Complete Acoustic Solutions for Data Center Construction

WALLS OF TROY™

53	47	0.90
STC	OITC	NRC

RIVERBANK LABS · TL26-262 (STC/OITC) · A26-364 (NRC)

For Developers · Contractors · Municipalities · Corporations

Exterior Perimeter Walls · Interior Ceiling Systems
Proven on Highways. Lab-Tested. Built for the Long Term.



THE LOW-FREQUENCY THREAT — INVISIBLE, INESCAPABLE, AND UNHEALTHY

Data center equipment hums at 31.5–250 Hz — the sound that travels farthest and is hardest to stop

31.5–80 Hz

Felt More Than Heard

Pressure and vibration you feel indoors.

80–160 Hz

Body-Resonance Range

Passes through ordinary walls and windows.

160–250 Hz

Tonal Hum

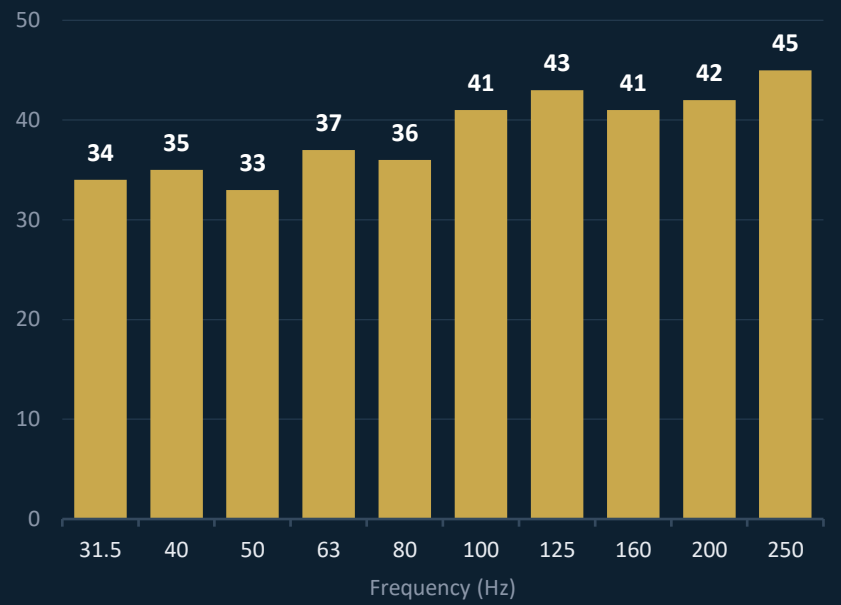
The sound neighbors complain about most.

Standard dB(A) readings discount bass

A site can “pass” on paper while neighbors still hear the hum. WHO community-noise guidance (1999) notes low-frequency noise can disturb rest and sleep even at low levels.

WALLS OF TROY BLOCKS 33–45 dB ACROSS THE HUM BAND

Transmission loss (dB) · RAL-TL26-262 · 31.5–250 Hz



31.5–80 Hz values from the RAL report’s extended-range appendix (outside the accredited 100–5,000 Hz range).

DATA CENTER NOISE SOURCES — WHY EVERY CAMPUS NEEDS ACOUSTIC PLANNING

Chillers & Cooling

85–95 dB(A)

24/7 fans — the main low-frequency drone.

Backup Generators

90–105 dB(A)

Routine NFPA 110 test runs — a top neighbor complaint.

Towers & AHU Exhaust

70–85 dB(A)

Rooftop fans push noise toward neighbors.

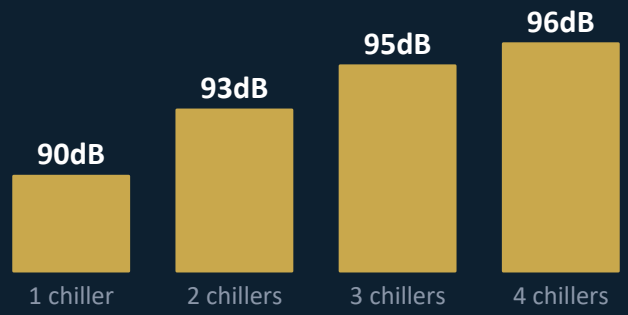
Transformer Hum

55–80 dB(A)

120 Hz tone — tonal-noise rules tighten limits.

THE 3 dB RULE — NOISE STACKS UP

- Decibels add logarithmically: two identical chillers = +3 dB, four ≈ +6 dB.
- Add towers, AHUs and generators and a plant reaches 100–105 dB(A).
- The low-frequency part (31–250 Hz) is the hardest to block.



Bars: dB(A) for identical 500-ton chillers

COMMUNITIES ARE PUSHING BACK — NOISE RULES ARE TIGHTENING

2026 brought new low-frequency and tonal-noise rules · Plan the wall before the permit hearing

Prince William Co., VA

Revised noise code adds “steady tonal sound” — effective May 1, 2026.

St. Joseph Co., IN

Low-frequency sound limits adopted April 2026, ahead of a Microsoft data center.

St. Louis, MO

New rules: annual third-party noise reports, equipment enclosures, 600-ft setbacks.

Nashville, TN

Nashville Zoo publicly opposed a data center ~50 yards from animal enclosures.

Chandler, AZ

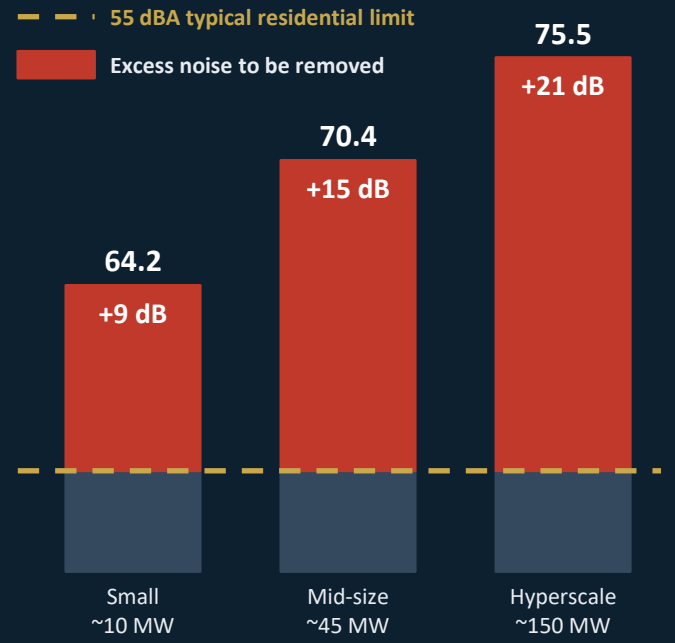
Pre-construction acoustic baseline study required for new data centers.

Niagara Falls, NY

50 dBA day / 45 dBA night limits written with data centers in mind.

HOW FAR OVER THE LIMIT?

Unmitigated dBA at 300 ft from the equipment yard



Simplified point-source model, no barrier, flat ground.

Sources: PWC VA Ch. 14 · WVPE 4/29/26 · KCUR 9/30/26 · WSMV 6/2/26 | Troy Acoustics Corporation

DATA CENTER CAMPUS CONSTRUCTION — COMPLETE TROY ACOUSTICS SOLUTION



Walls of Troy installation — Puerto Rico

Plan Acoustics Before Permitting

Retrofits, permit denials and lawsuits cost far more than a wall designed in from day one.

TROY SYSTEM CAPABILITIES

Exterior Wall	NRC 0.90 · STC 53 · OITC 47 · 22'+ heights
Interior Ceiling	CAC 38 · NRC 1.0 · ASTM E1414-16
Compliance	FHWA · HUD · EPA · OSHA · local codes
Security	Solid mass wall · zero line of sight
Certifications	UL723 Class A · ASTM G21 · ASTM E2180
Life Cycle	30+ year service life · minimal upkeep
Applications	New build · Retrofit · Campus expansion

THE SOLUTION:

Walls of Troy™ Sound Barrier for Data Centers

Proven on American highways. Now purpose-built for data center perimeters.



Walls of Troy installation — Puerto Rico

NRC

0.90

Noise Reduction Coefficient

Absorbs sound instead of reflecting it.

SAA 0.87 · RAL-A26-364 · ASTM C423 · tested 2026-07-02

STC

53

Sound Transmission Class

41 dB at 100 Hz → 64 dB at 4–5 kHz.

RAL-TL26-262 · ASTM E90 / E413 · tested 2026-06-26

OITC

47

Outdoor-Indoor Transmission Class

The low-frequency exterior rating.

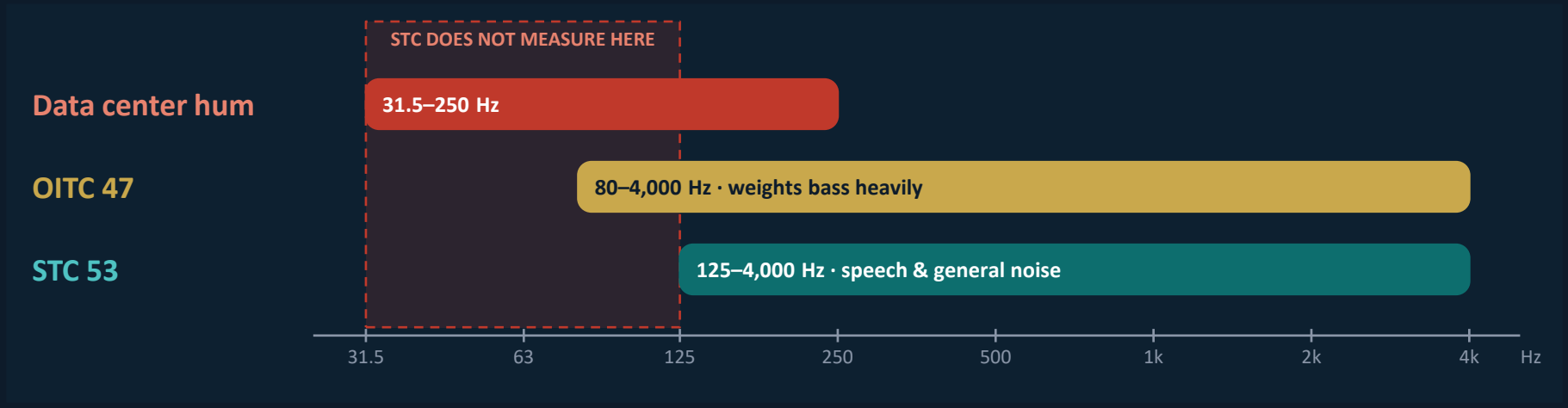
RAL-TL26-262 · ASTM E1332

Tested on a real installed wall — not a lab prototype

Specimen from a completed highway barrier, Río Hondo, PR · NVLAP-accredited lab

STC vs. OITC — TWO RATINGS THAT TELL THE COMPLETE STORY

Which frequencies each rating measures — and where data center hum lives



STC 53 — Sound Transmission Class

- ✓ The building-code rating most specs require.
- ✓ 90 dB on one side → roughly 37 dB on the other.
- ✓ Starts at 125 Hz — above most HVAC hum.

OITC 47 — Outdoor-Indoor Transmission Class

- ✓ Built for exterior transportation & industrial noise.
- ✓ Starts at 80 Hz and weights low frequencies most.
- ✓ The better yardstick for data center noise.

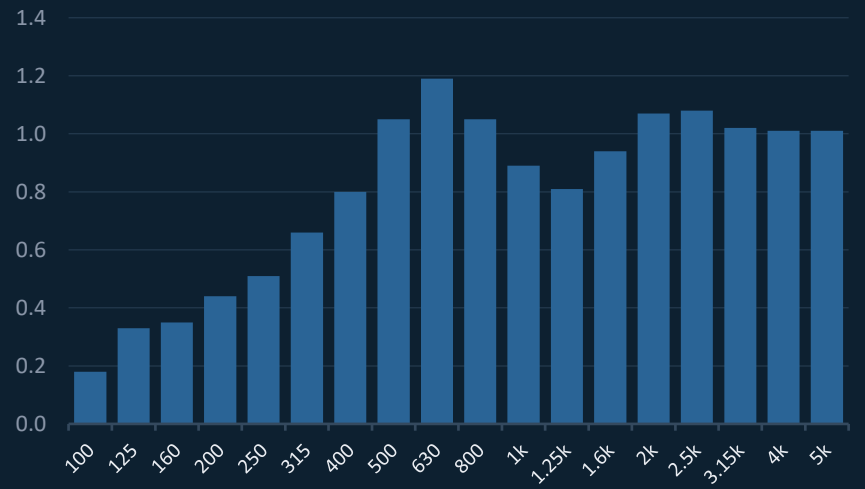
WHY BOTH MATTER: STC 53 meets the codes. OITC 47 proves the wall stops the deep hum that travels farthest.

INDEPENDENT ACOUSTIC PERFORMANCE — 2026 RIVERBANK LABORATORY DATA

Riverbank Acoustical Laboratories · NVLAP 100227-0 · RAL-TL26-262 · RAL-A26-364 · final reports issued 2026-07-17

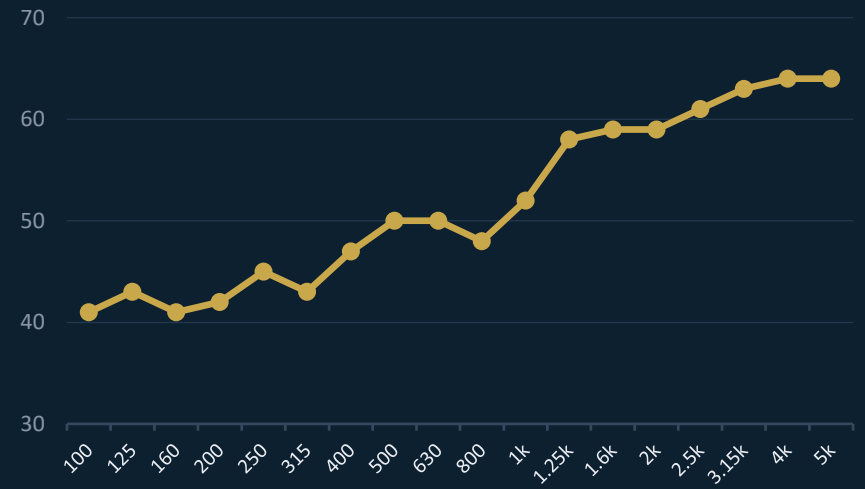
SOUND ABSORPTION — NRC 0.90

Absorption coefficient by frequency · RAL-A26-364



SOUND BLOCKING — STC 53 / OITC 47

Transmission loss (dB) by frequency · RAL-TL26-262



NRC 0.90

SAA 0.87 · peak 1.19 at 630 Hz

Absorbs HVAC broadband noise

STC 53

41 dB at 100 Hz · 64 dB at 4–5 kHz

Blocks every code-regulated band

OITC 47

ASTM E1332 · low-frequency rating

The data center exterior standard

NOISE COMPLIANCE — FEDERAL, STATE & LOCAL STANDARDS

EPA · FHWA · OSHA · HUD · State property-line codes · Local zoning

THE COMPLIANCE REALITY: Every site faces layered limits from day one. Troy's exterior + interior system is engineered for each layer — and Troy models your site to confirm it.

FHWA NAC Cat. B

67 dB(A)

Leq(h) · residential

Troy: STC 53 + NRC 0.90 absorption

HUD 24 CFR Part 51

65 / 45 dB

DNL exterior / interior goal

Troy: STC 53 wall + CAC 38 ceiling

EPA Levels Document

55 / 45 dB

Ldn outdoor / indoor

Troy: OITC 47 for low-frequency hum

OSHA 29 CFR 1910.95

85 dB(A)

8-hr TWA action level

Troy: NRC 1.0 ceiling cuts reverb

State Property-Line

Varies

dB(A) or by octave band

Troy: 33–64 dB TL, 31.5 Hz–5 kHz

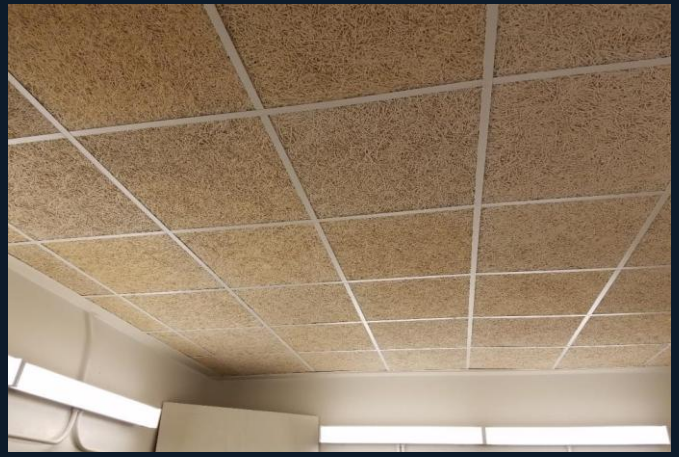
Local Zoning / CUP

50–65 dB(A)

typical at property boundary

Troy: acoustic study + wall design

DATA CENTER INTERIORS — WORKER SAFETY & THE TROY CEILING SOLUTION



Troy fiber-cement ceiling panel — CAC-181107

OSHA HAZARD — 29 CFR 1910.95

90–96	dB(A) in server halls
85	dB(A) TWA action level
4 hr	max exposure at 95 dB(A)

THE TROY INTERIOR CEILING SOLUTION

CAC
38
Ceiling Attenuation Class

NRC
1.0
Maximum absorption

Stops Flanking

CAC 38 keeps server noise out of offices and control rooms.

Cuts Exposure

NRC 1.0 soaks up reverb, lowering worker dB(A).

Drop-In Tile

1" fiber cement in standard 15/16" grid. Build or retrofit.

Lab Tested

NVLAP lab · ASTM E1414-16 · USG TROYC-100118.

THIRD-PARTY CERTIFICATIONS — CRITICAL FOR DATA CENTER USE

FIRE SAFETY



UL723 (ASTM E84) — Class A

UL cert. #20180302-R27255 · confirmed Oct 2025

- ✓ Flame Spread Index: 0
- ✓ Smoke Developed Index: 0
- ✓ Highest UL fire class

WHY IT MATTERS
Supports campus fire-review & permitting

ANTI-FUNGAL



ASTM G21 — Accugen Labs

Lab Report #175034 · June 2021

- ✓ Zero growth at 7–28 days
- ✓ 5 mold genera tested
- ✓ No loss of acoustic performance

WHY IT MATTERS
Holds up in humid, outdoor equipment yards

ANTI-MICROBIAL



ASTM E2180 — Accugen Labs

Lab Report #175035 · June 2021

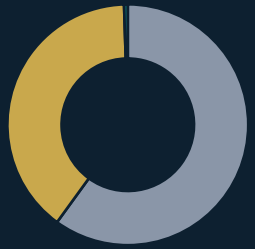
- ✓ ≥99.9999% vs. S. aureus
- ✓ ≥99.9999% vs. K. pneumoniae
- ✓ 24-hour contact-time test

WHY IT MATTERS
Suited to high-density equipment areas

PANEL COMPOSITION & STRUCTURAL SPECIFICATIONS



TROY BOARD™ MIX



- 60% Portland cement
- 39.5% wood fiber
- 0.5% sodium silicate

Zero VOC · non-toxic

Flame spread: 0

Insoluble in water

30+ year service life

WALLS OF TROY™ PANEL SPECS

Troy Board Dimensions	4" × 47¾" × 11'-3"
Panel Dimensions	7¾" × 60" W × 11'-9" L
Panel Weight (8' length)	1,300 lbs · 41.2 lbs/sq ft
Panel Weight (4.5' × 12')	2,225 lbs per panel
Available Wall Heights	Up to 22'+ on steel W-posts
Concrete (Structural)	3,000 psi · rebar fy ≥ 40 ksi
Post Embed Plates	3/8" steel · (2) ½" × 4" headed studs
Acoustic Ratings	**NRC 0.90 · STC 53 · OITC 47 (RAL 2026)**

COMPETITIVE COMPARISON — SOUND BARRIER OPTIONS FOR DATA CENTERS

Performance Criterion	Walls of Troy™	Concrete Wall (Reflective)	Fiberglass Panel	Timber / Wood
NRC (sound absorption)	✓ 0.90	✗ ~0.02	◐ ~0.35	◐ ~0.10
STC (transmission block)	✓ 53	◐ 45–55	✗ 25–35	✗ 20–30
OITC (low-freq exterior)	✓ 47	◐ ~38–45	✗ 18–26	✗ 14–22
Low-freq hum (31.5–250 Hz)	✓ 33–45 dB TL	✗ Reflected	✗ Marginal	✗ None
Tonal noise margin	✓ Large	✗ None	◐ Small	✗ None
UL723 Class A fire	✓ Yes	✓ N/A	◐ Varies	✗ Class C
Anti-fungal / anti-microbial	✓ Both	◐ Fungal only	✗ No	✗ No
Modular / adjustable height	✓ Yes	✗ Difficult	✓ Yes	✓ Yes
Long-term maintenance	✓ Minimal	✓ Low	◐ Moderate	✗ High

✓ Meets / exceeds ◐ Partial / variable ✗ Does not meet

BEYOND ACOUSTICS — SECURITY, PRIVACY & LONG-TERM ASSET VALUE

Physical Security

22'+ solid cement-wood panels in steel posts — hard to breach, cut or climb.

Complete Privacy

No sight lines, no photos of equipment or operations from next door.

Zero Line of Sight

Deliveries, staff and site layout stay fully screened.



Today's remote site is tomorrow's neighborhood.

THE FUTURE VALUE ARGUMENT

Growth Is Inevitable

Homes follow data centers. Plan for neighbors on day one.

Value Multiplies

When stricter limits arrive, the wall is already compliant.

Permanent Infrastructure

A low-maintenance security asset as the campus scales.

Property Value

A screened, quiet perimeter is an investment, not a cost.

THE TROY ACOUSTICS SYSTEM

Complete Acoustic Solutions for Data Center Construction

For Developers · Contractors · Municipalities · Corporations · Nationwide

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