O&M Best Practice Checklist

ACOUSTICAL CONTROL

A Performance & Inspection Checklist for Facility Operators

AUDIENCE

Facility maintenance staff, building operators, controls technicians, and chief building engineers responsible for the operation, inspection, verification, and maintenance of HVAC noise & vibration control, room finishes that affect acoustics, sound masking and AV systems, and partition / enclosure conditions that govern sound isolation. Acoustical consultants, designers, commissioning agents, industrial hygienists, and owners may also use this checklist as a reference.

MINDSET

Proactive vs. Reactive. Healthy buildings deliver intended acoustic conditions only when HVAC, room finishes, partitions, AV/sound-masking, and operational policy are operating as intended and maintained together.

WHY

Acoustic conditions directly affect speech intelligibility, learning, productivity, privacy, sleep, stress, and (in healthcare) patient outcomes. Most acoustic complaints in operating buildings stem not from the design alone but from drift over time: HVAC equipment aging or fouling, vibration isolator alignment or changes, acoustic finishes being altered (i.e., painted) or removed, partition penetrations for building operation changes or additions, door seals wearing or in need of adjustment, sound-masking systems being turned off or modified without calibration, and AV system changes or alterations. The authoritative references for design and operation include ANSI/ASHRAE/USGBC/IES Standard 189.1 §8.3 (Acoustical Control — outdoor noise, indoor background noise, sound transmission, and reverberation), the ASHRAE Handbook — HVAC Applications (Sound & Vibration Control chapter), the ASHRAE Practical Guide to Noise and Vibration Control for HVAC Systems (Schaffer, 2011), ANSI/ASA S12.2 (room-noise criteria — NC, RC), and ANSI/ASA S12.60 (classroom acoustics — background noise, reverberation, sound isolation). Voluntary rating systems (LEED v5 EQ Acoustic Performance, WELL Sound, FGI Guidelines for healthcare) reference these same core criteria.

BACKGROUND & OBJECTIVES

The goals of this acoustics preventive-maintenance checklist are to:

- Provide facility staff with a single, practical schedule of monthly, quarterly, semi-annual, annual, and multi-year acoustic inspection tasks aligned with ANSI/ASHRAE/USGBC/IES 189.1 §8.3, ASHRAE HVAC Applications (Sound & Vibration Control), the ASHRAE Practical Guide to Noise and Vibration Control for HVAC Systems, ANSI/ASA S12.60, and ANSI/ASA S12.2.
- Maintain space conditions, background sound level (NC/RC), reverberation time (RT60/T60), speech privacy (SPC), sound isolation (NIC/STC/IIC), and vibration, within the design intent throughout the life of the building.
- Detect and correct common acoustic failure modes (HVAC noise creep, duct/fitting regenerated noise, vibration isolator failure, partition penetrations, ceiling-plenum flanking, door-seal failure, sound-masking drift, reverberation creep from finishes loss) before they become persistent complaints.
- Reduce occupant exposure to chronic noise stress and speech-privacy failures, especially in schools, healthcare, residential, and confidential-work environments.
- Establish the proactive baseline that supports speech-intelligibility, learning, hearing-health, and privacy commitments.
- If applicable, align with voluntary rating systems including LEED v5 EQ (Acoustic Performance), WELL Sound, the FGI Guidelines (healthcare/residential acoustics), and IBC/IECC requirements.
- Create a documented, auditable record (logs, dates, findings, corrective actions) that supports tenant agreements, accessibility (ADA effective communication), warranty / insurance, and occupant-complaint response.
- Promote a 'good is better than perfect' culture: complete the basic checks every cycle, capture observations, and iterate.

MEASURES OF SUCCESS

- ✓ Background sound levels in occupied spaces (HVAC-off / steady-state) within the design NC/RC criterion for the room type (per ANSI/ASA S12.2 and ANSI/ASA S12.60 for schools).
- ✓ Reverberation time (RT60) in core learning, communication, and gathering spaces within design limits (e.g., ANSI/ASA S12.60 ≤ 0.6 s for classrooms ≤ 10,000 ft³; ≤ 0.7 s for larger).
- ✓ Speech privacy (Speech Privacy Class — SPC) and sound isolation (NIC/STC) for confidential partitions (e.g., private offices, medical exam/treatment rooms, classrooms, conference rooms, etc.) meets the published design intent without recurring complaints.
- ✓ Sound-masking systems operating, balanced, and within the design dB(A) and spectrum tolerance; outages logged and corrected.
- ✓ Vibration isolators (spring, neoprene, inertia bases) functional; no audible structure-borne noise complaints in occupied zones adjacent or near mechanical rooms
- ✓ AV / public-address systems deliver speech transmission index (STI ≥ 0.50) or speech intelligibility (SII / STIPA) at design points; AV calibration current.
- ✓ Acoustic finishes (ceiling tiles, panels, baffles, carpet) inspected and maintained; substitutions or repairs replicate the original NRC / absorption performance.
- ✓ Annual occupant survey shows ≥ 80% acoustic satisfaction; recurring complaints have documented corrective action; no unaddressed clusters > 30 days.
- ✓ Reduction in unscheduled work orders related to acoustic complaints year over year.

HOW TO USE THIS CHECKLIST

Acoustical performance generally only changes where there are alterations to the building, finishes, or from changes in mechanical systems (i.e., regular maintenance: fan belts, filters, bearings, etc.). Each tab is a stand-alone inspection sheet. For each task, record the date completed, the technician initials, and a status (Pass / Fail / Deferred / N-A) along with findings and corrective action. The Observations Log captures occupant complaints and inter-cycle findings; the Sound Masking, AV & Vibration tab covers specialized acoustic systems; the Standards Crosswalk maps each task to its governing standard for auditors and reviewers.

PRIMARY SOURCES

- ANSI/ASHRAE/USGBC/IES Standard 189.1 — Standard for the Design of High-Performance Green Buildings, §8.3 Acoustical Control (outdoor site noise, indoor background noise (NC/RC), sound transmission (STC), and reverberation).
- ASHRAE Handbook — HVAC Applications, Sound & Vibration Control chapter (HVAC noise & vibration design and operation).
- ASHRAE Handbook — HVAC Applications, Health Care chapter (acoustic requirements for healthcare).
- Schaffer, M.E. — A Practical Guide to Noise and Vibration Control for HVAC Systems, 2nd ed. (ASHRAE, 2011) — general design guidelines, airside / water-side equipment, vibration isolation, specifications, construction, troubleshooting, and acoustic rating systems & criteria.
- ANSI/ASHRAE Standard 62.1 — Ventilation and Acceptable Indoor Air Quality (referenced for ventilation / natural-ventilation sections that interact with acoustic operation, e.g., operable openings, pressurization).
- ANSI/ASA S12.60 Part 1 — Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools (background noise, reverberation, sound isolation).
- ANSI/ASA S12.2 — Criteria for Evaluating Room Noise (NC, RC, RNC).
- USGBC LEED v5 — Indoor Environmental Quality credit: Acoustic Performance.
- WELL Building Standard — Sound concept (sound mapping, reverberation, sound isolation, sound masking, HVAC noise, hearing health).
- FGI Guidelines for Design and Construction of Hospitals / Residential Health, Care, and Support Facilities — Acoustic Design.
- International Building Code (IBC) — sound transmission requirements at dwelling-unit / public separations and Assistive Listening Systems in assembly spaces (§1108).
- Manufacturer O&M instructions for sound-masking systems, AV systems, vibration isolators, acoustic ceilings/wall panels, door seals, and HVAC silencers.

Acoustical Performance Observational Tasks - Non-Instrumented

Walk-through checklist to be used as a baseline review of existing acoustical conditions. The following also apply as point of comparison completed at the conclusion of commissioning post-construction and within first 30 days of occupancy (for new buildings). These tasks align the perceived performance and systems that often require final adjustments to meet the acoustical performance goals and preemptively identifies potential emerging occupant complaints. The following are intended to be observed without calibrated equipment or test systems; non-instrumented observation assessment.

Building / Site: **Inspector:** **Period:**

#	Topic / Equipment	Inspection / Maintenance Task	Type	Source / Reference	Standard Section / Clause	Status	Date Completed	Performed By (Initials)	Findings / Corrective Action
BACKGROUND SOUND									
1	HVAC noise — unoccupied walk-through	During unoccupied hours, walk a representative sample of occupied spaces (offices, classrooms, exam rooms, conference rooms, lobbies) with HVAC running at normal occupied operation. Listen for and flag any obvious or annyoning HVAC noise (rumble, whoosh, hiss, tonal whine, fluttering damper). Spot-check supply diffusers, return grilles, and transfer grilles for whistle, throttle noise, or balancing-damper rattle. Note location, equipment, and description of the sound.	V	ASHRAE HVAC Apps — Sound & Vibration; ASA S12.2; ASHRAE 189.1 §8.3	Background sound				
2	Exterior noise - intrusion through windows, exterior doors, and exterior ventilation systems	Observation of exterior noise intrusion (e.g., transit, outdoor HVAC systems, etc) into spaces during HVAC noise walk-through.	V	ASHRAE HVAC Apps — Sound & Vibration; ASA S12.2; ASHRAE 189.1 §8.3	Background sound				
3	Transient Building Systems - unoccupied system operations	With a colleague evaluate the noise and vibration-borne impact into occupied spaces from plumbing systems (e.g., bathrooms, kitchens, laundry), elevators or other internal conveyance systems, and rain leaders (where possible).	V	ASHRAE HVAC Apps — Sound & Vibration; ASA S12.2; ASHRAE 189.1 §8.3	Background sound				
4	Mechanical-room door & wall penetrations	Visually inspect mechanical-room doors, wall penetrations, and ductwork passing through rated assemblies. If mechanical system noise is perceived, note type of noise, location, and any visual observations of door seals, seals, and conduit/pipe penetrations.	V	ASHRAE HVAC Apps — Sound & Vibration; ASA S12.2; ASHRAE 189.1 §8.3	Background sound				
SOUND ISOLATION & SPEECH PRIVACY									
5	Partitions - Transmission Loss & Speech Privacy	When possible, listen in adjacent enclosed room to conversations/lectures happening next door to note how perceptible speech is between enclosed rooms.	V	ASHRAE 189.1 §8.3	Airborne sound				
6	Floor-Ceiling Assembly - Transmission Loss & Footfall Insulation	When possible, work with a colleague or while upstairs rooms/spaces are occupied listen to walking noise below and document, if footfalls or rolling carts are audible. Listen to conversations or activities happening above or below to note how perceptible speech is between floors.	V	ASHRAE 189.1 §8.3	Vibration-borne sound				
7	Operable Partitions & Demountable Systems - Transmission Loss & Speech Privacy	When possible, listen outside sensitive rooms to the perceptibility of conversations/lectures through door. Where door seals are present, inspect and verify that they create a tight seal between the frame and threshold and the door core, and the door closes fully. Note audible speech bleed from corridors during occupied conditions.	V	ASHRAE 189.1 §8.3	Airborne sound				
8	Doors - Transmission Loss & Speech Privacy	When possible, listen outside sensitive rooms to the perceptibility of conversations/lectures through door. Where door seals are present, inspect and verify that they create a tight seal between the frame and threshold and the door core, and the door closes fully. Note audible speech bleed from corridors during occupied conditions.	V	ASHRAE 189.1 §8.3	Airborne sound				
REVERBERATION TIME / REFLECTED SOUND									
9	Reverberation Time - Sound Control	Listen to sound in open areas (i.e., open-plan work areas, cafeterias, gyms) and document the perceived loudness of the space. Document the type and locations of finishes.	V	ASHRAE HVAC Apps — Sound & Vibration; ASHRAE Practical Guide ch.8	Reverberant Sound				
10	Reverberation Time - Speech Clarity	Listen to conversation, presentation, or AV presentation within enclosed rooms and describe the perception of speech within the room. Note any effects on speech intelligibility or clarity.	V	ASHRAE HVAC Apps — Sound & Vibration; ASHRAE Practical Guide ch.5	Reverberant Sound				
VIBRATION & VIBRATION ISOLATION									
11	Vibration check — adjacent to mech rooms / transit	Stand in spaces adjacent to or directly above/below mechanical rooms, elevator equipment, and (where applicable) near transit lines or vibrating equipment. Flag any perceptible vibration or perceived noise in surfaces (i.e., walls).	V	ASHRAE HVAC Apps — Sound & Vibration; ASHRAE Practical Guide ch.8	Structure-borne vibration				
12	Vibration isolator visual check	Where accessible, visually inspect vibration isolators (i.e., springs, pads, mounts, etc) supporting HVAC and building systems (i.e., AHUs, pumps, chillers, fans, etc.). If vibration is preceptible in the floor adjacent to equipment, document the condition of the isolators, connection conditions (e.g., pipe connections, electrical conduit).	V	ASHRAE HVAC Apps — Sound & Vibration; ASHRAE Practical Guide ch.5	Vibration isolation				
SOUND MASKING & AV SYSTEMS — FUNCTIONAL									
13	Sound-masking functional check	Walk all zones served by sound masking. Confirm each zone is energized and there is background sound. If the sound is noticeable, describe what it sounds like.	V	Manufacturer O&M; LEED v5 EQ Acoustic	Sound masking — operational				
14	Public address / paging audibility	Run a routine page or test announcement across the building. Confirm intelligibility in all required zones (corridors, lobbies, stairwells). Note dead spots or distortion.	V	NFPA 72 (where applicable); WELL Sound	Voice paging intelligibility				
OCCUPANT FEEDBACK									
15	Acoustic complaint log review	Review and respond to all acoustic complaints received in the past 30 days (too loud, speech overheard, vibration, masking too loud / too quiet, AV unclear). Document follow-up and route to the appropriate frequency tab.	V	ASA S12.60; LEED v5 EQ Acoustic; WELL Sound	Complaint response				

Type Codes:

V = Verify (visual inspection / acoustic walk, no calibrated tools) | Vd = Validate (calibrated measurement — SLM, dosimeter, RT60, IR thermography for HVAC noise) | T = Test (controlled test of an acoustic component, e.g., functional sound-masking test)

Acoustical Performance Observational Tasks - Instrumented

Instrumented testing of acoustical conditions for existing buildings that have not been acoustically commissioned to baseline existing acoustical conditions. The following also apply as tasks for acoustical commissioning post-construction and within first 30 days of occupancy (for new buildings). These tasks align the perceived performance and systems that often require final adjustments to meet the acoustical performance goals and preemptively identifies potential emerging occupant complaints. The following are intended to be assessed with with calibrated equipment and following approved test standards.

Building / Site: **Inspector:** **Period:**

#	Topic / Equipment	Inspection / Maintenance Task	Type	Source / Reference	Standard Section / Clause	Status	Date Completed	Performed By (initials)	Findings / Corrective Action
BACKGROUND SOUND									
1	Background sound - All sources	During unoccupied hours, with HVAC running at normal occupied operation, measure the background sound in rooms. Distinguishing the type of noise source is optional. Document the independent contributors of noise (HVAC vs exterior instrusion vs. transient building systems) where possible; flag any space ≥ 5 dB above criterion.	Vd	ASHRAE HVAC Apps — Sound & Vibration; ASA S12.2; ASHRAE 189.1 §8.3	Background sound				
2	Mechanical Rooms, IDF/MDF, & Doors	Measure the sound within mechanical rooms, IDF/MDF, or other IT closets and outside the door for general documentation and future reference.	Vd	ASHRAE HVAC Apps — Sound & Vibration	Background sound				
3	Façade & exterior-noise study	Conduct a façade and exterior-noise study (outdoor SPL at property line and at sensitive façade exposures) to verify continued compliance with ASHRAE 189.1 outdoor-noise limits, local ordinance, and design intent. Include any changes in neighborhood / transit / construction conditions.	Vd	ASHRAE 189.1 §8.3 (Outdoor Noise); local ordinance	Façade & exterior noise study				
SOUND ISOLATION & SPEECH PRIVACY									
4	Partitions - Transmission Loss & Speech Privacy	Measure the sound isolation (Noise Isolation Class and/or Normalized Noise Isolation Class) and Speech Privacy Class (SPC) for at least 10% of enclosed rooms.	Vd	ASHRAE 189.1 §8.3	Airborne sound				
5	Floor-Ceiling Assembly - Transmission Loss & Footfall Insulation	Measure the sound isolation (Noise Isolation Class and/or Normalized Noise Isolation Class) and footfall insulation (Impact Sound Rating and/or Normalized Impact Sound Rating) for each floor-ceiling assembly and flooring finish condition seperating sensitive rooms.	Vd	ASHRAE 189.1 §8.3	Vibration-borne sound				
6	Doors - Transmission Loss & Speech Privacy	Measure the sound isolation (Noise Isolation Class and/or Normalized Noise Isolation Class) and Speech Privacy Class (SPC) for each door condition type (e.g., confidential rooms with or without seals).	Vd	ASHRAE 189.1 §8.3	Airborne sound				
REVERBERATION TIME / REFLECTED SOUND									
7	Reverberation Time - Sound Control	Measure the reverberation time within spaces qualified in applicable standards for the building type; document for speech frequencies (250 Hz - 4,000 Hz).	Vd	ASHRAE 189.1 §8.3; FGI; ANSI S12.60; LEED v5; WELL	Reverberant Sound				
VIBRATION & VIBRATION ISOLATION									
8	Vibration check — adjacent to mech rooms / transit	Measure the vibration at the base of each equipment (below vibration, where applicable and accessible).	Vd	ASHRAE HVAC Apps — Sound & Vibration; ASHRAE Practical Guide ch.5	Structure-borne vibration, Vibration Isolation				
SOUND MASKING & AV SYSTEMS — FUNCTIONAL									
9	Sound-masking functional check	Using a Class 1 or 2 SLM with 1/3-octave capability, spot-check 2-3 zones against the design masking spectrum. Confirm overall level is within ±2 dB(A) of design and spectrum is within ±3 dB per 1/3-octave band.	Vd	Manufacturer O&M; LEED v5 EQ Acoustic	Sound masking — operational				
10	Public address / paging audibility	In 1-2 representative rooms per typology (conference, classroom, auditorium), play a calibration reference (pink noise or speech sample) and verify SPL coverage uniformity (±3 dB across listener positions) and absence of feedback risk at design gain.	Vd	NFPA 72 (where applicable); WELL Sound	Voice paging intelligibility				
OCCUPANT FEEDBACK									
11	Acoustic complaint log review	Review and respond to all acoustic complaints received in the past 30 days (too loud, speech overheard, vibration, masking too loud / too quiet, AV unclear). Completed instrumented tests of these identified conditions.	Vd	ASA S12.60; LEED v5 EQ Acoustic; WELL Sound	Complaint response				

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Acoustics Performance Deficiency Investigation

Investigation of contributing conditions to deficient performance: HVAC noise sources and paths, vibration isolators in detail, sound-masking balance, AV calibration spot-checks, and the partition / ceiling conditions that govern sound isolation.

Building / Site: **Inspector:** **Period:**

#	Topic / Equipment	Inspection / Maintenance Task	Type	Source / Reference	Standard Section / Clause	Status	Date Completed	Performed By (Initials)	Findings / Corrective Action
BACKGROUND SOUND									
1	Background Noise - Identify contributors	For rooms/spaces exceeding the criterion ≥ 5 dB from instrumented assessment, identify, if possible, perceived contributions (e.g., HVAC, transient building systems, exterior intrusion); be as specific as possible	V	ASHRAE 189.1 §8.3; ASA S12.2; ANSI/ASA S12.60	Background sound — NC/RC				
2	Silencer / duct lining inspection (accessible)	Where access is available, inspect supply-side and return-side silencers, duct lining, and elbow/turning-vane assemblies for blockage, debris, biological growth, lining delamination, or evidence that lining has been removed during prior service.	V	ASHRAE HVAC Apps — Sound & Vibration; ASHRAE Practical Guide ch.2; ASHRAE 62.1 §5.7	Duct silencer / lining				
3	VFD / motor tonal noise	Listen at VFDs, motors, and starter cabinets for new tonal whine, harmonic chatter, or carrier-frequency artifacts. Coordinate with the electrical / controls team to verify carrier frequencies and grounding.	V	ASHRAE HVAC Apps — Sound & Vibration; ASHRAE Practical Guide ch.8; manufacturer O&M	Motor / VFD acoustic emissions				
4	Windows & Fenestrations	Inspect and document any identified paths of exterior noise intrusion with respect to exposure of outside noise source(s). Detail the type of exterior sound source and approximate distance from building.	V	ASHRAE 189.1 §8.3; ASA S12.2; ANSI/ASA S12.60	Motor / VFD acoustic emissions				
VIBRATION ISOLATION — DETAIL									
5	Vibration Isolators Installed Conditions - Springs, Pads, etc	Spot-check spring deflection (against design deflection) on representative AHU, fan, and pump bases. Confirm 80-100% of nominal deflection; confirm pad and mount isolators is not over-compressed or showing material fatigue..	V	ASHRAE HVAC Apps — Sound & Vibration; ASHRAE Practical Guide ch.5	Vibration isolator performance				
6	Flexible connections	Inspect flex-duct connections between equipment and ductwork, flexible pipe connectors, and electrical conduit drops. Confirm connectors are not stretched, kinked, or rigidly bypassed.	V	ASHRAE HVAC Apps — Sound & Vibration; ASHRAE Practical Guide ch.5	Flexible connection integrity				
7	Roof-mounted equipment — curb / pad	Inspect equipment curbs, vibration pads, and roof penetrations for cracks, settled pads, or removed isolation grommets.	V	ASHRAE HVAC Apps — Sound & Vibration; ASHRAE Practical Guide ch.1 / ch.4	Roof-mounted vibration isolation				
PARTITION / CEILING — SOUND ISOLATION									
8	Ceiling tile / plenum flanking	Walk above representative confidential partitions (where possible) or remove and replace ceiling tiles to confirm the partition runs slab-to-slab (or has the designed acoustic ceiling-plenum barrier). Visually note penetration details for MEP, electrical, and data.	V	ASHRAE 189.1 §8.3 (Sound Transmission); ASHRAE Practical Guide ch.1; FGI	Partition / plenum flanking				
9	Operable Partitions & Doors	Inspect the installed conditions and seal conditions for operable partitions and doors at terminations to walls, flooring, frame, and/or ceiling.	V	ASHRAE 189.1 §8.3 (Sound Transmission); ASHRAE Practical Guide ch.1	Partition penetrations				
REVERBERATION TIME / REFLECTED SOUND									
10	Sound Absorptive Finishes	For spaces identified as reverberant or loud (complaints about speech intelligibility or too noisy from occupants), document the finishes on ceiling, walls, flooring, and furniture.	V	ASHRAE 189.1 §8.3; FGI; ANSI S12.60; LEED v5; WELL	Reverberant Sound				
SOUND MASKING — BALANCE									
11	Masking Units & Zoning	Confirm sound masking units are installed and programmed in accordance with manufacturer's specifications.	V	Manufacturer O&M; LEED v5 EQ Acoustic	Sound masking — spectrum & level				
AV / PA SYSTEMS — FUNCTIONAL									
12	Microphone / speaker condition	Inspect ceiling and table microphones, lavalier microphones, and overhead speakers for physical damage, dust accumulation, or muting/programming drift.	V	Manufacturer O&M	AV hardware condition				
OCCUPANT FEEDBACK & DOCUMENTATION									
13	Acoustic complaint trending	Trend the past 6 months of acoustic complaints by zone and type (HVAC noise, speech privacy, masking, AV, vibration, exterior). Identify any clusters and route to annual / as-required cycles.	V	ASA S12.60; LEED v5 EQ Acoustic; WELL Sound	Complaint trending				
14	Acoustic Management Plan refresh	Walk-through review of the Acoustic Management Plan (design intent, NC targets, RT60 targets, masking levels, isolation requirements, complaint pathway) with stakeholders.	V	ASA S12.60; LEED v5 EQ	Acoustic management plan				

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Acoustical Performance - Event Driven

Maintaining the acoustical performance with yearly maintenance and when changes occur to building or support systems. This provides a basis of assessment for any event-driven actions to address complaint clusters, tenant changes, or building modifications.

Building / Site: **Inspector:** **Period:**

#	Topic / Equipment	Inspection / Maintenance Task	Type	Source / Reference	Standard Section / Clause	Status	Date Completed	Performed By (Initials)	Findings / Corrective Action
EVERY 1 YEAR									
1	Door-seals & operable-partition retro-commissioning	Inspect and adjust seals as needed. Replace or upgrade failed seals. Automatic door bottom or mechanized door seals need to be inspected and adjusted regularly to maintain acoustical performance.	Vd	ASHRAE 189.1 §8.3 (Sound Transmission); manufacturer O&M	Door / operable partition retro-commissioning				
AS REQUIRED (event-driven)									
2	Tenant fit-out / change of use	After tenant fit-out, change of use, or major reorganization (e.g., open plan to private office, classroom to lab), reassess background noise, reverberation, sound isolation, and masking requirements for the affected spaces.	Vd	ASHRAE 189.1 §8.3	Change-of-use acoustic review				
3	Acoustic complaint cluster	When acoustic complaints cluster in a zone (≥ 3 complaints / 30 days, or recurring across surveys), execute a targeted acoustic investigation: measurements, root-cause diagnosis, and corrective action plan.	Vd	ASHRAE 189.1 §8.3; ASA S12.60; LEED v5 EQ	Complaint cluster response				
4	Mechanical equipment replacement / addition	After any major mechanical equipment replacement (AHU, fan, chiller, cooling tower, generator) or new equipment installation, re-measure background sound and vibration in affected occupied spaces.	Vd	ASHRAE HVAC Apps — Sound & Vibration	Equipment replacement acoustic review				
5	Renovation acoustic review	Before any renovation that affects acoustic-critical partitions, ceilings, or finishes, review the original acoustic design intent and incorporate equivalent or better performance into the renovation scope.	V	ASHRAE 189.1 §8.3; ASA S12.60; LEED v5 EQ	Renovation acoustic review				
6	Extreme-event review	After events such as storms, equipment failures, or extended construction nearby, review acoustic conditions for any new exterior noise, façade damage, or vibration issues.	V	ASHRAE Resilience guidance	Extreme-event review				
DOCUMENTATION & PROGRAM REVIEW									
7	Acoustic Management Plan	Document the materials, details, and observations (visual and instrumented) to identify when event driven changes warrant an acoustical design review/update.	V	ASA S12.60; LEED v5 EQ Acoustic; WELL Sound	Acoustic management plan				
8	O&M Manual update	Review and update the O&M Manual sections covering acoustic finishes, door seals, sound masking, AV, vibration isolation, and partition / penetration policy.	V	Facility O&M policy	O&M documentation				
9	Staff training & competency	Provide acoustic-focused training for O&M staff to quantify building maintenance versus system/building deficiency: HVAC noise diagnosis, vibration isolation inspection, masking levels/calibration, door-seal maintenance, partition / penetration policy for changes/alterations, and complaint triage.	V	ASA S12.60; LEED v5 EQ	Staff training				

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Acoustical System Validation & Maintenance — Sound Masking, AV / Paging, & Vibration Systems

Dedicated tab for specialized acoustic systems and the spaces where their performance is most consequential: sound-masking systems for speech privacy and noise control, AV / PA systems for intelligibility, and vibration isolation for occupant comfort and sensitive equipment. These topics are referenced by ASHRAE 189.1 §8.3, ANSI/ASA S12.60 (classrooms), FGI (healthcare/residential), LEED v5 EQ Acoustic Performance, and WELL Sound.

Building / Site: **Inspector:** **Period:**

#	Topic / Equipment	Inspection / Maintenance Task	Type	Source / Reference	Standard Section / Clause	Status	Date Completed	Performed By (Initials)	Findings / Corrective Action
SOUND MASKING — POLICY & DESIGN INTENT									
1	Design intent documentation	Confirm the building's sound-masking design intent is documented: covered zones, target spectrum, target overall level dB(A), schedule, and design speech-privacy goals.	V	Manufacturer O&M; LEED v5 EQ Acoustic	Masking design intent				
2	Coverage map current	Confirm the sound-masking coverage map / zone list is current relative to any partition or churn changes. Flag any new spaces where masking should be added or removed.	V	Manufacturer O&M	Masking coverage map				
SOUND MASKING — OPERATION & TUNING									
3	Level & spectrum balance	Calibrated measurement of overall level (dB(A)) and 1/3-octave spectrum at each zone against the design target. Re-balance any zone outside ±2 dB(A) overall or ±3 dB per 1/3-octave band.	Vd	Manufacturer O&M; LEED v5 EQ Acoustic	Masking level & spectrum				
4	Schedule & ramp	Verify masking schedule (start, ramp-up, ramp-down) matches occupancy and any after-hours policy. Confirm paging mute / duck logic operates without leaving zones silent.	V	Manufacturer O&M	Masking schedule / paging interface				
5	Recordkeeping	Maintain a written or electronic record of masking inventory, calibration events, and complaints / actions per zone.	V	Facility recordkeeping policy	Masking recordkeeping				
AV / PA SYSTEMS — POLICY & OPERATION									
6	Inventory & coverage	Maintain an inventory of AV / PA systems by space, with design intent (use cases, intelligibility goal STI, coverage uniformity, ALS support).	V	Manufacturer O&M; ASA S12.60	AV inventory				
7	Calibration & intelligibility	Verify AV calibration is current; measure STI / STIPA in critical-listening spaces (auditoria, classrooms, large conference). Target STI ≥ 0.50 (good) or ≥ 0.60 (excellent) per design intent.	Vd	Manufacturer O&M; ASA S12.60	AV intelligibility — STI/STIPA				
8	Assistive Listening Systems (ALS)	Inspect and functionally test assistive listening systems (induction loops, IR, FM, RF) in spaces where required by ADA / IBC. Verify coverage, transmitter operation, and receivers are available.	V	ADA; IBC §1108	ALS — ADA compliance				
VIBRATION — POLICY & OPERATION									
9	Vibration-sensitive equipment register	Maintain a register of vibration-sensitive equipment (electron microscopes, MRI, audiometric booths, sensitive metrology) and the design vibration criterion (VC-A, VC-B, etc.) for each location.	V	ASHRAE HVAC Apps — Sound & Vibration; ASHRAE Practical Guide ch.5	Vibration-sensitive register				
10	Vibration isolator inventory	Maintain an inventory of vibration isolators by equipment / location / design deflection. Schedule inspection and re-shimming per OEM and ASHRAE guidance.	V	ASHRAE HVAC Apps — Sound & Vibration	Isolator inventory				
INTEGRATION & RECORDS									
12	Acoustic-system commissioning records	Maintain or retrieve the original commissioning records (background sound, sound isolation, reverberation time, masking, AV, ALS, vibration isolation). Update after any major change. Records support warranty, accessibility, and acoustic-rating documentation.	V	LEED v5 EQ Acoustic; WELL Sound; ADA	Acoustic Cx records				
13	Occupant feedback channel	Maintain a clear, single occupant feedback channel for acoustic, AV, and vibration issues. Route to a designated owner with target response and resolution times.	V	LEED v5 EQ Acoustic; WELL Sound	Occupant feedback channel				

Type Codes:
V = Verify (visual inspection / acoustic walk, no calibrated tools) | Vd = Validate (calibrated measurement — SLM, dosimeter, RT60, IR thermography for HVAC noise) | T = Test (controlled test of an acoustic component, e.g., functional sound-masking test)

Additional Acoustic Observations & Concerns Log

Use this log to record any acoustic observation, concern, or occupant complaint that arises, or to document follow-up on items flagged as 'Fail' or 'Deferred' in the assessment/observation tabs. Common observations: space is loud (HVAC) / loud when occupied (reverberant) / conversations overheard / speech is unclear / feel vibration or pulsing. Each entry should be linkable back to its source standard.

Date	Time	Location / Room	Equipment / System	Observation / Concern	Level of Concern	Tested?	Measurement / Reading	Source / Reference	Action Taken / Next Steps	Performed By	Status

Common Observations and Path Forward

This indicates some common issues that can be observed and the potential path forward towards resolution. Please know that this information is captured in the proactive checklists and will be checked accordingly.

Common Negative Observations	Technical Description	Metric(s)	Considerations	Next Steps / Remediation
Space is Loud (without occupants)	Background sound pressure level	decibels (A-weighted, C-weighted) - Leq/Lmax, Noise Criteria (NC)	Noise from HVAC systems (noise through ductwork, noise from suspended or nearby equipment, noise	Work with acoustical consultant to identify source(s), path(s) and cost-efficient solutions.
Space is Loud (with occupants)	Reverberation time, Sound Strength	Reverberation Time (RT60), G	Material finishes, room size/dimensions, room volume, aesthetics, layout (i.e. open-plan spaces)	Assess the room performance and determine the type and location for sound absorptive finishes or other
Conversations overheard	Speech Privacy, Sound Isolation/Transmission	Speech Privacy Class (SPC), Noise Isolation Class (NIC)	Partition construction/details, ceiling plenum & HVAC conditions, doors and door seals	Assess the sound isolation and privacy performance and built conditions/details affecting sound transmission and
Speech is unclear, muddy	Speech Clarity, Intelligibility	Reverberation Time (RT60), Speech Transmission Index (STI), Speech Intelligibility Index (SII), Articulation Index	Material finishes, room size/shape, room volume, aesthetics, AV system design/layout	Assess the room with respect to room layout, finishes, and microphone/speaker layout.
Feel vibration, hear pulsing	Structure-borne vibration or low-frequency sound	Acceleration (g, micro-m/s^2, micro-in/s^2), Velocity (micro-m/s, micro-in/s), Displacement (mm, inch)	Structural vibration from movement, mechanical systems, or nearby transit	Assess vibration in floor and/or walls, identify the source and installation conditions.

Source & Standards Crosswalk

This crosswalk maps the requirements of ANSI/ASHRAE/USGBC/IES 189.1 §8.3 (Acoustical Control), the ASHRAE Handbook — HVAC Applications (Sound & Vibration Control), the ASHRAE Practical Guide to Noise and Vibration Control for HVAC Systems (Schaffer, 2011), ANSI/ASHRAE 62.1, ANSI/ASA S12.60 (Schools), ANSI/ASA S12.2 (Room Noise), USGBC LEED v5 EQ Acoustic Performance, WELL Sound, FGI Guidelines, and IBC accessibility to the tabs in this workbook so a reviewer can confirm coverage.

Standard / Rating System	Section / Credit	Title / Topic	Frequency	Where in this Workbook
ANSI/ASHRAE/USGBC/IES STANDARD 189.1 — HIGH-PERFORMANCE GREEN BUILDINGS, §8.3 ACOUSTICAL CONTROL				
ASHRAE 189.1	§8.3 (Outdoor Noise)	Site / property-line noise limits from building mechanical equipment		
ASHRAE 189.1	§8.3 (Indoor Background Noise)	Maximum background noise (dBA & dBC) by space type (combination of HVAC, exterior, and other building systems)		
ASHRAE 189.1	§8.3 (Sound Transmission)	Airborne sound isolation (STC/NIC) between adjacent spaces		
ASHRAE 189.1	§8.3 (Reverberation)	Reverberation-time limits in meeting, core learning, healthcare, and presentation spaces		
ASHRAE HANDBOOK — HVAC APPLICATIONS, SOUND & VIBRATION CONTROL				
ASHRAE Handbook — HVAC Apps	Sound & Vibration Control chapter	HVAC noise & vibration sources, paths, and treatment (silencers, lining, isolators)		
ASHRAE Handbook — HVAC Apps	Health Care chapter (acoustics sections)	Acoustic criteria for healthcare spaces		
ASHRAE PRACTICAL GUIDE TO NOISE AND VIBRATION CONTROL FOR HVAC SYSTEMS (SCHAFFER, 2011)				
Practical Guide	Ch. 1 — General Design Guidelines	Mechanical-room location, wall/floor selection, duct chases, penetrations		
Practical Guide	Ch. 2 — Airside Equipment	Fans, AHUs, ductwork, terminal units, silencers, regenerated noise		
Practical Guide	Ch. 3 — Water-Side Equipment	Chillers, cooling towers, pumps; outdoor noise control		
Practical Guide	Ch. 4 — Packaged & Unitary Equipment	Rooftop units, heat pumps, fan coils, split systems		
Practical Guide	Ch. 5 — Vibration Isolation	Springs, elastomers, hangers, pads, inertia bases, flexible connectors		
Practical Guide	Ch. 7 — Construction-Phase Tasks	Field installation issues that recur during O&M (overloaded springs, shipping shims, short-circuit conduits, taut flex)		
Practical Guide	Ch. 8 — Troubleshooting Noise & Vibration	Frequency-domain diagnosis of common complaints; field inspection checks		
Practical Guide	Appendix B — Rating Systems & Criteria	RC, RC Mark II, NC, NCB, dB(A) weighting; recommended indoor sound criteria		
Practical Guide	Appendix C — Measuring HVAC System Noise	Field sound-measurement procedure and data-sheet conventions		
ANSI/ASHRAE STANDARD 62.1 — VENTILATION (INTERACTIONS WITH ACOUSTICS)				
ASHRAE 62.1	§5.7	Air-cleaner / duct-lining sound considerations (microbial-growth potential)		
ASHRAE 62.1	§6.4.3	Operable openings / natural-ventilation interaction with façade sound isolation		
ANSI/ASA S12.60 — ACOUSTICAL PERFORMANCE CRITERIA FOR SCHOOLS				
ANSI/ASA S12.60	§5.1	Background noise — 35 dBA / 55 dBC in core learning spaces		

ANSI/ASA S12.60	§5.2	Reverberation time ≤ 0.6 s (≤10,000 ft³) / ≤ 0.7 s (>10,000 ft³)	
ANSI/ASA S12.60	§5.3 / §5.4	Sound isolation — partitions (STC/NIC) and exterior/façade	
ANSI/ASA S12.2 — CRITERIA FOR EVALUATING ROOM NOISE			
ANSI/ASA S12.2	NC / RC / RNC methods	Background noise rating methods (NC, RC, RNC) for occupied rooms	
ACCESSIBILITY — IBC §1108			
IBC	§1108 (ALS)	Assistive Listening Systems — coverage and receivers in assembly spaces	
USGBC LEED v5 — EQ ACOUSTIC PERFORMANCE			
LEED v5 EQ	Acoustic Performance — HVAC background noise	Comply with ANSI/ASA S12.2 NC limits for room types	
LEED v5 EQ	Acoustic Performance — Reverberation	RT60 limits by space type (per ANSI/ASA S12.60 or design)	
LEED v5 EQ	Acoustic Performance — Sound isolation	STC / NIC targets at partitions	
LEED v5 EQ	Acoustic Performance — Sound masking	Masking system operation and level	
WELL BUILDING STANDARD — SOUND			
WELL Sound	Sound mapping	Identification of loud / quiet zones and acoustic intent	
WELL Sound	Maximum noise levels	HVAC and operational background noise targets	
WELL Sound	Sound reducing surfaces / reverberation	Reverberation time and absorptive finishes	
WELL Sound	Sound masking	Speech privacy support via sound masking	
WELL Sound	Hearing health	Limits on potentially hazardous occupant noise exposure	
FGI GUIDELINES — HEALTHCARE / RESIDENTIAL ACOUSTICS			
FGI Guidelines	Acoustic Design — site exterior noise	Site / exterior noise criteria for healthcare and residential	
FGI Guidelines	Acoustic Design — room noise	NC limits by room type (patient room, exam, OR, etc.)	
FGI Guidelines	Acoustic Design — sound isolation & speech privacy	STC / NIC and speech-privacy at exam, treatment, counseling rooms	
IBC / IECC — CODE BASIS (SOUND TRANSMISSION)			
IBC	§1207 (or current)	Sound transmission at dwelling unit / public separations (STC 50 lab, 45 field; IIC 50/45)	
OCCUPANT-FACING — COMMON NEGATIVE OBSERVATIONS (SOURCE: IEQ Technical Guide)			
IEQ Source	Common Observation	Space is Loud (without occupants) — background sound from HVAC, traffic, or exterior sources (NC, dB(A) Leq/Lmax)	As observed
IEQ Source	Common Observation	Space is Loud (with occupants) — reverberation, room finishes, layout (RT60, Sound Strength G)	As observed
IEQ Source	Common Observation	Conversations overheard — speech privacy, sound isolation (SPC, NIC)	As observed

IEQ Source	Common Observation	Speech is unclear, muddy — speech clarity / intelligibility (RT60, STI, SII, AI)	As observed
IEQ Source	Common Observation	Feel vibration / hear pulsing — structure-borne vibration or low-frequency sound (g, mm/s, in)	As observed