

Advanced Flooring Concepts

Leaders in Innovative Commercial Flooring!

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The Silent Advantage

The Specifier's Guide to Acoustical Flooring

The floor-ceiling assembly — not the floor covering alone — determines acoustical performance. A method for specifying it, and for verifying it. Every figure traces to a named, certified third-party Intertek report.

12

CERTIFIED THIRD-PARTY TESTS · 2017–2024

STC · IIC · HIIC

EVERY ASSEMBLY TESTED PER ASTM E90, E492 & E3222

Adam Clark, CEO · Advanced Flooring Concepts

WHITE PAPER EDITION · 2026

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CHAPTER ONE

Executive Summary

The five things to know before specifying acoustical flooring.

1 **The sound mat assumption is outdated.** Since 2000, the year the International Building Code was adopted, the standard advice from architects and acousticians was that a separate sound mat between the subfloor and the gypsum underlayment was required to meet Section 1206. Recent third-party laboratory testing demonstrates that an acoustically-backed glue down LVT — with the acoustical layer adhered directly to the back of the LVT — can outperform conventional sound mat assemblies while eliminating an entire construction step. The principle is straightforward: acoustical dampening works best when it sits closest to the source of the impact.

2 **There are three ratings that matter, not one.** STC measures airborne sound (voices, television, music). IIC measures impact sound (footsteps, dropped objects). HIIC measures the same impact energy weighted toward the frequencies the human ear finds most objectionable. Section 1206 specifies STC and IIC minimums; it does not specify HIIC. HIIC is included in specifications because it better predicts how the floor will sound to occupants — not because it is required by code.

3 **The assembly matters more than the floor covering.** A floor covering does not have an IIC rating on its own — the entire floor-ceiling assembly has the rating. The same LVT can score a 50 IIC in one assembly and a 56 IIC in another. Specifying a floor covering without specifying the gypsum underlayment, wood framing or concrete deck, ceiling resilient channel, batt insulation, and gypsum wallboard ceiling is specifying nothing.

4 **HIIC better predicts what the floor will actually sound like.** A high IIC does not always mean a floor sounds quiet. HIIC captures the low-frequency footfall energy occupants complain about most, and the higher it is, the quieter the assembly sounds. No code or brand requires HIIC — which is precisely why specifying it protects you.

5 **Acoustical specification is a structural decision.** Acoustical performance directly affects vacancy rates, tenant retention, online review scores, and property valuation. It is also one of the few specifications that can simultaneously improve construction speed, reduce assembly thickness, increase the long-term crack resistance of the gypsum underlayment, and meet code — when the right acoustical LVT is specified in the right assembly.

What This Guide Covers

This specifier's guide is written for the person who specifies the floor — the architect, the spec writer, or the acoustical consultant who decides what goes into the construction documents. It explains how sound moves between floors in multi-family and hospitality buildings, what the three acoustical ratings actually measure, how every major floor covering category performs on the two most common assemblies, and how to read an acoustical test report. All performance data attributed to Advanced Flooring Concepts comes from certified third-party Intertek laboratory testing, verifiable by report number.

CHAPTER TWO

Introduction

Why acoustics are the hidden differentiator in hotel and multi-family real estate.

Every material decision ultimately affects net operating income. Operators focus heavily on cost-per-unit, finish quality, and visual brand consistency. Acoustical performance — despite being one of the most powerful levers for resident and guest satisfaction — remains one of the most consistently under-specified line items in modern construction.

This is not because the science is unclear. The lab data, the building codes, and the brand standards have been settled for years. The gap is one of translation: acoustical engineering language doesn't reach the people making the specification decision. Architects inherit ratings from spec sheets without verifying assemblies. General contractors are asked to install systems they can't compare. Owners discover the problem only after the first wave of noise complaints.

This guide is written to close that translation gap. It explains what the acoustical ratings actually measure, how the major floor covering categories actually perform, and how to read a third-party test report. Performance numbers attributed to Advanced Flooring Concepts are referenced by test number so any specifier can verify them.



A polished, Class A multi-family interior finished in acoustical LVT — Vantage at Fair Oaks. Real built work, not a render — the standard this guide is built to help you specify with confidence.

The content reflects a library of 12 certified third-party acoustical assembly tests covering glue down LVT and SPC click systems on both wood framing and concrete construction.

About the Author

ADAM CLARK — FOUNDER & CEO, ADVANCED FLOORING CONCEPTS

Hi, I'm the CEO of Advanced Flooring Concepts. I've been directly involved in working with flooring products and acoustical testing for 11 years.

In 2018 we launched Soundstop, initially designed for multi-family apartments to eliminate the separate sound mat by bonding the acoustical backing directly to the LVT. Since then we've redesigned the product and broadened the line, focusing on providing a diverse group of acoustical flooring built to handle most floor assemblies — whether in multi-family or hospitality.

I wrote this book from the perspective of someone who works alongside owners, architects, interior designers, general contractors, and flooring contractors. I'm not an acoustical expert myself, but I've been shaped over the years by people who are.

My focus is working with customers to improve their acoustical results for LVT flooring — specifically, stopping the transmission of sound from upper floors to lower ones. In the grand scheme of things, a lot goes into making sure a building performs acoustically, and my goal is to help the people specifying the floor get that decision right.

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How to Use This Guide

- Chapters 3–5 explain the business case, the physics, and the three ratings. Start here if acoustical specification is new to you.
- Chapter 6 compares every major floor covering category on the two most common assemblies, using real test data.
- Chapter 7 covers assembly analysis (wood framing vs. concrete) and the resilient channel decision.
- Chapters 8 and 9 provide zone-by-zone specification guides for hotels and multi-family.
- Chapter 10 documents Section 1206 and state housing finance requirements.
- Chapter 11 presents three documented case studies.
- Chapter 12 walks through a real Intertek test report end to end.
- The Appendix contains the glossary, the bibliography, and the CSI guide specification.

CHAPTER THREE

The Business Case & the Sound-Mat Reversal

Why acoustics pays — and how an attached-backing floor can replace a separate sound mat.

Acoustical performance is usually treated as a comfort feature. It is a building code requirement and also a comfort issue — and, just as importantly, a financial one. The buildings that get acoustics right outperform on measurable metrics: turnover cost, online review scores, achievable rent, and exit valuation. The buildings that get it wrong absorb costs that never appear on the original construction budget.

What Tenant Turnover Actually Costs

Industry data puts the cost to turn a unit — marketing, vacancy days, repairs, and prep — near $3,900 (Zego, 2023), with National Apartment Association data placing most turns between $1,500 and $3,500. For a 200-unit property running at industry-average turnover rates near 50%, even a modest improvement in renewal rates translates directly to six-figure NOI impact.

Noise is one of the most frequently cited preventable causes of non-renewal in multi-family research — yet J Turner Research's analysis of 10,000 satisfaction surveys found it did not crack the top 10 stated complaints. The implication is not that noise is unimportant, but that it surfaces in reviews and renewal decisions without showing up in complaint logs. Residents quietly do not renew — which makes acoustical performance a silent driver of turnover, and an expensive one.



Real built work — acoustical LVT installed at the Hyatt Centric in downtown Austin, Texas. The financial argument is anchored to assets that perform in the field, not just in the lab.

What Noise Costs in Hospitality

Noise has ranked as the most commonly experienced problem reported by hotel guests in J.D. Power's North America Hotel Guest Satisfaction Index — yet fewer than half of the guests who hit it report it to the front desk. The rest carry it straight into the review. And online reputation maps directly to revenue: Cornell's Center for Hospitality Research found that a one-point gain on a hotel's 100-point Global Review Index is associated with roughly a 0.89% increase in ADR, a 0.54% increase in occupancy, and a 1.42% increase in RevPAR. It is the same silent driver that quietly costs multi-family its renewals.

The Sound Mat Reversal

Since 2000, meeting Section 1206 in wood-framed construction has generally meant adding a separate sound mat between the subfloor and the gypsum underlayment — an extra material, an extra trade, and a deflecting layer that works against the gypsum's long-term crack resistance. Recent testing shows an acoustical LVT, with the backing adhered directly under the wear surface, can outperform a buried sound mat while deleting that layer entirely. Dampening works best closest to the impact: the backing sits directly beneath the footstep, where a mat under 3/4" of gypsum sits further from the source.

The same logic applies to the gypsum itself. The 1" pour became standard only to add crack resistance over a 1/4" sound mat; the fire-rating minimum is 3/4" poured directly on the subfloor. Removing the mat allows a return to that original 3/4" direct pour — no sacrifice in acoustical performance, fire rating, or code compliance, and fewer steps to install.

The contrast is documented in certified third-party testing on a near-identical wood-truss assembly — same truss, resilient channel, gypsum, and ceiling; the only differences the floor covering and the mat (the full four-method head-to-head is in the table that follows).

The pattern holds across both impact measures. STC is effectively tied — airborne performance is carried by the assembly's mass, not the floor covering. But on impact, the attached-backing floor leads with no mat at all: IIC 56 versus 54, and HIIC 68 versus 55 — a 13-point margin on the metric that best predicts perceived quiet. The attached-backing floor meets Section 1206 on its own, leads on the number occupants actually feel, and deletes a material and a trade. (STC, IIC, and HIIC are defined in Chapter 5; on every scale, higher means quieter.)

The same result holds in a click format. On the same wood platform with no separate mat, the Soundstop SPC Click line (tested as Furrow Acoustical Click, report P2000.02) reaches STC 61 / IIC 54 / HIIC 63 — clearing Section 1206 on its own, with the glue-down a step ahead on impact (IIC 56 / HIIC 68 to the click's 54 / 63). The takeaway is not the margin between formats; it is that the separate mat can be deleted in either one, on a certified assembly, with code compliance intact.

ONE FLOOR, FEWER STEPS

The same acoustic result, built three ways — counted in real installation steps.

SOUND MAT BELOW GYPSUM

Conventional since 2000

STEPS **10**

4 materials · 2–3 trades

1. Prep subfloor
2. Perimeter isolation
3. Lay sound mat
4. Tape moisture barrier
5. Pour + cure gypsum
6. Prep gypsum surface
7. Apply adhesive
8. Install LVT
9. Roll floor
10. Finish perimeter

TOPICAL MAT — ACOUSTICAL UNDERLAYMENT

Double-glue method shown

STEPS **8**

2 materials · 1–2 trades

1. Prep subfloor
2. Roll out mat
3. Adhesive to subfloor
4. Bond underlayment
5. Adhesive for LVT
6. Install LVT
7. Roll floor
8. Finish perimeter

ACOUSTICAL LVT — ATTACHED BACKING

No separate mat · AFC

STEPS **6**

1 material · 1 trade

1. Prep subfloor
2. Acclimate planks
3. Apply adhesive
4. Install LVT
5. Roll floor
6. Finish perimeter

Real installation steps by method. The topical-mat row shows the double-glue method; its floating and single-glue variants reduce to five and six steps. Step lists reflect standard manufacturer installation procedures.

Four Ways to Quiet a Floor

There are four ways to address impact noise under a hard-surface floor on a given structure, distinguished by where the acoustical layer sits. A separate mat goes below the gypsum, or as a topical layer directly under the plank. The pad can instead be bonded into the plank itself. Or both at once — an attached pad over a separate mat below the gypsum, the approach reserved for the most demanding targets. The table reports each method with its certified result where one exists; the conclusion is left to the reader.

METHOD	THE ADDED LAYER	STC	IIC	HIIC	TEST
Separate mat below the gypsum	1/8″ sound mat under the gypsum	**60**	**54**	**55**	R7447.16†
Topical mat under the LVT	thin mat above the gypsum	—	—	—	test results are not available
Attached backing — Soundstop Glue Down 3mm	none — pad bonded to the plank	**61**	**56**	**68**	R5773.02
Attached backing + separate mat (the “double-down”)	SAM-N12 Ultra mat below the gypsum	**60**	**59**	**70**	R5772.04

† The separate-mat-below-gypsum row is a single certified competitor assembly (Shaw R7447.16 — a 2mm standard LVT over a 1/8″ sound mat), shown for reference; it is not a claim about every separate-mat product, and other mat systems will test differently. The topical underlayment is shown as a method, not a rated assembly — AFC has not commissioned a certified test for it, so no ratings are published.

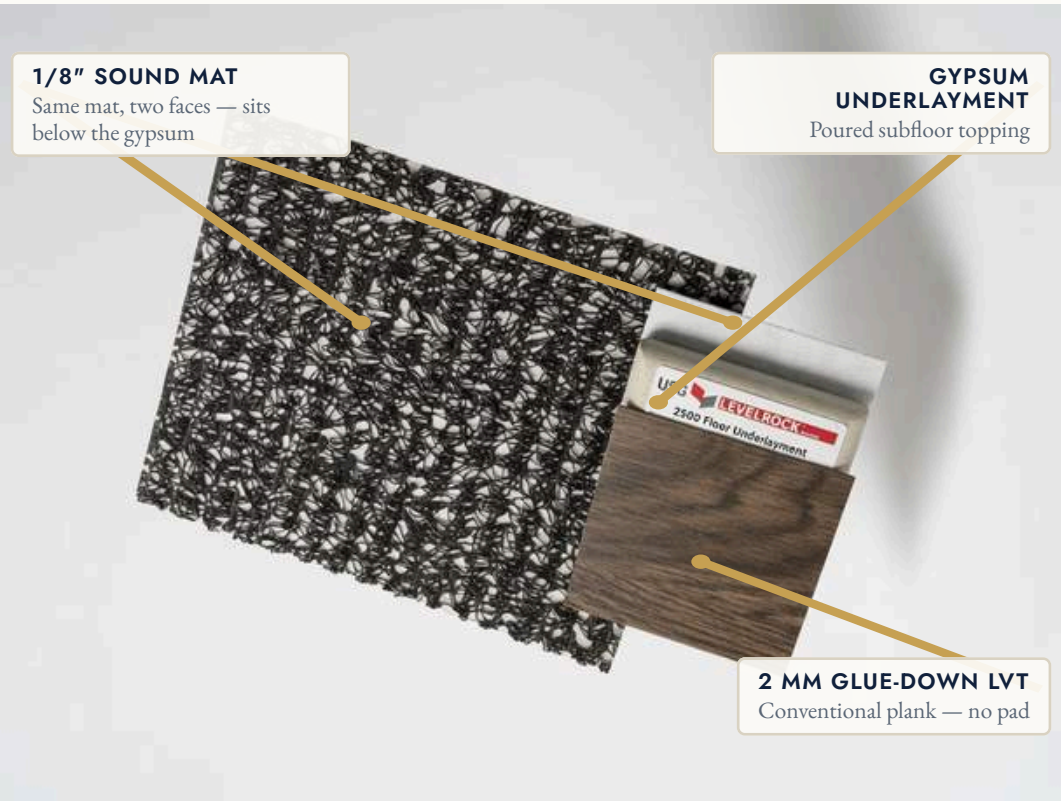
Two of these methods rely on a separate mat and the trade that installs it; one bonds the acoustical pad into the plank and deletes that layer; the fourth combines both, reserved for the most demanding targets. The rows with a certified test are the assemblies that were actually built and measured — the comparison is only as good as the assembly behind each number.

01 Separate Mat Below the Gypsum

STC 60 IIC 54 HIIC 55

R7447.16 · THIRD-PARTY REFERENCE

The conventional method since 2000 — a standard glue-down plank over a separate sound mat laid beneath the gypsum pour.



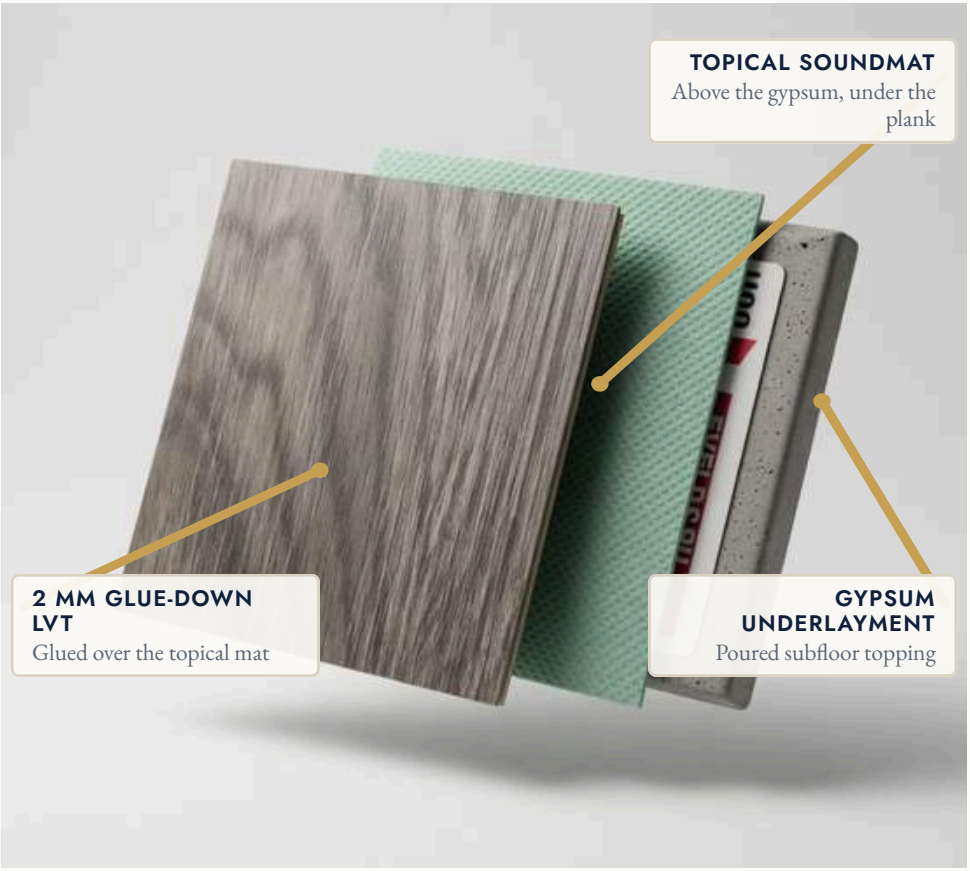
HOW THIS READS ON A TEST REPORT

These are the upper layers of the floor-ceiling assembly, in the order a report's cross-section drawing lists them — floor covering, gypsum underlayment, sound mat. That drawing is the assembly the rating belongs to; Chapter 12 shows how to verify it, layer by layer, before accepting a number.

02 Topical Mat Under the LVT

CONTACT TOPICAL SOUNDMAT MANUFACTURER FOR TEST RESULTS

A thin acoustical underlayment laid above the gypsum, directly under a 2 mm glue-down plank. Common in the field — shown here as a method, not a rated assembly.



HOW THIS READS ON A TEST REPORT

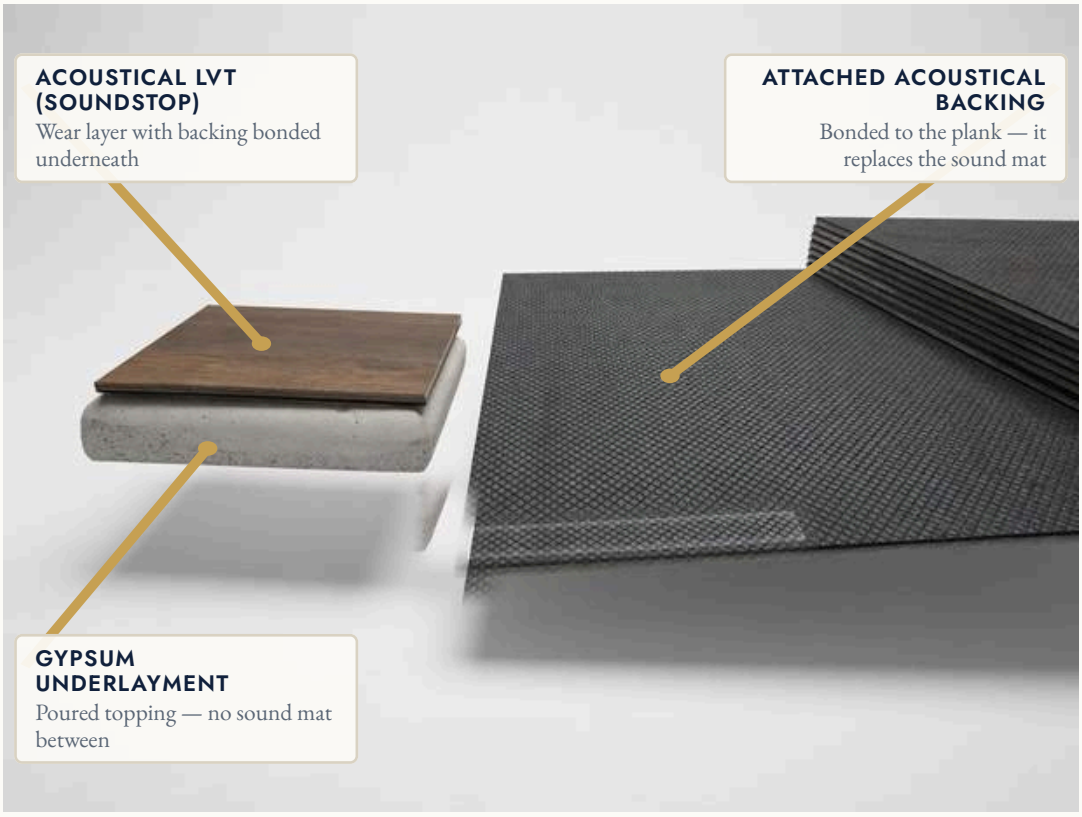
AFC has not tested this assembly, so AFC publishes no rating. If the topical mat's manufacturer publishes data, request their certified report for the assembly you are building and read it the same way Chapter 12 teaches — the rating belongs to the assembly, not the mat alone.

03 Use Acoustical Flooring to Eliminate the Sound Mat

STC 61 IIC 56 HIIC 68

R5773.02 · AFC REPORT

The acoustical backing is bonded to the underside of the plank and glued straight onto the gypsum — deleting the separate sound mat, and a material and a trade with it.



HOW THIS READS ON A TEST REPORT

This is the exact assembly Chapter 12 walks through, end to end — Report R5773.02. Its cross-section drawing shows no sound-mat line: the attached backing carries the rating. Reading that drawing is how a specifier confirms the mat was eliminated by design, not simply left out.

04 Acoustical LVT + a Soundmat

STC 60 IIC 59 HIIC 70

R5772.04 · AFC REPORT

The attached-backing plank over a separate 5 mm mat below the gypsum — the "double-down," both acoustical layers at once, reserved for the most demanding targets.





HOW THIS READS ON A TEST REPORT

Chapter 12 reads this report (R5772.04) against R5773.02 — the same wood assembly with the 5 mm SAM-N12 Ultra mat added below the gypsum. The cross-section drawing shows one extra line, the mat; that single line is the assembly the higher IIC and HIIC belong to.

Figure 3.2 — The four ways to quiet a floor, shown as a floor build-up — the same question answered by where the acoustical layer sits. Each is shown with its certified result where one exists; none is presented as a recommendation. The conclusion is left to the specifier.

THE SECOND LEVER: THE CEILING

Every method above works on the floor side of the assembly. In wood framing, though, the floor covering is only one of two independent levers on the impact rating — the ceiling below is the other. Impact energy that reaches the structure is either carried straight through the framing into the room below or interrupted before it can radiate, and how the ceiling is hung decides which.

The ceiling is decoupled three ways, in rough order of isolation: **resilient channel**, hung off the framing on a flexible leg; **sound-isolation clips with hat channel**; and an **independent or suspended ceiling** on its own structure — the most effective and the most expensive. Which decoupling was used is part of the rating, not a detail to leave loose — the field-failure modes (channel substitution, short-circuiting) are catalogued in the limitations below.

The consequence: the floor covering and the ceiling are not substitutes to be traded against one another — both are bound into one rating, with the mat, the gypsum, and the framing. Change any one, the ceiling included, and the assembly owes a new certified report.

When a Separate Sound Mat Is Still the Right Call

Attached acoustical backing is a strong default for impact noise, and it earns that by deleting a layer when it works. It does not solve every problem. A specifier should know exactly where a separate sound mat, a different layer, or a change to the structure is the better call.

AIRBORNE (STC) IS NOT A FLOOR-COVERING PROBLEM

STC is governed by the assembly's mass and decoupling — the gypsum underlayment, the resilient channel, the ceiling, the cavity insulation. Neither attached backing nor a separate mat moves STC meaningfully. If the binding constraint is voices and television between units, the answer is in the assembly, not the floor covering.

THE MOST DEMANDING TARGETS CAN NEED BOTH

Attached backing reliably clears the code minimum and performs well above it. But the most aggressive targets — luxury and penthouse units, music rooms, home theaters — may need attached backing *and* a separate mat, or a thicker one. Treat it as a strong baseline, not a ceiling.

THE RATING BELONGS TO THE ASSEMBLY, NOT THE PRODUCT

A separate mat in a *certified* assembly beats attached backing in an *untested* one. Specify the assembly that was tested, or test the assembly you are building.

RENOVATION AND STRUCTURE CHANGE THE MATH

When the ceiling cannot be touched — occupied renovation, or a property-improvement plan that stops at the slab — or when the structure is bare concrete with no drop ceiling, the underlayment is often the only variable left to move. There, a separate sound mat or a topical underlayment may be the right tool, and sometimes the only one.

SOMETIMES THE MAT IS THERE FOR OTHER REASONS

Over concrete, a separate underlayment may be specified for moisture or crack isolation regardless of acoustics. When a mat is already there for those reasons, the acoustic comparison is moot — design for the whole stack.

THE HONEST SUMMARY

Attached backing wins often enough to be the default, earning it by deleting a layer and a trade. Knowing where it does not — and saying so — is what separates a specification from a sales sheet.

The Code Floor Is Not the Target

Section 1206 sets a minimum of IIC 50 / STC 50 (lab), 45 (field), for floor-ceiling assemblies between dwelling units. This is the legal floor — the minimum below which the building is non-compliant — not where successful operators specify.

Limitations of Laboratory Testing

Lab ratings are benchmarks, not guarantees; field results vary from the laboratory for specific, identifiable reasons:

- **Room size.** Field room dimensions differ from the lab chamber, changing measured performance.
- **Construction quality.** Lab specimens are built perfectly; poor field workmanship reduces performance.
- **Resilient channel short-circuiting.** The single biggest field failure — screwing the correct channel through into the framing — can cost up to 9 IIC points. Substituting a cheaper channel grade costs about 2–3 points (Chapter 7); substituting other layers in the stack, 3–8 (Chapter 12).
- **Furnishings and finishes.** Furniture, cabinets, and appliances all affect field results.
- **Ceiling penetrations.** Absent in the lab; in the field they reduce performance.
- **Flanking paths.** Sound travels around the assembly through walls, pipes, ducts, and structure.

FIELD-TEST RECOMMENDATION

For large multi-family and hotel projects, field testing on the first completed phase is the highest-ROI quality-control step available. It catches assembly errors before they are replicated across hundreds of units.

CHAPTER FOUR

Acoustics Explained

A plain-language guide for developers, contractors, and specifiers.

You do not need to be an acoustical engineer to specify the right floor. Understanding the basics will help you ask better questions, read test reports with confidence, and avoid the most common specification mistakes.

Why Hard Flooring Changed Everything

For decades, carpet quietly solved the acoustical problem in multi-family and hotel construction without anyone thinking much about it. Carpet is a natural sound absorber — the fiber pile traps airborne sound, the pad beneath cushions impact, and the combined system performs at IIC 60 minimum without any engineered acoustical treatment.

The shift to hard-surface floor coverings changed the physics of the building. LVT, hardwood, and tile are rigid, dense materials. They do not absorb sound — they transmit it. Every footstep becomes a mechanical vibration that travels through the plank, the adhesive, the subfloor, and into the structural framing. The occupant below hears it not as a muffled thud but as a sharp, clear impact. Replacing carpet with LVT removes the material that was passively solving the acoustical problem; without an engineered replacement, IIC drops 15–20 points. That gap must be closed by the floor assembly — and the floor covering decision is the last lever before the slab is covered.

How Sound Travels Between Floors

There are three distinct kinds of sound in a multi-family or hotel building. IIC and HIIC measure impact sound (footsteps, drops). STC measures airborne sound (voices, TV, music). NRC measures sound absorption within a room — a separate concern addressed by ceiling treatments and soft furnishings, not the floor.



Figure 1 · The three kinds of sound in a floor-ceiling assembly. Impact (footsteps, drops) is measured by IIC and HIIC; airborne sound (voices, TV, music) by STC.

The Four Layers of the Acoustical Assembly

Sound transmission between floors is stopped (or not) at four layers, working downward from the source:

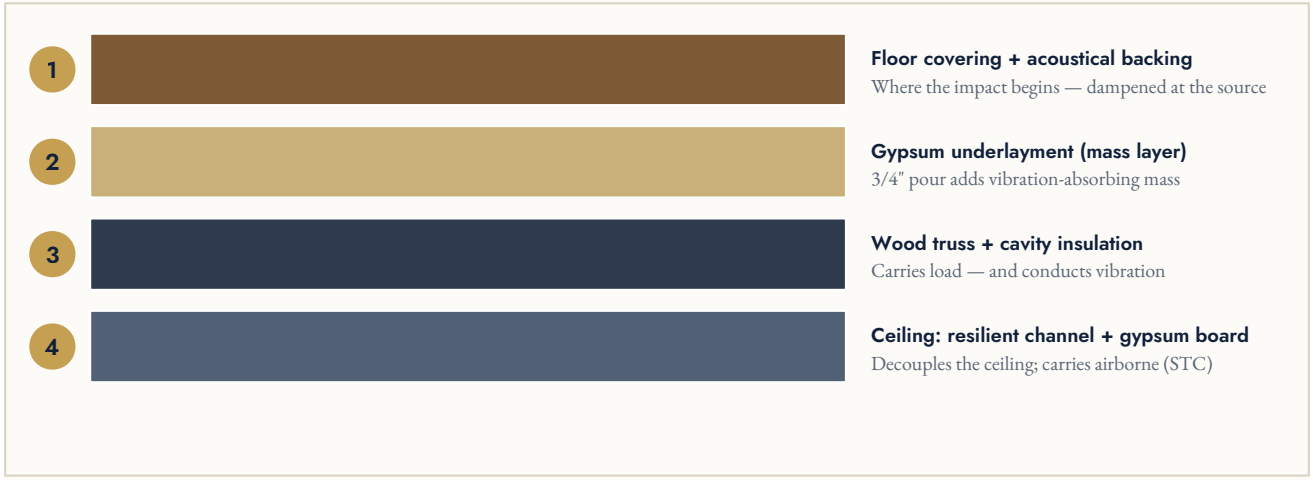


Figure (A3) · The four layers of a wood-framed floor-ceiling assembly. The IIC and HIIC ratings reflect the combined performance of all four layers — not the floor covering alone.

The Two Types of Noise

IMPACT (STRUCTURE-BORNE) NOISE — MEASURED BY IIC AND HIIC

Generated when an object strikes the floor surface: footsteps, dropped objects, chair legs, rolling luggage. This is the dominant complaint driver in multi-family and hotel properties. The floor covering controls this noise more directly than any other element, and the right acoustical backing closes the carpet-removal gap described above.

AIRBORNE NOISE — MEASURED BY STC

Generated when sound waves travel through air from voices, television, and music. On floor-ceiling assemblies, STC is primarily governed by mass — concrete deck, gypsum underlayment, gypsum wallboard ceiling, and ceiling cavity insulation. Switching from carpet to LVT changes STC by only 1–3 points. Wall and ceiling construction does the heavy lifting on STC, not the floor covering.

CHAPTER FIVE

STC, IIC & HIIC

The three ratings you need to know.

Each rating answers a different question. Understanding the difference is what separates a clean specification from a complaint-prone one.

	STC	IIC	HIIC
What it measures What controls it	Airborne sound (voices, TV, music) Walls, ceiling, mass layers	Impact noise (footsteps, drops) Full floor-ceiling assembly	How the floor sounds to the human ear Full floor-ceiling assembly
Test standard	ASTM E90 / E336	ASTM E492 / E1007	ASTM E3222
Section 1206 min.			
	50 / 45	**50 / 45**	**No minimum**
Floor covering affects it?	Minimally (1–3 pts)	Yes — directly	Yes — most directly

STC — Sound Transmission Class

STC measures resistance to sound waves that travel through air. Tested per ASTM E90 (lab) and E336 (field), the single number reflects performance across the 125–4,000 Hz speech range. For floor-ceiling assemblies, STC is primarily a function of mass. Section 1206 minimum: STC 50 lab / 45 field. Some hotel brands require STC 60, which is straightforward on a properly-specified assembly.

The highest STC in the AFC library is 62 (NorthStar concrete-and-drop-ceiling assembly); AFC wood assemblies reach STC 61. Because STC is governed mainly by the floor-ceiling assembly's mass rather than the floor covering, the covering choice moves it little.

IIC — Impact Insulation Class

IIC measures how well a floor-ceiling assembly attenuates structure-borne sound from mechanical impact. Tested per ASTM E492 (lab) using a standardized tapping machine, and E1007 (field). Unlike STC, IIC is directly influenced by the floor covering and its acoustical backing. Section 1206 minimum: IIC 50 lab / 45 field. TDHCA (Texas tax-credit) requirement: IIC 55 certified by architect or engineer of record.

The highest IIC on an AFC wood-framing assembly is 59 (acoustical backing plus a sound mat); a concrete-and-drop-ceiling assembly reaches IIC 64. Each result is labeled by report number, and the program ceiling on every metric is summarized at the end of this chapter.

HIIC — High-Frequency Impact Insulation Class

IIC tells you how a floor performs in a laboratory scoring system. HIIC better predicts how people will perceive footstep noise in a real building. The standard IIC weighting was developed when carpet was the dominant finish, and it underweights the low-frequency footfall energy that travels most easily through a modern hard-surface assembly. HIIC captures that energy — the energy occupants complain about most. The higher the HIIC, the better the assembly sounds to the human ear.

HIIC is always higher than IIC for the same assembly. A floor that meets Section 1206 at IIC 50 does not "fail" HIIC. No code minimum exists: Section 1206 specifies STC and IIC, not HIIC. No hotel brand specifies an HIIC minimum either. That is precisely why HIIC is worth specifying voluntarily — it is the metric that best predicts whether occupants will actually be satisfied with how the floor sounds, independent of any code or brand checkbox. Advanced Flooring Concepts tests for it because the assembly with the highest HIIC is the one a guest or resident experiences as quietest. The AFC library's top result, HIIC 72 (Test R5772.02), is the highest-performing assembly in the program on that perception-weighted measure.

THE CEILING OF THE AFC TEST LIBRARY

METRIC	BEST RESULT	ASSEMBLY	TEST
STC	**62**	4mm Soundlock · 6" concrete + drop ceiling	NorthStar 240830002
IIC	**64**	4mm Soundlock · 6" concrete + drop ceiling	NorthStar 240830002
IIC · wood framing	**59**	acoustical backing + sound mat · wood	AFC R5772.02 / .04
HIIC	**72**	Soundstop SPC Click 6.5mm + sound mat · wood	AFC R5772.02
HIIC · no separate mat	**68**	Soundstop Glue Down 3mm · wood	AFC R5773.02

One snapshot of the program ceiling on each metric; the full 12-test library — every STC, IIC, and HIIC result — is labeled by its Intertek report. The HIIC 68 result is notable for needing no separate sound mat: the LVT's attached backing carries the assembly to a level conventional mat systems reach only with thicker, more expensive topical mats.

Reading Across the Three Ratings

SPEC TARGET	STC	IIC	HIIC	APPLICATION
Section 1206 Minimum	**50**	**50**	**None**	Legal floor

Standard Multi-Family	**55**	**55**	**60+**	Most apartments
Soundstop Glue Down 3mm	**61**	**56**	**68**	Reference benchmark



CHAPTER SIX

Acoustics by Product Category

How every major floor covering performs.

The acoustical rating of a floor is not a property of the floor covering alone — it is a property of the entire floor-ceiling assembly. The same LVT can score IIC 56 on a wood-framed assembly and IIC 64 on a concrete one. Before comparing categories, you have to fix the assembly.

This chapter compares every major floor covering category on two standard assemblies:

- **Wood Framing Assembly** — Open-web wood truss + 3/4" gypsum underlayment + standard ceiling. Typical for 0–5 story construction. The acoustically challenging case.
- **Concrete Assembly** — 6" concrete slab + drop ceiling. Typical for 5+ story construction. The acoustically forgiving case.

Wood Framing + 3/4" Gypsum Underlayment + Standard Ceiling

FLOOR COVERING CATEGORY	IIC	HIIC	SOURCE
Carpet + pad (broadloom)	**60 min**	—	Published ranges
Carpet tile	**55–60**	—	Published ranges
Soundstop Glue Down 3mm, no sound mat	**56**	**68**	AFC R5773.02
Soundstop SPC Click 5mm, no sound mat	**54**	**63**	AFC P2000.02
Conventional 2mm LVT + 1/8" sound mat (reference)	**54**	**55**	Shaw R7447.16
Soundstop Glue Down 3mm + 5mm SAM-N12 Ultra mat	**59**	**70**	AFC R5772.04
Soundstop SPC Click 5.5mm + sound mat	**59**	**68**	AFC R5772.07
Soundstop SPC Click 6.5mm + sound mat	**59**	**72**	AFC R5772.02
Engineered hardwood + underlayment	**52–60**	—	Published ranges
Solid hardwood + underlayment	**48–55**	—	Published ranges
Ceramic / porcelain tile + decoupling membrane	**50–60**	—	Published ranges
Natural stone + isolation layer	**48–56**	—	Published ranges

Rubber	**55–62**	—	Published ranges

6" Concrete Slab + Drop Ceiling

FLOOR COVERING CATEGORY	IIC	HIIC	SOURCE
Carpet + pad	**62–72**	—	Published ranges
4mm Soundlock	**64**	—	NorthStar 240830002
5.5mm acoustical SPC click	**61**	—	SoundGuard 200323007
Soundstop SPC Click 6.5mm (no drop ceiling)	**58**	**61**	AFC R5773.01
SPC click + drop ceiling	**69**	**71**	3rd party
Tile / stone	**55–65**	—	Published ranges
Polished concrete (no floor covering)	**28–38**	—	Published ranges

AFC numbers are from certified Intertek lab reports. The conventional-approach row (Shaw R7447.16) is a certified third-party report cited for comparison, not an AFC test. NorthStar, SoundGuard, and the third-party concrete row are specific tested results AFC supplies for reference, not AFC product tests. Rows marked "Published ranges" give IIC/STC ranges consistent with published laboratory-test compendia and trade and manufacturer data — principally the California Office of Noise Control Catalog of STC and IIC Ratings for Wall and Floor/Ceiling Assemblies. HIIC is shown only for assemblies with a specific tested result; no published HIIC data exists at the floor-covering-category level.

What the Data Actually Shows

On wood framing, acoustical glue down LVT performs in the same IIC range as carpet. On the impact metric, the no-mat attached-backing assembly leads the thinner conventional LVT-over-mat approach despite deleting a layer — the full head-to-head is in the table above. Carpet on the same assembly typically delivers IIC 60+. The acoustical gap that opened when carpet was replaced with hard-surface flooring has been closed.

On concrete with a drop ceiling, acoustical LVT meets or beats most floor covering categories. Tests show IIC in the 61–64 range across AFC-library assemblies — competitive with carpet on the same construction.

HIIC is where acoustical LVT differentiates. 6.5mm Soundstop SPC Click with a 3/16" sound mat achieved HIIC 72 (Test R5772.02) — the highest result in the AFC program on a wood framing assembly.

Tile, stone, and hardwood are still acoustically demanding. They can hit code-compliant IIC numbers, but only with significant added treatment. The system cost on these categories often exceeds the system cost of acoustical LVT for equivalent acoustical performance. **Polished concrete is not viable above grade.**

CHAPTER SEVEN

Floor Assembly Analysis

Wood framing vs. concrete — and the resilient channel decision.

The single most important acoustical decision in a building is made before any floor covering is selected. It is the structural system. Open-web wood truss and concrete slab construction produce dramatically different acoustical starting points — and the gap is wider than most architects realize until field testing exposes it.

The Two Dominant Assembly Types

Open-Web Wood Truss Framing — Engineered wood trusses with triangular webbing, typically 14″–18″ deep. Standard in 0–5 story Type V construction. Cost-efficient, fast to build, and acoustically the more challenging starting point. Used in nearly all garden-style and mid-rise multi-family construction, and the majority of select-service hotel construction.

Concrete Slab — Either conventionally reinforced or post-tension concrete, typically 6″–8″ thick. Standard in 5+ story Type I/II construction. Higher material and labor cost, but starts at a substantially better acoustical baseline. Used in high-rise multi-family and full-service hospitality.

Why Wood Framing Is Acoustically Demanding

A bare open-web wood truss assembly performs at roughly IIC 38–42 with no acoustical treatment — well below code, well below brand standard, and well below the threshold at which complaints stop. The reasons are physical: low mass (wood is far less dense than concrete, so STC starts low), cavity resonance (the 14″–18″ open cavity amplifies some structure-borne vibration), and mechanical coupling (truss top chords are rigidly connected to the subfloor, transmitting impact energy with little dampening).

How Wood Framing Becomes Code-Compliant

The path from a bare IIC 38–42 truss to a code-compliant assembly is a stack of specific layers. Certified third-party tests on near-identical wood-truss assemblies confirm the effect — three AFC assemblies below, with the conventional thin-LVT-plus-mat approach shown as a labeled reference:

WOOD FRAMING ASSEMBLY	IIC	HIIC	TEST
Soundstop Glue Down 3mm, no sound mat, on 3/4″ gypsum underlayment	**56**	**68**	R5773.02

Soundstop Glue Down 3mm + 5mm SAM-N12 Ultra mat under gypsum underlayment	**59**	**70**	R5772.04
Soundstop SPC Click 6.5mm + 3/16" sound mat under gypsum underlayment	**59**	**72**	R5772.02
Conventional 2mm LVT + 1/8" sound mat — third-party reference	**54**	**55**	R7447.16†

† R7447.16 is a certified Intertek report issued to Shaw Industries — a 2mm standard LVT over a standard 1/8" sound mat — shown as third-party reference on a near-identical wood-truss structure. It is a different assembly, not a stacking step on the AFC floors above, and implies no endorsement by the laboratory.

A wood framing assembly can meet code-compliant performance — but only when every layer in the stack is specified correctly. Skip the gypsum underlayment, undersize the sound mat, or substitute the ceiling assembly, and the IIC drops out of compliance fast.

Why Concrete Is Acoustically Forgiving

A bare 6" concrete slab performs at roughly IIC 45–52 with no floor covering at all — already at or near code minimum before any acoustical engineering. Add a drop ceiling with appropriate insulation, and the same slab can perform at IIC 60+ before specifying a floor covering.

CONCRETE ASSEMBLY	STC	IIC	SOURCE
4mm Soundlock on 6" concrete + drop ceiling	**62**	**64**	NorthStar 240830002
5.5mm acoustical SPC click on 6" concrete + drop ceiling	**59**	**61**	SoundGuard 200323007
Soundstop SPC Click 6.5mm on 6" concrete (no drop ceiling)	**53**	**58**	AFC R5773.01

Two findings worth flagging: **the drop ceiling matters more than the floor covering** (a drop ceiling can swing concrete IIC by roughly 10 points on the same slab and floor covering), and **on concrete the floor covering choice has less acoustical leverage** — specifications can prioritize aesthetics, durability, and brand standards because the structure provides the acoustical floor.

The Resilient Channel Decision

Every published acoustical floor-ceiling assembly test for wood-framed construction relies on resilient channel installed beneath the gypsum wallboard ceiling. The channel decouples the gypsum board from the framing, preventing impact energy from transmitting directly into the room below. Without resilient channel — or with the wrong channel installed incorrectly — the assembly's IIC drops out of code compliance.

Not all resilient channel performs equally, and the gap between what is *tested* and what is *built* is a quiet source of field shortfall. AFC's certified assemblies are tested at Intertek on ClarkDietrich RC Deluxe (RCSD) — the

premium channel. Most apartments are actually framed with ClarkDietrich RC-1 Pro (RCUR), the standard channel. An independent comparison by Veneklasen Associates (LoVerde, 2015) documents that the RC-1 Pro substitution runs 2–3 IIC points lower than the RC Deluxe used in the test.[1] When the published rating was achieved on RC Deluxe and the building is framed with RC-1 Pro, design for that 2–3 point difference rather than assuming the lab number.

The installation pitfall: even the correct channel fails if installed wrong. The most common error is screwing through the channel into the framing — collapsing the decoupling. Recommended screw length is 1 inch for a single layer of 5/8″ gypsum board. Field investigation of a single 100 square foot wall area has documented as many as 21 screws passing through the channel into the framing — silently negating the acoustical specification.

> **THE CHANNEL IS PART OF THE TESTED ASSEMBLY**
>
> Every assembly in the AFC library was tested with ClarkDietrich RC Deluxe (RCSD) resilient channel. The channel is not interchangeable. An independent evaluation by Veneklasen Associates documented that substituting the lower-cost RC-1 Pro (RCUR) channel reduces IIC by 2–3 points in the lab — enough to drop an assembly a tier even where it still meets code minimum.[1] Specify the channel that produced the rating, not a visually similar substitute.

[1] LoVerde, John. Veneklasen Associates, Inc., Santa Monica, California. Acoustical comparison of ClarkDietrich RCSD (RC Deluxe) and RCUR (RC-1 Pro), April 13, 2015.

CHAPTER EIGHT

Hotel Acoustical Flooring

A zone-by-zone specification guide.

A hotel is not one acoustical environment. It is seven. The same building houses guestrooms that demand sleep-grade quiet, corridors that absorb constant luggage and footstep traffic, lobbies where impression and impact compete, and back-of-house spaces where durability outweighs everything else. A single floor covering specification cannot serve all seven. This chapter walks each zone in the order a guest experiences them.

ZONE 1: LOBBY & ENTRY

Priority: slip resistance and durability. Lobbies are large hard-surface spaces typically on slab-on-grade, with no occupied space below. Typical floor coverings: porcelain tile or natural stone, SPC click tile or 6.5mm SPC plank, polished concrete on slab-on-grade. ASTM D2047 ≥ 0.5 wet/dry coefficient of friction; 20-mil minimum wear layer.

ZONE 2: CORRIDORS

Priority: durability and slip resistance. Section 1206 does not set acoustical minimums for corridor flooring — the structural separation between corridor and guestrooms below carries the acoustical assembly. Typical: carpet tile, glue down LVT with integrated acoustical backing, acoustical SPC click. 20-mil minimum wear layer.

ZONE 3: GUESTROOMS

Priority: all three ratings — STC, IIC, and HIIC. This is the most demanding zone in the hotel. A guest in Room 412 must not hear voices from 414, footsteps from 512, or luggage wheels from the corridor. Every major hotel brand specifies guestroom acoustical performance in its FF&E requirements. In the AFC acoustical line, guestroom flooring is 5mm and up: 5mm acoustical glue down or SPC click for upscale and extended-stay, and 6.5mm SPC click for luxury — optionally over a 1/8″ or 3/16″ sound mat; carpet in select brands. For this zone, the Soundstop line — acoustical glue down and SPC click with the acoustical backing bonded directly to the plank — is the certified specification; the guestroom assemblies and their Intertek report numbers are shown below.

GUESTROOM ASSEMBLIES — SELECTED RESULTS

ASSEMBLY	STC	IIC	HIIC	TEST
Soundstop SPC Click 5.5mm + sound mat + wood	**60**	**59**	**68**	R5772.07

Soundstop SPC Click 6.5mm + 3/16" sound mat + wood	**60**	**59**	**72**	R5772.02
5.5mm acoustical SPC click + 6" concrete + drop ceiling	**59**	**61**	—	SoundGuard 200323007
4mm Soundlock + 6" concrete + drop ceiling	**62**	**64**	—	NorthStar 240830002

All rows are certified Intertek or partner tests.

> **STACKING BOTH LAYERS FOR MAXIMUM PERFORMANCE**
>
> For higher-end hotels and multi-family that want to maximize performance, the integrated acoustical pad and a traditional sound mat are not an either/or choice. The same Soundstop product can be installed over a sound mat below the gypsum to "double down" on performance — the path to the highest ratings in the library. It is also the right move on renovations where a sound mat is already in place: adding the integrated-pad product on top lets an owner get a true read on their actual scores rather than guessing.

ZONE 4: GUEST BATHROOMS

Moisture resistance first; acoustical performance secondary. Porcelain tile with cementitious or decoupling membrane; SPC click (waterproof core); LVT with welded seams. Decoupling membrane adds 3–5 IIC points on tile.

ZONE 5: AMENITY SPACES (POOL DECK, SPA, BAR, RESTAURANT)

Priority varies by space. Pool deck and spa demand slip resistance and moisture tolerance; restaurant flooring must absorb impact without retaining odors or stains. Typical: 6.5mm acoustical SPC or WPC click; porcelain tile (pool, spa); carpet tile (lounge, conference). Wet slip resistance ≥ 0.5 (ASTM D2047).

ZONE 6: FITNESS CENTER

Impact attenuation at the source. Dropped weights and equipment generate among the most disruptive sounds in a hotel. Rubber tile or roll (free-weight zones); high-density rubber over acoustical underlayment (cardio); acoustical SPC click with thick sound mat (group fitness). Locate on slab-on-grade or above non-occupied space where possible.

ZONE 7: BACK-OF-HOUSE

Durability over acoustics. Sheet vinyl (laundry, kitchen); glue down LVT (housekeeping corridors); sealed concrete. Back-of-house LVT is specified at a 3mm minimum thickness with a 20-mil minimum wear layer.

CHAPTER NINE

Multi-Family Acoustical Flooring

A zone-by-zone specification guide.

In multi-family, the acoustical contract is unwritten but binding. A tenant signs a lease assuming reasonable peace and quiet. When that assumption fails, the consequences extend across the lease term — non-renewal, online reviews, and in some cases lease-termination claims under the implied warranty of quiet enjoyment. Unlike hotels, multi-family inherits the same resident for 12 months — or loses them, expensively.

ZONE 1: GROUND-FLOOR LIVING UNITS (SLAB-ON-GRADE)

Priority: minimal. No occupied space below. Typical: 2mm or 3mm glue down LVT; carpet (still common in bedrooms); sheet vinyl; tile. 8–12 mil wear layer. Moisture management matters more than acoustics.

ZONE 2: UPPER-FLOOR LIVING UNITS

Priority: all three ratings. The highest-risk zone in the building. Every unit above ground floor sits over another leased unit. Typical: acoustical glue down LVT with integrated backing (the multi-family standard); acoustical SPC click; carpet; engineered hardwood with underlayment (premium and Class A). Section 1206 minimum: STC 50 / IIC 50 lab. TDHCA requirement: IIC 55. Most market-rate Class A communities target STC 55–58 and IIC 55–58. For wood framing, 3/4" gypsum underlayment is part of the spec.

ACHIEVABLE PERFORMANCE ON STANDARD MULTI-FAMILY / DORMITORY / SENIOR LIVING ASSEMBLIES (AFC TEST LIBRARY)

ASSEMBLY	STC	IIC	HIIC	TEST
Soundstop Glue Down 3mm + 3/4" gypsum + wood, no sound mat	**61**	**56**	**68**	R5773.02
Soundstop SPC Click 5mm + 3/4" gypsum + wood, no sound mat	**61**	**54**	**63**	P2000.02
Soundstop Glue Down 3mm + 5mm SAM-N12 Ultra mat + wood	**60**	**59**	**70**	R5772.04
4mm Soundlock on 6" concrete + drop ceiling	**62**	**64**	—	NorthStar 240830002
5.5mm acoustical SPC click on 6" concrete + drop ceiling	**59**	**61**	—	SoundGuard 200323007

ZONES 3–5: KITCHENS, BATHROOMS & BEDROOMS (WITHIN UNIT)

Kitchens: same floor covering as adjacent living area — continuous flooring from living to kitchen is the multi-family standard. If tile is used, decoupling membrane is required to maintain IIC compliance. **Bathrooms:**

moisture management primary; porcelain or ceramic tile with decoupling membrane, SPC click, sheet vinyl, or LVT with welded seams. **Bedrooms:** bedroom-only carpet specifications are an increasingly common acoustical compromise — hard flooring in high-traffic zones, soft flooring where impact attenuation matters most for sleep quality.

ZONE 6: CORRIDORS (COMMON AREAS)

Durability and slip resistance. Carpet tile (historical standard); acoustical SPC click; 3mm glue down LVT with 20-mil wear layer. 20-mil minimum for corridors and common areas.

ZONES 7–9: AMENITY, FITNESS & PET AREAS

Amenity spaces (leasing office, lobby, mail, lounge) prioritize slip resistance and durability — porcelain or stone tile, SPC click tile, carpet tile, LVT plank, 20-mil wear layer. Fitness centers need impact isolation at the source (rubber tile or roll, acoustical SPC click with thick sound mat) — locate on slab-on-grade or over parking. Pet areas (dog wash, indoor pet park) prioritize sanitation — rubber tile or sealed roll, sheet vinyl with welded seams, sealed concrete; drain and slope detailing govern.

> **TAX-CREDIT RISK REALITY**
>
> Texas Department of Housing and Community Affairs administers the Low-Income Housing Tax Credit program under the Qualified Allocation Plan, updated annually. Recent TDHCA language has typically required STC 60 / IIC 55 between dwelling units, with architect or engineer of record certification, and field testing is increasingly common on competitive 9% applications. A failed field test can delay certificate of occupancy, with carrying-cost penalties that accumulate daily — specifying correctly the first time is meaningfully cheaper than correcting it later. Verify current cycle requirements at tdhca.texas.gov.

CHAPTER TEN

Codes & Regulatory Requirements

What Section 1206 and state housing finance actually require.

Acoustical specification operates inside two concentric layers of requirement: federal/state building code and state housing finance requirements. Each has its own authority, update cycle, and enforcement mechanism.

Layer 1: International Building Code Section 1206

Published by the International Code Council; adopted with amendments by every U.S. state.

RATING	LABORATORY MINIMUM	FIELD MINIMUM
STC	**50**	**45**
IIC	**50**	**45**

Test methods: STC — ASTM E90 (lab) / E336 (field); IIC — ASTM E492 (lab) / E1007 (field). Scope: multi-family dwelling units, hotels with stacked guestrooms, condominiums, dormitories, and mixed-use structures with vertically stacked occupied units. The code does not set an HIIC minimum. Section 1206 is the legal floor, not the design target — field-measured assemblies typically perform below their laboratory rating.

Layer 2: State Housing Finance Authority Requirements

For tax-credit and affordable housing projects, state housing finance agencies typically require performance above the Section 1206 minimum. Texas is representative: TDHCA administers the federal LIHTC program under the Qualified Allocation Plan, with recent language typically requiring STC 60 / IIC 55 between dwelling units, certified by the architect or engineer of record. California TCAC, New York HCR, and other agencies have their own QAPs with varying requirements. The pattern is consistent: performance above the Section 1206 floor.

Hospitality Targets

Beyond code and state housing requirements, hotels typically target acoustical performance keyed to the floor assembly rather than to a star rating: an IIC of 55+ on an open-web wood truss floor assembly, and an IIC of 60+ on a concrete floor assembly with a drop ceiling. Both are met in the AFC test library — wood-truss

assemblies reach IIC 56–59 (Tests R5773.02, R5772.04, R5772.02), and a 6" concrete slab with a drop ceiling reaches STC 62 / IIC 64 (NorthStar 4mm Soundlock, 240830002).

SPECIFIER'S CHECKLIST

- Confirm which IBC edition has been adopted in the project jurisdiction (typically 2018 or 2021).
- Check state housing finance requirements (TDHCA, CTCAC, or comparable) if tax-credit financed.
- Obtain current brand standards direct from the brand design and construction group for the specific property.
- Specify HIIC alongside IIC — even where no minimum exists — for all hard-surface installations.
- Require lab test documentation matching the actual assembly being installed, not a substituted assembly.
- Plan for field testing on the first completed phase of any project above 100 units or any tax-credit award.
- Document the as-built assembly for brand PIP compliance and tax-credit recompliance.

Selecting the Right Acoustical Floor

1. **Identify the structure.** Wood-framed or concrete — this sets the acoustical starting point and how much work the floor must do.
2. **Establish the governing number.** The highest of IBC Section 1206, the housing-finance requirement (if tax-credit financed), and the hotel brand standard.
3. **Match the assembly, not the product.** Specify a complete floor-ceiling assembly with a third-party test that hits the number — every layer, referenced by report.
4. **Spend acoustical budget where it has leverage.** The floor covering carries real load on wood framing, far less on concrete with a drop ceiling.
5. **Specify HIIC alongside IIC,** even though no code requires it — it best predicts occupant satisfaction.
6. **Verify in the field.** Field-test the first completed phase on any large or tax-credit project.

CHAPTER ELEVEN

Case Studies

Three documented installations.

The case studies below represent three completed Advanced Flooring Concepts installations across multi-family and hospitality construction. Each documents the assembly used and the test result achieved.



FIDELIS GRAND CENTRAL



VANTAGE COMMUNITIES



HYATT CENTRIC AUSTIN

Project 1 — Fidelis Grand Central, Conroe, Texas

200,000 SF Class A multi-family development on a wood framing assembly. By using an Advanced Flooring Concepts acoustically-backed LVT, the project eliminated the need for a sound mat under or over the gypsum underlayment — speeding the construction sequence, lowering the assembly profile, and making the gypsum underlayment more crack resistant.

STC	IIC	HIIC	TEST
61	**56**	**68**	R5773.02

The assembly meets Section 1206 of the IBC — without a separate sound mat.

Project 2 — Vantage Communities, Class A Multi-Family

Wood framing assembly multi-family installation using Advanced Flooring Concepts 3.5mm Soundstop acoustical glue down LVT under 3/4" gypsum underlayment.

STC	IIC	HIIC	TEST
59	**51**	**61**	N3441.02

Project 3 — Hyatt Hotel, Downtown Austin, Texas

Hotel guestroom installation on a wood framing assembly with 3/16″ sound mat under 3/4″ gypsum underlayment, finished with Advanced Flooring Concepts 6.5mm Soundstop SPC Click. The assembly was selected for the click installation aesthetic combined with the highest available HIIC performance on wood framing construction. Installation by DCO Commercial Floors.

STC	IIC	HIIC	TEST
60	**59**	**72**	R5772.02

The HIIC 72 result is the highest in the Advanced Flooring Concepts test library.

CHAPTER TWELVE

How to Read an Acoustical Test Report

A practical primer, walked through a real Intertek report.

Every acoustical specification ultimately rests on a third-party laboratory test report. Vendors will quote IIC and HIIC numbers freely. A specifier who can read the underlying report can verify those numbers; a specifier who cannot is trusting the marketing.

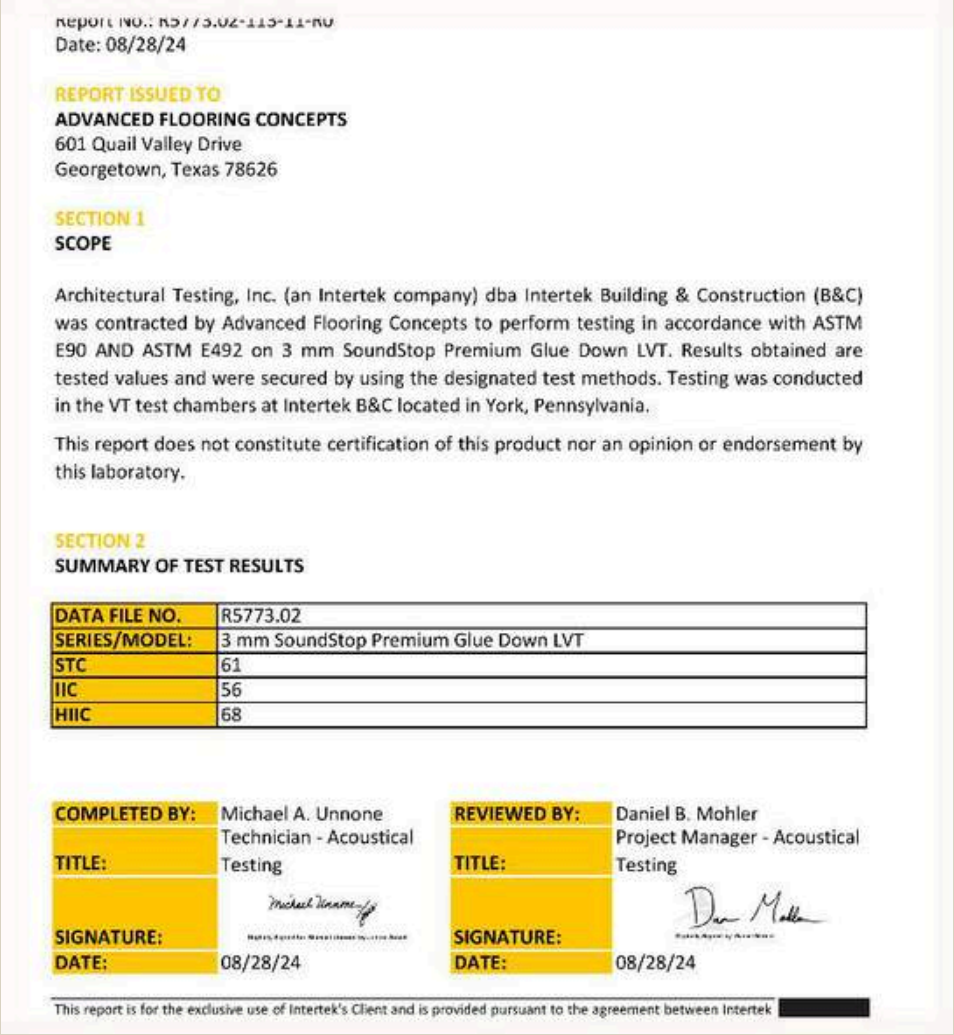
This chapter walks one real report end to end — Intertek Test Report R5773.02, a wood framing assembly with 3mm Soundstop Premium glue down LVT, no sound mat. We use it to teach the anatomy of every acoustical test report you will ever read. Then we compare it to a second report (R5772.04, the same assembly with a 5mm USG SAM-N12 Ultra sound mat added) to demonstrate how to read across two reports.

Three Pages Tell You Almost Everything

An acoustical test report is fifteen pages of frequency tables, calibration logs, and lab certifications. Three of those pages carry the information that matters for specification decisions:

1. The **Summary** page tells you what the test produced, who conducted it, what laboratory accreditation backs it, and who signed off on the result.
2. The **Photographs** page tells you the assembly being claimed actually existed and was tested — forensic documentation that the report is not fabricated.
3. The **Drawing** page tells you the exact assembly the test scored. Change any layer on your project and the published rating no longer applies.

Page One That Matters: The Summary



Report No.: R5773.02-113-11-R0
Date: 08/28/24

REPORT ISSUED TO
ADVANCED FLOORING CONCEPTS
601 Quail Valley Drive
Georgetown, Texas 78626

SECTION 1
SCOPE

Architectural Testing, Inc. (an Intertek company) dba Intertek Building & Construction (B&C) was contracted by Advanced Flooring Concepts to perform testing in accordance with ASTM E90 AND ASTM E492 on 3 mm SoundStop Premium Glue Down LVT. Results obtained are tested values and were secured by using the designated test methods. Testing was conducted in the VT test chambers at Intertek B&C located in York, Pennsylvania.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

SECTION 2
SUMMARY OF TEST RESULTS

DATA FILE NO.	R5773.02
SERIES/MODEL:	3 mm SoundStop Premium Glue Down LVT
STC	61
IIC	56
HIIC	68

COMPLETED BY:	Michael A. Unnone	REVIEWED BY:	Daniel B. Mohler
TITLE:	Technician - Acoustical Testing	TITLE:	Project Manager - Acoustical Testing
SIGNATURE:		SIGNATURE:	
DATE:	08/28/24	DATE:	08/28/24

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek [redacted]

Figure 12.1 — Test Report R5773.02, Summary page (Sections 1 and 2). The Summary identifies the lab, the report, the standards, and the rating numbers, and carries the signatures of the technician and project manager. All five elements are independently verifiable by calling the lab.

WHAT THE SUMMARY TELLS YOU

1. **The lab and its accreditation.** Intertek Building & Construction, York, Pennsylvania. The IAS Accredited Testing Laboratory mark confirms ISO/IEC 17025 accreditation. A report without an accreditation mark is not one a code official will accept.

2. **The report number.** R5773.02-113-11-R0 — uniquely tied to one test, one assembly, one date. Any specifier can call the lab with this number to verify the report exists.

3. **The ASTM standards.** ASTM E90 (airborne) and ASTM E492 (impact, via the standard tapping machine). Field-tested ratings use E336 and E1007 instead, and run lower.

4 **The three rating numbers.** STC 61 for airborne, IIC 56 for impact, HIIC 68 for high-frequency impact.

5 **Two signatures.** The technician who conducted the test and the project manager who reviewed it — both signed and dated. A test result is a signed laboratory result with two named people accountable for it.

> **IF ANY OF THOSE FIVE ELEMENTS IS MISSING**
>
> No accreditation mark, no traceable report number, no ASTM standard cited, no rating signed off by a named technician — the report is not trustworthy. There is no exception and no benefit of the doubt. The number of reports circulating in the multi-family and hospitality industries that lack one or more of these five elements is not small.

Page Two That Matters: The Photographs



Figure 12.2 — Test Report R5773.02, Section 16 (Photographs). Source-room view (top) and receive-room view (bottom). The 3mm glue down LVT is visible across the test specimen floor; the resilient channel pattern across the ceiling drywall is visible in the receive-room photo.

The source-room photograph shows the installed floor covering as it was tested — the floor covering across the full specimen, the perimeter framing, and the standard tapping machine that ASTM E492 specifies. The receive-room photograph is more useful than most specifiers realize: the pattern of the resilient channel is visible across the ceiling drywall, so you can count the channels and verify the spacing — confirming whether a channel was installed at 305 mm or 406 mm on center directly from the photograph.

Page Three That Matters: The Drawing

The most important page in any acoustical test report is the cross-section drawing. It shows every layer of the assembly the rating numbers belong to. Change any one of those layers and the rating no longer applies. The drawing is, in effect, a contract: this is the assembly that produced this result.

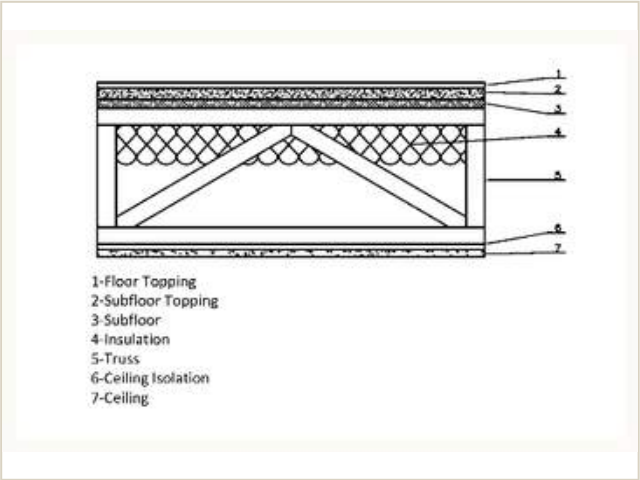


FIGURE 12.3a — R5773.02 (NO SOUND MAT) · SEVEN LAYERS

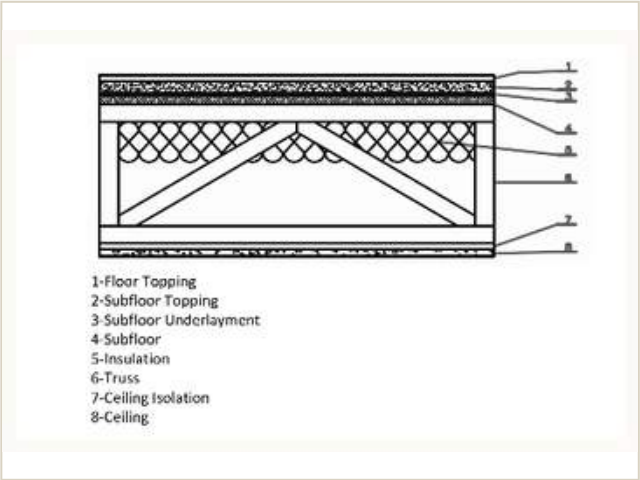


FIGURE 12.3b — R5772.04 (WITH SOUND MAT) · EIGHT LAYERS

In R5772.04, the sound mat is inserted as a new line — Subfloor Underlayment — between the gypsum underlayment and the subfloor. Every other layer is identical to R5773.02. The Intertek labels are lab terminology; each numbered line is, for a specifier, a category of decision.

READING THE DRAWING: EVERY LAYER, EVERY OPTION, WHAT WAS TESTED

INTERTEK LABEL	WHAT IT ACTUALLY IS	R5773.02 (NO MAT)	R5772.04 (WITH MAT)
Floor Topping	The floor covering / wear surface	3mm Soundstop Premium GD LVT	3mm Soundstop Premium GD LVT
Sound Mat	The single variable — topical mat between gypsum and subfloor	None	5mm (0.2″) USG SAM N12™ Ultra
Subfloor Topping	Gypsum underlayment pour (3/4″ min for fire rating)	3/4″ gypsum underlayment	3/4″ gypsum underlayment
Subfloor	OSB / plywood on truss top chord	3/4″ OSB sheathing	3/4″ OSB sheathing
Insulation	Cavity insulation between truss webs	R-13 unfaced fiberglass	R-13 unfaced fiberglass
Truss	Structural framing	18″ open-web wood truss	18″ open-web wood truss
Ceiling Isolation	Resilient channel decoupling the ceiling	ClarkDietrich RC Deluxe™	ClarkDietrich RC Deluxe™
Ceiling	Gypsum wallboard ceiling	5/8″ Type C gypsum	5/8″ Type C gypsum
STC	Airborne rating — ASTM E90	**61**	**60**
IIC	Impact rating — ASTM E492	**56**	**59**

HIIC	Perceived-quiet rating — ASTM E3222	**68**	**70**

COMMON SUBSTITUTIONS THAT QUIETLY BREAK THE TEST

Drop the gypsum underlayment to 1/2". Substitute a copycat resilient channel. Use Type X instead of Type C drywall. Omit the batt insulation. Any of these can drop the IIC by 3–8 points, and the published rating no longer applies — but the substitution rarely shows up in the specification documents until field testing exposes it.

Reading Two Reports Side by Side

The same floor covering, tested twice on the same wood-truss assembly, with one variable changed: a 5mm USG SAM-N12 Ultra sound mat added between the gypsum underlayment and the subfloor.



ADVANCED FLOORING CONCEPTS

SCOPE

SUMMARY OF TEST RESULTS

DATA HLL NO.:	R5773.02
CERES/MODEL:	Truss Solutions Phoenix Blue Ridge - VT
STC:	61
IIC:	56
HIIC:	68

COMPILED BY:	Michael A. Ortmore	REVIEWED BY:	Daniel J. Mohler
TITLE:	Technician - Non-solicit Testing	TITLE:	Project Manager - Acoustical Testing
SIGNATURE:		SIGNATURE:	
DATE:	08/28/24	DATE:	09/18/24

R5773.02 — NO MAT · STC 61 / IIC 56 / HIIC 68



ADVANCED FLOORING CONCEPTS

SCOPE

SUMMARY OF TEST RESULTS

DATA HLL NO.:	R5772.04
CERES/MODEL:	Truss Solutions Phoenix Blue Ridge - VT
STC:	60
IIC:	59
HIIC:	70

COMPILED BY:	Morgan S. J. Kennedy	REVIEWED BY:	Daniel J. Mohler
TITLE:	Technician - Non-solicit Testing	TITLE:	Project Manager - Acoustical Testing
SIGNATURE:		SIGNATURE:	
DATE:	08/28/24	DATE:	09/18/24

R5772.04 — WITH 5mm MAT · STC 60 / IIC 59 / HIIC 70

One variable changes, and the result is precise: **STC drops one point** (61→60, within the noise floor of lab testing), **IIC gains three points** (56→59, moving the assembly into the TDHCA range), and **HIIC gains two points** (68→70). Whether the sound mat is worth the added material, installation cost, and construction time becomes a project-level decision — the no-mat assembly already passes Section 1206 by six IIC points. Both are legitimate specifications.

WHAT TO REQUEST FROM ANY VENDOR

- The full PDF of the test report — not just the Summary page or a marketing excerpt.
- Verifiable accreditation (IAS, A2LA, or equivalent ISO/IEC 17025 mark) and lab address.
- The ASTM standards cited — E90 / E492 for lab, E336 / E1007 for field.

- The bill of materials and the cross-section drawing.
- The source-room and receive-room photographs.
- Two named signatures with dates — technician and project manager or reviewer.
- A report date that matches a current product.

A vendor who can produce all of this is selling a real product. A vendor who cannot — for any element of the list — is selling marketing.

APPENDIX A

Glossary

Acoustical terminology used in this guide.

Acoustical LVT — Luxury vinyl tile with an acoustical backing adhered directly to the underside of the wear surface. Eliminates the need for a separate sound mat in many assemblies.

ASTM E90 / E336 — Laboratory and field test methods for airborne sound transmission loss; the basis for STC ratings.

ASTM E492 / E1007 — Laboratory and field test methods for impact sound transmission via the standard tapping machine; the basis for IIC ratings.

ASTM E3222 — Laboratory test method for high-frequency impact sound transmission; the basis for HIIC ratings.

Drop Ceiling — A suspended ceiling below the structural deck, creating an air cavity. Significantly improves IIC and STC on concrete-deck assemblies.

Flanking Path — An indirect route by which sound travels between spaces — through walls, around the assembly, or through ducts and pipes — bypassing the primary barrier.

Gypsum Underlayment — A self-leveling cementitious or gypsum-based pour applied over the subfloor to add mass and contribute to fire and acoustical ratings.

HIIC (High-frequency Impact Insulation Class) — A single-number rating of how an assembly performs against impact sound in the frequencies the human ear finds most objectionable. Better predicts how a floor will actually sound than IIC alone.

IIC (Impact Insulation Class) — A single-number rating of resistance to impact sound — footsteps, drops, rolling objects. The primary code-referenced impact rating in Section 1206.

NRC (Noise Reduction Coefficient) — A rating of how much sound a material absorbs within a room (different from blocking transmission between rooms). Relevant to ceiling treatments and soft furnishings, not the floor covering itself.

Open-Web Wood Truss — An engineered wood floor truss with triangular webbing, typically 14″–18″ deep. The standard framing system for 0–5 story Type V construction.

Resilient Channel — A thin metal channel between the framing and the gypsum wallboard ceiling that decouples the two to prevent vibration transmission. AFC's tested assemblies use ClarkDietrich RC Deluxe

(RCSD); apartments are commonly built with the standard RC-1 Pro (RCUR), which runs 2–3 IIC points lower in the field.

Section 1206 — The sound transmission section of the International Building Code. Sets STC and IIC minimums (50 lab / 45 field) for floor-ceiling assemblies between dwelling units.

Sound Mat — A separate acoustical underlayment, typically 1/8″ to 1/4″ thick, installed between the gypsum underlayment and the subfloor. Increasingly replaced by integrated acoustical backings on the floor covering itself.

SPC Click — Stone Plastic Composite click-installation flooring. A rigid, waterproof core flooring with a click-lock method, commonly available with integrated acoustical backings.

STC (Sound Transmission Class) — A single-number rating of resistance to airborne sound — voices, television, music. Tested per ASTM E90 (lab) / E336 (field).
FF&E — Furniture, Fixtures & Equipment; the brand-standard package, flooring included, that a hotel franchise requires. **PIP** — Property Improvement Plan, the renovation scope a brand requires at conversion or renewal. **QAP** — Qualified Allocation Plan, the annually updated rules a state housing agency uses to award Low-Income Housing Tax Credits. **ADR / RevPAR** — Average Daily Rate / Revenue Per Available Room, the core hotel revenue metrics.

APPENDIX B

Bibliography & References

Standards, codes, and research cited in this guide.

STANDARDS & CODES

- ASTM E90, E336 — Airborne sound transmission loss (laboratory and field).
- ASTM E492, E1007 — Impact sound transmission via the tapping machine (laboratory and field).
- ASTM E3222 — High-frequency impact sound transmission.
- ASTM D2047 — Static coefficient of friction of polish-coated flooring surfaces.
- International Code Council. International Building Code, Section 1206 — Sound Transmission. Most recent published edition.

INDUSTRY & ACADEMIC RESEARCH

- LoVerde, John. Veneklasen Associates, Inc. Acoustical comparison of ClarkDietrich RCSD (RC Deluxe) and RCUR (RC-1 Pro) resilient channels, April 13, 2015.
- Cornell University Center for Hospitality Research. Anderson, Chris K. "The Impact of Social Media on Lodging Performance." Relationship between the ReviewPro Global Review Index (GRI) and ADR, occupancy, and RevPAR (a one-point GRI gain associated with +0.89% ADR / +0.54% occupancy / +1.42% RevPAR).
- J.D. Power. North America Hotel Guest Satisfaction Index (NAGSI). Noise identified as the most commonly experienced hotel guest problem, frequently unreported to staff (2011 edition); in-stay problems sharply depress guest satisfaction (2011 and 2025 editions).
- National Apartment Association. Research on resident turnover, replacement cost, and lease renewal drivers (survey data placing most unit turns at $1,500–$3,500).
- Zego (2023). Apartment turnover-cost benchmark — average cost to turn a unit of roughly $3,900.
- J Turner Research. Multi-family resident satisfaction survey analysis (10,000+ responses; noise did not rank among the top 10 stated complaints).
- DuPree, Russell B. *Catalog of STC and IIC Ratings for Wall and Floor/Ceiling Assemblies.* Office of Noise Control, California Department of Health Services, Berkeley, CA. A compendium of laboratory STC and IIC results across approximately 500 construction assemblies.

STATE HOUSING & TAX-CREDIT RESOURCES

- Texas Department of Housing and Community Affairs (TDHCA). Qualified Allocation Plan for the LIHTC Program. Annually updated; current requirements at tdhca.texas.gov.
- Texas Property Code — sections governing implied warranty of quiet enjoyment in residential leases.

LABORATORY TEST DOCUMENTATION

All AFC-attributed test data is from certified Intertek laboratory reports, verifiable by report number with Intertek Building & Construction, York, Pennsylvania. Reports referenced include R5772.02, R5772.03, R5772.04, R5772.06, R5772.07, R5773.01, R5773.02, N3441.02, G9143.01, and P2000.02, plus the NorthStar 4mm Soundlock (240830002, reports SHF-002/SHF-003) and SoundGuard (200323007) concrete assemblies. Report R7447.16 (Shaw Industries) is cited as third-party reference data only and is not an AFC test. Independent Accreditation Service (IAS): ISO/IEC 17025 accreditation.

APPENDIX C

CSI Guide Specification

Resilient Tile Flooring · MasterFormat 09 65 19 · a ready-to-edit three-part section.

This appendix provides editable three-part specification language a spec writer can paste into a project manual and adapt. Bracketed items [ ] are project choices, and performance values are left for the specifier to set per project. It operationalizes the rest of this guide: the rating is a property of the whole assembly, and the only way to hold it is to require the certified report for the assembly actually specified.

> **MASTERFORMAT PLACEMENT**
>
> Resilient LVT and SPC plank are specified under **09 65 19 — Resilient Tile Flooring** (broad scope **09 65 00** Resilient Flooring). Coordinate related work: **09 65 13** Resilient Base & Accessories; **03 54 16** Hydraulic Cement / gypsum underlayment. Acoustic underlayment (sound mat), where used, is carried as a performance article within this Section rather than as a separate division.

SECTION 09 65 19 — RESILIENT TILE FLOORING

PART 1 — GENERAL

1.01 SUMMARY. This Section includes acoustical resilient tile flooring (glue-down LVT and/or SPC click plank with integrated acoustical backing), acoustic underlayment where scheduled, adhesives, and accessories. Related Sections: 09 65 13 Resilient Base & Accessories; 03 54 16 gypsum underlayment; [Division 06] wood framing / subfloor; [09 29 00] gypsum board ceiling and resilient channel.

1.02 REFERENCES. ASTM E90 / E336 (airborne, laboratory / field); ASTM E492 / E1007 (impact, laboratory / field); ASTM E3222 (high-frequency impact, HIIC); ASTM E413 / E989 (STC / IIC classification); ASTM F710 (concrete substrate for resilient flooring); ASTM F1869 / F2170 (substrate moisture); ICC International Building Code Section 1206 (Sound Transmission); ISO/IEC 17025 (laboratory accreditation).

1.03 PERFORMANCE REQUIREMENTS. Acoustical performance is a property of the complete floor-ceiling assembly, not the floor covering alone, and shall be demonstrated for the assembly as actually specified. Provide a floor-ceiling assembly achieving not less than:

- Airborne: STC [55], laboratory per ASTM E90 (Section 1206 minimum STC 50 lab / 45 field).
- Impact: IIC [55], laboratory per ASTM E492 (Section 1206 minimum IIC 50 lab / 45 field).
- High-frequency impact: HIIC [__], laboratory per ASTM E3222. HIIC is an owner-elected performance criterion; no code or brand currently mandates a minimum. Specify it where perceived quiet is a project priority.

Values stated are laboratory ratings. Field-tested values (ASTM E336 / E1007) typically run below laboratory results; coordinate field-test acceptance criteria in 1.06 and Part 3.

1.04 SUBMITTALS. Product data and samples for each product. **Acoustical test reports:** submit the complete certified third-party (ISO/IEC 17025-accredited) laboratory test report for the *actual assembly specified* — including the Summary (ratings), Photographs, and cross-section Drawing pages — identified by report number. A report for a different assembly, or summary ratings without the corresponding report number, is not acceptable. Provide LEED / VOC documentation where applicable.

1.05 QUALITY ASSURANCE. Single-source responsibility for the floor covering and its acoustical backing. Installer experienced with acoustical resilient assemblies. Provide a mock-up or first-phase assembly where required.

1.06 FIELD ACOUSTICAL TESTING. [Where required] Provide field testing (ASTM E336 / E1007) of the first completed representative assembly before replication across the project. On large multi-family and hotel projects this is the highest-value quality-control step available — it catches assembly errors before they are built hundreds of times.

1.07 DELIVERY, STORAGE & CONDITIONS. Acclimatize materials and condition spaces per manufacturer requirements. **1.08 WARRANTY.** Manufacturer commercial warranty, [__] years.

PART 2 — PRODUCTS

2.01 MANUFACTURERS. Basis of design: Advanced Flooring Concepts (Soundstop acoustical LVT and SPC click lines). Substitutions per 1.04 and the substitution clause below.

2.02 ACOUSTICAL RESILIENT TILE. Glue-down LVT and/or SPC click plank with an acoustical backing adhered directly beneath the wear layer. Overall thickness [__ mm]; wear layer [__ mil] (20-mil minimum for corridors, commercial common areas, and back-of-house; back-of-house LVT at 3mm minimum thickness). Dimensional stability, slip resistance, and fire performance per the referenced standards.

2.03 ACOUSTIC UNDERLAYMENT (SOUND MAT). [Include only where the specified assembly requires it.] Where an attached acoustical backing carries the rating, a separate sound mat is not required — do not add one without a certified report for the resulting assembly.

2.04 GYPSUM UNDERLAYMENT & ACCESSORIES. Coordinate gypsum underlayment (03 54 16) thickness with the certified assembly. Provide adhesives, resilient base (09 65 13), transitions, and reducers as scheduled.

PART 3 — EXECUTION

3.01 EXAMINATION. Verify substrate flatness, soundness, and moisture per ASTM F710 / F1869 / F2170 before installation. Do not proceed over non-conforming substrates.

3.02 PREPARATION. Prepare the substrate per manufacturer instructions; gypsum underlayment cured and within moisture limits.

3.03 INSTALLATION. Install per manufacturer instructions and the certified assembly. Where a resilient-channel ceiling carries the rating, protect the decoupling: do not fasten through the channel into the framing (a single short-circuited screw path measurably reduces IIC). Install the channel that produced the rating, not a visually similar substitute.

3.04 FIELD QUALITY CONTROL. Perform field acoustical testing per 1.06 where required. Field results below the specified field minimum require corrective work before continuing.

3.05 PROTECTION & CLEANING. Protect finished flooring and clean per manufacturer instructions.

> **SUBSTITUTION CLAUSE (PASTE INTO 1.04 OR DIVISION 01)**
>
> The acoustical rating applies only to the assembly tested. Any change to the floor covering, acoustical backing, sound mat, gypsum underlayment thickness, resilient channel type, ceiling assembly, or cavity insulation constitutes a different assembly and voids the submitted rating. Proposed substitutions shall be accompanied by a complete certified third-party (ISO/IEC 17025) test report for the actual substituted assembly, identified by report number. Summary ratings without the corresponding report are not acceptable.

This guide specification is provided as an editing aid. The architect or engineer of record is responsible for project-specific performance values, coordination, and final specification content.

Advanced Flooring Concepts

Leaders in Innovative Commercial Flooring!

The Silent Advantage Starts Here.

Specifying a quiet floor should not be a gamble. Advanced Flooring Concepts builds acoustical flooring that meets code, performs in the real building, and eliminates an entire step from the construction sequence — and backs every claim with third-party test data a specifier can verify before committing it to a spec. Founded in 2013 by Adam Clark and based in Texas, AFC is a commercial flooring distributor and specification partner holding one of the largest publicly available libraries of certified third-party acoustical assembly tests on glue down LVT and SPC click flooring for wood-framed and concrete construction.

WHAT AFC OFFERS

- 12 tests in the AFC library, covering both wood framing and concrete assemblies — verifiable by Intertek report number.
- Soundstop acoustical LVT and SPC click product lines designed for Section 1206 compliance.
- Partnerships with SAR Floors, NorthStar Flooring, Mapei, USG, and All State Rubber for full-assembly, warrantable system specification.
- A complete, branded specification proposal in 48 hours — marked-up drawings, specified products, exact quantities, wall base, and transitions.
- Specification review and acoustical assembly consulting for architects, developers, and general contractors.

Adam Clark, Founder & CEO

Advanced Flooring Concepts

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