

ALPHA TESTING AND INSPECTION, INC.



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September 14, 2007

ATI-5595

Boh Bros Construction Co., LLC
P. O. Drawer 53266
New Orleans, LA 70153
Attn: Mr. Ron Brylski

RE: Vibration Data Reports
State Project No. 006-01-0022
Huey P. Long Bridge Widening
(Railroad Modifications)
Jefferson Parish, LA

Gentlemen:

We have reviewed the vibration monitoring reports for the time period of September 8, 2006 through August 3, 2007. There were two to three monitors at the East Bank site at various distances from a range of 50 feet to 500 feet from construction activity. We also had two monitors at the West Bank site at various distances from a range of 200 feet to 400 feet from construction activity.

There were very few readings that reached the project specifications limits for the peak particle velocity levels of .25 inches, but were not sustained for a long period of time. The percentage that reached the peak particle velocity levels of .25 inches was less than 1/2 %. There were a total of 360 reports for this job in which the monitoring started approximately at 7:00 a.m. and continued to approximately 5:00 p.m. The vibration monitor readings were at intervals of every 10 seconds, and with having very few readings that reached the project specifications, we find this unremarkable. In regards to the project specifications limits for the peak particle velocity levels of .25 inches, this is a very conservative threshold.

In comparison to the Bureau of Mines report RI8507, which is intended to be an extremely safe criteria, the conclusion on page 68, stated in item 6, "Practical safe criteria for blasts that generate low-frequency ground vibrations are 0.75 in/sec for modern gypsum board houses and 0.50 in/sec for plaster on lath interiors. For frequencies above 40 Hz, a safe particle velocity maximum of 2.0 in/sec is recommended for all houses." That vibration velocity and the frequency is applicable for pile driving at or near structures. A copy of the Bureau of Mines report is enclosed.

We feel very confident there was no damage caused during sheet pile and "H" pile driving.

If you have any questions or concerns, please do not hesitate to call me.

Assuring you of my cooperation, I remain

ALPHA TESTING & INSPECTION, INC.

Michael A. Devillier
President

MD/lr
Enclosures

RI

8507

Bureau of Mines Report of Investigations/1980

**Structure Response and Damage
Produced by Ground Vibration
From Surface Mine Blasting**

By D. E. Siskind, M. S. Stagg, J. W. Kopp,
and C. H. Dowding



UNITED STATES DEPARTMENT OF THE INTERIOR

Report of Investigations 8507

Structure Response and Damage Produced by Ground Vibration From Surface Mine Blasting

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UNITED STATES DEPARTMENT OF THE INTERIOR
Cecil D. Andrus, Secretary

BUREAU OF MINES
Lindsay D. Norman, Director

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4. Strip mining--Environmental aspects. I. Siskind, D. E. II. Title.
III. Series: United States. Bureau of Mines. Report of investigations ;
8507.

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CONCLUSIONS

The problems of blasting vibration damage to residential structures and human tolerance to vibrations have been analyzed using data from a wide variety of studies. Statistical techniques of mean and variance analysis and probability plots have both been applied to the damage data from the 10 studies and demonstrated the following:

1. Particle velocity is still the best single ground motion descriptor.

2. Particle velocity is the most practical descriptor for regulating the damage potential for a class of structures with well-defined response characteristics (e.g., single-family residences).

3. Where the operator wants to be relieved of the responsibility of instrumenting all shots, he could design for a conservative square root scale distance of $70 \text{ ft/lb}^{1/2}$. The typical vibration levels at this scaled distance would be 0.08 to 0.15 in/sec.

4. Damage potentials for low-frequency blasts ($< 40 \text{ Hz}$) are considerably higher than those for high-frequency blasts ($> 40 \text{ Hz}$), with the latter often produced by close-in construction and excavation blasts.

5. Home construction is also a factor in the minimum expected damage levels. Gypsum-board (Drywall) interior walls are more damage resistant than older, plaster on wood lath construction.

6. Practical safe criteria for blasts that generate low-frequency ground vibrations are 0.75 in/sec for modern gypsumboard houses and 0.50 in/sec for plaster on lath interiors. For frequencies above 40 Hz, a safe particle velocity maximum of 2.0 in/sec is recommended for all houses.

7. All homes eventually crack because of a variety of environmental stresses, including humidity and temperature changes, settlement from consolidation and variations in ground moisture, wind, and even water absorption from tree roots. Consequently, there may be no absolute minimum vibration damage threshold when the vibration (from any cause, for instance, slamming a door) could in some case precipitate a crack about to occur.

8. The chance of damage from a blast generating peak particle velocities below 0.5 in/sec is not only small (5 pct for worst cases) but decreases more rapidly than the mean prediction for the entire range of vibration levels (almost asymptotically below about 0.5 in/sec).

9. Human reactions to blasting can be the limiting factor. Vibration levels can be felt that are considerably lower than those required to produce damage. Human reaction to vibration is dependent on event duration as well as level. Particle velocities of 0.5 in/sec from typical blasting (1-sec vibration) should be tolerable to about 95 pct of the people perceiving it as "distinctly perceptible". Relevant to whole-body vibration reaction is the degree that the vibration interferes with activity (sleep, speech, TV viewing, reading), presents a health hazard, and affects task proficiency. For people at home, the most serious blast vibration problems are house rattling, fright (fear of damage or injury), being startled, and for a few, activity interference. Complaints from these causes can be as high as 30 pct at 0.5 in/sec, and this is where good public relations attitudes and an educational program by the blaster are essential.