

INDUSTRIAL
DEVELOPMENT
ENGINEERING

Lead Industries Association, Inc.
292 Madison Ave.
New York 17, N. Y.



Look Ahead with Lead

April 14, 1964

SUBJECT: NOISE CONTROL
CASE HISTORY

To Members of the Lead Industries Association, Inc.:

Attached is the third detailed report of a case history of a successful experimental installation of lead for noise control. It follows case histories sent to you with our letters of December 4, 1962 and March 20, 1964.

We hope you will find the information contained in this most recent case history useful in your own promotion and sale of lead for noise control.

Very truly yours,

Executive Vice President

RLZ:mk
Enc.

INDUSTRY DEVELOPMENT BULLETIN

Lead Industries Association, Inc.
292 Madison Ave.
New York 17, N. Y.



Look Ahead with Lead

April 14, 1964

LEAD FOR NOISE CONTROL -- CASE HISTORY # 3

Hotel America, Hartford

Summary: When a change in floor plan of the new Hotel America in Hartford, Connecticut made it necessary to thin a section of the wall between hotel rooms, the architect contacted LIA for help. He required the same sound isolation in a wall not exceeding $1\frac{1}{4}$ " in thickness as he expected to achieve with a good conventional wall 4" thick. A basic construction was suggested by LIA and the final detailed drawing was worked out by Lewis Goodfriend through the ILZRO consulting arrangement. Tests of the completed wall show that the thin lead "fin" does not lower the transmission loss of that wall of the room. Testing conditions were poor and the performance ratings are made questionable by leakage of sound through cracks in both the conventional wall and the thin lead fin. We, therefore, prefer not to stress the numerical results (although they show the lead wall to be slightly better than the conventional wall).

History and Problem: Mr. Martin Ginsberg of the architectural firm of Curtis and Davis phoned LIA January 23, 1963. A revision of the floor plan of the Hotel America in Hartford, Conn., had made it necessary to bring the common wall between hotel rooms to join the front wall of the building at narrow mullions instead of on the columns. The specific problem was to find some wall construction which, in the allowable $1\frac{1}{4}$ " of wall thickness, would provide sound isolation equal to that of the conventional wall used in the balance of the room.

This conventional wall was $3/8$ " plaster over $3/8$ " gypsum lath on both sides of $2\frac{1}{2}$ " steel studs. Glass fiber batting was called for in the space between. The performance of such a wall is estimated to be 42 db nine-frequency average.

-more-

Hotel America, Hartford

-2-

April 14, 1964

Action taken:

Immediately following Ginsburg's call we visited Ginsburg's office. The job was past deadline and immediate action was called for. Preliminary estimates showed what type of structure was called for. This was a laminate of gypsum board with fairly heavy sheet lead (6 or 8 pound).

By early March, detailed drawings were in the hands of the architect. The detail suggested for the thin wall (subsequently called the "fin" or "lead fin") is shown in the attached drawing. It should be noted that, as installed and inspected on February 6, 1964, the felt gasketing had been replaced with urethane foam gasket and the calking had not been done though the room was apparently finished. Furthermore, at one place the metal window frame passes into the joint between the fin and the front wall of the building. At this point the gasketing had been cut away leaving a gap of about 3/16"x 2". Rather great improvement in performance can be expected when this gap is closed with calking.

This was not the only uncertain factor in making the test. There was no choice of rooms to be tested -- only one room was available which had a door installed and which was not filled with supplies of some kind. The door was about 15 inches shorter than the door opening and obviously a transom will be installed at a later date. This opening was blocked with corrugated cardboard during the tests, but noise pouring out of the doorway of the source room to the corridor and from the corridor through the makeshift door barrier contributed to the noise level in the receiving room without any doubt.

Despite a very high ambient noise in the receiving room (overall 58 db) due to construction work in progress and air diffuser noise, the signal levels were at least 6 db higher than the background. If the room is retested under better conditions, it is almost certain that the high ambient noise will limit the test results unless a more powerful noise source is employed.

Results:

Figure 2 shows the measured noise reduction through the conventional wall and through the wall which had the short lead fin. It should be emphasized that both walls are probably much better than this. The measured reduction is severely limited by noise leakage. In both cases the curves are based on four readings in the source room and four in the receiving room. Except in the lowest frequency band, readings in either room agreed within about 3 db with the significant exceptions marked. The asterisk marks bands where the location nearest the cracks at the fin-front wall joint read high. The star indicates bands with high readings for the location nearest the cracks in the conventional wall. By placing an extension microphone close to the cracks it was possible to record a sound spectrum which peaked in these bands. The relatively low frequencies at which the conventional wall joint peaked are quite unexpected and do not seem to be the sort of behavior normally associated with leakage through cracks. We have no explanation for this. It was quite easy to localize these leaks with a stethoscope and the quality of the sound (pitch of the noise) seemed to agree with the spectrum we metered.

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Hotel America, Hartford

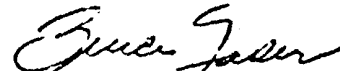
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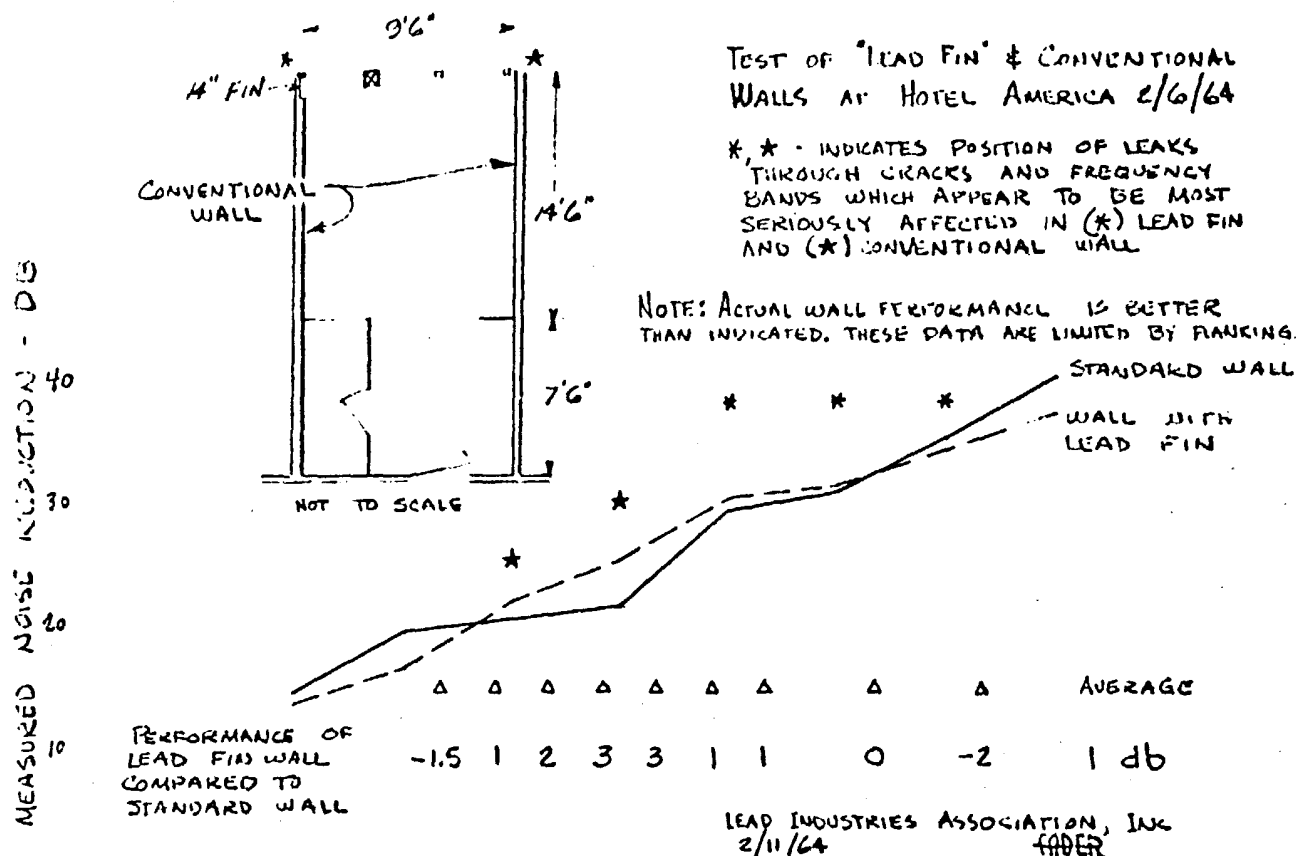
April 14, 1964

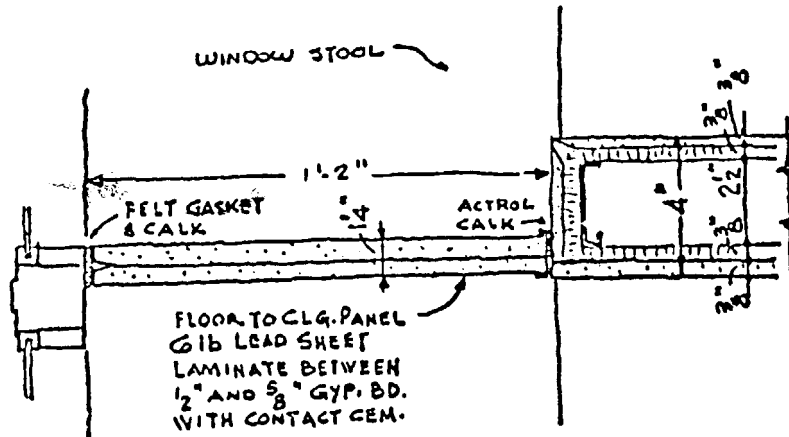
Technical addendum:

The equipment used was loaned by the Research Lab of American Smelting and Refining Company and Mr. John Monan of their research staff participated in the tests. The equipment was: Altec 755-C speaker in an infinite baffle, a Grayson-Statler noise generator, EV 654A calibrated microphone (calibration correction were not required or made in this test), and an IAC sound spectrometer with octave band analyzer.

Respectfully submitted,

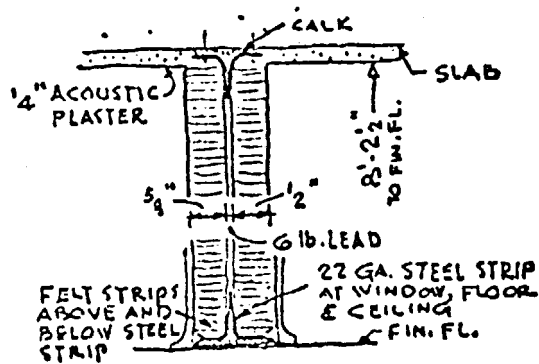

E. D. Martin
Bruce FaderEF:bd
Attachments





PLAN AT MULLION

3' x 1'-0"



SECTION

1/2 F.S.

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