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25 July 2018

Ying-Min Li
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Email: yingminli@hotmail.com

Subject: 37280 Magnolia Street
Environmental Noise Study
Salter Project: 18-0398

Dear Ying-Min:

As requested, we conducted an environmental noise study for the project. The purpose of the study is to determine the noise environment at the proposed site, to compare the measured data with applicable standards, and to propose mitigation measures as necessary. This report summarizes the results.

PROJECT CRITERIA

City Noise Guidelines

The City of **Newark's** General Plan¹ states the limit of noise exposure in interior living spaces to be DNL 45 dB.

In addition, Policy EH-7.7 states:

"Include recommended mitigation measures to achieve compliance with the adopted policies and standards of the Noise Element. Where the noise source in question consists of intermittent single events, the report should address the effects of maximum noise levels in sleeping rooms and potential sleep disturbance issues."

"Include estimates for interior and exterior noise exposure after the prescribed mitigation measures have been implemented."

"Describe a post-project assessment program that could be used to evaluate the effectiveness of the proposed mitigation"

¹ Policy EH-7.7: Acoustical Study Requirement. Require acoustical studies for new developments in areas where the noise levels exceed the 'normally acceptable' levels for proposed land use; based on Table EH-2. For residential uses, the analysis should include mitigation measures to limit the noise exposure in interior living spaces to 45 dB Ldn, consistent with California Title 24.

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NOISE ENVIRONMENT

The project is located at the corner of Magnolia Street and Baine Avenue, approximately 130 feet from rail tracks. To quantify the existing noise environment, we conducted long term noise measurements at two locations around the site between 27 June and July 2 2018. The meters measured continuous **noise levels and recorded "loud" noise events so that we** could identify the source of the noise (e.g., train horns). The meters were attached to light poles at an approximate height of 12 feet.

Based on our measured data, we calculated the expected DNL at the various facades and elevations. Across the site, the average noise level varies from approximately DNL 70 dB to DNL 75 dB, and the maximum noise levels during train passbys are typically 95 dBA to 100 dBA from the horn used for the nearest crossing.

ANALYSIS AND RECOMMENDATIONS

Using the 26 April 2018 floor plans, we calculated the window and exterior door STC² ratings needed to meet the project criterion. Our calculations are based on the following assumptions:

- Ceilings are 9-feet high
- Bedrooms will be carpeted and other rooms will have hard floor finishes
- Single-stud exterior walls with a moderate weight siding, insulation, and a single interior layer of interior gypsum board
- Where STC ratings are 37 or greater, the interior gypsum board is to be installed on resilient channels (equal to ClarkDietrich RC Deluxe, Model RCSD)

To meet the indoor DNL 45 dB, it will be necessary for the facades to be sound-rated. The minimum window and exterior door STC ratings to meet the DNL 45 dB criterion are shown on the attached mark-up (STC 30 to 40).

To address City Policy EH-7.7 and single-event noise from train passbys, we discussed the option of further upgrading the windows to STC 45 (e.g., Milgard Quiet-Line) and adding a second layer of interior gypsum board on all facades, particularly bedrooms, that are exposed to train horns. This measure would reduce maximum train horn noise inside to between approximately 55 dBA and 65 dBA (depending on exposure to the trains). If needed, train noise levels could be measured at the end of construction.

The recommended STC ratings are for full window assemblies (glass and frame) rather than just the glass itself. Tested sound-rated assemblies should be used. For reference, typical one-inch glazing assemblies (two 1/4-inch thick panes with a 1/2-inch airspace) achieve an STC rating of 32. Where STC ratings above 33 are required, at least one pane will need to be laminated. Above STC 38 to 40, a glazed assembly greater than a typical 1-inch IGU is needed.

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² STC (Sound Transmission Class) – A single-number rating defined in ASTM E90 that quantifies the airborne sound insulating performance of a partition under laboratory conditions. Increasing STC ratings correspond to improved airborne sound insulation.

Where windows need to be closed to achieve an indoor DNL of 45 dB, an alternative method of supplying fresh air (e.g., mechanical ventilation) should be considered. This applies to all residences. This issue should be discussed with the project mechanical engineer.

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This concludes our environmental noise study for the 37280 Magnolia Street project. If you have any questions, please give us a call.

Sincerely,

CHARLES M. SALTER ASSOCIATES, INC.



Jake Schpero
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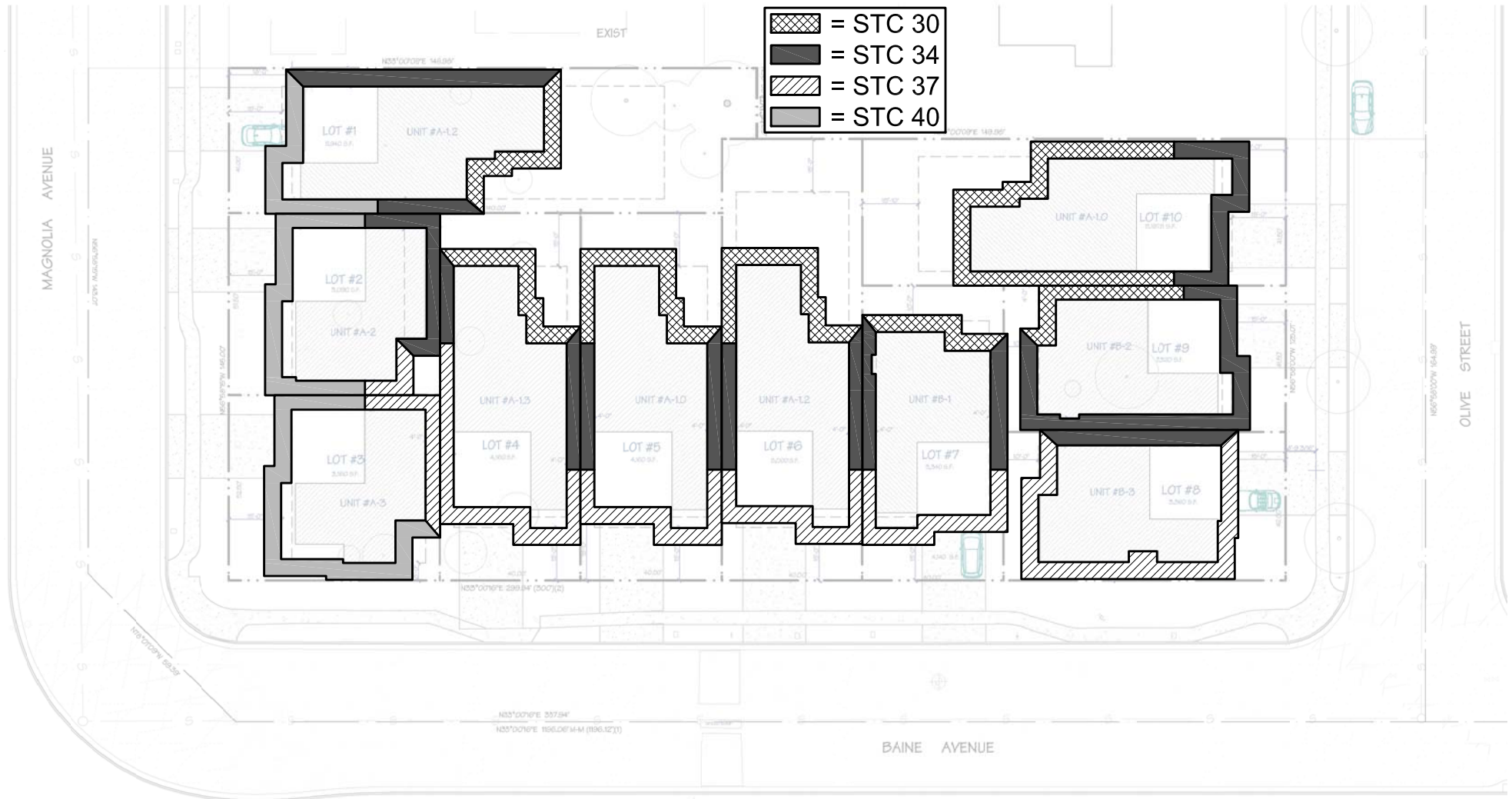


37280 MAGNOLIA STREET MEASUREMENT LOCATIONS AND MEASURED NOISE LEVELS

FIGURE 1

Salter #
18-0398

JMS/JLD
07.25.18



NOTE: STC RATINGS ARE FOR THE COMPLETE ASSEMBLY (E.G. GLASS, FRAME, AND OPERABLE SECTIONS) BASED ON TEST REPORTS FROM AN NVLAP ACCREDITED LAB.

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37280 MAGNOLIA STREET MINIMUM CODE-REQUIRED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (ALL FLOORS)

FIGURE 2

Salter #
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JMS/JLD
 07.25.18

13 July 2018

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Subject: **37280 Magnolia Street
Vibration Study**
Salter Project: 18-0398

Dear Ying-Min:

As requested, we conducted a vibration study for this proposed project. The purpose of the study is to determine the vibration environment at the site, compare the measured data with applicable standards, and propose mitigation measures as necessary. This report summarizes the results of our study.

ASSESSMENT OF GROUNDBORNE VIBRATION

Vibration Guidelines per FTA and SBTCP Mitigation 11-2

The Federal Transit Administration (FTA)¹ provides ground borne vibration (GBV) guidelines according to several use categories and various frequencies of events. Table 1, below, summarizes the FTA general assessment criteria for ground-borne vibration.

Table 1: FTA General Assessment Criteria

Land Use Category	GBV Impact Levels (VdB re 1 μ -in/sec)		
	Frequent Events	Occasional Events	Infrequent Events
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB

Frequent events are defined as more than 70 vibration events of the same source per day. Occasional events are defined as between 30 and 70 vibration events of the same source per day and infrequent events are fewer than 30 vibration events of the same source per day. Since there is an average of 20 to 25 trains a day, it is categorized as infrequent events.

Vibration Results and Recommendations

We conducted one long-term vibration measurement at an existing home from 29 June to 3 July 2018. The measurement was conducted at a setback of approximately 150 feet from the centerline of the nearest train track.

¹ Federal Transit Administration, "Transit Noise and Vibration Impact Assessment", May 2006.

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Measured train vibration levels were between 67 and 77 VdB and did not exceed the FTA general assessment criteria for infrequent events. It should be noted that vibration levels in this report were measured at-grade. The FTA document identifies that vibration will change as it enters the building. However, the effect of the building on vibration is dependent on the structural design. This should be discussed with the structural engineer so as to reduce the potential for amplification inside the building.

* * *

This concludes our and vibration study for the 37280 Magnolia Street project. Should you have any questions, please give us a call.

Sincerely,

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