BARRIER FENCE

3” FENCE SYSTEM
SOUND TESTING
APRIL, 2022

SOUND TESTING

Reduction to harsh loud noises, including road and vehicles is a frequently discussed topic around housing developments near roadways. Barrier Fence conducts tests to ensure our products meet our customer expectations. While no guarantee can be made given a variety of weather factors, install methods, soil conditions etc. This document contains laboratory research and recommendations on Barrier Fence sound walls.

TEST METHODOLOGY

Barrier Fence was tested in an accredited U.S. Department of Commerce, National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP) as an ISO 17025:2017 Laboratory (NVLAP Lab Code: 100227-0) and for this test procedure. The test reported in this document conformed explicitly with ASTM E90-09 (2016): "Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements." The single number rating of the specimen was calculated according to ASTM E413-16: "Classification for Rating Sound Insulation."

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STC TEST RESULTS

Sound transmission loss values are tabulated at the eighteen standard frequency bands. A graphic presentation of the data and additional information appear on the following pages. The precision of the transmission loss test data is within the limits set by the ASTM Standard E90-09 (2016).

FREQ.	TL	ΔTL	DEF.	FREQ.	TL	ΔTL	DEF.
100	17	0.58	0	800	25	0.16	0
125	20	0.77	0	1000	21	0.19	4
160	21	0.53	0	1250	18	0.14	8
200	20	0.59	0	1600	33	0.11	0
250	21	0.24	0	2000	36	0.13	0
315	23	0.28	0	2500	35	0.15	0
400	25	0.23	0	3150	35	0.12	0
500	26	0.24	0	4000	39	0.09	0
630	26	0.21	0	5000	43	0.08	0

STC=22

ABBREVIATION INDEX

FREQ. = 1/3 OCTAVE BAND CENTER FREQUENCY, Hz
TL = TRANSMISSION LOSS, dB
ΔTL = 95% CONFIDENCE INTERVAL FOR TL MEASUREMENTS, dB
DEF. = DEFICIENCIES, dB BELOW SHIFTED STC CONTOUR (SUM OF DEF = 12)
STC = SOUND TRANSMISSION CLASS

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OITC TEST RESULTS

The determination of the Outdoor Indoor Transmission Class (OITC) as reported was made with explicit conformity to the procedures described in the ASTM E1332-16 test standard. Test Method ASTM E90-09 (2016) was used to obtain the sound transmission loss data. This rating is based on an average transportation noise source spectrum and an A-weighted sound level reduction, either of which may be inappropriate for some applications.

One-third Octave Band Center Frequency, Hz	Reference Sound Spectrum, dB	Test Specimen Transmission Loss, dB
80	103	14
100	102	17
125	101	20
160	98	21
200	97	20
250	95	21
315	94	23
400	93	25
500	93	26
630	91	26
800	90	25
1000	89	21
1250	89	18
1600	88	33
2000	88	36
2500	87	35
3150	85	35
4000	84	39

OITC = 23

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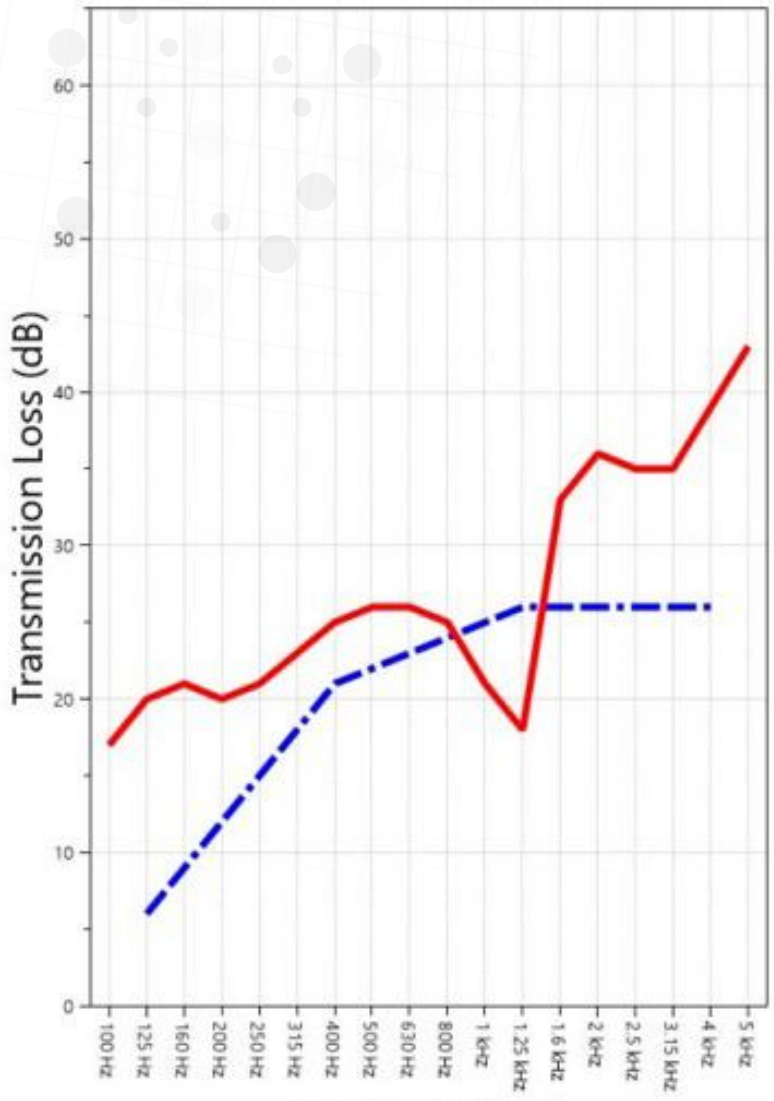
STC = 22

OITC = 23

TRANSMISSION LOSS

SOUND TRANSMISSION CLASS

CONTOUR



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The following non-accredited data were obtained in accordance with ASTM E90-09 (2016), but extend beyond the defined frequency range of 100 Hz to 5,000 Hz. These unofficial results are representative of the RAL test environment only and intended for research & comparison purposes. Sampling precision observed during this procedure is reported.

1/3 Octave Band Center Frequency (Hz)	Sound Transmission Loss (dB)	Applicable Corrections	ΔTL (Eq. A2.5) (dB)	Repeatability (dB)
31.5	20	*ZZ F*	1.30	1.01
40	22	*Z F*	0.98	2.26
50	13		0.76	1.52
63	14		0.56	1.47
80	14		0.91	0.60
100	17		0.58	0.67
125	20		0.77	0.71
160	21		0.53	0.35
200	20		0.59	0.33
250	21		0.24	0.42
315	23		0.28	0.41
400	25		0.23	0.46
500	26		0.24	0.18
630	26		0.21	0.26
800	25		0.16	0.24
1000	21		0.19	0.27
1250	18		0.14	0.15
1600	33		0.11	0.12
2000	36		0.13	0.13
2500	35		0.15	0.19
3150	35		0.12	0.14
4000	39		0.09	0.17
5000	43		0.08	0.17
6300	46		0.07	0.21
8000	48		0.10	0.50
10000	48		0.21	1.21
12500	46		0.18	1.74

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Measured sound pressure levels in the receive room are within 10 dB of the ambient noise level at the marked frequency band. Receive room levels used to calculate Transmission Loss are corrected according to ASTM E90 Section 10.3.

Measured sound pressure levels in the receive room are within 5 dB of the ambient noise level at the marked frequency band. Receive room levels used to calculate Transmission Loss are corrected according to ASTM E90 Section 10.3.1. Transmission Loss values calculated from levels corrected this way will be less than or equal to Transmission Loss values from a hypothetical test using the same specimen and a receive room with idealized ambient sound levels of (-∞) dB.

The reported Transmission Loss is within 10 dB of the laboratory flanking limit at the marked frequency band. The measured performance of the specimen may be limited by the performance of the laboratory building structure at this frequency band.

The reported Transmission Loss at the marked frequency band has been corrected according to ASTM E90 Section A3.2.7 to account for possible sound transmission through the filler assembly.

The reported Transmission Loss at the marked frequency band has been corrected according to ASTM E90 Section A3.2.8 to account for possible sound transmission through the filler assembly. Transmission Loss values corrected this way will be less than or equal to Transmission Loss values from a hypothetical test using the same specimen and an idealized filler assembly with a Sound Transmission Class rating of (∞).

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Glossary of Variability Metrics
Specimen: 3 inch Barrier Fence System

ΔTL, the 95% confidence interval for reported transmission loss values, is calculated from the standard deviation of the sets of measurements for source room sound pressure level, receive room sound pressure level, and receive room sound absorption. This metric is calculated in an effort to quantify the combined influences of room geometry, microphone positioning, and other varying environmental conditions on reported results.

Repeatability, expressed as a 95% confidence interval, is calculated from the standard deviation of transmission loss as obtained from a set of six (6) consecutive tests conducted according to this test method by RAL on 2020-02- 13. The tests were performed on a specimen composed of 24 gauge steel paneling, using the same test opening as used in this report. This metric provides an estimate of the variation in results that might be observed if the test were repeated with no change to the installed specimen. Note that repeatability will vary with the construction type.