Pearson Place 2nd Addition
SINGLE FAMILY DEVELOPMENT

Ramsey, Minnesota

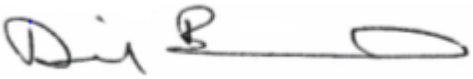
TRAFFIC NOISE ASSESSMENT

Prepared for

Development Consulting Services
Attn: John Dobbs

by

David Braslau Associates, Inc.
6603 Queen Avenue S, Suite M
Richfield, MN 55423
Tel: 612-331-4571
FAX: 612-331-45672
Eml: david@braslau.com



Dr. David Braslau, President

15 March 2024

EXECUTIVE SUMMARY

The Pearson Place 2nd Addition is a proposed residential development in Ramsey, Minnesota consisting of plots for three single family residences.

The project is located immediately adjacent to US Highway 10 in Anoka County.
The purpose of this study is to determine if the project is in compliance with Minnesota state noise standards, or if needed, to meet provisions in Minnesota State Rules to comply with Minnesota Noise Standards.

Predicted traffic noise levels from Highway 10 have been based on traffic volumes from Automatic Traffic Recorder data on the MnDOT traffic data website map and assigned vehicle type percentage.

Under Minnesota noise rule definitions, the hour from 6 to 7 AM falls under the nighttime category while the 4-5 PM hour falls under the daytime category. The MinnNoise computer model has been used to estimate nighttime (6-7 AM) and daytime (4-5 PM) sound levels at selected receptors sites on residential plots in the project. Due proximity to Highway 10, the predicted nighttime L10 and L50 levels at all receptor sites are above daytime and nighttime standards for residential land use but can be brought into compliance with state rules if appropriate STC rated windows are installed. Under exceptions to the rules, the STC rating needed for windows and doors with direct exposure to highway noise will depend upon the area percentages of exterior wall components.

Individual home design and/or self-standing barriers could provide some shielding from traffic noise.

Table of Contents

List of Figures

List of Tables

1.0 INTRODUCTION

1.1. Objectives of this Noise Assessment

This *Traffic Noise Assessment* evaluates the potential impacts of noise from Highway 10 on the proposed Pearson Place 2nd Addition single-family residential development in Ramsey, Minnesota.

Hourly traffic volumes on Highway 10 have been based on traffic count data from the MnDOT Traffic Application website as discussed in Section 2.1 of this report.

Projected traffic noise levels from Highway 10 are compared with the Minnesota daytime and nighttime noise standards to determine the potential for noise impacts and need for any mitigation.

1.2. Site Location and Plan

Location of the development on an area map is shown on **Figure 1.1**. The site plan is shown in **Figure 1.2.** The Landscape plan is shown in **Figure 1.3.**

1.3. Minnesota Noise Standards

The Minnesota State Noise Standards for residential land use are presented in **Table 1.1.** Residential land uses are included in the NAC-1 (Noise Area Classification -1) under Minnesota Rule 7030.0040.

Table 1.1 Minnesota State Noise Standards (NAC-1)

	Daytime (7:00 am to 10:00 pm)	Nighttime (10:00 pm to 7:00 am)
L10	65 dBA	55 dBA
L50	60 dBA	50 dBA

L10 is the level exceeded 10% or 6 minutes of an hour. L50 is the level exceeded 50% or 30 minutes of an hour. The L10 level, which has been shown to accurately reflect traffic noise along major highways, is used in this report to determine compliance.

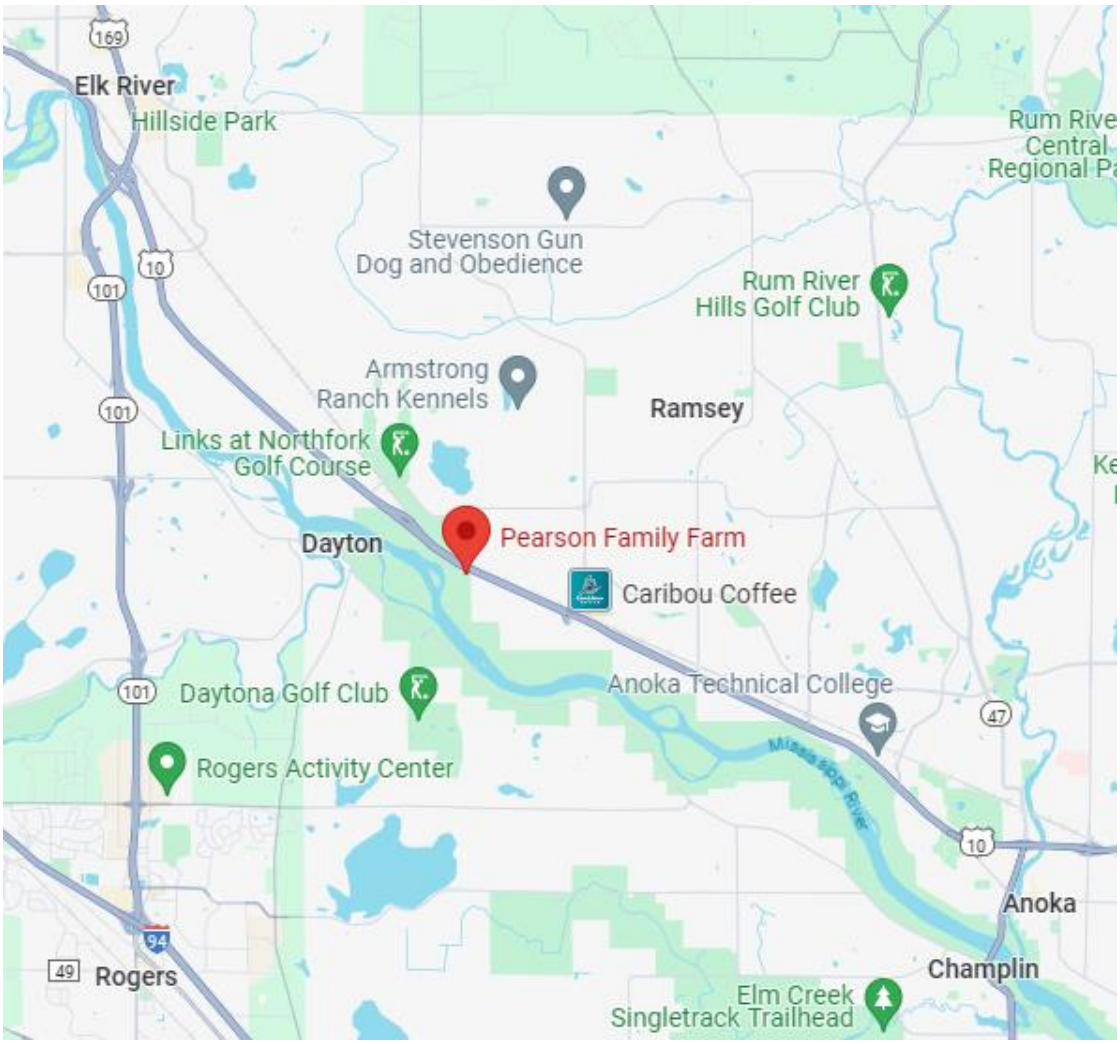


Figure 1.1 Site Location

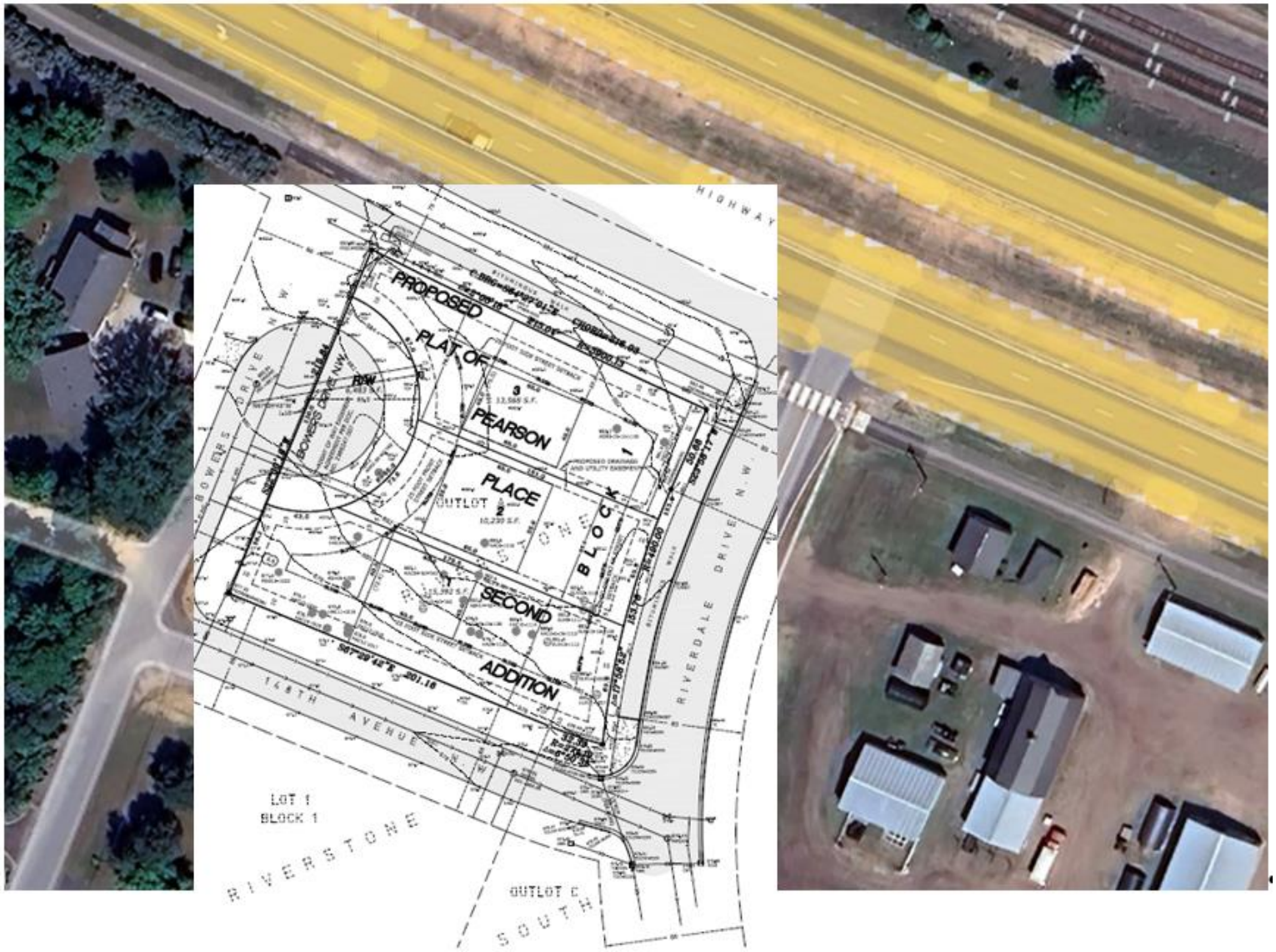


Figure 1.2 Project Layout Relative to Highway 10

2.0 TRAFFIC NOISE MODEL AND PREDICTIONS

2.1. Traffic Noise Model

The MinnNoise traffic noise model has been used to predict noise levels associated with vehicle traffic. The traffic noise model geometry with assumed noise receptor sites and a possible berm/wall combination is shown in **Figure 2.1.** The footprint of a six-foot wall on a six-foot berm would occupy the side-street setback.

Hourly traffic volumes on Highway 10 were based on data from ATR (Automatic Traffic Recorder) 352 which is located is only 3300 feet to the west of the project on Highway 10. Since the most recent data at this station are from the year 2019 because of issues with the recorder, the 2019 volumes have been adjusted to 2023 data using growth rates at ATR 365 located to the east on Highway 65, approximately the same distance from Minneapolis as ATR 352.

The assumed vehicle mix by direction was based on similar traffic noise studies in the Twin Cities Metropolitan Area - 95% automobiles, 3 % medium trucks and 2% heavy trucks. A traffic speed of 65 mph was used in this assessment. Assumed vehicle mix and hourly volumes are shown in **Table 2.1**. "MT" are medium (two-axle trucks) while "HT" are heavy (multi-axle trucks).

Table 2.1 Assumed Hourly Volume and Vehicle Mix

EB	AM	PM
Auto	1545	1362
MT	49	43
HT	33	29
TOTAL	1626	1434
WB	AM	PM
Auto	407	2169
MT	13	69
HT	9	46
TOTAL	428	2284

The traffic noise model geometry showing the noise receptor sites relative to the east and west roadways is shown in **Figure 2.2**. Also shown on the figure is the assumed highway noise barrier and an assumed effective barrier presented by the homes themselves shielding the east and west facades by traffic noise associated with the long lengths of road to either side of the property.

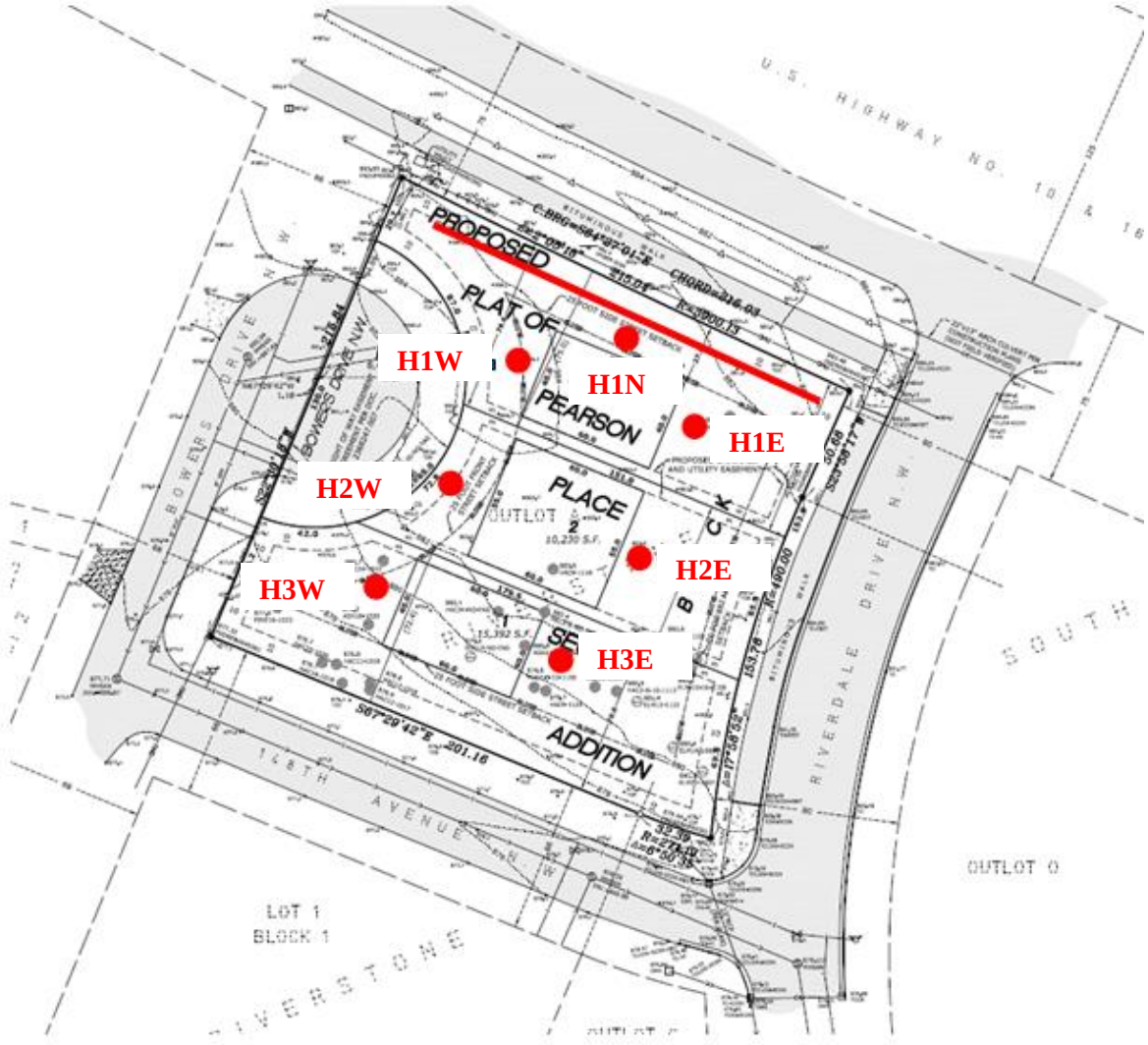


Figure 2.1 Noise Receptor Sites and Possible Berm/Barrier

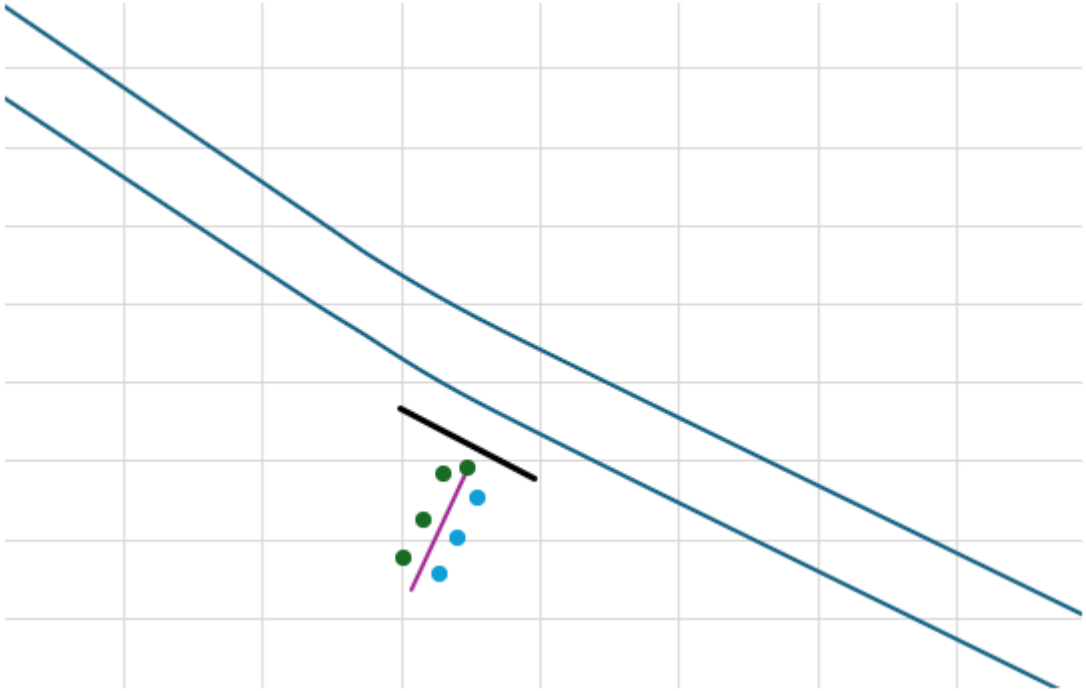


Figure 2.2 Traffic Noise Model Geometry

2.2. Noise Model Predictions

Traffic noise predictions for L10 and L50 are presented in **Table 2.2** for both the 6-7 AM period (covered by nighttime standards) and the 4-5 PM period (covered by daytime standards).

Table 2.2 Predicted Noise Levels (dBA)

L10 LEVELS

Receiver	AM	PM
H1W	62	64
H2W	65	66
H3W	70	71
H3N	75	75
H1E	62	64
H2E	65	66
H3E	70	70

L50 LEVELS

Receiver	AM	PM
H1W	57	59
H2W	59	61
H3W	63	65
H3N	70	70
H1E	57	59
H2E	59	61
H3E	63	64

Predicted levels relative to the NAC-1 Daytime (PM) and Nighttime (AM) standards are shown in **Table 2.3**.

Table 2.3 Exceedance of Nighttime (AM) and Daytime (PM) Standards

L10 LEVELS

Receiver	AM - 55	PM - 65
H1W	7	-1
H2W	10	1
H3W	15	6
H3N	20	10
H1E	7	-1
H2E	10	1
H3E	15	5

L50 LEVELS

Receiver	AM - 50	PM - 60
H1W	7	4
H2W	9	6
H3W	13	10
H3N	20	15
H1E	7	4
H2E	9	6
H3E	13	9

From the tables above, it can be seen that the noise wall does not provide sufficient noise reduction to comply with the state daytime or nighttime noise standards.

2.3. Compliance with State Noise Standards

The first method for reducing traffic noise to comply with state noise standards would be construction of a noise wall along the length of the property along the highway. The effectiveness of a 12-foot-high noise wall is shown below in **Table 2.4**. Exceedances of the state am and pm noise standards with the barrier are shown in **Table 2.5**.

Table 2.4 Predicted Noise Levels (dBA) with a 12-foot Wall

L10 LEVELS

Receiver	AM	PM
H1W	62	63
H2W	63	65
H3W	64	66
H3N	65	66
H1E	62	63
H2E	63	65
H3E	65	66

L50 LEVELS

Receiver	AM	PM
H1W	56	59
H2W	57	60
H3W	58	61
H3N	59	61
H1E	57	59
H2E	58	60
H3E	59	61

Table 2.5 Exceedance of Nighttime and Daytime Standards with at 12-ft Wall

L10 LEVELS

Receiver	AM - 55	PM - 65
H1W	7	-2
H2W	8	0
H3W	9	1
H3N	10	1
H1E	7	-2
H2E	8	0
H3E	10	1

L50 LEVELS

Receiver	AM - 50	PM - 60
H1W	6	4
H2W	7	5
H3W	8	6
H3N	9	6
H1E	7	4
H2E	8	5
H3E	9	6

The limited effectiveness of the noise barrier can be seen in **Figure 2.3**. The receptor site closest to the highway has the maximum benefit. There is a diminishing benefit of the wall as the east and west receptors become more exposed to traffic.

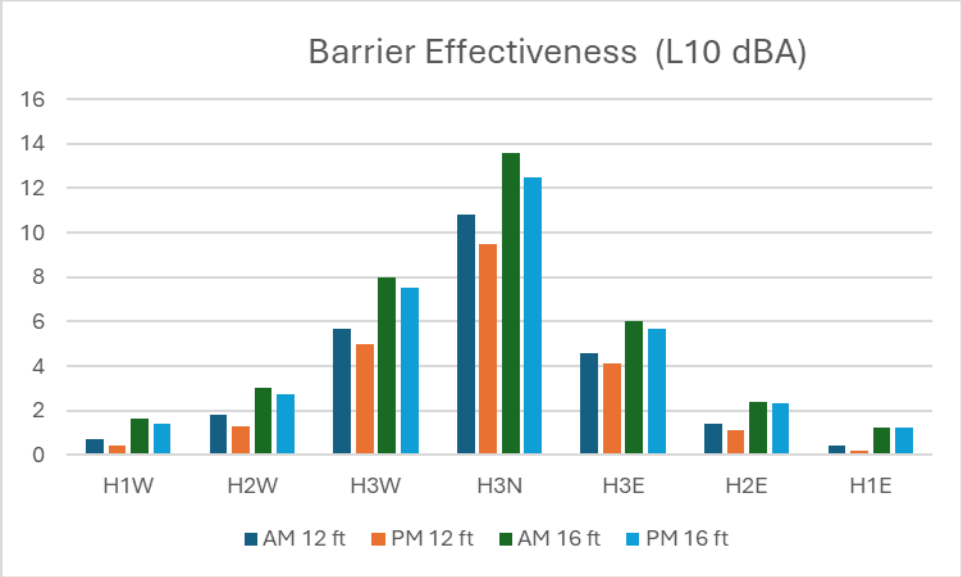


Figure 2.3 Noise Wall Effectiveness

To comply with Minnesota state noise standards, exceptions to the rules under Subpart 3 of Minnesota Rule 7030.0050 must be met. However, under exceptions contained in Minnesota Rules, commercial noise standards (NAC-2) can be applied to residential land use if the provisions in the rules can be met. The applicable provisions of Minnesota Rule 7030.0050 are presented below.

> Subp. 3. Exceptions. The noise area classification for land use may be changed in the following ways if the applicable conditions are met.
>
> B. The standards for a building in a noise area classification 2 shall be applied to a building in a noise area classification 1 if the following conditions are met:
> (1) the building is constructed in such a way that the exterior to interior sound level attenuation is at least **30** dB(A)
> (2) the building has year-round climate control; and
> (3) the building has no areas or accommodations that are intended for outdoor activities.

Table 2.6 Predicted Level RE NAC-2 Standards with no Barrier

L10 LEVELS				L50 LEVELS		
Receiver	AM - 70	PM - 70		Receiver	AM - 65	PM - 65
H1W	-8	-6		H1W	-8	-6
H2W	-5	-4		H2W	-6	-4
H3W	0	1		H3W	-2	-1
H3N	5	5		H3N	5	5
H1E	-8	-6		H1E	-8	-6
H2E	-5	-4		H2E	-7	-4
H3E	-1	0		H3E	-2	-1

Table 2.7 Predicted Level RE NAC-2 Standards with a 12-Foot Barrier

L10 LEVELS				L50 LEVELS		
Receiver	AM - 70	PM - 70		Receiver	AM - 65	PM - 65
H1W	-8	-7		H1W	-9	-6
H2W	-7	-5		H2W	-8	-5
H3W	-6	-4		H3W	-7	-4
H3N	-5	-4		H3N	-7	-4
H1E	-8	-7		H1E	-9	-6
H2E	-7	-5		H2E	-7	-5
H3E	-5	-4		H3E	-6	-4

From **Table 2.7** it can be seen that the L10 and L50 levels at all receptor sites can be brought into compliance with state noise standards if the 30 dBA outdoor-to-indoor attenuation can be met. Without detailed drawings of the building facades exposed to traffic noise, it is not possible to determine the specific type of wall and glazing needed to comply with the state noise standards. An example of the type of analysis required to ensure that the required 30 dBA attenuation can be made is presented in **Table 2.8** below. The composite STC is based upon the acoustical energy transmitted through each wall component.

Table 2.8 Example Determination of Net Wall STC

Wall with Patio Door	STC	AREA (S.F.)	AREA (%)
Wall	42	75	62.50
Windows	30	45	37.50
TOTAL		120	100.00
COMPOSITE STC	34		
Traffic adjustment	-3		
Net STC	31		
Wall with Windows and Door	STC	AREA (S.F.)	AREA (%)
Wall	42	60	50.00
Windows	35	40	33.33
Door	26	20	16.67
TOTAL		120	100.00
COMPOSITE STC	33		
Traffic adjustment	-3		
Net STC	30		

3.0 SUMMARY OF FINDINGS

Predicted traffic noise levels from Highway 10 on the proposed Pearson Place 2nd Addition residential development in Ramsey, Minnesota have been based on traffic volumes from MnDOT traffic flow website data. The MinnNoise traffic computer model has been used to estimate nighttime (AM) and daytime (PM) sound levels at assumed receptor sites at the perimeter of proposed building footprints on the property.

A total of seven noise receptor sites have been evaluated and compared with the Minnesota noise standards for residential land uses. While the predicted levels were in excess levels contained in the standards, exceptions to the rules permit the commercial noise standards if a 30 dBA reduction exterior-to-interior sound level reduction can be achieved with appropriate exterior façade design.

An exterior façade with a minimum of a 2x6 wall with siding, acoustical insulation and a 5/8-inch gypsum interior layer and glazing with an appropriate STC rating can meet the exemptions to the rule. The addition of a noise wall or barrier would not be needed for noise control purposes. However, if outdoor uses are to be provided on the site such as patios or entertainment areas, these could be incorporated into the building design to provide shielding of traffic noise or provided with individually designed noise barrier shielded areas.

y:\jobs\2024jobs\224002\report\pearsonpl2ndadd-traffic-noise-assessment.doc