

To:	Calex Gonzalez, P.E.		
From:	Mike Parsons, P.E.	Project:	West Dowling Road Phase II: Noise Analysis
cc:			
Date:	September 21, 2010	Job No:	Dept. 249, #111949

Re: Wall Opening at Chad Street Noise Analysis

The Municipality of Anchorage is specifically calling for Chad Street to be connected to West Dowling Road as a right-in, right-out intersection. As a result, the Alaska Department of Transportation & Public Facilities (DOT&PF) has asked HDR to model an opening in Chad Street to determine the effectiveness of the wall and whether it will still warrant being built as far to the west as the previous noise model suggested.

In an effort to determine the appropriate length for the noise wall located along West Dowling Road, the Federal Highway Administration's Traffic Noise Model (TNM), Version 2.5, was used to predict noise levels and perform noise barrier analysis. Noise modeling was performed in accordance with procedures in the State of Alaska DOT&PF Traffic Noise Abatement Guidance (April 2009).

The DOT&PF Traffic Noise Abatement Guidance requires that DOT&PF consider two criteria when evaluating whether noise barriers should be incorporated into a project: feasibility and reasonableness. Feasibility deals primarily with engineering considerations (e.g., can a substantial noise reduction be achieved given the conditions of a specific location? Is the ability to achieve noise reduction limited by factors such as topography, access requirements for driveways or ramps, the presence of local cross streets, maintenance needs, or other noise sources in the area?). A noise barrier must provide a minimum of 5 decibels of noise reduction (positive noise benefit) to be considered feasible. DOT&PF will not provide abatement for commercial or industrial zoned (Activity C) properties. DOT&PF Traffic Noise Abatement Guidance requires that a determination of economic reasonableness of noise barriers be made before a final decision to build the barriers can be rendered. The policy provides guidance for determination of the overall reasonableness of noise abatement options.

The noise policy states that the test for cost reasonableness is calculated by dividing the number of benefited residential units that receive a minimum of 5-dBA reduction in noise level into the estimated total cost of the noise barrier. If the cost is \$32,000 per residence or less, the barrier is

deemed economically reasonable. If this cost is exceeded, the noise abatement measures would not be recommended.

This analysis modeled a noise wall for the impacted residences along Raspberry Road, as discussed below.

Build Alternative Wall with Opening for Chad Street

Predicted future traffic noise levels meet or exceed the NAC at modeled receptors 1-6. A barrier was evaluated to determine its potential to mitigate these noise impacts. The barrier attempted to provide at least a 5-dBA reduction at all of the impacted receptors and to reduce future build noise levels to less than 66 dBA. The barrier modeled is located along the southern right-of-way and with an opening provided for access to Chad Street. Figure 1 shows an aerial view of the proposed wall location.

HDR evaluated a noise barrier approximately 709-feet in length. The wall was located on the edge of the right-of-way. The height of the barrier was 10 feet.

Sixteen (16) receptors receive a noise level reduction from this noise barrier, but only 12 receptors receive a reduction of 5 dBA or more (minimum reduction required to meet the feasibility criteria). All of the impacted receptors receive a noise reduction of at least 5-dBA. Table 1 below summarizes the noise barrier modeled for this area. At the modeled cost of \$30.00 per square foot, the barrier would cost approximately \$212,700. **The cost per benefitted receptor for Wall A is approximately \$17,725 and meets the cost reasonableness standard specified in the DOT&PF Noise Policy (\$32,000 per benefitted receptor).**

**Table 1
Summary of Noise Barrier Analysis**

Wall/ Receptors	Barrier Length (ft)	Average Barrier Height (ft)	Insertion Loss (dBA)	Total Number of Shielded Receptors	Total Number of Impacted Receptors	Number of Benefitted Receptors ¹
A/1-6; 14-23	709	10.0	2.6-12.9	16	6	12 (1-6, 17-22)

¹ Receptors where the noise level reduction from the barrier is at least 5 dBA.