

**Sprain Brook Parkway PLYWALL® Noise Barrier System
Palmer Ave. to NYS Route 100 (Central Park Ave.)
Westchester County, NY**

Post-Construction Noise Evaluation



Prepared for:

Hoover Treated Wood Products, Inc.



November 2007

Introduction:

This report presents the results of a post-construction noise evaluation of the Sprain Brook Parkway (SBP) noise barrier located between Palmer Ave. and NYS Route 100 (Central Park Ave.) in Westchester County, NY. This noise barrier is constructed of the PLYWALL® Noise Barrier System manufactured by Hoover Treated Wood Products, Inc.

The objective was to determine the effectiveness of the PLYWALL® Noise Barrier System at reducing the traffic noise levels from the SBP in the neighboring residential community located directly east of the SBP northbound travel lanes.

Summary:

Noise measurements were taken at two receiver sites corresponding to 1st row residential homes behind the SBP noise barrier, and one additional site corresponding to 2nd row residential homes behind the noise barrier. These measurements along with traffic noise model results formed the basis of the post-construction noise barrier evaluation. The noise barrier was determined to be effective because it provides an 11 dBA insertion loss (that is, the level of traffic noise reduction resulting from the noise barrier) at the 1st row sites, and a 7 dBA insertion loss at the 2nd row site. A tabular presentation of the insertion loss results is provided in Table 2 under “Findings and Conclusions”.

Methodology:

This post-construction noise barrier evaluation uses the “Indirect Predicted Method” as described in the *Methods for Determining the Insertion Loss of Outdoor Noise Barriers*, American National Standards Institute, ANSI S12.8-1998, April 1998. This method was used at three locations within the residential area behind the noise barrier, and compares noise measurements conducted after the barrier’s installation with computed noise levels using the Traffic Noise Model (TNM version 2.5) for identical locations without the noise barrier. Simultaneous measurements were conducted at a reference location above the top of the noise barrier to record dominant highway noise levels that are not influenced by any other noise sources. The measurement locations and reference locations were inserted into the TNM model used in the pre-construction barrier design analysis (*Sprain Brook Parkway Noise Barrier Acoustical Design Report – Palmer Ave. to NYS Route 100 (Central Park Ave.), NYSDOT, October, 2005.*), and then as necessary, traffic was adjusted to traffic conditions present during the post-construction measurements.

Noise Measurements:

Short-term measurements of 10 to 15 minute duration on September 20, 2007 were conducted at each of three sites within the residential area using a Metrosonics db-308 integrating noise level meter, MK-308R pendant microphone, WS-308 windscreen, and CL-304 acoustical calibrator. During each short-term measurement, noise levels were

585.232.5135

www.bergmannpc.com

200 First Federal Plaza / 28 East Main Street / Rochester, New York 14614

measured at one of two reference positions above the top of the noise barrier. All noise measurements were conducted with equipment conforming to ANSI Standard S1.4 for Type 1 (Precision) noise level meters. Calibrations traceable to the U.S. National Institute of Standards and Technology (NIST) were carried out in the field before and after each set of measurements using acoustical calibrators. In all cases, the measurement site microphone was protected by a windscreen, and supported on a tripod approximately five feet above the ground. Figure 1 shows the location of the noise measurement sites.

Figure 1. Noise Measurement Locations

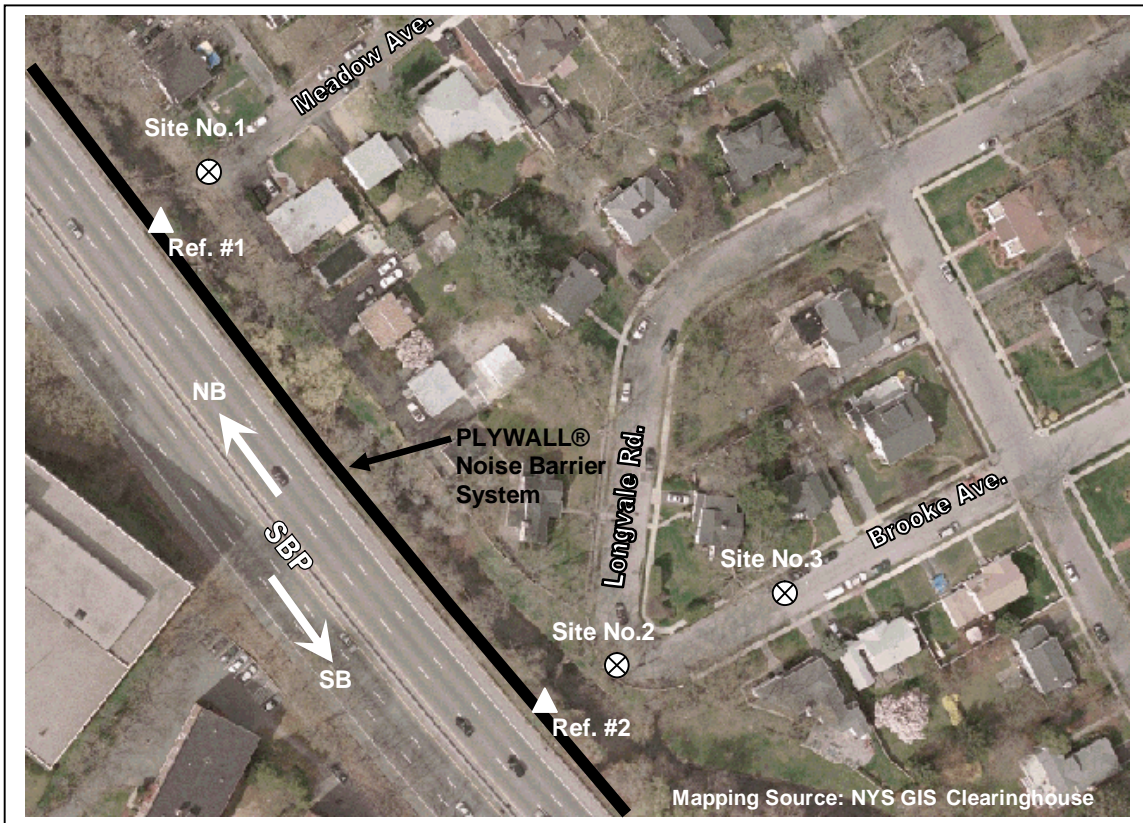


Table 1 provides a summary of the noise measurement results at both the residential sites and the reference microphone locations. At all residential measurement locations, the dominant noise source is the SBP. Measured traffic noise levels ranged from approximately 64 dBA, L_{eq} at the 1st row locations (Site Nos. 1 and 2) to about 60 dBA, L_{eq} at the 2nd row site (Site No. 3). The reference measurement (Ref. #1), located directly above the top of the barrier opposite Meadow Ave. (Site No. 1), was used to record reference levels during the measurements at Site 1. The reference measurement (Ref. #2), located directly above the top of the barrier opposite Brooke Ave. (Sites Nos. 2 and 3), was used to record reference levels during the measurements at Site No. 2 and Site No. 3. Because the reference microphones were located in close proximity to the SBP, and did not receive any benefit from the barrier, traffic noise dominated the measured noise levels of approximately 81 dBA, L_{eq} at these locations.

Table 1. Summary of Noise Measurements (Residential Area / Reference Location)

Site No.	Site Location	Date	Time	Measured L _{eq} (dBA)	
				Res. Area	Ref. Location
1	Meadow Ave.	9/20/07	3:55PM – 4:10PM	64	81
2	Longvale Road	9/20/07	4:41PM – 4:51PM	64	81
3	Brooke Ave.	9/20/07	5:05PM – 5:15PM	60	81

Findings and Conclusions:

Following the post-construction noise barrier noise measurements, an analysis was conducted using the indirect predicted method for all measurement sites to determine the noise reduction benefit provided by the noise barrier.

Table 2 provides a summary of the results obtained using the indirect predicted method. The first column provides the measurement site number and location. The second column provides the computed *no-barrier* L_{eq} noise levels for each measurement site. These noise levels were computed using TNM version 2.5. The third column of the table provides the *with-barrier* noise levels measured on September 20, 2007. The measurements were conducted between 4:00PM and 5:30PM at or close to loudest-hour traffic noise conditions, with traffic speeds estimated at 60 mph. The last column of the table, the difference of the second and third columns, shows the noise reduction provided by the noise barrier at each of the measurement sites.

Table 2. Insertion Loss Results: Indirect Predicted Method

Measurement Site No./ Location	Computed/Measured L _{eq} Noise Level (dBA)		Approximate Noise Reduction (dB) (Computed – Measured)
	Computed No-barrier Noise Level	Measured With-barrier Noise Level	
1. Meadow Avenue	75	64	11
2. Longvale Road	75	64	11
3. Brooke Avenue	67	60	7

The noise reduction provided by the noise barrier is approximately 11 decibels for the 1st row sites (Meadow Ave. & Longvale Rd.), and approximately 7 decibels for the 2nd row site (Brooke Ave.). These measured noise reduction values are consistent with the predicted noise reduction values calculated for the original design report prepared prior to construction. The Federal Highway Administration (FHWA) and New York State Department of Transportation (NYSDOT) require that noise barriers be designed to provide substantial noise reduction on the order of 7 to 10 dBA to the most benefited receivers. The PLYWALL® Noise Barrier System was successfully used to provide substantial noise reductions along the SBP.

585.232.5135

www.bergmannpc.com

200 First Federal Plaza / 28 East Main Street / Rochester, New York 14614