's Landing project.

Sincerely,

A handwritten signature in black ink, appearing to read 'SDM', with a long horizontal flourish extending to the right.

Steven D. Mann

Steven D. Mann
3205 Nonbeck Rd.
Silver Spring, MD 20906

PLACE STICKER AT TOP OF ENVELOPE TO THE RIGHT
OF THE RETURN ADDRESS. FOLD AT DOTTED LINE

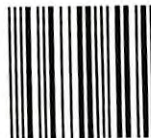
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Mr. Robert Hubbell
President
Brookfield Washington, LLC
3201 Termantown Rd.
Suite 150

Pereira, Sandra

From: Craig Kazanjian <craig@kazbrothers.com>
Sent: Monday, June 05, 2017 4:20 PM
To: Pereira, Sandra
Subject: FW: Bradford / Sousa Landscaping
Attachments: 17-0213 Sousa Landscaping.pdf

Below is my last email from Mrs. Sousa.

Attached here is the plan we sent her at that time. I held off on extending the fence along her border until I got staff comments, and figured out the final PUEs and drainage swales along that edge.

The attachment shows the proposed board on board fence in red. I spoke with Keely today. We can extend the fence further to screen the open space and the next alley down. That would address her concern below. We can do this as part of the final revisions.

Craig

From: Cristina Sousa [mailto:cristinasousarealestate@gmail.com]
Sent: Tuesday, February 14, 2017 12:46 PM
To: Craig Kazanjian <craig@kazbrothers.com>
Subject: Re: Bradford / Sousa Landscaping

Craig,

My husband and I reviewed the landscaping draft last night. We like the wooden fence and the landscaping on the back of our property. On the side we would like the wooden fence to come all way to the corner of our house instead of making it just half way. We want it to look even with the other side of the house. What kind/style of wooden fence will this be? Will you match what we have on the other side? Last but not least we would prefer if more of the Thuja Occidentalis (T0) trees would be planted along the side of our property line rather than the smaller trees. It would give both sides more privacy.

Thank you
Cristina

On Mon, Feb 13, 2017 at 5:08 PM, Craig Kazanjian <craig@kazbrothers.com> wrote:

Mrs. Sousa,

Attached here is an updated draft of the proposed landscaping around your property. There are 2 attachments: the new layout, and the corresponding landscaping legend.

We added a 6 foot high board-on-board fence around the back of your property, and down a portion of the side. The fence is shown in red on the layout.

Please review and let me know your thoughts.

Craig

From: Cristina Sousa [mailto:cristinasousarealestate@gmail.com]

Sent: Thursday, January 26, 2017 12:01 PM

To: Craig Kazanjian <craig@kazbrothers.com>

Subject: Re: Bradford / Sousa Landscaping

Thank you

On Thu, Jan 26, 2017 at 11:19 AM Craig Kazanjian <craig@kazbrothers.com> wrote:

I'm meeting with the engineer on Monday. I will get more clarification on the plan, and get back to you with more details next week.

Craig

From: Cristina Sousa [mailto:cristinasousarealestate@gmail.com]

Sent: Wednesday, January 25, 2017 4:23 PM

To: Craig Kazanjian <craig@kazbrothers.com>

Subject: Re: Bradford / Sousa Landscaping

Craig,

I was just taking a look at the draft and see that you won't plant trees all the way along my property line also I'm not sure if you are installing a fence along that side of my property. Could you please clarify that for me?

Thank you

Cristina Sousa

On Tue, Jan 24, 2017 at 3:54 PM, Craig Kazanjian <craig@kazbrothers.com> wrote:

Mrs. Sousa,

Attached here is the Landscaping Plan Legend with the various types of trees, and a blow up of your border with the tree codes.

Craig

From: Cristina Sousa [mailto:cristinasousarealestate@gmail.com]

Sent: Saturday, January 21, 2017 11:45 AM

To: Craig Kazanjian <craig@kazbrothers.com>

Subject: Re: Bradford / Sousa Landscaping

Hi Craig,

Thank you for sending me this draft. For me looking at the draft is really hard to tell if this will be enough or not. It seems to be two different types of trees along my property line. I would appreciate if you could tell me what type and size of trees these will be.

Thank you

Cristina Sousa

On Mon, Jan 16, 2017 at 2:34 PM, Craig Kazanjian <craig@kazbrothers.com> wrote:

Mrs. Sousa,

We have completed our 1st draft of the Landscaping Plan for Bradford's Landing. Attached here is a section of the Landscaping Plan which shows a proposed landscaping buffer between your property and the new subdivision.

Please take a look, and let me know if you have any questions or concerns.

Craig

Pereira, Sandra

From: Pereira, Sandra
Sent: Friday, June 09, 2017 11:39 AM
To: 'Cristina Sousa'
Subject: RE: Bradford's Landing Plan#120170060
Attachments: 17-0606 Sousa Landscaping.pdf

Dear Ms. Sousa,

I am writing to follow-up on the request below for additional landscaping and a privacy fence between your property and the proposed development at Bradford's Landing. Site Plan no. 820170060 for Bradford's Landing is now under review and it includes a landscape plan. The landscape plan shows a mix of evergreen trees and shrubs, as well as a 6-foot high board-on-board privacy fence, along the northern and eastern boundaries of your property where it abuts the new development. Please see the attached sketch illustrating the proposed landscaping and fence. The total length of the fence is highlighted in red and blue. The blue section is the additional fence to be provided along the side of your house.

We believe that these measures provide adequate screening and buffering between your property and the proposed development, and therefore improve compatibility between your home and the proposed development. We trust also that these measures address your original request. As always, please don't hesitate to contact me should you have any questions or comments.

Thank you,
Sandra

Sandra Pereira, RLA
Area 3 Acting Supervisor

M-NCPPC Montgomery County Planning Department
8787 Georgia Avenue, Silver Spring, MD 20910
phone (301) 495-2186 :: fax (301) 495-1306
sandra.pereira@montgomeryplanning.org

From: Pereira, Sandra
Sent: Thursday, November 10, 2016 3:17 PM
To: 'Cristina Sousa' <cristinasousarealestate@gmail.com>
Subject: RE: Bradford's Landing Plan#120170060

Dear Ms. Sousa,

Thank you for sharing your concerns with us. As part our review process, we assess compatibility of the proposed development with existing homes. Common measures used to achieve or improve compatibility include landscaping and privacy fences. We agree that such measures should be applied where the new development abuts your property.

Please note that these recommendations are best suited as part of Site Plan review, which includes a landscape plan and is more detailed than a preliminary plan. Currently, the project is undergoing Preliminary Plan review with a tentative Planning Board Hearing date of December 15. It is our understanding that the Applicant (developer) intends to submit the required Site Plan application early in January. We will raise these concerns and recommendations at that time.

Please don't hesitate to contact me should you have further questions or concerns.

Sincerely,
Sandra

Sandra Pereira, RLA
Area 3 Coordinator

M-NCPPC Montgomery County Planning Department
8787 Georgia Avenue, Silver Spring, MD 20910
phone (301) 495-2186 :: **fax** (301) 495-1306
sandra.pereira@montgomeryplanning.org

From: Cristina Sousa [<mailto:cristinasousarealestate@gmail.com>]
Sent: Tuesday, November 08, 2016 9:40 AM
To: Pereira, Sandra <sandra.pereira@montgomeryplanning.org>
Subject: Bradford's Landing Plan#120170060

Hello,

My name is Cristina Sousa, and I am currently living at 3521 Norbeck Rd in Silver Spring MD. I am writing to you today with concerns about the plans for the new development that was recently made public that will be constructed next door to my home.

I was hoping to request that the developer consider planting trees and installing a fence between my property and the town homes that will be built so as to keep the privacy of my home intact, as well as that of the new neighbors.

Since the construction of the other development on the west side of my property (Norbeck Crossing) in the last three years, there has been an increase in the numbers of homes and families moving into my neighborhood, further decreasing the privacy of my family and I once had. Though I understand this is expected with new developments, we are requesting that the new developer could create a barrier similar to what the previous developer did. The developers of Norbeck Crossing provided both their new residents and my family with improved privacy between the properties by building a wooden fence and planting a tree line on the development's side.

Please take this in consideration. I have lived in my home for over 14 years, and though new developments are to be expected, I am hoping that the integrity and privacy of my home remain on a similar level.

Thank you,

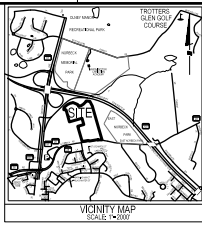
Cristina Sousa
301 219 3251

Attachment I
Final FCP Composite

BRADFORD'S LANDING

FINAL FOREST CONSERVATION PLAN

820170060
(8th) ELECTION DISTRICT MONTGOMERY COUNTY, MARYLAND



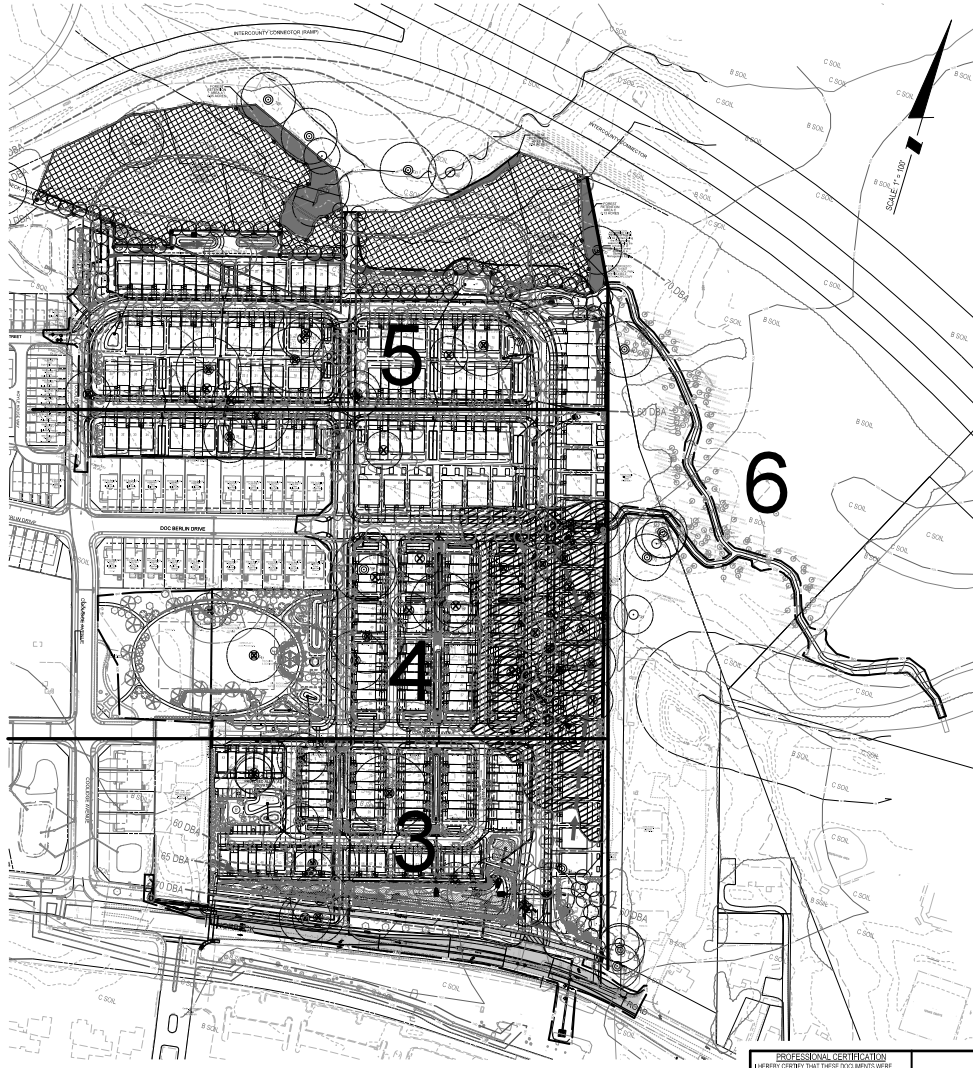
PLANNING DEPARTMENT USE ONLY (E-PLANS)

FOREST CONSERVATION WORKSHEET									
Bradford Landing									
May 18, 2011									
NET TRACT AREA:									
Input the number "1" under the appropriate land use.									
Limit to only one entry.									
A. Total tract area	26.74								
B. Land dedication acres (park, county facility, etc.)	0.00								
C. Land dedication for roads or utilities (not being constructed by this plan)	0.00								
D. Area to remain in commercial agricultural production	0.00								
E. Office Disturbance (off-site area outside LDD for Greenbelt at Norbeck Crossing)	3.07								
(0.57 acres for off-site park plus 1.50 acres for Norbeck Road and Bradford Road disturbance outside limits already accounted for from Greenbelt at Norbeck Crossing FCP approval)									
F. Net Tract Area	30.61								
LAND USE CATEGORY: (from Tree Technical Manual)									
Input the number "1" under the appropriate land use.									
Limit to only one entry.									
AREA	MDR	ICA	HER	MPD	CA	D			
0	0	0	1	0					
G. Afforestation Threshold	15%	x F =	4.62						
H. Conservation Threshold	20%	x F =	6.16						
EXISTING FOREST COVER:									
J. Existing forest cover									3.85
K. Area of forest above afforestation threshold									0.00
L. Area of forest above conservation threshold									0.00
BREAK EVEN POINT:									
M. Forest retention above threshold with no mitigation									0.00
N. Clearing permitted without mitigation									0.00
PROPOSED FOREST CLEARING:									
O. Total area of forest to be cleared									3.33
P. Total area of forest to be retained									0.52
PLANTING REQUIREMENTS:									
Q. Reforestation for clearing above conservation threshold									0.00
R. Reforestation for clearing above conservation threshold									0.00
S. Credit for retention above conservation threshold									0.00
T. Total reforestation required									6.66
U. Total afforestation required									0.77
V. Credit for landscaping (may not exceed 20% of "U")									1.33
W. Total reforestation and afforestation required									8.10
X. Total reforestation and afforestation provided onsite									4.89
Y. Total reforestation and afforestation provided offsite									1.41

AFFORESTATION AREAS	
AREA 'A'	2.08 AC.
AREA 'B'	1.61 AC.
TOTAL	4.69 AC.

GENERAL NOTES:

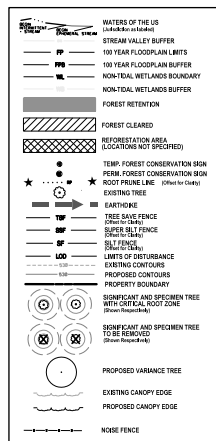
- THE EXISTING ZONE IS R-200 / TDR-7.
- BOUNDARY INFORMATION IS FROM A SURVEY PREPARED BY SOLTESZ, INC.
- THE PROJECT LIES WITHIN THE QUINCY MASTER PLAN.
- THIS SITE LIES WITHIN THE NORTHWEST BRANCH - BACHELOR'S RUN WATERSHED. THIS AREA IS NOT A SPECIAL PROTECTION AREA.
- PEPCO, BELL ATLANTIC, INC., WASHINGTON GAS LIGHT CO. OF MD., THE CITY OF ROCKVILLE, WASHINGTON SUBURBAN SANITARY COMMISSION AND CABLE TV MONTGOMERY ARE THE PUBLIC UTILITY COMPANIES THAT WILL PROVIDE SERVICE TO THE PROPOSED DEVELOPMENT.
- THE PROPOSED LAYOUT, PARKING, DRIVEWAYS, BUILDINGS AND UTILITIES ARE APPROXIMATE AND SUBJECT TO CHANGE.
- NO FLOODPLAIN EXISTS ON SITE.
- THERE ARE NO DESIGNATED HISTORIC SITES ASSOCIATED WITH THESE PARCELS.
- THERE ARE NO KNOWN RARE, THREATENED, OR ENDANGERED SPECIES OCCURRING ON THIS PROPERTY.
- EXISTING WATER AND SEWER SERVICE CATEGORIES: W-1S-1, W-3S-3
- PORTIONS OF NORBECK AVENUE AND BRADFORD ROAD WILL BE ABANDONED.
- A COMBINATION OF SUPER SILT FENCE AND TREE PROTECTION FENCE CAN ONLY OCCUR WITH THE APPROVALS OF BOTH THE M-NPCPP FOREST CONSERVATION INSPECTOR AND THE DPS SEDIMENT CONTROL INSPECTOR.



Forest Conservation Data Table	
Number of Acres	
Tract	26.74
Remaining in Agricultural Use	0.00
Road & Utility ROWs	0.00
Total Existing Forest	3.85
Forest Retention	0.52
Forest Cleared	3.33
Land Use & Thresholds	
Land Use Category	MDR
Conservation Threshold	20%
Afforestation Threshold	15%
Total Channel	
Length (ft.)	30
Average Buffer	
Width (ft.)	125
Acres of Forest in	
Wetlands	0.00
100-year Floodplain	0.00
Stream Buffers	0.00
Priority Areas	0.00

1. Only Road or Utility ROWs need to be measured as part of development application.
2. Landowners/owners/conservation easements & thresholds allowed.
3. Measured from the stream edge to buffer edge.

LEGEND



SHEET INDEX:

- F.1. COVER SHEET
F.2. FCP DETAILS
F.3. 30 SCALE FCP ENLARGEMENT
F.4. 30 SCALE FCP ENLARGEMENT
F.5. 30 SCALE FCP ENLARGEMENT
F.6. 40 SCALE FCP ENLARGEMENT

COVER SHEET



Rockville Office
2 Research Place, Suite 100
Rockville, MD 20850
P. 301.948.2750 F. 301.948.9067
www.soltesz.com

Rockville
Lanham
Water
Leesburg
Potsdam
Soltesz, Inc. LLC

MSS UTILITY NOTE

ANY UTILITIES SHOWN ON THIS PLAN ARE BASED ON THE RECORD DRAWINGS AND FIELD SURVEY. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO CONSTRUCTION. ANY UTILITIES NOT SHOWN ON THIS PLAN SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. ANY UTILITIES SHOWN ON THIS PLAN SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. ANY UTILITIES NOT SHOWN ON THIS PLAN SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

OWNER/DEVELOPER/APPLICANT

BROOKFIELD WASHINGTON, LLC
3201 JERMANTOWN ROAD, SUITE 150
FAIRFAX, VA 22030
202.880.2121
CONTACT: CHRIS KAZAKIAN

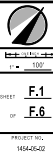
PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THE FOREST CONSERVATION PLAN PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
ENGINEER: SOLTESZ, INC. EXPIRATION DATE: 04/01/2017



FINAL FOREST CONSERVATION PLAN BRADFORD'S LANDING

QUINCY 8TH ELECTION DISTRICT, MONTGOMERY COUNTY, MARYLAND



F.1
OF
F.6

Attachment J

Traffic Noise Impact and Barrier Analysis

October 22, 2016

Neil Patel
Brookfield Residential
3201 Jermantown Road, Suite 150
Fairfax, VA 22030Re: Bradford's Landing
Outdoor Traffic Noise Analysis

Mr. Patel:

This report summarizes the outdoor traffic noise analysis for the Bradford's Landing (formerly known as Norbeck Road Properties and Greenbriar at Norbeck Crossing) project in Montgomery County, MD. Indoor traffic noise levels will be evaluated at a later date when the architectural drawings are farther along. STC ratings required by the building code between adjacent townhouses are not covered in this report.

1. Executive summary

A site survey was performed and sound levels were measured in the locations shown in Figure 2 for seven days. Traffic volumes were counted briefly at the end of the survey. The Traffic Noise Model was used to model existing conditions. The output sound levels compared well to the measured sound levels. Traffic forecasts were provided by the Maryland State Highway administration, with additional information gathered from other sources. The Traffic Noise Model was used to predict future noise levels in outdoor recreation areas and at the facades of residences.

The design goals are to ensure that the Day-Night Average Sound Level (DNL) not exceed 60 dB in usable outdoor areas such as rear yards and tot lots or 45 dB inside residences.

The projected DNL will be as high as 66.2 dB in the rear yard of the most-impacted townhouse lot. In order to reduce noise levels in rear yards we recommend constructing three six- to seven-foot tall walls around townhouse rear yards as located in Figure 11.

The projected DNL will be as high as high as 69.2 dB at the facade of the most-impacted residence. This information can be used in the future to predict indoor traffic noise levels.

2. Introduction

Hush Acoustics LLC was contracted by Brookfield Residential to perform sound level measurements on the site, to model future noise levels, and to design noise barriers, as necessary. This analysis was based on the Bradford's Landing Preliminary Plan drawing prepared by Soltesz dated October 18, 2016. This drawing shows lot and house locations, finished floor elevations of most houses, existing and proposed ground elevations, and the location and elevation of the existing pavement of all nearby roads. The site is located along the south side of Route 200 (the Inter-County Connector), well to the east of Georgia

Avenue (Route 97), and to the north of Norbeck Road (Route 28). A vicinity map is included as Figure 1.

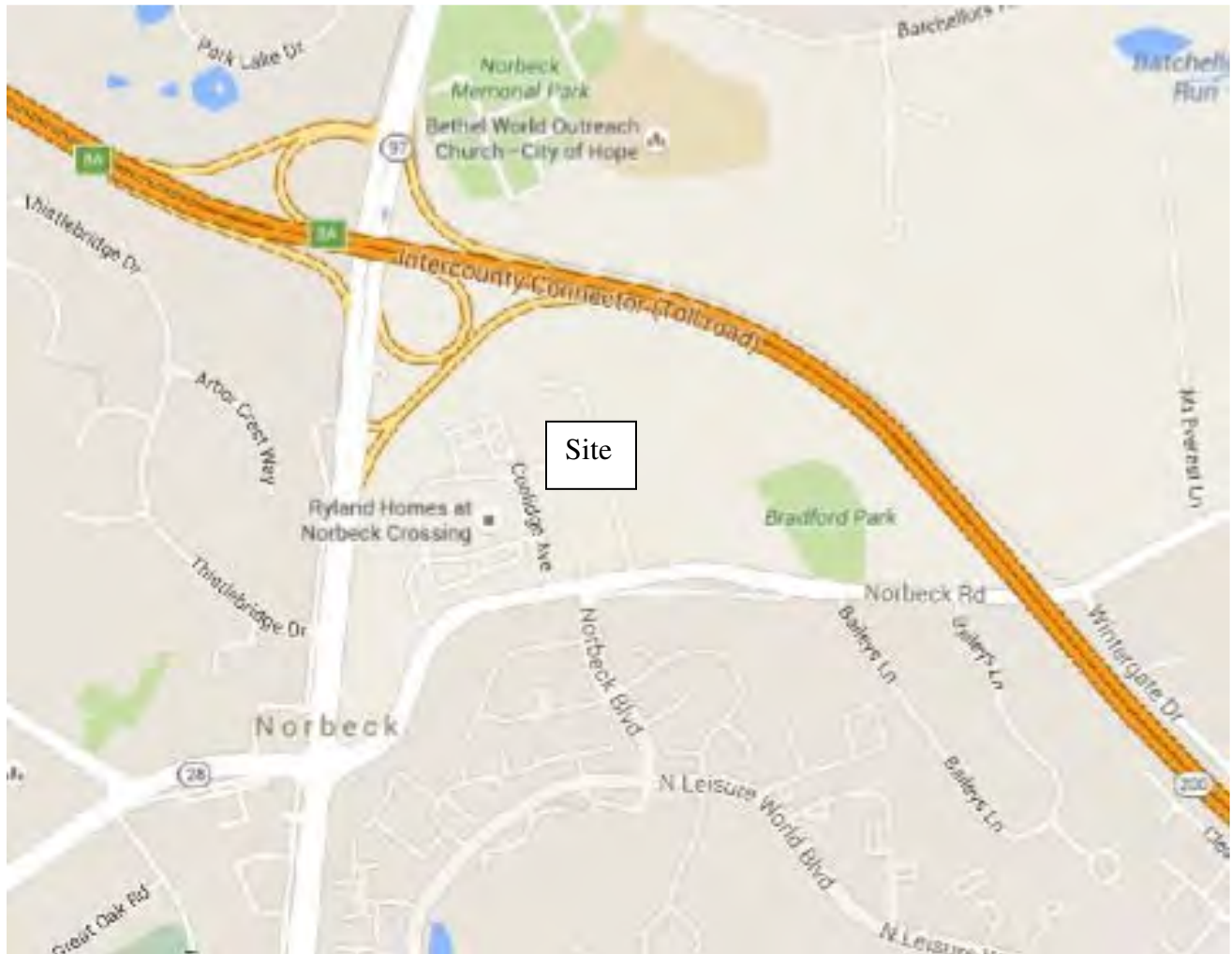


Figure 1. Vicinity Map

Per a conversation with Mr. Mark Pfefferle of Montgomery County Park and Planning staff on December 22, 2006, and with Mr. Josh Penn on February 24, 2012, we understand that Montgomery County uses the 1983 Staff Guidelines to evaluate transportation noise impacts for proposed residential land development. The guidelines provide outdoor DNL criteria as a function of both site location and community type. Per the map, the goal would be 60 dB at the site. However, per Table 2-1 of the guidelines, the DNL goal would be 65 dB along “major highway corridors” and 60 dB typically throughout the county. We had confirmed with a conversation with county staff in 2009 for this site that the goal is 65 dB. However, since the site plan requirement for the adjacent Ryland Homes site was 60 dB, we assumed county staff would use a 60 dB goal for this site as well. Although the Staff Guidelines say the noise level goals apply at the building line, from conversations with county staff we learned that they should be evaluated in usable outdoor areas such as rear and sometimes side yards, as

well as common recreation areas. It was assumed the criteria do not apply on elevated decks or at rear-loaded townhouses (since there are no usable outdoor yard areas). The Montgomery County Staff Guidelines also state that the interior noise guideline is a DNL of 45 dB.

3. Site survey

The purposes of the site survey are as follows:

1. to collect noise level data on the site. Noise level data are useful for the following reasons:
 - a. to determine how the hourly average sound levels compare to the Day-Night Average Sound Levels (DNL). The DNL is the noise metric used by Montgomery County, MD. However, the Traffic Noise Model (TNM) uses the hourly average sound level. For locations mostly impacted by traffic noise, the relationship between the DNL and loudest hour average sound level is relatively constant. The measured sound levels are useful for determining this relationship.
 - b. to identify any significant non-traffic noise sources.
2. to observe traffic conditions such as prevailing speeds, classifications (i.e., percentages of automobiles, trucks, buses, and motorcycles), and directional distributions. Many of these parameters are not well documented in traffic studies. The prevailing speed often differs from the posted speed limit.
3. to observe road conditions such as locations and timing of traffic flow control devices (e.g., traffic signals, stop signs, and toll booths), and the pavement type.
4. to observe site conditions not represented on the site plan such as the presence and height of existing noise barriers along the road right-of-way.

The purpose of the site survey was not to determine how loud it is at the site. That is performed using the computerized noise modeling discussed below.

3.1 Sound level measurement procedure

Larson Davis model 831 and LxT sound level meters were installed in the locations indicated M1 and M2 in Figure 2 from approximately 12 pm on Wednesday March 2, 2016, through approximately 3 pm on Wednesday March 9, 2016. The sound level meters were programmed to report average, maximum, and minimum A-weighted sound levels during each one-minute interval. For an explanation of A-weighted sound levels see the appendix. The meters were chained to trees and the microphones were attached to poles 27 and 18 feet above the ground at locations M1 and M2, respectively.

3.2 Site observations

The site currently has a few single-family residences with large areas of lawns and some areas of forest, and is generally at a lower elevation than Route 200 (i.e., the Inter-County Connector). The main noise sources on the site are traffic on Route 200 and Norbeck Road. There is also some sound from birds and wind (it was quite windy during set up). Although Georgia Avenue is quite far from the site, it was included to be conservative.

There is a traffic signal on Georgia Avenue just south of Route 200. There is a traffic signal on Norbeck Road near the site at Norbeck Boulevard. There are no traffic signals on Route 200.

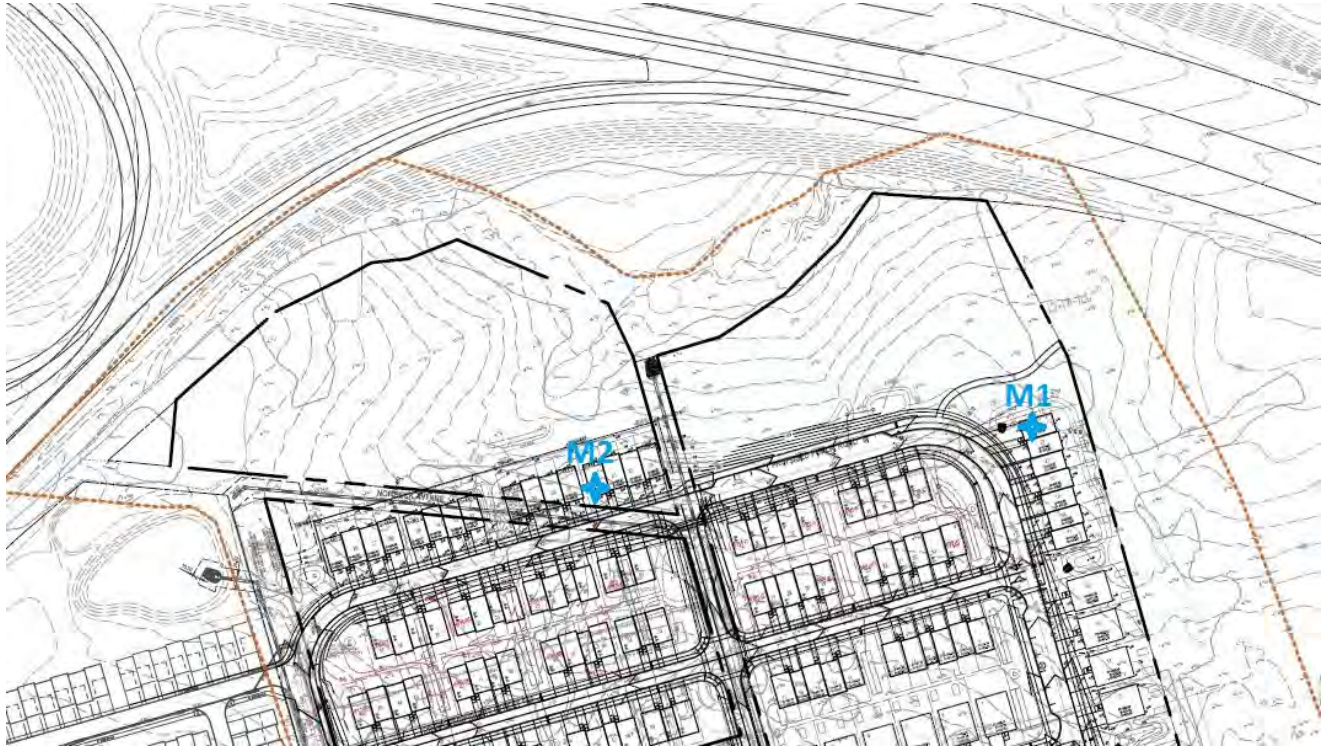


Figure 2. Sound Level Meter Locations

Route 200 has three through lanes of traffic each direction, with an on- and off-ramps for Georgia Avenue. Georgia Avenue has three through lanes of traffic each direction, with a variety of turning lanes at the site. Norbeck Road has one through lane of traffic each direction.

The posted speed limits are 60 mph on Route 200, 50 mph on Georgia Avenue, and 40 mph on Norbeck Road.

3.3 Measured sound levels

Average sound levels during five-minute intervals were calculated based on the measured one-minute average sound levels. Figure 3 presents the resulting five-minute average sound levels. Hourly average sound levels were calculated based on the five-minute average sound levels. Figure 4 presents the hourly average sound levels. The Day-Night Average Sound Levels (DNL) were calculated for each full calendar day. Table 1 presents the DNL and loudest-hour average sound level, and the difference between the two, for each calendar day.

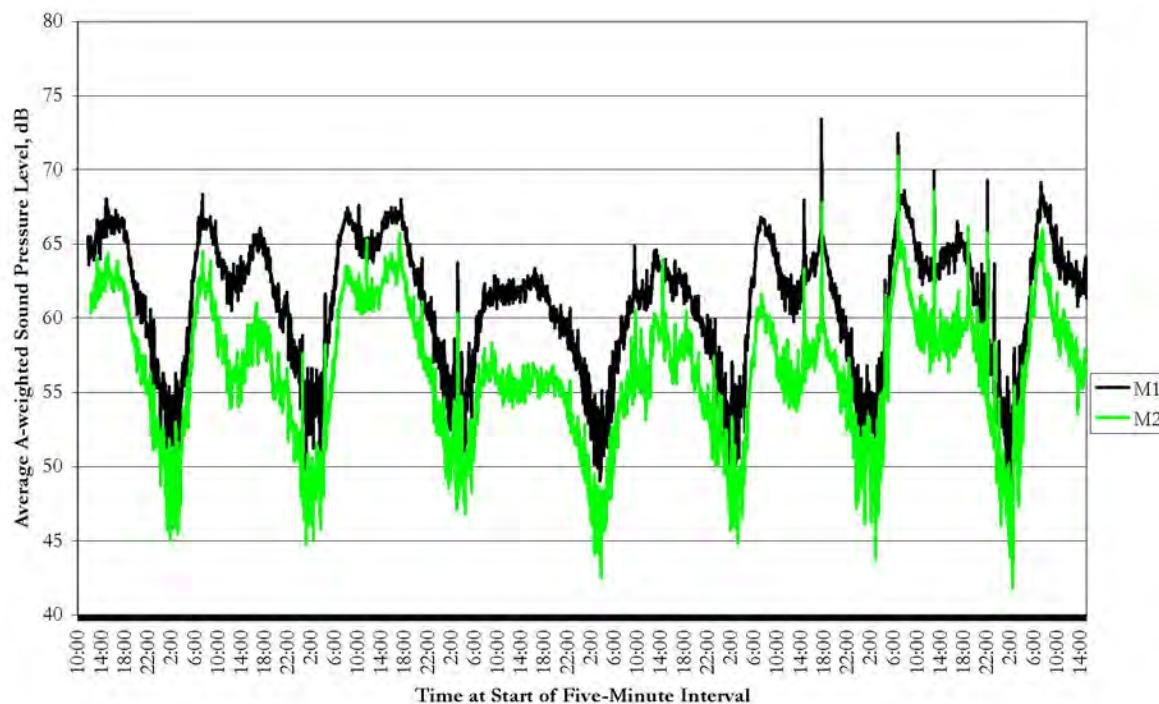


Figure 3. Five-Minute Average Sound Levels

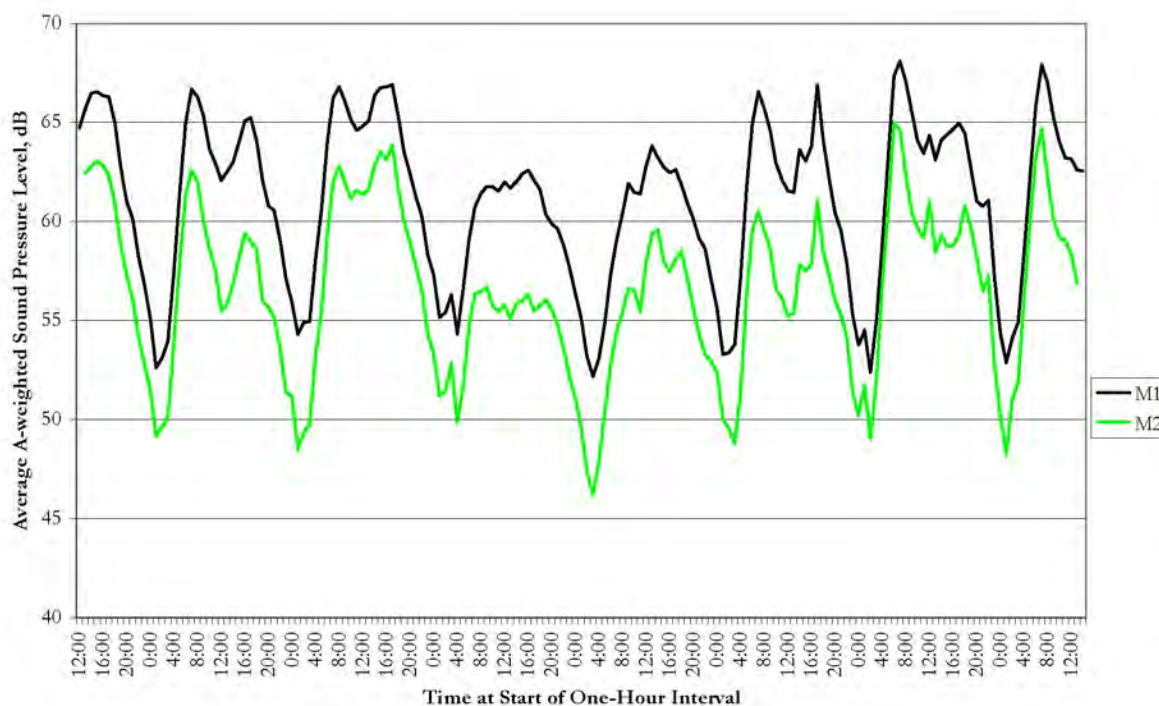


Figure 4. Hourly Average Sound Levels

Table 1. Measured DNL and Loudest-Hour Average Sound Levels, dB

Day, Date	DNL		Loudest-Hour Average Sound Level		DNL Minus Loudest-Hour Average	
	M1	M2	M1	M2	M1	M2
Wed, March 02, 2016			66.5	63		
Thu, March 03, 2016	66.7	62.3	66.7	62.6	0.0	-0.2
Fri, March 04, 2016	67.2	63.0	66.9	63.8	0.3	-0.8
Sat, March 05, 2016	64.4	59.6	62.6	56.7	1.9	2.9
Sun, March 06, 2016	63.7	58.9	63.8	59.6	-0.1	-0.6
Mon, March 07, 2016	66.5	61.3	66.9	61	-0.4	0.2
Tue, March 08, 2016	68.1	65.0	68.1	65	0.0	0.0
Wed, March 09, 2016			67.9	64.7		

Table 2. Extrapolated Hourly Traffic Volumes and Prevailing Speeds

Time	Lanes	Speed	Autos	Medium Trucks	Heavy Trucks	Buses	Motorcycles
145-155 pm	GA Ave NB to Rt 200 EB	-	276	18	6	6	0
	Rt 200 EB to GA Ave NB	43.5	210	6	0	6	0
	Rt 200 EB (w/o ramp to GA NB)	67	912	36	60	0	0
	Rt 200 WB (w/ ramp to GA NB)	65	972	48	36	12	12
200-210 pm	GA Ave SB	44	1200	30	12	6	12
	GA Ave NB	47	1284	18	12	12	12
222-232 pm	Norbeck WB	33	606	6	12	6	0
	Norbeck EB	37	612	0	36	0	6

3.4 Traffic counts

Traffic volumes were counted during a ten -minute interval for each direction of traffic at the end of the survey on Wednesday March 9, 2016. From these volumes the hourly average traffic volumes were extrapolated. Table 2 presents the extrapolated hourly traffic volumes. Automobiles include pickup trucks, passenger cars hauling trailers, and vans. Medium trucks are six-wheeled cargo vehicles with two axles. Heavy trucks are cargo vehicles with three or more axles. Speeds were determined using a hand-held radar gun. The median speeds for dozens of vehicles are listed in Table 2.

3.5 Weather

Weather can affect both the propagation of sound from a roadway, as well as produce sound by rustling leaves or causing wind or rain noise at the microphone. For these reasons, weather conditions were documented during the survey. Hourly weather information was obtained from the website Weather Underground. The following precipitation and wind faster than 10 mph were noted:

- Mar. 2 – 10-20 mph wind (gusts to 34 mph) from W to NW at the start of the survey to 8:30 pm
- Mar. 4 – 8-12.7 mph wind (gusts to 18.4 mph) from the N to NW at 12:30 to 4:30 pm

4. Outdoor noise modeling

4.1 TNM overview

In the United States, roadway traffic noise levels are typically analyzed using the Federal Highway Administration's (FHWA) Traffic Noise Model (TNM). The current version is 2.5. The output from TNM is the hourly average sound level at the receivers. The program allows input of the following information:

- Coordinates of selected points along the road centerlines
- Pavement width and type
- Road locations that are elevated (structure roadways)
- Hourly volumes and speeds of autos, medium trucks, heavy trucks, buses, and motorcycles for each road segment
- Locations of traffic flow control devices such as stop signs, traffic signals, and toll booths at the start of roads
- Coordinates and heights of evaluation points (receivers)
- Coordinates of ground elevations in selected locations (terrain lines)
- The default ground type
- Coordinates and height of areas covered with thick evergreen forest (tree zones)
- Coordinates of existing and proposed objects that shield the site such as noise walls and buildings (barriers)
- Coordinates, height and spacing between buildings of rows of buildings which partially shield the site (building rows)

Not used for this project:

- Coordinates and ground material in selected locations (ground zones)

4.2 TNM validation

The traffic volumes and speeds presented in Table 2 were input into TNM. This TNM run is called the validation run. The following roads were used in TNM:

- Three separate roads representing each through lane of Route 200 eastbound
- Three separate roads representing each through lane of Route 200 westbound
- One road representing the ramp from Route 200 eastbound to GA Avenue NB
- One road representing the ramp from GA Avenue NB to Route 200 eastbound
- One road representing all 3 lanes of GA Avenue NB before the traffic signal (the one immediately to the south of Route 200)
- One road representing all 3 lanes of GA Avenue NB after the traffic signal
- One road representing all 3 lanes of GA Avenue SB before the traffic signal
- One road representing all 3 lanes of GA Avenue SB after the traffic signal
- Norbeck Road EB before the traffic signal at Norbeck Blvd

- Norbeck Road EB after the traffic signal at Norbeck Blvd
- Norbeck Road WB before the traffic signal at Norbeck Blvd
- Norbeck Road WB after the traffic signal at Norbeck Blvd

The locations and elevations of selected points along each road, and the width of each road, were taken from the Preliminary Plan. Per FHWA guidance all pavement was modeled as “Average.” The effects of the traffic signals on Norbeck Road at Norbeck Blvd and on Georgia Avenue just south of Route 200 were included. We performed on-site counts and estimated the percentages of traffic that slowed to 5 mph or less due to the traffic signal to be as follows:

- 50% WB on Norbeck Road
- 46% EB on Norbeck Road
- 27% NB on Georgia Avenue (the same percentage was used on the SB lanes)

One terrain line was added along the southern edge of the ramp from Georgia Avenue NB to Route 200 EB to model the change in elevation between the road and site. Ground elevations were determined from the site plan.

Tree zones were added along Route 200 to the north and east of the site. Ground elevations of the tree zones were determined from the site plan. The trees were assumed to be 50 feet tall.

Barriers were added to represent the existing buildings to the west and south of the site. Ground elevations and building elevations were estimated based on information in the computer program Google Earth.

The default ground type was lawn.

The output sound levels were then compared to the sound levels measured during the traffic counts. Table 3 presents this comparison.

Table 3. Comparison of TNM Validation Run Output and Measured Sound Levels, dB

	M1	M2
Measured During Traffic Counts at 1:45 to 1:55 pm	62.8	56.6
TNM Output	63.0	59.3
TNM Minus Measured	+0.2	+2.7

It can be seen from Table 3 that TNM was conservative, producing sound levels between 0.2 and 2.7 dB higher than were measured. This level of agreement between the modeled and measured sound levels is reasonable and within the accepted level of accuracy of TNM.

4.3 Future traffic conditions

In an e-mail on March 14, 2016, the Maryland State Highway Administration provided the following traffic forecasts:

MD 97 – 0.25 mile north of MD 28:

- 2016 ADT 49,000
- 2036 ADT 53,750

MD 28 – 0.10 mile E of MD 97:

- 2016 ADT 22,850
- 2040 ADT 27,600

In order to use a single future date in the analysis we extrapolated from the SHA data to estimate the ADT on Georgia Avenue for the year 2040. The provided data implies an annual escalation factor of 0.5%. Using this factor, we estimate that the 2040 ADT will be 54,833 on Georgia Avenue.

SHA also provided hourly counts for the 48-hour period from September 1 to 2, 2015, for Georgia Avenue 0.25 miles north of Norbeck Road. From these data we determined the following:

- We used data for 5-6 pm. Route 200 has more traffic in the afternoon than the morning, and it controls noise levels on the site, so we need to use afternoon peak-hour data for Georgia Avenue to be consistent. The 5-6 pm hour has the highest total traffic volume in the afternoon and a high percentage of trucks.
- 5-6 pm included 7.9% of the total daily traffic volume.
- At 5-6 pm, 56.6% of traffic was heading northbound.
- At 5-6 pm, traffic included 1.0% medium trucks, 1.1% heavy trucks, 0.4% buses, and 0.3% motorcycles.

SHA also provided hourly counts for the 48-hour period from September 29 to 30, 2015, for Norbeck Road 0.1 mile east of Georgia Avenue. From these data we determined the following:

- We used data for 8-9 pm since it likely is the loudest hour. It has far more trucks than in the afternoon, and almost as much total traffic as in the afternoon, with more traffic on the westbound lane closest to the site.
- 8-9 am included 8.1% of the total daily traffic volume.
- At 8-9 pm, 65.7% of traffic was heading westbound.
- At 8-9 pm, traffic included 3.1% medium trucks, 2.1% heavy trucks, 0.5% buses, and 0.4% motorcycles.

Additional information was obtained from the document entitled “Travel Characteristics on MD 200 Intercounty Connector (ICC) & Vicinity” dated June 19, 2013, prepared by the Washington Council of Governments. Per Figure 5 entitled “Average Weekday Projections for ICC (by Segment/Direction)” the 2040 volumes are 32,088 westbound and 36,677 eastbound. Per Figure A5 entitled “2040 ICC Volumes by Time Period (3-7 pm)” part (b) entitled “PM Peak,” during the 4-hour afternoon rush period there are 14,844 vehicles westbound and 15,173 eastbound. This implies a directional factor of 50.5% westbound in the afternoon. Based on the 48-hour counts for Georgia Avenue, the afternoon peak-hour included 27.6% of the total volume during the afternoon rush period of 3-7 pm. This same

factor was applied to the 2040 Route 200 volumes to estimate future peak-hour volumes of 4,092 EB and 4,183 WB.

Per our traffic counts, it was assumed that the 2040 peak-hour traffic volume on the ramp from Georgia Avenue NB would be 23.3% of the total volume on EB Route 200 (or 953 vehicles). Likewise, per our traffic counts it was assumed that the 2040 peak-hour traffic volume on the ramp from Route 200 to Georgia Avenue NB would be 16.9% of the traffic volume on EB Route 200 (or 691 vehicles).

Per the Environmental Impact Statement (EIS) for the ICC it was assumed that the future traffic would include 4% medium trucks and 2% heavy trucks. Per our traffic counts, it was assumed that traffic would also include 0.6% buses and 0.6% motorcycles. These same percentages were used for the ramps to and from Route 200.

We used the speeds from the validation run of 67 mph EB and 65 mph WB on Route 200, 44 mph SB and 47 mph NB on Georgia Avenue, 33 mph WB and 35 mph EB on Norbeck Road, and 43.5 mph on the ramps to and from EB Route 200.

The resulting forecast traffic volumes and speeds are presented in Table 4.

Table 4. Year 2040 Loudest-Hour Traffic Volumes

Lanes	Autos	Medium Trucks	Heavy Trucks	Buses	Motor-cycles	Prevailing Speed (mph)
Ramp GA NB to ICC EB	884	38	19	6	6	43.5
Ramp Rt 200 EB to GA NB	642	28	14	4	4	43.5
Rt 200 EB (not incl. ramp)	2,913	126	63	19	19	67
Rt 200 WB	3,882	167	84	25	25	65
GA Ave SB	1,833	20	21	7	6	44
GA Ave NB	2,389	26	28	10	7	47
Norbeck Rd WB	1,379	46	31	7	6	33
Norbeck Rd EB	719	24	16	4	3	35

4.4 Future traffic noise modeling

TNM was run using the traffic volumes and speeds presented in Table 4. All parameters from the validation run were retained for the future run, including the following:

- Road locations, pavement types, widths, elevations, and traffic signals
- Default ground type
- Barriers for existing buildings to the east and west
- Terrain line to the south of the ramp from Georgia Avenue NB to Route 200 EB
- Tree zones

The only changes from the validation run, other than the traffic volumes and speeds, were:

- the deletion of some barriers of houses to be removed along Norbeck Road

- the addition of barriers representing the proposed townhouses
- the addition of terrain lines representing the top and bottom of the proposed retaining wall along the row of northern townhouses
- the addition of building rows representing the proposed single-family houses
- the addition of receivers at the houses and in outdoor recreation areas

The outdoor recreation areas included rear yards of front-loaded townhouses (not rear-loaded townhouses), rear yards of single-family detached houses, a small common recreation area just behind the southern-most row of townhouses, and a large common active recreation area in the middle of the site.

4.5 Future outdoor traffic noise levels

It can be seen from Table 2 that the DNL on weekdays was between 0.8 dB below and 0.3 dB above the loudest-hour average sound level. The future loudest-hour average sound levels were output from TNM. To be conservative, we assumed that in the year 2040 the DNL would be approximately 1 dB greater than the loudest-hour average sound level for locations along both Route 200 and Norbeck Road. This assumption is equivalent to assuming that a slightly higher percentage of traffic would travel on Route 200 and Norbeck Road at night (between 10 p.m. and 7 a.m.) than presently do along Route 200.

The resulting year 2040 DNL are presented in Figures 5 through 10. It can be seen from Figures 5 and 8 that the DNL will exceed the limit of 60 dB in some townhouse rear yards along Route 200. Therefore, there is a need for noise barriers to meet the county criteria along Route 200. It can be seen from Figures 6 and 7 that the DNL will not exceed the limit of 60 dB in outdoor areas along Norbeck.

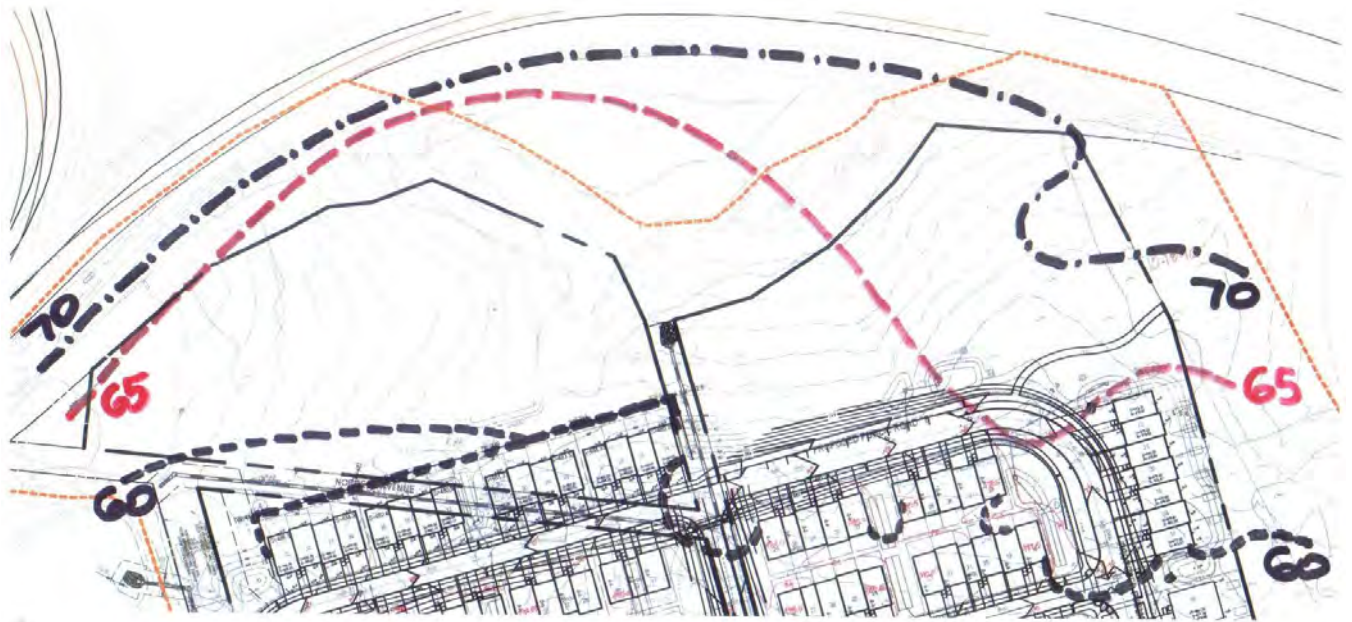


Figure 5. Year 2040 DNL, dB, Contours Five Feet High along Route 200



Figure 6. Year 2040 DNL, dB, Contours Five Feet High along Norbeck Road



Figure 7. Year 2040 DNL, dB, in Rear Yards and Common Recreation Area at Norbeck Road

5. Outdoor highway noise mitigation

As noted above, noise barriers are required to meet the county criteria. We recommend constructing the following three noise walls as shown in Figure 11:

- A seven foot tall wall along the rear yards of townhouse lots 24 to 39 (at the northern side of the site), with perpendicular returns toward the houses. The wall is located at the top of the proposed retaining wall.
- An L-shaped wall along the rear yards of townhouse lots 17 to 23 (at the northern corner of the site) with a height of 6 feet at the rears of lots 17 to 23 and 7 feet for the short leg at the side of

lot 23. Also, it is necessary to re-grade the rear yards of lots 17 to 23 such that the yard elevations are no more than 1 foot higher than the bottom of the noise wall at that lot.

- A small three-legged six-foot tall wall at the rear yards of townhouse 18 and 38 toward the northern corner of the site.



Figure 8. Year 2040 DNL, dB, in Rear Yards along Route 200



Figure 9. Year 2040 DNL, dB, at Facades of Residences on Top Floor along Norbeck Road

These barriers can consist of noise walls made of a variety of materials such as wood, metal, concrete, and CMU. If a wood noise wall design is selected, we recommend using a design such as the one shown in Figure 12. Whatever wall type is used, it must not have gaps at the ground. Note that we are not

structural or geotechnical engineers and are expressing no opinion about the structural or geotechnical strength of any walls that we propose.

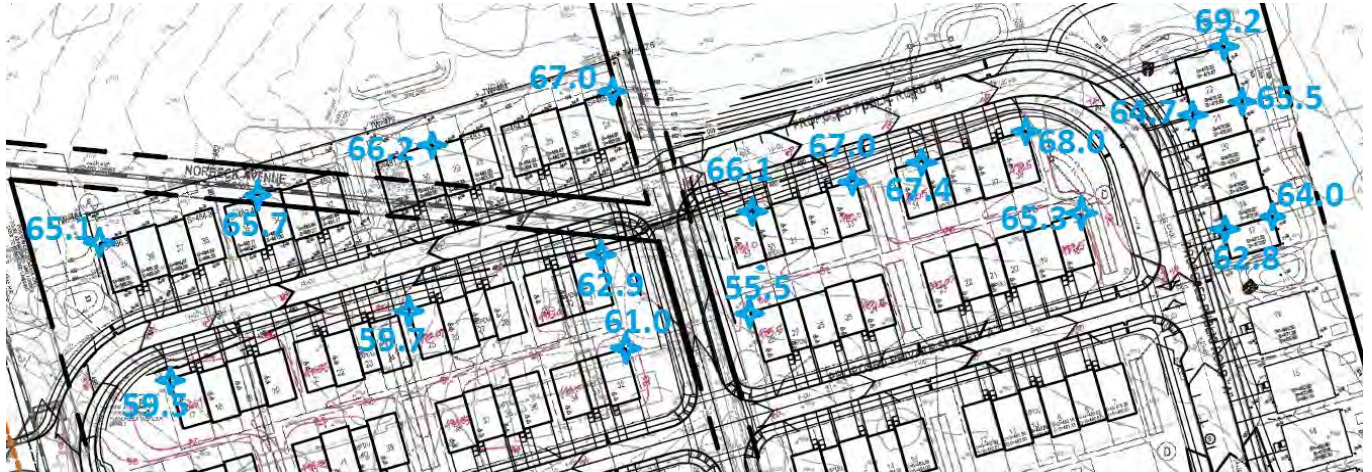


Figure 10. Year 2040 DNL, dB, at Facades of Residences on Top Floor along Route 200

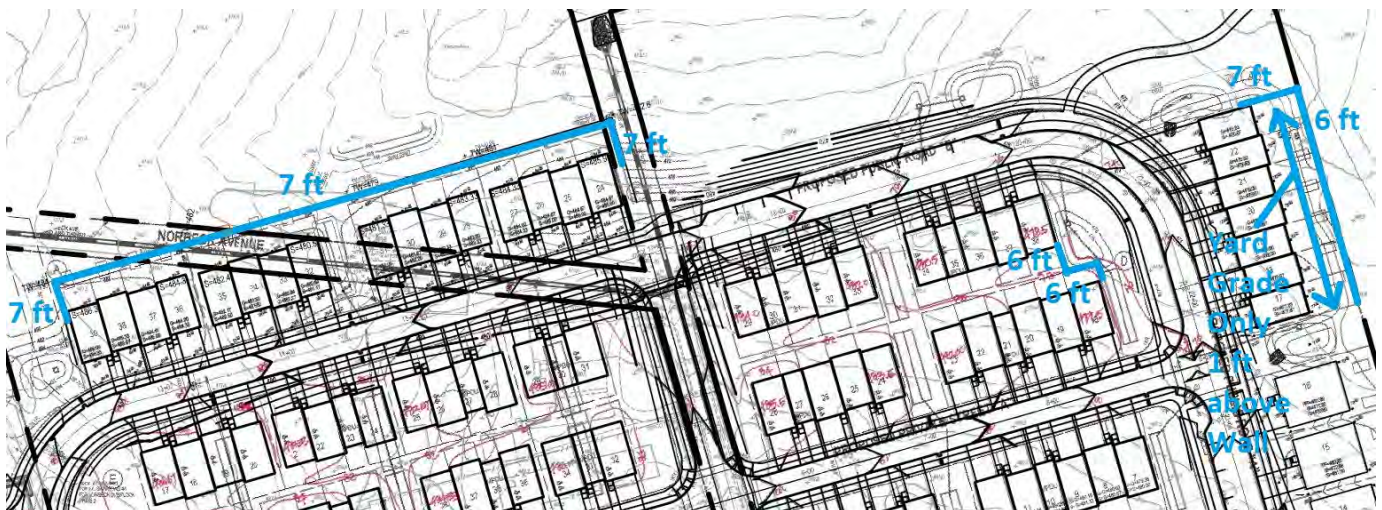


Figure 11. Proposed Noise Walls along Route 200

The following appendices provide additional information about acoustical terminology and criteria, and the precision of this analysis. If you have any questions, please contact me at 703/534-2790 or via e-mail at Gary@HushAcoustics.com.

Sincerely,

Gary Ehrlich

Gary Ehrlich, P.E.
Principal

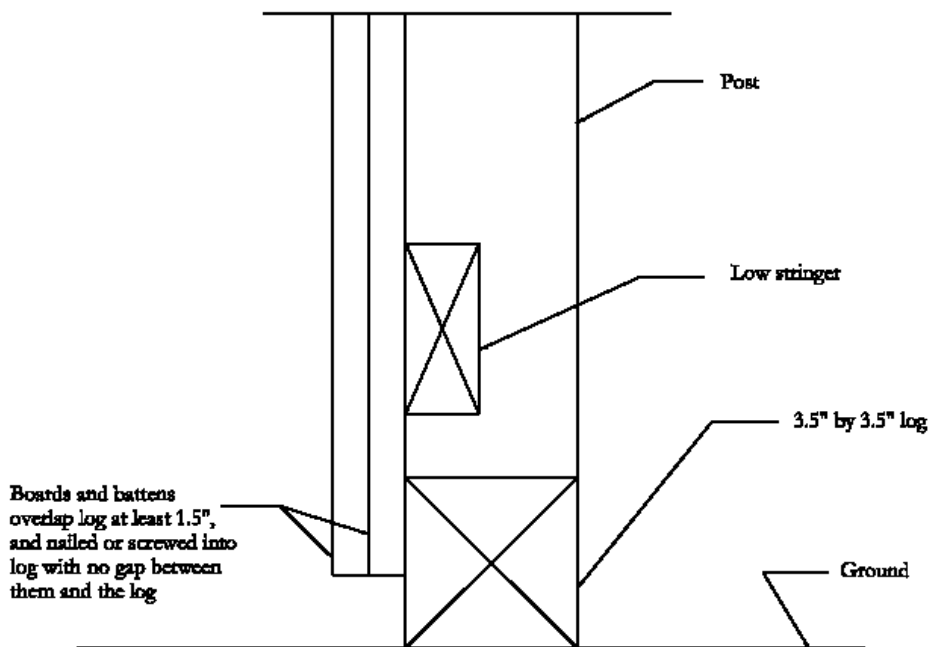
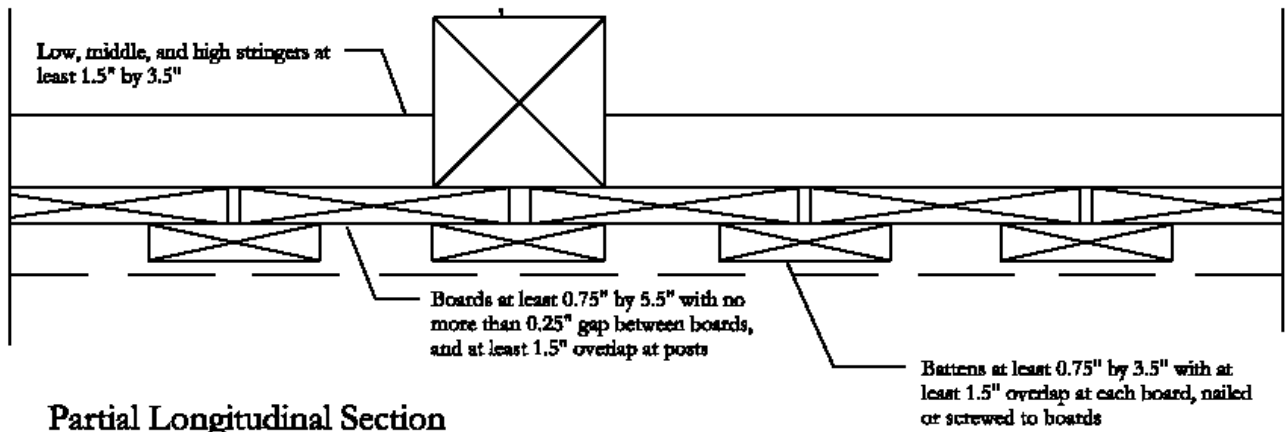


Figure 12. One Acceptable Wood Noise Wall Detail

Appendix A – Noise Metrics

There are many different ways to express sound levels, but all ways must have some means of incorporating the three most important aspects of the sound: loudness (level), pitch (frequency), and duration (time pattern). The chosen way to express the sound level is known as the noise metric.

Level. The sound level is almost always expressed in decibels, abbreviated dB. The decibel is a unitless quantity; it is technically based a ratio between the sound pressure and a standard reference pressure. Sound level meters can show the sound level varying with a moving needle or changing electronic display. How quickly this display changes, and therefore how quickly the meter responds to changes in sound level, is called the time weighting network or simply the meter “response.” The four most commonly used responses are peak, impulsive, fast, and slow; peak response is the fastest response while slow is the slowest. The peak response is only normally used to evaluate the potential for hearing damage and damage to structures, and is never used to express the annoyance of noise. The impulsive response is only typically used to evaluate loud periodic noises such as pile driving and gun fire. The fast and slow responses are the most commonly used. Fast response is used when the sound level changes relatively rapidly over time as would be the case at a night club or a construction site. Slow response is used when the sound level is relatively steady as would be the case for environmental noise such as near highways, railroads, and airports.

Following are how high A-weighted sound levels are for some familiar sounds (taken from U.S. Environmental Protection Agency documents):

Noises:

Chain saw operator	103-115 dBA
Heavy truck at 50 feet	85-95 dBA
Motorcycle driver	80-115 dBA
Power lawn mower operator	80-95 dBA
Subway rider	80-90 dBA
Train passenger	72-90 dBA
City bus at 50 feet	70-85 dBA
Waste food disposer	67-93 dBA
Automobile at 50 feet	64-88 dBA
Vacuum cleaner	60-85 dBA
Washing machine	47-73 dBA
Refrigerator	45-68 dBA

Average conversational speech at 1 meter:

Inside suburban house	55 dBA
Outdoors in suburban area	55 dBA
Inside urban house	57 dBA
Outdoors in urban area	65 dBA
On a train	66 dBA
On an aircraft	68 dBA

Frequency. The frequency of sound is always expressed in Hertz, abbreviated Hz. The audible frequency range (20 Hz to approximately 15,000 or 20,000 Hz) is typically divided into bands covering one octave,

or one-third of an octave. Each doubling of frequency is defined as one octave. A sound level can then be stated either as a single-value covering the entire audible frequency range, or for a given octave or one-third octave band. When sound levels are stated for the entire audible frequency range, the sound could be filtered to roughly simulate the hearing sensitivity of the average person. There are two commonly-used filter types: A- and C-weighting. An A-weighted sound level is by far the most commonly used, and was designed to approximately represent the hearing sensitivity of a person exposed to sounds of moderate loudness. A C-weighted sound level is occasionally used to assess noise from blasting and other loud short-duration sounds and was developed to approximately represent the hearing sensitivity of a person exposed to loud sounds. For environmental noise studies, or for most other purposes as well, it is assumed that the sound level is A-weighted if there is no specific designation otherwise.

Time Pattern. The variation of a sound level over time is perhaps the most complex of the three parameters, and there are a myriad of ways to express this variation. The various ways can be divided into single-event sound levels and long-term sound levels. Examples of “single events” are a train passby, an aircraft overflight, or a gun firing. Single-event sound levels can be based on the maximum sound level reached during the event (abbreviated L_{max}), the total sound energy produced during the event (known as the sound exposure level, or SEL), or the number of times the sound level exceeds a threshold value (known as the number of events above, or NA). Long-term sound levels must be based on sound levels over a given time interval. Common time intervals are one hour and 24 hours. During this time interval the stated quantity could be the average sound level (known as the equivalent-continuous sound level, or L_{eq}), the amount of time the sound level exceeds a threshold value (known as time above, or TA), or the sound level exceeded any set percentage of the time (known as the statistical sound level; e.g., the sound level exceeded ten percent of the time is written L_{10} , while the sound level exceeded 90 percent of the time is written the L_{90}). One-hour average sound levels, or occasionally one-hour statistical sound levels, are used by the Federal Highway Administration and state departments of transportation to express highway noise levels. The sound level exceeded 90 percent of the time, L_{90} , is often considered the background sound level, since it is not significantly affected by loud periodic noise events. 24-hour average sound levels, and occasionally 24-hour statistical sound levels, are typically used to express all forms of transportation noise including highway, aircraft, and railroad noise. The 24-hour average noise level can include some adjustments to account for peoples’ increased sensitivity to noise in the evening and at night. The two most common ways to account for this sensitivity is with the Day-Night Average Sound Level (DNL) and the Community Noise Equivalent Level (CNEL). The DNL is just a 24-hour average sound level for a calendar day with 10 dB added to all noise which occurs between 12 a.m. and 7 a.m. and between 10 p.m. and midnight. The CNEL is identical to the DNL but with 5 dB added to all noise which occurs between 7 p.m. and 10 p.m.

Appendix B – Noise Criteria

Noise is unwanted since it causes: (1) hearing damage, (2) annoyance, (3) speech interference, and (4) sleep disturbance. There are various types of noise criteria that revolve around different unwanted causes. The Occupational Safety and Health Act (OSHA) established maximum allowable sound levels in the workplace in an effort to prevent hearing damage. The OSHA limits often become significant in industrial and military settings, as well as for construction workers. In most work and home environments the sound levels are well below the OSHA limits. Most noise criteria relate to the other

three unwanted effects of noise. There are noise criteria at the federal, state, and local levels, and there are also non-regulatory criteria developed by many private and governmental organizations.

Federal Noise Criteria. There are many government agencies that have established noise criteria. The U.S. Environmental Protection Agency (EPA) developed many of the criteria used by other federal agencies. The U.S. Department of Housing and Urban Development (HUD) established an outdoor noise standard for residential land use. This HUD program lays out three levels for noise. A DNL below 65 dB is “acceptable.” A DNL over 65 dB but not exceeding 75 dB is “normally unacceptable.” A DNL above 75 dB is “unacceptable.” The HUD indoor noise goal is that the DNL not exceed 45 dB inside proposed residences. These limits are typically only evaluated by HUD when the project receives funding from the Federal Housing Administration (FHA). The Federal Aviation Administration (FAA) has established an outdoor threshold with a DNL of 65 dB, above which residential development is not compatible. The FAA indoor threshold is also a DNL of 45 dB. These limits are typically only evaluated when environmental noise studies (such as environmental assessments or environmental impact statements) are performed in support of a major project, or when existing residences, schools, or churches are sound insulated in FAA-sponsored programs. The Department of the Navy uses similar criteria which are typically only evaluated when environmental noise studies (such as Air Installation Compatible Use Zone, or AICUZ, studies) are completed in support of a major realignment of assets. The Federal Highway Administration (FHWA) established noise abatement criteria (NAC) for various land uses; the NAC for residential use is an hourly average sound level of 67 dB outdoors and 52 dB indoors. When the sound level approaches or exceeds the NAC a noise impact occurs. The state departments of transportation may define the word “approach” although it is typically considered to be when the sound level reaches within one dB of the NAC.

State Noise Criteria. Many states have established different noise criteria for four purposes: (1) to control noise produced by citizens, (2) to evaluate the compatibility of a proposed land use with respect to environmental noise, (3) to determine if construction of a state-funded noise barrier is warranted along a highway, and (4) to verify that new construction provides adequate acoustical separation between dwelling units of multi-family housing. The first purpose is incorporated into a noise ordinance and is enforceable against the person generating the noise. The Code of Maryland includes such as noise ordinance, while in the state of Virginia the noise ordinances are developed at the local level. Noise ordinances typically limit the maximum A-weighted noise level, and many also limit the maximum noise level in each octave band. The second purpose is incorporated into the environmental noise policy and is enforceable by the state and local (if adopted at the local level) planning and zoning departments. The Code of Maryland also includes such an environmental noise policy, while in most other states such as Virginia it is solely up to the municipalities to develop such a policy. The state of California has a building code requirement that if the outdoor DNL or CNEL exceeds 60 dB, an acoustical analysis shall be performed demonstrating that the indoor DNL or CNEL not exceed 45 dB. Environmental noise policies are almost always expressed in terms of the DNL, with the exception of the state of California which also uses CNEL. The third purpose is incorporated in the noise barrier policy and is used by the state department of transportation. Maryland and Virginia, as well as other states, have such a noise barrier policy. The noise barrier policies are almost always expressed in terms of the hourly average sound level referencing the noise abatement criteria used by the FHWA, although some are expressed in terms of the sound level exceeded during 10 percent of the hour (the L_{10}). The fourth purpose is

incorporated into the state and local building code in the form of a minimum acceptable Sound Transmission Class (STC) or Impact Insulation Class (IIC) rating.

Local Noise Criteria. Many municipalities have established both a noise ordinance and an environmental noise policy. The environmental noise policy is sometimes summarized in a policy plan, comprehensive plan, or similar document, while in other jurisdictions it is not documented at all (outside of in-house planning department memos). The environmental noise policy is sometimes enforceable by ordinance in the case of an overlay zone. Overlay zones are often adopted around airports or military air bases, as is the case for High Point, North Carolina. In some municipalities the state department of transportation noise barrier policy is used to assist determining if a developer applying for a re-zoning must build a highway noise barrier.

Private Noise Criteria. In many cases, there are no applicable regulatory criteria. For example, there rarely is any regulatory limit on noise levels due to plumbing systems, noise levels in classrooms, or noise levels transmitted from one office to another. In these cases it is useful to consider non-binding criteria developed by private and governmental organizations. The American Society of Heating Refrigerating and Air-conditioning Engineers (ASHRAE) provides recommendations regarding noise from mechanical systems. The ASHRAE recommendations are typically expressed in terms of the Room Criterion (RC) rating, and formerly were expressed in terms of the Noise Criterion (NC) rating. The American National Standards Institute (ANSI) developed a standard regarding noise levels in schools, and this standard has been adopted into law in some jurisdictions. The World Health Organization (WHO) has developed many noise standards for various purposes. In some cases it is useful to assess what percentage of syllables, words, or sentences would be intelligible in a given noise environment; two noise metrics used for this purpose are called the speech transmission index (STI) and the articulation index (AI). Various textbooks provide guidance on appropriate STI and AI values. There has also been some research into the percentage of people that would be “highly annoyed” or awakened by given noise levels. This research could be cited in the development of a noise criterion.

Appendix C – Precision of Predictions

It is not generally feasible to calculate the precision of a noise level or noise level reduction predictions. Unlike fields such as structural engineering, it is not typical practice to incorporate a specific margin of error in acoustical studies. Where possible, somewhat conservative assumptions were used in the outdoor noise level analysis. However, STC ratings quoted by manufacturers of products such as windows and doors are inherently anti-conservative, since the manufacturer has the option to test products many times and only publish the best rating the product ever achieved. Also, there are a variety of field installation issues which could make the STC ratings of walls be lower than anticipated. These two factors (slightly conservative assumptions used to predict outdoor noise levels, and possibly anti-conservative data used to predict indoor noise levels) may roughly balance each other out. The end result is that our predictions should roughly match future measured sound levels on average, with a statistical variation above and below.

If a general margin of error were desired, it would be advisable to exceed the recommended acoustical performance (often expressed by the STC rating) of walls, windows, and doors by a couple of points. For highway noise analyses, a margin of error could be also incorporated by extending any

recommended highway noise barriers farther (i.e., shielding a greater angle of view) and a couple of feet higher. If you would like to incorporate a specific margin of error, please let us know and we could revise our analysis.

Note that the noise levels presented in this report are based on the assumption that the rooms are furnished; noise levels in unfurnished rooms will be higher. This effect can account for a 2 to 3 dB difference in many cases.

If a specific proffered commitment is made during the rezoning process for a project regarding the noise level inside residences or in outdoor activity areas, we would recommend incorporating a specific margin of error of approximately 2 dB. While such a margin of error is not routinely included, and would likely increase construction (building and/or noise wall) costs, it could limit liability should noise levels vary slightly from the predictions.

Hush Acoustics LLC does not provide any warranty or guarantee as to the precision of the noise level or noise level reduction predictions or measurements.

Note that we are not structural or geotechnical engineers and are expressing no opinion about the structural or geotechnical strength of any walls that we propose.

Appendix D – Field Testing

As noted above there are local and state environmental noise policies which specify the maximum allowable indoor DNL or CNEL. Typically, there is no requirement for a field test.

March 3, 2017

Neil Patel
Brookfield Residential
3201 Jermentown Road, Suite 150
Fairfax, VA 22030

Re: Bradford's Landing
Indoor Traffic Noise Analysis

Mr. Patel:

This report summarizes the indoor traffic noise analysis for the Bradford's Landing (formerly known as Norbeck Road Properties and Greenbriar at Norbeck Crossing) project in Montgomery County, MD.

The year 2040 DNL from our prior report on outdoor noise are presented in Figures 1 and 2. These figures show that the DNL will be as high as:

- 68.4 dB at the 16-foot wide middle units and the 20-foot wide middle and end unit townhouses along Norbeck Road; these houses all have fronts facing Norbeck Road
- 67.4 dB at the 16-foot wide middle units along the ICC; these all have fronts facing the ICC
- 69.2 dB at the 24-foot wide middle and end units along the ICC



Figure 1. Year 2040 DNL, dB, at Facades of Residences on Top Floor along Norbeck Road

The indoor requirement is a DNL of 45 dB or lower. To provide a modest margin for error of 1.5 dB, we are designing for a DNL of 43.5 dB indoors. The building envelope must reduce noise levels by as much as 24.9 dB at a 16- and 20-foot wide lots along Norbeck Road, 23.9 dB for a 16-foot wide lots along the ICC, and 25.7 dB for a 24-foot wide lots along the ICC.



Figure 2. Year 2040 DNL, dB, at Facades of Residences on Top Floor along Route 200

The Noise Reduction (NR) is the difference between noise levels outdoors and indoors in a single one-third octave frequency band and is calculated based on the following equation:

$$NR_i = 10 \text{ Log } \left(\frac{\sum A_i}{\sum (A_i / 10^{TL_i/10})} \right) - 10 \text{ Log } \left(\frac{1}{4} + \frac{\sum S_i}{\sum (S_i a_i)} \right)$$

where:

NR_i is noise reduction in a single one-third octave band,

A_i is the area of each exterior envelope material (e.g., walls, windows, doors, and roof),

TL_i is the transmission loss of each exterior envelope material,

S_i is the surface area of each room finish material (e.g., walls, floors, beds, etc.), and

a_i is the sound absorption coefficient of each room finish material

The areas of exterior envelope materials were taken from the Schematic Plans & Elevations architectural drawings prepared by DFC Architects, PC dated November and December 2016.

Transmission loss is a laboratory measure of the sound insulation performance in a single one-third octave band of a product or assembly. The transmission losses of the windows and doors were obtained from published test reports provided by various manufacturers; the results were grouped based on ranges of reported STC ratings. In lieu of acoustical tests for the specific products, we estimate that the proposed windows have a Sound Transmission Class (STC) rating of at least 24 and doors have a rating of at least STC 22. These are the lowest we have seen in the past. The STC rating is a common rating used to describe the sound insulation performance of windows and doors, as well as other products and assemblies. Upgrades to the window and door acoustical performance were considered below. Acoustical data for the walls were obtained from data in the acoustical literature. Walls will be sided, brick, or stone. Since sided walls are the worst acoustically, we used data for them to be conservative. Since the acoustical performance of the roof will be so much better than that of the walls, windows, and doors, and since the roof is partially shielded from highway noise, the roof was neglected in our analysis of highway noise.

The sound absorption coefficient is a value that expresses how much incident sound is absorbed by a room finish material; a value of 0.0 represents no absorption (i.e., complete reflection) while a value of 1.0 represents complete absorption. The areas and sound absorption coefficients of room finish materials were assumed based on typical finishes for the given type of room. In other words, it was assumed that rooms would be normally furnished; in unfurnished rooms noise levels will be higher.

The Noise Level Reduction (NLR) is the A-weighted difference between noise levels outdoors and indoors and is calculated based on the following equation:

$$NLR = \sum (10^{(L_o + C)/10}) - \sum (10^{(L_o - NLR_i + C)/10})$$

where:

L_o is the noise level outdoors in a single one-third octave band, and

C is the A-weighting correction in a single one-third octave band

For the purposes of this calculation it is not necessary to know the absolute noise level outdoors. Rather, it is only necessary to know how the noise levels vary as a function of frequency; this variation is known as the sound spectrum. The sound spectrum for typical highway noise was obtained from acoustical data in the literature.

Table 1 presents the calculated NLR for each room impacted by highway noise for the basic design plus 6 possible sets of upgrades. The indoor DNL can be determined by subtracting the NLR in Table 1 from the DNL in Figure 1 and 2. In Table 1, the wall upgrade at the right for upgrade 6 is Resilient Channels (RC) between the studs and gypsum board for non-masonry exterior walls.

Table 1. Noise Level Reduction (NLR)

Upgrade	Basic	1	2	3	4	5	6
Wall Upgrade	-	-	-	-	-	-	RC
Window Rating	STC 24	STC 27	STC 28	STC 29	STC 30	STC 31	STC 31
Door Rating	STC 22	STC 23	STC 25	STC 26	STC 27	STC 28	STC 29
20' Wide Unit 279							
Front BR4 – mid	22.7	24.4	24.8	26.0	26.6	26.5	28.7
Front BR4 – end	21.6	23.0	23.4	24.4	24.8	24.7	27.5
Front rec/study/foy - mid	21.5	23.0	24.0	24.8	25.2	25.7	27.5
Front rec/study/foy - end	21.6	23.0	23.4	24.4	24.8	24.7	27.5
Front dining – mid	21.6	23.5	24.1	25.3	26.0	25.9	27.7
Front dining – end	20.2	21.9	22.4	23.3	23.9	23.8	26.3
Front owners BR1 - mid	23.6	25.2	25.6	26.8	27.4	27.3	29.5
Front owners BR1 - end	22.3	23.6	23.9	24.8	25.1	25.1	28.2
24' Wide Units 280							
Rear rec or BR4	20.1	21.7	22.9	23.7	24.2	24.7	26.1
Front liv/din	21.6	23.5	24.0	25.2	25.9	25.8	27.7
Rear great	21.2	22.8	23.8	24.6	25.2	25.5	27.2

Front BR2	22.9	24.7	25.1	26.4	27.0	27.0	28.9
Front BR3	23.1	24.9	25.3	26.6	27.2	27.2	29.1
Rear owner's bed	23.0	24.8	25.3	26.7	27.3	27.2	28.9
Rear owner's bath	22.4	24.0	24.5	25.5	26.0	25.9	28.5
24' Wide Unit 281							
Rear rec/BR4	20.5	21.7	23.2	23.6	23.9	24.8	26.3
Front living - mid	21.8	23.7	24.2	25.4	26.1	26.0	27.9
Front living - end	21.0	22.7	23.2	24.2	24.8	24.7	27.0
Front opt. study - mid	22.4	24.3	24.9	26.0	26.8	26.7	28.5
Front opt. study - end	20.7	22.3	22.8	23.7	24.2	24.1	26.8
Rear kit/fam/din - mid	20.5	21.7	23.0	23.5	23.8	24.5	26.4
Rear kit/fam/din - end	19.8	21.0	22.1	22.6	22.9	23.4	25.7
Front BR2 - mid	23.7	25.4	25.9	27.1	27.6	27.6	29.7
Front BR2 - end	22.0	23.4	23.7	24.6	25.0	25.0	27.9
Front BR3	23.1	24.8	25.3	26.6	27.1	27.1	29.0
Rear owner's bed	24.0	25.6	26.0	27.1	27.5	27.5	30.0
16' wide Units 282/283							
Front opt rec	21.2	22.7	23.8	24.6	25.1	25.6	27.1
Front living	21.5	23.4	24.1	25.4	26.2	26.1	27.6
Front owner's bed	23.1	24.8	25.3	26.7	27.3	27.2	29.1

We recommend the following upgrades as located in Figures 3 and 4:

- Upgrade 6 which is resilient channels between the studs and gypsum board for non-masonry exterior walls, windows rated at STC 31 or higher, and doors rated at STC 29 or higher of lots where the DNL outdoors is in the range of 67.0 to 69.2 dB. This applies to 11 townhouses along Norbeck Road and 6 along the ICC.
- Upgrade 5 which is windows rated at STC 31 or higher and doors rated at STC 28 or higher for lots where the DNL outdoors is in the range of 66.5 to 66.9 dB. This applies to 10 townhouses along the ICC.
- Upgrade 4 which is windows rated at STC 30 or higher and doors rated at STC 27 or higher for lots where the DNL outdoors is in the range of 66.2 to 66.4 dB. This applies to 4 townhouses along the ICC.
- Upgrade 3 which is windows rated at STC 29 or higher and doors rated at STC 26 or higher for lots where the DNL outdoors is in the range of 65.7 to 66.1 dB. This applies to 4 townhouses along Norbeck Road and 5 along the ICC.
- Upgrade 2 which is windows rated at STC 28 or higher and doors rated at STC 25 or higher for lots where the DNL outdoors is in the range of 64.6 to 65.6 dB. This applies to 4 townhouses along Norbeck Road and 9 along the ICC.
- Upgrade 1 which is windows rated at STC 27 or higher and doors rated at STC 23 or higher for lots where the DNL outdoors is in the range of 63.4 to 64.5 dB. This applies to 4 townhouses along Norbeck Road and 4 along the ICC.



Figure 3. Recommended Upgrade Packages by Location along the ICC



Figure 4. Recommended Upgrade Packages by Location along Norbeck Road

If you have any questions, please contact me at 703/534-2790 or via e-mail at Gary@HushAcoustics.com.

Sincerely,

Gary Ehrlich

Gary Ehrlich, P.E.
Principal