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Integrated Designs and Technical Apparatus

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Contents

PART XI. WORKED DESIGNS AND CASE STUDIES

Chapter 37. Integrated Design Examples and Comparative Assembly Studies

- 37.1 Integrated design begins with an evidence question
- 37.2 The design-basis matrix
- 37.3 Linear energy combination governs weak-path analysis
- 37.4 Frequency-resolved design and the limits of a single number
- 37.5 Common design states and uncertainty
- 37.6 Gypsum double-stud legal conference suite
- 37.7 Legal-suite services and opening control
- 37.8 Legal-suite room acoustics, commissioning and use
- 37.9 Resilient lightweight retrofit in an occupied office
- 37.10 Fully grouted CMU executive room
- 37.11 CMU room openings, services and verification
- 37.12 Reinforced-concrete diplomatic briefing room
- 37.13 Concrete room doors, ducts and pressure states
- 37.14 Historic stone room with reversible inner lining
- 37.15 Conservation evidence and commissioning
- 37.16 Acoustic door and two-door sound-lock comparison
- 37.17 Interior glazing and vision-panel comparison
- 37.18 Floor, ceiling, plenum and raised-floor integration
- 37.19 Ceiling-plenum and underfloor weak-path study
- 37.20 HVAC and silencer design
- 37.21 HVAC pressure, door operation and quiet states
- 37.22 Plumbing, sprinkler, electrical, data and firestop coordination
- 37.23 Penetration registers and future capacity
- 37.24 Audiovisual systems and amplified source states
- 37.25 Sound masking and operational speech discipline
- 37.26 Room-within-room high-isolation suite
- 37.27 Room-within-room construction and inspection
- 37.28 Diplomatic-facility integrated example
- 37.29 Commercial privileged-discussion room
- 37.30 Medical consultation room, dignity and accessibility
- 37.31 New construction and retrofit comparison
- 37.32 Comparative wall selection
- 37.33 Low-frequency design and structural flanking
- 37.34 Openings and service-path comparative controls
- 37.35 Cost, disruption and lifecycle value
- 37.36 Integrated commissioning architecture
- 37.37 Measurement uncertainty and acceptance
- 37.38 Comparative acceptance register

37.39 Comparative synthesis across room types

- 37.39.1 Structural, fire, smoke and acoustic obligations
- 37.39.2 Hygrothermal, environmental and durability conditions
- 37.39.3 Maintainability, supply chain and competence
- 37.39.4 Model completeness before numerical refinement
- 37.39.5 Occupied speech consequence, event duration and listener opportunity
- 37.39.6 Design for observability, controlled intervention and forensic recovery
- 37.39.7 Data integrity, stable identifiers and configuration control
- 37.39.8 Programme governance, competence and independent review
- 37.39.9 Climate, overseas logistics and operational resilience
- 37.39.10 Computational reproducibility and model governance
- 37.39.11 Controlled information, redaction and release-copy integrity

37.40 Conclusions and transfer to failure analysis

Chapter 37 Glossary

Chapter 38. Failure Case Studies and Lessons for Institutional Practice

- 38.1 Case-study status, evidence classes and limits of inference
- 38.2 From symptom to causal mechanism
- 38.3 Composite case A. Door-seal failure under frame distortion
- 38.4 Composite case B. Automatic bottom, threshold transition and operational wear
- 38.5 Composite case C. Duct cross-talk between adjoining rooms
- 38.6 Composite case D. Shared ceiling plenum and quiet-state reversal
- 38.7 Composite case E. Silencer substitution, casing breakout and regenerated noise
- 38.8 Composite case F. Incomplete masonry joints and porous interfaces
- 38.9 Composite case G. Grout voids and false confidence from wall mass
- 38.10 Composite case H. Concrete flanking through slab and column continuity
- 38.11 Composite case I. Glazing frame and mullion cavities
- 38.12 Composite case J. Resilient-system bridging by backing and fasteners
- 38.13 Composite case K. Floating-floor perimeter bridge and concentrated loading
- 38.14 Composite case L. Later cable penetration and configuration drift
- 38.15 Composite case M. Sprinkler alteration and rigid support coupling
- 38.16 Composite case N. Ceiling access, displaced barriers and maintenance damage
- 38.17 Composite case O. Masking dependence and quiet-state failure
- 38.18 Composite case P. Conferencing software, gain limits and amplified source drift
- 38.19 Composite case Q. Erroneous reliance on headline STC
- 38.20 Composite case R. Insufficient commissioning and inadequate dynamic range
 - 38.20.1 Repeatability, reproducibility and the misleading comfort of one successful campaign
 - 38.20.2 Immediate protective actions while causation remains unresolved

- 38.20.3 Human factors, operational discipline and design that tolerates ordinary behaviour
- 38.21 Composite case S. False confidence from a narrow test population
- 38.22 Composite case T. Undocumented maintenance and progressive seal ageing
- 38.23 Composite case U. Product substitution and configuration drift before handover
- 38.24 Composite case V. Contractor access and a forgotten temporary bridge
- 38.25 Distinguishing complaint, defect, nonconformance, vulnerability and compromise
- 38.26 Evidence custody, destructive opening and expert reporting
- 38.27 Before-and-after comparison, covariance and causal strength
- 38.28 Dominant-path migration and the danger of symptom repair
- 38.29 Failure clustering across interfaces, changes and institutional processes
- 38.30 Governance controls and lifecycle change triggers
 - 38.30.1 Periodic inspection and condition-based retesting
 - 38.30.2 Multi-room programme analytics and common-cause review
 - 38.30.3 Competence, handoffs and ownership of the complete boundary
 - 38.30.4 Commercial incentives, schedule pressure and evidence quality
 - 38.30.5 Public-source boundaries, anonymisation and responsible case publication
- 38.31 Institutional learning, assurance review and feedback to design
- 38.32 Final synthesis and transition to Part XII
- Chapter 38 Glossary

PART XII. FINAL SYNTHESIS AND TECHNICAL APPARATUS

- XII.1 The system-level thesis
 - XII.1.1 Integration gate and evidence protocol
- XII.2 The four-proposition doctrine
 - XII.2.1 Integration gate and evidence protocol
- XII.3 The weakest-path doctrine
 - XII.3.1 Integration gate and evidence protocol
- XII.4 Source states and information consequence
 - XII.4.1 Integration gate and evidence protocol
- XII.5 Receiver access and operating states
 - XII.5.1 Integration gate and evidence protocol
- XII.6 Configuration lifecycle and evidence chain
 - XII.6.1 Integration gate and evidence protocol
- XII.7 Evidence hierarchy and public-source boundaries
 - XII.7.1 Integration gate and evidence protocol
- XII.8 Design principles for lightweight construction
 - XII.8.1 Integration gate and evidence protocol
- XII.9 Masonry, concrete, stone and massive construction
 - XII.9.1 Integration gate and evidence protocol
- XII.10 Doors, glazing and movable boundaries
 - XII.10.1 Integration gate and evidence protocol

- XII.11 Building services and the acoustic boundary
 - XII.11.1 Integration gate and evidence protocol
- XII.12 Room acoustics, masking and operational control
 - XII.12.1 Integration gate and evidence protocol
- XII.13 Measurement architecture and metrology
 - XII.13.1 Integration gate and evidence protocol
- XII.14 Uncertainty and decision rules
 - XII.14.1 Integration gate and evidence protocol
- XII.15 Construction surveillance and concealment
 - XII.15.1 Integration gate and evidence protocol
- XII.16 Commissioning and acceptance
 - XII.16.1 Integration gate and evidence protocol
- XII.17 Forensic diagnosis and remediation
 - XII.17.1 Integration gate and evidence protocol
- XII.18 Lifecycle governance and change control
 - XII.18.1 Integration gate and evidence protocol
- XII.19 Governmental comparison and authority boundaries
 - XII.19.1 Integration gate and evidence protocol
- XII.20 Programme assurance and institutional learning
 - Programme metrics require restraint
 - XII.20.1 Integration gate and evidence protocol
- XII.21 Final synthesis
 - Twenty-three principal design and evidentiary rules
 - Rule 1. Define the protected function before selecting a rating
 - Rule 2. Keep the four propositions separate
 - Rule 3. Model the complete transfer network
 - Rule 4. Retain frequency-resolved evidence
 - Rule 5. Treat small discontinuities as high-transmission paths
 - Rule 6. Design interfaces before broad fields
 - Rule 7. Use tested assemblies only within demonstrated equivalence
 - Rule 8. Define source states, including amplified audio
 - Rule 9. Map listener access separately from standard microphone positions
 - Rule 10. Separate physical isolation from masking dependence
 - Rule 11. Preserve as-designed through as-operated states
 - Rule 12. Inspect concealed work before concealment
 - Rule 13. Match the measurement model to the question
 - Rule 14. Distinguish standard tests from diagnostics
 - Rule 15. Use uncertainty to improve decisions, not decorate reports
 - Rule 16. Write authority dispositions separately from engineering results
 - Rule 17. Repair the verified mechanism and anticipate path displacement
 - Rule 18. Distinguish measurement uncertainty, configuration uncertainty and model discrepancy

Rule 19. Preserve as-designed, as-submitted, as-built, as-tested and as-operated states

Rule 20. Make change control part of technical design

Rule 21. Use comparative governmental doctrine without manufacturing equivalence

Rule 22. Bound electronic and non-acoustic questions explicitly

Rule 23. Write conclusions at the strength supported by evidence

XII.21.1 Integration gate and evidence protocol

XII.22 Publication and authority boundary

XII.22.1 Integration gate and evidence protocol

XII.23 Closing design and evidentiary propositions

XII.23.1 Integration gate and evidence protocol

XII.24 Final research and professional agenda

XII.24.1 Integration gate and evidence protocol

XII.25 Unified-book architecture: secure construction, acoustic security, STC, and sound engineering

XII.25.1 Integration gate and evidence protocol

XII.26 Continuous revision, source freeze, and immutable release practice

XII.26.1 Integration gate and evidence protocol

APPENDIX A. NOTATION, SYMBOLS, UNITS, AND CONVENTIONS

Application and quality-control protocol

APPENDIX B. PRINCIPAL EQUATIONS, VALIDITY CONDITIONS, AND INTERPRETATION

Energetic level addition

Background subtraction

Composite boundary

Ideal mass-law screen

Mass-air-mass resonance

Thin-plate critical frequency

Sabine decay screen

Isolation transmissibility

Sampling detection probability

APPENDIX C. CANONICAL CALCULATION RECORD

APPENDIX D. SOURCE-STATE MATRIX

APPENDIX E. TEST-PLANNING FORM

APPENDIX F. UNCERTAINTY-BUDGET TEMPLATE

APPENDIX G. PENETRATION REGISTER

APPENDIX H. DOOR, FRAME, HARDWARE, AND SEAL SCHEDULE

APPENDIX I. GLAZING AND FRAME SCHEDULE

APPENDIX J. HVAC AND AIR-PATH REGISTER

APPENDIX K. INSPECTION HOLD-POINT SCHEDULE

APPENDIX L. COMMISSIONING CHECKLIST AND EVIDENCE DOSSIER

APPENDIX M. CONSTRUCTION-SURVEILLANCE CHECKLIST

APPENDIX N. FORENSIC EXAMINATION FORM

APPENDIX O. REMEDIATION REGISTER

APPENDIX P. CHANGE-CONTROL FORM

APPENDIX Q. GOVERNMENTAL CROSSWALK METHODOLOGY

APPENDIX R. SOURCE-STATUS AND CITATION METHODOLOGY

APPENDIX S. MODEL SPECIFICATION LANGUAGE

APPENDIX T. EXPERT-REPORT OUTLINE

APPENDIX U. LIFECYCLE INSPECTION AND RECOMMISSIONING SCHEDULE

APPENDIX V. VALIDATION GATES AND PUBLICATION-EVIDENCE CHAIN

**APPENDIX W. OWNER'S PROJECT REQUIREMENTS AND ROOM-DATA-SHEET
TEMPLATE**

**APPENDIX X. ACCEPTANCE, CONDITIONAL USE, AND AUTHORITY-DISPOSITION
FORM**

**APPENDIX Y. PROGRAMME METRICS, AUDIT, AND CORRECTIVE-ACTION
EFFECTIVENESS**

APPENDIX Z. DATA INTEGRITY, FILE CONTROL, AND CHECKSUM PRACTICE

APPENDIX AA. MULTIDISCIPLINARY DESIGN-REVIEW CHECKLIST

APPENDIX AB. FAILURE-MODE, EFFECTS, AND CRITICALITY METHOD

APPENDIX AC. COMPETENCE, TRAINING, AND RESPONSIBILITY MATRIX

**APPENDIX AD. INFORMATION-CONSEQUENCE AND SPEECH-EXPOSURE
ASSESSMENT**

APPENDIX AE. SYSTEM RELIABILITY AND MAINTENANCE LOGIC

APPENDIX AF. MASTER GLOSSARY AND CONTROLLED TERMINOLOGY

APPENDIX AG. CONSOLIDATED FORMULA AND VALIDITY REGISTER

APPENDIX AH. MASTER OBJECT AND WORKED-EXAMPLE REGISTER

AH.1 Figure register

AH.2 Table register

AH.3 Worked-example register

**APPENDIX AI. MASTER SOURCE, AUTHORITY, AND INTERNAL CROSS-REFERENCE
REGISTER**

APPENDIX AJ. MASTER SUBJECT INDEX AND CROSS-REFERENCE GUIDE

PART XI. WORKED DESIGNS AND CASE STUDIES

Part XI forces the preceding physics, construction doctrine, measurement practice and institutional controls to coexist within rooms that must actually be designed, built, tested, operated and maintained. Chapter 37 develops integrated examples. Chapter 38 then examines failures that arise when one link in the resulting evidence chain is omitted, altered or misunderstood.

Chapter 37. Integrated Design Examples and Comparative Assembly Studies

Secure-room design becomes intellectually serious when every isolated calculation is forced to coexist with the room that must actually be built, used, tested, maintained and authorised; a partition does not stand alone; its edge restraint changes its vibration. Its door changes the composite transmission. Its ceiling changes the flanking network. Its duct changes the airborne path. Its electronic systems change the source state; its users change both the source and the operating discipline. The engineer must therefore move from component evidence to an integrated source-path-receiver model while preserving the difference between prediction, observation, consequence and institutional decision.

The examples in this chapter are engineering studies rather than governmental templates. They use public standards, public doctrine and the methods developed in Chapters 1 through 36. They do not reproduce controlled thresholds or imply that a design acquires accreditation by resemblance. Each example begins with an authorised function, identifies credible source and receiving states, develops an as-designed configuration, tests weak paths in linear energy terms, states uncertainties, and ends with commissioning and lifecycle controls. Laboratory assembly performance, installed field performance, occupied speech-security performance and formal acceptance remain distinct propositions throughout.¹

An integrated example must also be multidisciplinary; structural capacity, fire resistance, smoke control, accessibility, conservation, information technology, cybersecurity, electronic security, maintenance and operational

¹ [MB-0316](#). ASTM International, ASTM E90-23, ASTM E336-25a.

continuity are not accessories to acoustics; they are constraints and coequal obligations; a detail that increases sound isolation while defeating egress, firestopping, movement or lawful access is not an acceptable design. A code-compliant detail can likewise remain acoustically inadequate. The professional task is to preserve each obligation in its proper evidence chain and to reconcile them before work is concealed.

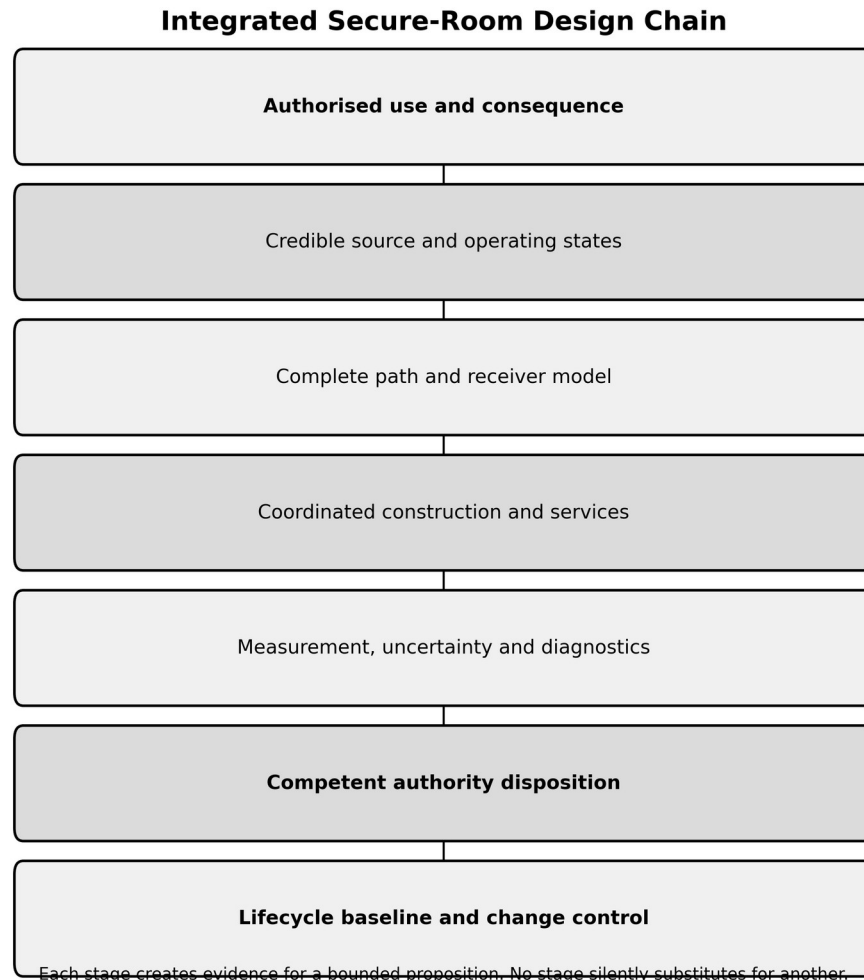


Figure 37-1. Integrated secure-room design proceeds from authorised use and source state through path modelling, coordinated construction, measurement, uncertainty, authority disposition and lifecycle control. Author's original diagram.

37.1 Integrated design begins with an evidence question

A design team often receives an apparently simple instruction such as “provide an STC 55 conference room”. That statement is incomplete. It does not identify whether the value applies to a laboratory wall specimen, an installed wall field, a composite wall containing a door, the room pair as occupied, or a speech-security criterion at accessible listener positions. It does not define source vocal effort, room furnishing, background state, frequency range, uncertainty or who is authorised to accept the result. The

first integrated design task is therefore to convert the instruction into a hierarchy of testable propositions.

The hierarchy begins with function. The room may support attorney-client privilege, a medical consultation, a diplomatic briefing, a corporate transaction, research and development, or classified discussion; function determines consequence, source states, occupancy, electronic systems, realistic listener access and operating conditions; a legal room in a leased office may be controlled by landlord access and a shared plenum. A diplomatic room may require a separate governmental authority process; a medical room may place accessibility, hygiene and continuous operation above a marginal gain from a difficult doorset. The design basis must state these differences before selecting an assembly.

The second question is evidentiary. The team must identify what decision each measurement or inspection is meant to support; laboratory transmission loss can compare specimens; a field room-pair result characterises an installed relationship under a defined state; a closed-room speech method addresses a bounded source-listener problem. Construction photographs can establish observed interfaces. None of those records alone decides formal use. Writing the evidence question early prevents a polished but irrelevant test programme.

Worked example 37.1. Converting a headline rating into a requirement set

A client requests “STC 55 walls” around a 42 square metre legal conference room. The engineer converts that phrase into six controlled requirements: laboratory evidence for the proposed wall assembly; an installed room-pair isolation requirement under the applicable field method; a door-system

requirement under its own method; a closed-room speech assessment at the corridor, service cupboard, ceiling void and adjoining office; an operating-state matrix covering HVAC, masking, conferencing and quiet-night conditions; and a final disposition by the responsible authority based on the complete dossier. The conversion does not increase the nominal wall rating. It prevents the rating from being mistaken for the room result.

37.2 The design-basis matrix

The design basis should be expressed as a matrix rather than a narrative promise; each row identifies the protected function, source, path, receiver, measurand, method, criterion owner, required evidence and change trigger; the matrix exposes missing information early. A corridor row may reveal that the quiet-night background is unknown; a ceiling-void row may show that no authorised listener-access assumption has been agreed. A conferencing row may reveal that the installed loudspeaker can exceed the human source used in an earlier test. A fire-alarm row may reveal a pressure and door-latching condition absent from the acoustic consultant's first test plan.

The matrix also separates public methods from controlled criteria. A public document can state that a particular standard measures room-pair isolation or closed-room speech privacy. A project-specific requirement may remain controlled. The report can explain the method and evidence without publishing the protected threshold. This separation is essential in diplomatic, intelligence, defence and sensitive commercial work. Refusal to invent a missing criterion is not a deficiency. It is part of technical discipline.²

² [MB-1127](#). ISO/IEC 17025:2017, JCGM 106:2012.

Table 37-1. Integrated design-basis and evidence matrix

Field	Required content	Design use	Acceptance evidence
Authorised function	Information type, occupants, duration and consequence	Establishes threat and operating states	Authority-approved use statement
Source state	Talker distribution, maximum credible vocal effort and amplified audio	Sets boundary excitation	Source protocol and calibration record
Receiver and access	Adjoining rooms, corridors, voids, exterior and maintenance access	Defines listener positions and controls	Access map and receiving-state schedule
Path model	Walls, openings, junctions, services, structure and electronics	Ranks design effort	Path register and calculations
Measurand and method	Band quantities, ratings, speech metric, vibration or airflow	Prevents metric substitution	Approved test plan
Decision rule	Limit, uncertainty, guard band and authority	Controls conformity risk	Signed disposition
Configuration baseline	Materials, details, software, pressure, masking and furniture	Makes results reproducible	As-built and as-operated dossier
Change trigger	Penetration, replacement, software, maintenance or incident	Preserves validity	Change-control and recommissioning record

A useful matrix is alive throughout delivery. Design assumptions become submittal requirements. Submittals become hold points. Hold points become as-built evidence. The final test plan uses the same identifiers and states; after acceptance, the change process asks which matrix rows a proposed alteration can affect; this continuity reduces the common loss of meaning that occurs when the specification, construction team, test team and operator use different names for the same boundary.

Worked example 37.2. Source-state matrix for ordinary and amplified discussion

A room supports ordinary seated speech, raised discussion and video conferencing; reference source levels in one critical band are set at 72 dB, 80

dB and 88 dB respectively at the declared reference position; a boundary attenuation of 52 dB therefore produces receiving contributions of 20 dB, 28 dB and 36 dB. The adjoining background varies from 34 dB during occupied HVAC operation to 27 dB during night setback; the matrix shows that ordinary daytime speech has a favourable margin while amplified night use can dominate the background. The wall did not change. The source and receiver states did.

37.3 Linear energy combination governs weak-path analysis

Whole-room transmission is governed by the energetic sum of paths, not by the arithmetic average of ratings. For uncorrelated receiving contributions expressed as levels, the screened total is

$$L_{tot} = 10 \log_{10} \left(\sum_{i=1}^n 10^{L_i/10} \right),$$

where L_i is the receiving contribution from path i in decibels and n is the number of represented paths. The relation is a power summation. It assumes compatible references and no coherent phase treatment. It is nevertheless the correct first defence against the intuitive error that a very strong wall can compensate for a weak door, duct or joint.

A path budget should include direct wall fields, doors, glazing, ceiling plenums, raised floors, ducts, pipes, conduits, structural junctions and operating states; not every item needs a precise prediction at concept stage; it needs a defensible representation and a stated uncertainty. Omitting a path because its input data are inconvenient is more damaging than using a bounded conservative estimate; a complete moderate model is ordinarily

more useful than an optimistic high-resolution model with one missing branch.

Dominant paths migrate after treatment. A door may control the original result; after adjustment, the return duct may control; after duct treatment, a ceiling edge may appear; this does not mean the earlier diagnosis was wrong. It means the total is a network. The design should predict likely migration so that repairs and commissioning remain proportionate.

Worked example 37.3. Parallel paths and dominant-path migration

A corridor receives 36 dB through a doorset, 31 dB through a return path and 28 dB through the wall field; the energetic total is 37.3 dB; door correction reduces its contribution by 10 dB to 26 dB. The new total is 33.0 dB, an improvement of 4.3 dB rather than 10 dB, because the return path now controls; treating the return to 23 dB then reduces the total to 29.1 dB. The calculation shows why local improvement and whole-room improvement answer different questions.

37.4 Frequency-resolved design and the limits of a single number

Two assemblies with equal STC or R_w can behave differently in speech-relevant and low-frequency bands. A lightweight double-leaf wall may have a mass-air-mass depression. A stiff glass pane may exhibit coincidence. A concrete wall may provide strong direct airborne isolation while transmitting chiller force through the slab. A door may lose upper-band performance at its perimeter. Integrated design therefore retains the one-third-octave or octave-band data used to produce the rating and superimposes the source spectrum and receiving background.

The relevant margin at a receiving position is not the wall rating. It is the relation between the transmitted source spectrum and the receiving background after all material paths, geometry, room response and electronic states are considered. Closed-room speech methods can provide bounded probability or privacy measures under their stated listener assumptions. They do not address electronically aided collection or every determined adversary. A design narrative should state the inference supported by each metric before reporting its number.³

Frequency resolution is also essential for diagnosis; a broad high-frequency deficit may suggest leakage or porous closure; a narrow low-frequency peak may reflect a room mode, panel resonance or structural forcing; a coincidence-related dip has a different remedy from an unsealed frame. One integer rating can hide these distinctions and encourage the wrong repair.

Worked example 37.4. Equal STC, unequal speech-band weakness

Assembly A and Assembly B both carry STC 55; at 125 Hz, A provides 42 dB transmission loss and B provides 50 dB; at 2 kHz, A provides 64 dB and B provides 55 dB; the room contains amplified conference audio with strong low-frequency content, so A may excite a receiving-room modal or structural response more strongly despite the equal rating. If the adjacent corridor is extremely quiet above 1 kHz, B's smaller upper-band margin may instead control intelligibility. The selection cannot be resolved by STC alone. Source and receiver spectra determine which difference matters.

³ [MB-0092](#). ASTM E413-22 and ISO 717-1:2020, ASTM E413-22, ISO 717-1:2020.

37.5 Common design states and uncertainty

Every case in this chapter distinguishes as-designed, as-submitted, as-built, as-tested and as-operated states. The distinction is not clerical. A wall can be designed as a double-stud assembly, submitted with a different board product, built with a rigid conduit bridge, tested with the door positively pressurised against its seals, and operated with the conferencing system at a higher gain. Each state changes the inference.

Uncertainty has at least three layers. Measurement uncertainty describes dispersion associated with the measured quantity and measurement model. Configuration uncertainty concerns incomplete knowledge of the physical or operating state. Model discrepancy concerns the difference between the selected mathematical representation and the real room. A precise analyser cannot cure missing information about a hidden bridge or an undocumented software update. A detailed finite-element model can remain wrong because a return-air opening was omitted. The final statement should identify which uncertainty layer controls the decision.⁴

A configuration register therefore deserves the same care as the numerical result. It should identify materials, dimensions, room contents, source and receiver positions, pressure, HVAC, masking, audiovisual state, door operation, firmware, access, temperature and any temporary condition. Where a state cannot be reconstructed, the report should narrow its conclusion rather than fill the gap with confidence.

⁴ [MB-0926](#). ISO 12999-1:2020, JCGM 100:2008.

Worked example 37.5. Guarded acceptance with unresolved configuration uncertainty

A field result is 52.4 dB against a requirement of 50 dB, with expanded measurement uncertainty of 1.4 dB; a pre-authorised rule requires result minus uncertainty to be at least the limit, giving 51.0 dB, so the quantitative test passes. However, one wall-head bay was closed before required inspection and no alternative evidence resolves the resilient-clip condition; the authority may accept, require targeted verification or impose an operational limitation; the test supports installed performance under the measured state. It does not eliminate the separate configuration uncertainty.

37.6 Gypsum double-stud legal conference suite

The first integrated case is a new legal conference suite in a concrete-frame office building. The protected room is 8.0 m long, 5.5 m wide and 3.0 m high, with an adjoining open office on one side, a corridor on another and a service room behind the short wall. The client requires confidential speech under ordinary and raised vocal effort while retaining accessible egress, video conferencing, sprinklers and a return-air path.

The separating wall uses two independent 92 mm cold-formed steel stud rows with a 25 mm clear gap. Each room-facing leaf carries two layers of 16 mm fire-rated gypsum board with staggered joints. The cavity contains mineral fibre that does not bridge the stud rows. The leaves terminate independently at slab and structure. Deflection heads allow building movement without rigid contact. The wall extends to the structural deck rather than stopping at the suspended ceiling. Board mass, cavity depth,

stud spacing, fastening and perimeter seals remain tied to tested evidence rather than a generic assembly name.⁵

The geometry is selected with the complete room in view; the double-stud construction provides useful decoupling, but it consumes floor area and creates a deep wall head, door return and service interface; the design therefore assigns each outlet, conduit, display mount and backing plate to one leaf or to independent support. It prohibits continuous bracing, back-to-back boxes and cable trays that connect both frames; structural movement, fire resistance and seismic restraint are detailed before the acoustic layers are closed.

⁵ [MB-0778](#). Gypsum Association, ASTM C754-20, ASTM C840-23.

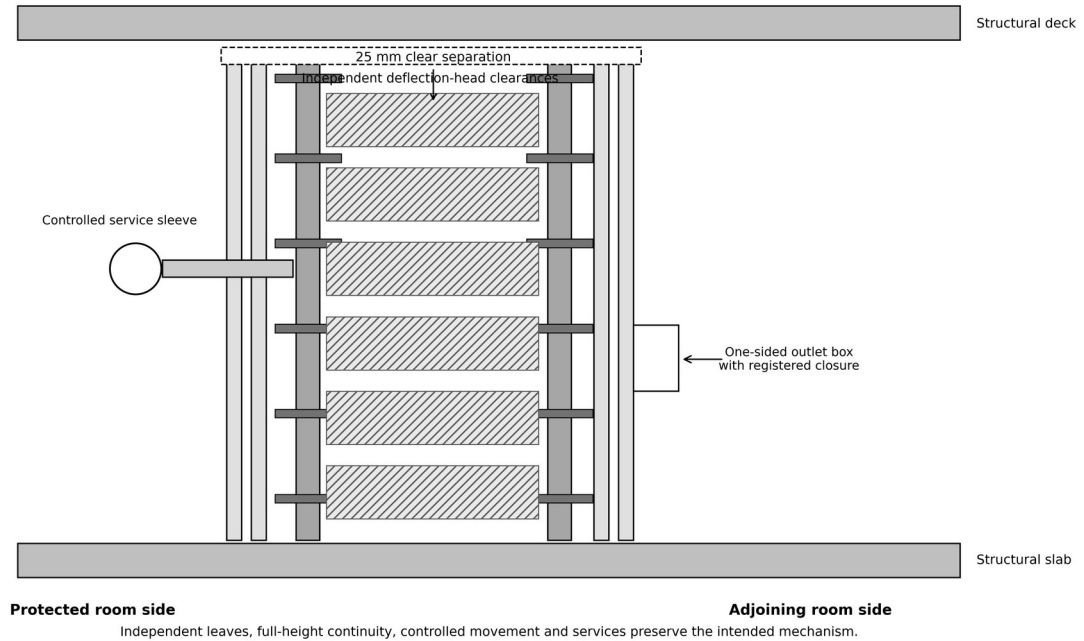
Gypsum Legal-Suite Wall and Interface Section

Figure 37-2. The legal-suite wall uses independent stud rows, staggered board layers, controlled head movement, isolated services and continuous perimeter closure. Author's original diagram.

Worked example 37.6. Ideal mass-air-mass resonance screen

Assume effective leaf surface masses $m'_1 = 22 \text{ kg/m}^2$ and $m'_2 = 24 \text{ kg/m}^2$, clear cavity depth $d = 0.210 \text{ m}$, air density $\rho_0 = 1.20 \text{ kg/m}^3$ and sound speed $c = 343 \text{ m/s}$. An ideal normal-incidence screen is

$$f_{mam} = \frac{1}{2\pi} \sqrt{\frac{\rho_0 c^2}{d} \left(\frac{1}{m'_1} + \frac{1}{m'_2} \right)}.$$

Substitution gives approximately 47 Hz. The dimensions reduce to inverse seconds. The estimate lies below the principal speech bands but does not prove low-frequency field performance. Stud coupling, finite panel size, cavity absorption, junctions and structural flanking can shift or broaden the response.

37.7 Legal-suite services and opening control

The legal suite contains one accessible acoustic doorset, a vision panel to a controlled anteroom, two display mounts, a sprinkler branch, power and data pathways, supply and return ducts, access control and a room-control processor; each interface is treated as a path and as a future maintenance event. The door rough opening receives independent frame backing that does not stitch the stud rows together; the vision system uses separate frames and controlled perimeter seals; display backing supports the imposed load without contacting both leaves. Cable pathways are concentrated within a registered service zone.

The return-air path is particularly important. A simple transfer grille would bypass the wall; the design uses a separated branch and silencer arrangement with sufficient cross-section to maintain airflow at an acceptable pressure drop; the silencer and duct casing are evaluated for insertion loss, regenerated noise and breakout. Fire and smoke requirements are coordinated with the mechanical path; access remains available so that a damper inspection or filter change does not require uncontrolled opening of the boundary.

The door is not specified by a catalogue number alone; the submittal must include test reports, dimensions, leaf construction, frame, seals, threshold, hardware, vision option and operating force; commissioning includes contact mapping, latching, access-control release, power loss, alarm state, pressure reversal and repeated cycles. A doorset that meets acoustic performance only when hand-pulled shut is not representative of normal use.

Worked example 37.7. Composite wall, door and glazing contribution

A 32 square metre wall field provides 60 dB in a selected band. A 2.2 square metre doorset provides 42 dB, and a 1.4 square metre glazed element provides 48 dB. With transmission coefficient $\tau_i = 10^{-R_i/10}$, the area-weighted composite coefficient is

$$\tau_c = \frac{32(10^{-6.0}) + 2.2(10^{-4.2}) + 1.4(10^{-4.8})}{35.6} = 5.42 \times 10^{-6}.$$

The corresponding composite reduction is $R_c = -10 \log_{10}(\tau_c) = 52.7$ dB before perimeter leakage and flanking are added. The 42 dB door reduces the nominal 60 dB wall by more than 7 dB. The example explains area weighting. It does not predict the complete room.

37.8 Legal-suite room acoustics, commissioning and use

Interior room acoustics influence source level and operational comfort; excessive reverberation can raise the reverberant field, reduce conferencing clarity and encourage greater vocal effort; excessive absorption can make speech comfortable but should not be credited as boundary isolation. The design therefore sets an interior reverberation objective, distributes absorption, controls table and display reflections, and confirms that absorptive finishes remain compatible with fire, durability and cleaning requirements.

Commissioning proceeds in layers. Construction inspection closes walls, penetrations, doors and ceiling interfaces; functional testing confirms door operation, HVAC balance, masking, conferencing modes and alarm states; acoustic testing measures room-pair isolation and investigates local paths; closed-room speech assessment then uses authorised source and receiver

assumptions. Final acceptance identifies the exact configuration and lists changes that trigger review.

Operational documentation is deliberately short enough to be used. It identifies closed-door rules, approved conferencing modes, maximum gain, masking status, after-hours conditions, adjacent-space control and the procedure for new cables or equipment. The design does not depend on perfect behaviour, but it does not pretend that an open door or uncontrolled loudspeaker has no consequence.

Worked example 37.8. Reverberation and vocal-effort consequence

Room volume is $V = 132 \text{ m}^3$. Initial equivalent absorption is $A = 44 \text{ m}^2$ sabins, giving the Sabine estimate

$$T_{60} = 0.161 \frac{V}{A} = 0.483 \text{ s}.$$

Removing wall panels reduces absorption to 32 m^2 and raises the estimate to 0.664 s. The longer decay does not translate directly into a fixed boundary-level increase, but it can raise the reverberant field and encourage greater vocal effort. The lifecycle register therefore treats removal of absorptive finishes as a material change.

37.9 Resilient lightweight retrofit in an occupied office

The second case concerns an occupied corporate office whose existing metal-stud partition stops at the underside of a suspended ceiling; the room is used for merger negotiations and legal strategy; demolition must be limited, business continuity maintained and the adjacent office cannot be vacated for more than one weekend. Existing field measurements show strong upper-band leakage above the ceiling and moderate direct-wall

performance; a superficial instruction to add another gypsum layer would treat the wrong mechanism.

The retrofit extends an independent lining from slab to deck on the protected-room side, with isolation clips and furring designed for the added board mass; the lining turns continuously at columns and frame returns; a plenum barrier is installed only after duct, cable tray, sprinkler and light paths are mapped. The return-air branch is rerouted through a silencer arrangement rather than being blocked; existing outlets are abandoned or reworked from one side. The ceiling grid is trimmed clear of the new lining, and the perimeter is sealed under observed hold points.

The design accepts that the existing base wall remains part of the system but no longer carries the principal isolation duty; it also accepts a reduced room area and a new mass-air-mass resonance; fire resistance, seismic movement, support loads, egress and access to valves and controls remain coordinated. The mock-up includes a wall head, column return, cable-tray crossing, light fitting and return-air path because those interfaces determine whether the retrofit can be repeated.

Worked example 37.9. Retrofit path ranking

Before work, receiving contributions at 1 kHz are estimated at 37 dB through the ceiling plenum, 33 dB through the wall field and 30 dB through the door; the energetic total is 38.8 dB; the lining lowers the wall contribution by 12 dB to 21 dB, but without the plenum remedy the total remains 37.9 dB. A plenum and return-path intervention lowers that contribution to 24 dB, giving a new total of 31.1 dB; wall improvement alone would have produced less than 1 dB whole-room benefit.

37.10 Fully grouted CMU executive room

A fully grouted concrete-masonry room is proposed inside an existing reinforced-concrete frame. The visible robustness of the wall does not eliminate the need for configuration control. Unit density, percentage solid, grout continuity, mortar bedding, reinforcement, bond beams, coatings, frame interfaces, movement joints, penetrations and structural supports all affect the installed result. The design uses normal-weight loadbearing units, fully grouted cells where structurally required, and a continuous cementitious parge on the concealed service side to close distributed porosity. The opposite face receives an independent lining to reduce room-finish constraints and decouple selected services.⁶

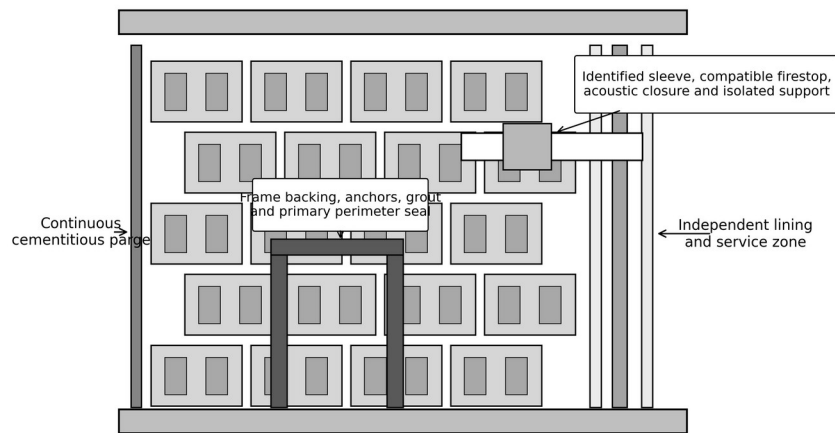
The wall is founded on the structural slab and extends to the deck; reinforcement and bond beams follow structural requirements; acoustic design does not interrupt reinforcement to create isolation; instead, connected flanks are controlled through room placement, independent interior layers, service routing and receiving-space management. Door frames receive defined backing and primary air seals. Grout filling is treated as a construction process requiring cleanouts, lift records, quantity reconciliation and targeted verification, not as an assumption derived from the wall type.

Construction surveillance distinguishes material conformity from installed continuity; unit certificates, grout tests and reinforcement inspection are necessary; they do not establish that every cell is filled or every head joint closed; delivery records are reconciled with theoretical volume. Photographs identify cleanouts and lifts. Where anomalies remain, targeted non-

⁶ [MB-1186](#). The Masonry Society, ASTM C90-24a, ASTM C476-24.

destructive or limited intrusive methods are selected with the structural engineer.

CMU Executive Room and Service Interfaces



Material identity, grout placement, joints, frames and services require independent evidence before concealment.

Figure 37-3. The CMU executive room coordinates grouted cells, parging, independent lining, frame closure, movement, services and structural junctions. Author's original diagram.

Worked example 37.10. Grout quantity reconciliation

A wall zone contains 48 cells with average clear area 0.0122 m^2 over a height of 2.8 m. Theoretical grout volume is

$$V_t = 48(0.0122)(2.8) = 1.640\text{ m}^3.$$

Allowing 7 per cent for absorption, test samples, spillage and geometry gives a planned delivered volume of 1.755 m^3 . Records show only 1.49 m^3 delivered to the zone. The 0.265 m^3 shortfall is not proof of a void at a particular location because cell dimensions and transfer losses are uncertain. It is a material anomaly requiring location-based review before concealment.

37.11 CMU room openings, services and verification

The executive room contains one acoustic door, two power clusters, a fibre pathway, sprinklers, a supply duct and a return path; no service is permitted to use a hollow cell network as an uncontrolled chase; sleeves are located, dimensioned and sealed through approved systems. Back-to-back boxes are prohibited. The door rough opening is inspected for plumb, anchor condition, grout or backing, sealant geometry and continuity before frame trim conceals the perimeter.

A pressure-assisted airflow screen can help identify connected openings, but it is not substituted for acoustic field testing. Air leakage and sound transmission share some physical features, yet the relations depend on aperture size, shape, path length, pressure, frequency and surrounding construction. The investigative plan uses airflow as corroborating evidence, not as an acoustic rating.

Commissioning includes local intensity or pressure scanning at the frame, movement joint, wall head and major services; the room-pair result is compared with the as-designed path model; if the wall field is stronger than required but the frame perimeter dominates, the repair addresses the frame. The project does not respond by increasing masonry thickness; the construction dossier retains unit and grout records, photographs, penetration identifiers, frame details, raw acoustic data, uncertainty, repairs and authority disposition.

Worked example 37.11. Parging mass versus air closure

A 13 mm cementitious parge with density $1,850 \text{ kg/m}^3$ adds surface mass

$$\Delta m' = 0.013(1850) = 24.1 \text{ kg/m}^2.$$

If the underlying wall mass is 260 kg/m^2 , ideal mass-law screening predicts only

$$\Delta R = 20 \log_{10} \left(\frac{284.1}{260} \right) = 0.77 \text{ dB}.$$

A measured 6 dB improvement above 1 kHz therefore cannot reasonably be attributed to added mass alone. Closure of distributed pores and incomplete joints is the more plausible principal mechanism, subject to comparable test states and uncertainty.

37.12 Reinforced-concrete diplomatic briefing room

A diplomatic briefing room is placed within a cast-in-place concrete core. The 250 mm walls provide high direct airborne isolation, yet the room adjoins a lift shaft, mechanical riser and transfer slab. The design problem is dominated by structural continuity, penetrations, door and duct paths, and operational access rather than by wall mass. The interior shell uses an independent ceiling and selected independent linings, but the system is not described as a perfect room within a room because the floor remains structurally connected and services cross the boundary.⁷

Concrete records identify mix, density, reinforcement, wall thickness, construction joints, form ties, embeds, sleeves, honeycombing repairs and later coring; the acoustic team reviews structural drawings before selecting sensor positions or interpreting vibration; a local low-frequency receiving response can be caused by slab mobility, lift machinery, a pipe support or a room mode. The design therefore combines airborne, vibration, pressure and operating-state evidence; public diplomatic-security doctrine informs

⁷ [MB-0021](#). American Concrete Institute, ACI CODE-318-25, ACI CODE-562-25.

institutional roles and evidence discipline while controlled criteria remain with the responsible authority.

Room placement is treated as an engineering control; separation from lift machinery, transfer beams, major risers and public façades can reduce risk more efficiently than elaborate interior treatment; where the building geometry cannot change, the structural and mechanical source paths are measured and modelled. Plant isolation, flexible connectors, support stiffness and local radiation are reviewed with the same care as the wall.

Worked example 37.12. Structural path versus airborne path

At 63 Hz, the measured receiving level is 45 dB when a chiller operates and 31 dB when it is off; airborne source pressure in the adjacent plant room changes by only 1 dB, but slab acceleration falls by 15 dB and coherence between chiller-base acceleration and receiving-slab velocity is 0.91. The observations support a structure-borne path. Adding a second interior wall lining would not address the dominant mechanism; the remedy instead modifies support isolation and flexible connections, then verifies both plant function and receiving response.

37.13 Concrete room doors, ducts and pressure states

The room uses a two-door sound lock because corridor access and consequence justify the added depth; each doorset is specified and commissioned independently; the vestibule receives absorption to limit internal build-up; door sequencing avoids simultaneous opening during protected use, but egress remains compliant. The pressure-control system is tested across normal, setback, emergency and smoke modes because differential pressure changes seal contact and operating force.

Supply and return paths use separated routes and silencers selected from frequency-resolved insertion-loss, pressure-drop and regenerated-noise data; the design does not sum catalogue insertion losses blindly; it accounts for transitions, flow direction, velocity, casing breakout, branch geometry, terminals and field installation. Duct support isolation is coordinated with fire and seismic restraints; access doors and dampers remain inspectable without creating uncontrolled bypasses.

The concrete shell can make openings proportionately more important. A large wall mass may lower direct transmission until the door, duct or service crossing controls nearly every relevant band. Commissioning therefore begins with operation and local path review rather than assuming the massive shell guarantees the room.

Worked example 37.13. Sound-lock energetic screen

A corridor path through the outer doorset is estimated at 38 dB receiving level when the inner door is open. With both doors closed, the inner doorset and absorptive vestibule reduce the contribution by 18 dB to 20 dB. A separate ceiling flank contributes 25 dB. The total is

$$L_{tot} = 10 \log_{10} (10^{20/10} + 10^{25/10}) = 26.2 \text{ dB}.$$

Improving the doorset by another 8 dB changes the total to only 25.2 dB because the ceiling flank dominates. The screen does not model coherence or exact vestibule modes, but it shows why doors and overhead paths require joint commissioning.

37.14 Historic stone room with reversible inner lining

A listed nineteenth-century stone room is adapted for privileged diplomatic meetings. The exterior walls are thick rubble masonry faced with ashlar, but

drawings are incomplete. Chimney flues, timber pockets, irregular voids, later conduits and variable pointing create unknown internal paths. Conservation requirements prohibit indiscriminate drilling, resin injection, removal of historic fabric or impermeable coatings that could redirect moisture.⁸

The design establishes a reversible freestanding inner lining with minimal discrete supports at approved locations; the lining stops short of significant mouldings and allows inspection of the historic wall; a generous cavity reduces double-leaf resonance risk, and selected absorptive treatment controls cavity response without trapping moisture. The new ceiling is independently supported where practicable; services are concentrated in accessible floor and ceiling zones rather than chased into stone. Door and window reveals receive reversible secondary elements whose interfaces are documented.

The room is not represented as known merely because the visible stone is thick; hidden voids can connect floors, flues and adjoining spaces; timber joist pockets can transmit vibration; moisture can change material stiffness, contact and deterioration. The as-found survey therefore becomes part of the design model and remains available for later comparison.

⁸ [MB-0786](#). ICOMOS public conservation principles, applicable heritage-authority requirements, Marshall Long.

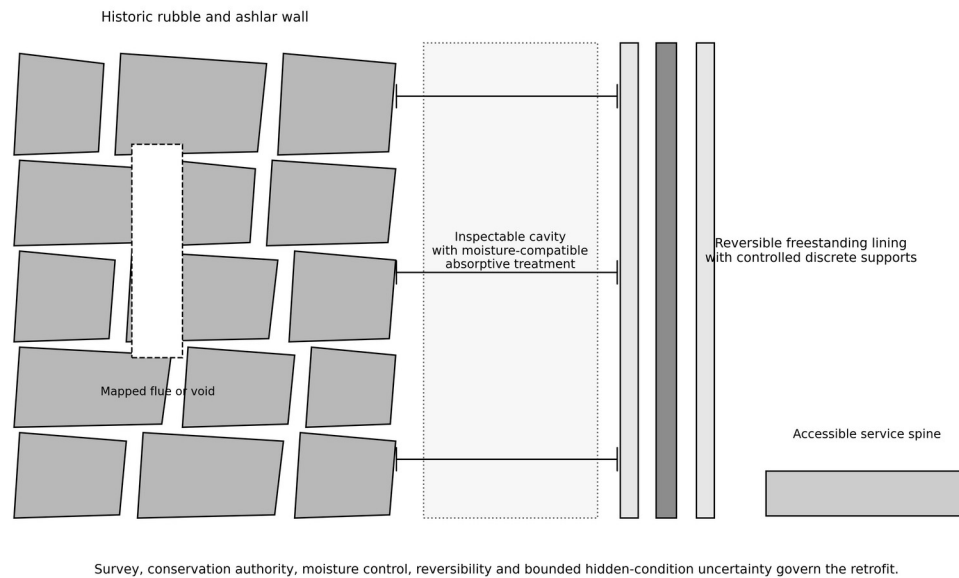
Historic Stone Room with Reversible Inner Lining

Figure 37-4. *The historic-stone retrofit uses a reversible inner lining, inspectable cavity, controlled discrete supports, secondary opening treatments and moisture-compatible details. Author's original diagram.*

Worked example 37.14. Large-cavity resonance screen

The existing stone wall has effective surface mass $m'_1 = 700 \text{ kg/m}^2$. The new lining has $m'_2 = 26 \text{ kg/m}^2$ and clear cavity $d = 0.35 \text{ m}$. Using the ideal mass-air-mass relation gives approximately 37 Hz. The heavy stone behaves nearly as a rigid backing in this screen, but actual response depends on voids, ties, supports, cavity leakage, lining dimensions and structural junctions. The estimate supports generous spacing. It does not certify historic-wall continuity.

37.15 Conservation evidence and commissioning

Before design, the team maps visible joints, flues, floor pockets, moisture patterns, repairs and known services; borescope or nondestructive methods are used only where heritage authority and technical value justify them;

baseline humidity, temperature and crack maps are preserved. Work proceeds through sample areas and first-of-type details; every anchor, spacer, seal and reversible closure is assigned a record. The conservation architect, structural engineer, acoustical engineer, fire specialist and security authority each retain a separate decision role.

Testing compares multiple source positions and receiving locations because irregular walls and openings can create local paths; a room-average result is supplemented by local scans at reveals, flues, floor edges and services; the final report distinguishes what is observed, inferred, untested and inaccessible. Monitoring triggers include moisture change, crack movement, window work, new cabling, floor repair and changes in meeting use.

Reversibility is not an excuse for weak detailing; a removable support can still create a rigid bridge; a secondary window can still fail at its perimeter; a service route can still create a direct opening. The conservation constraint changes the solution and the evidence burden. It does not change the underlying acoustics.

Worked example 37.15. Decision under hidden-condition uncertainty

Field testing meets the project requirement with a guarded 3 dB margin; one chimney flue remains inaccessible, but pressure and local acoustic scans show no material response under the tested state; the authority accepts the room subject to a restriction against drilling in the flue zone, quarterly visual inspection and retesting after fireplace or roof work. The disposition manages uncertainty. It does not prove that the concealed flue contains no connected void.

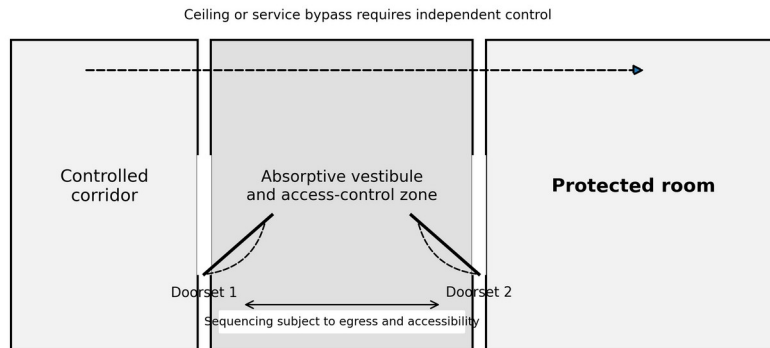
37.16 Acoustic door and two-door sound-lock comparison

A single high-performance doorset consumes less area and can perform well if alignment, compression, threshold and pressure remain controlled; a two-door arrangement reduces reliance on one seal line and can accommodate access-control staging, but only when both doors close reliably and the vestibule does not create a strong modal or ceiling bypass. A frequently open lobby performs poorly regardless of product ratings; operational realism therefore enters the engineering decision.

Door selection begins with the complete function; leaf and frame performance, fire rating, smoke seals, hardware, closer, automatic operation, access control, latching, threshold, operating force, manoeuvring clearance, maintenance and replacement parts all matter; a stronger door that users cannot operate lawfully or reliably is not the stronger system. A two-door system that encourages propping may be worse than one maintainable doorset.

The sound lock requires its own ceiling, floor and service treatment; absorption reduces internal build-up but does not replace either door; door sequencing can reduce exposure during entry, but egress and emergency modes remain controlling; the design tests the open and transitional states because short intelligible fragments can carry more information consequence than a long energetic average suggests.

Door and Sound-Lock Geometry



Two maintained doorsets reduce reliance on one seal line only when pressure, operation, overhead paths and human use are verified.

Figure 37-5. Door and sound-lock design integrates two maintained doorsets, vestibule absorption, sequencing, pressure, egress, access control and overhead paths. Author's original diagram.

Worked example 37.16. Expected open-state exposure

Arrangement A has a closed-state receiving contribution of 28 dB but is propped open for 1 per cent of protected discussion time, during which the contribution is 55 dB. Energetic time averaging gives

$$L_{eq} = 10 \log_{10} \left[0.99 \left(10^{28/10} \right) + 0.01 \left(10^{55/10} \right) \right] = 35.8 \text{ dB}.$$

The rare open state increases the long-term energetic level by more than 7 dB and may carry highly intelligible fragments. Time averaging still understates the information consequence of a short open interval. Operational control is therefore not a minor administrative matter.

37.17 Interior glazing and vision-panel comparison

An executive suite requires visual connection between the protected room and a controlled anteroom; three systems are compared: monolithic glass, asymmetric laminated double glazing and two independent glazed frames

with a large cavity; the study retains pane mass, bending stiffness, coincidence, damping, dimensions, edge support, cavity resonance, frames, gaskets, setting blocks, mullions, perimeter seals, fire and impact obligations, and field replacement risk.

The two-frame system provides the strongest potential isolation but consumes depth and complicates cleaning and condensation control; the laminated insulating unit is thinner and easier to procure, but its narrow cavity can place mass-air-mass resonance in an unfavourable band.

Monolithic glass is simplest but may exhibit pronounced coincidence and offers no cavity benefit; a small door vision panel can dominate its doorset through frame and gasket leakage even when the pane itself is adequate.

Glazing replacement is a lifecycle risk. A maintenance team may order equal thickness while changing lamination, pane asymmetry, air space, frame or gasket. The replacement register must therefore retain the complete accepted identity and define who may approve an alternative. Field verification should examine the frame and perimeter, not only the centre of glass.

Worked example 37.17. Vision-panel composite penalty

A 2.1 square metre door leaf provides 44 dB in a selected band. A 0.25 square metre vision assembly provides 32 dB. The remaining solid area is 1.85 square metres. The composite coefficient is

$$\tau_c = \frac{1.85(10^{-4.4}) + 0.25(10^{-3.2})}{2.10} = 1.10 \times 10^{-4},$$

or $R_c = 39.6$ dB. The vision assembly reduces the door by about 4.4 dB in that band. The calculation treats the elements as area contributions and does not separately model perimeter gaps, hardware or leaf vibration.

37.18 Floor, ceiling, plenum and raised-floor integration

The next case studies a briefing room on an elevated floor of a steel-framed building; the separating walls extend to the deck, but the protected room contains a raised access floor and an isolated ceiling; the adjacent corridor shares the structural slab, and the service room shares the ceiling plenum. The floor-ceiling system therefore carries airborne, impact, structure-borne, plenum and service paths that must be treated together.

The raised floor uses heavy panels on pedestals supported by the structural slab; its underfloor plenum carries power, fibre and conditioned air; the protected-room perimeter receives sealed cut panels and a barrier extending to the slab; pedestals do not cross the boundary. Cable openings are sleeved and registered. The isolated ceiling uses spring or elastomeric hangers selected for the supported mass and required natural frequency. Its perimeter remains clear of wall framing, luminaires, sprinklers, ducts and access panels. Fire and seismic restraints are designed to avoid uncontrolled rigid bypasses during normal operation.

A floor impact metric cannot substitute for airborne speech isolation, and a ceiling attenuation class cannot prove field plenum performance. The commissioning plan therefore includes room-pair airborne measurements, impact checks where relevant, local plenum diagnosis, structural vibration and inspection of the raised-floor boundary. The evidence is assigned to the proposition each method actually supports.⁹

Worked example 37.18. Floating-floor transmissibility screen

A floating floor has supported mass $m = 18,000 \text{ kg}$ and combined vertical stiffness $k = 1.28 \times 10^8 \text{ N/m}$. The undamped natural frequency is

⁹ [MB-0100](#). ASTM E492-25 and ASTM E1007-25, ASTM E492-25, ASTM E1007-25.

$$f_n = \frac{1}{2\pi} \sqrt{\frac{k}{m}} = 13.4 \text{ Hz}.$$

At forcing frequency 63 Hz, the ratio is $r=4.70$. With damping ratio $\zeta=0.10$, ideal force transmissibility is

$$T_F = \frac{\sqrt{1+(2\zeta r)^2}}{\sqrt{(1-r^2)^2+(2\zeta r)^2}} = 0.064.$$

This corresponds to approximately 23.9 dB force reduction. The model assumes a linear single-degree system without edge bridges, pipe restraints, distributed modes or rocking. Those conditions require physical and vibration verification.

37.19 Ceiling-plenum and underfloor weak-path study

Laboratory ceiling-plenum data are useful only within the prescribed configuration. Field plenums contain ducts, beams, lights, cable trays, sprinkler mains, structural bracing, gaps and varying depth. The protected-room design therefore models the plenum as a network. A deck-to-deck wall reduces one route, but return ducts, access panels and underfloor openings can remain. The team identifies each branch and estimates its receiving contribution before selecting barriers and silencers.¹⁰

A barrier is continuous at deck, walls, columns and services; its fire and smoke duties are coordinated with acoustic closure; a suspended ceiling remains an interior finish and local path, not the primary security boundary; access panels are located away from the critical wall head and provided with controlled closures. The raised-floor plenum is divided by a sealed barrier whose service crossings remain accessible for inspection.

¹⁰ [MB-0071](#). ASTM E1414, ASTM E336-25a.

The construction sequence preserves observability. Wall heads, plenum barriers and service crossings are inspected before ceiling closure. Diagnostic testing may occur before final finishes if it can identify gross bypasses economically. Deferred access panels are not casually added after acceptance because each panel changes both the path and the evidence state.

Worked example 37.19. Competing overhead and underfloor paths

Receiving contributions are 31 dB through the return duct, 29 dB through the ceiling plenum and 28 dB through the raised-floor service opening; the total is 34.0 dB; a ceiling barrier lowers the plenum contribution by 12 dB to 17 dB, but the total becomes 32.9 dB. Treating the return duct to 20 dB then gives 29.0 dB, still controlled by the underfloor opening; only after all three paths are reduced does the room approach its design margin.

37.20 HVAC and silencer design

A high-isolation room still requires ventilation, temperature control, smoke management and pressure stability; the HVAC case uses separate supply and return routes with no direct common branch to an uncontrolled listener location; silencers are selected from insertion-loss, pressure-drop and regenerated-noise data at the intended airflow direction and velocity. The mechanical engineer verifies fan reserve and operating point; the acoustical engineer evaluates cross-talk, breakout, terminal noise and pressure effects on doors. The fire engineer verifies dampers and smoke-control states. Maintenance personnel retain access without opening the protected boundary casually.

The silencer is not inserted as an isolated catalogue object. Upstream and downstream transitions, bends, duct gauge, casing reinforcement, external lagging, supports, flexible connectors, access doors and nearby room boundaries affect installed performance. Regenerated noise can raise protected-room background and induce greater vocal effort. Excessive pressure drop can reduce airflow, alter room pressure and compromise door seals. The design therefore optimises the system, not one insertion-loss column.¹¹

Duct routing is also a security and maintenance decision; long separated routes can provide useful attenuation but increase pressure and access requirements; shared shafts can create flanking and contractor access; a design with an inaccessible silencer may deteriorate unnoticed. The path register identifies every branch, terminal, access door, damper and support, together with the operating states that must be commissioned.

¹¹ [MB-0097](#). ASTM E477-26; ASHRAE Handbook, ASTM E477-26, ASHRAE Guideline 0-2019.

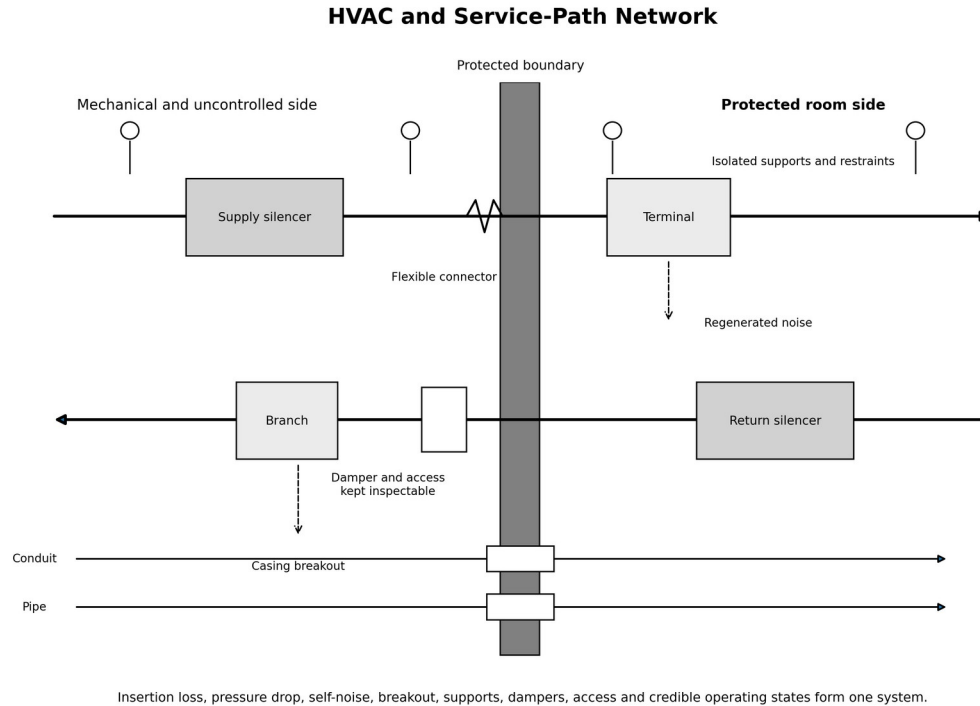


Figure 37-6. The HVAC and service-path network separates supply and return routes, controls cross-talk, limits casing breakout, coordinates supports and dampers, and preserves inspection access. Author's original diagram.

Worked example 37.20. Silencer insertion loss and regenerated noise

Upstream duct-borne speech contribution at 1 kHz is 58 dB. The silencer provides 28 dB laboratory insertion loss under the selected airflow, predicting a 30 dB transmitted contribution. Regenerated noise at the downstream terminal is 34 dB. Energetic combination gives

$$L_{out} = 10 \log_{10} \left(10^{30/10} + 10^{34/10} \right) = 35.5 \text{ dB}.$$

The system is controlled by regenerated noise, not residual speech. A longer silencer with 5 dB greater insertion loss but 2 dB greater self-noise could worsen the result. Casing breakout and field transitions require separate allowance and verification.

37.21 HVAC pressure, door operation and quiet states

Room differential pressure is specified as a range rather than one favourable value; door seal contact, closer force, automatic-bottom deployment, smoke control and airflow balance are verified at both extremes; the test matrix includes occupied daytime, night setback, emergency, filter-loaded and maintenance modes. The quietest receiving background may occur at night when fans stop, while the greatest source excitation may occur when conferencing remains available; one daytime test can therefore be technically precise and operationally unrepresentative.

The design avoids crediting incidental fan noise as permanent privacy control unless that sound is intentionally specified, monitored and maintained. Masking is commissioned separately. A fan failure, muted masking zone or software setback should appear as an alarmed or controlled state rather than an invisible reduction in protection. Trend records identify the fan speed, branch pressure, damper positions, filter condition and masking configuration associated with each acoustic baseline.

Pressure also affects accessibility and fire performance; an inward-opening door can become difficult to operate under positive room pressure; an outward-opening door can lose seal compression under the opposite state; smoke-control and emergency modes may reverse the ordinary pressure relationship. The final acceptance state therefore includes the permissible pressure envelope and the response required when controls move outside it.

Worked example 37.21. Door contact across pressure range

A doorset shows continuous seal contact at $+8 Pa$ room pressure but a 0.8 mm latch-side gap at $-6 Pa$. Local upper-band receiving level increases by 9 dB in the negative state. The design adjusts hinges, latch, closer and seal geometry so contact remains continuous from $-10 Pa$ to $+10 Pa$. The accepted condition is the robust pressure range, not the state that happened to exist during one favourable test.

37.22 Plumbing, sprinkler, electrical, data and firestop coordination

The service coordination case concerns a room in a hospital-administration suite with domestic water, waste, sprinklers, electrical feeders, fibre, copper data, access control and audiovisual cabling. Each service requires an opening and often a mechanical support. The acoustic boundary can therefore be defeated by a penetration that is fire compliant but acoustically open, or by a resilient sleeve that is short-circuited by a rigid clamp.

The penetration schedule defines service, sleeve, annulus, backing, firestop system, acoustic layer, support, movement, inspection access and future capacity. Firestop listings and engineering judgements remain within their proper authority. Acoustic sealant is not substituted for a listed firestop. Conversely, a listed firestop is not assumed to satisfy the room's acoustic requirement without evidence. The design can use a listed system plus an accessible acoustic closure where compatibility, movement and inspection are resolved.¹²

Piping and sprinklers carry both airborne openings and structure-borne forces; water state, pump operation, valve movement, thermal expansion,

¹² [MB-0102](#). ASTM E814, ASTM E2174-24.

seismic restraint and hanger geometry can change transmission; an empty pipe during commissioning is not representative of a pressurised flowing system. Electrical and communications pathways carry additional electronic-security concerns, but those concerns do not erase the physical opening or bridge; acoustic, fire, electrical, network and security reviews remain linked but separate.

Worked example 37.22. Pipe-support bridge

A pump excites a pipe at 50 Hz. The isolated hanger system has natural frequency 8 Hz and damping ratio $\zeta=0.12$, giving frequency ratio $r=6.25$. Ideal force transmissibility is approximately 0.043, or 27.3 dB force reduction. A rigid restraint installed across the isolation path carries 20 per cent of source force directly. The combined transmitted fraction is

$$T_c = 0.20 + 0.80(0.043) = 0.234,$$

which corresponds to only 12.6 dB reduction. The small rigid bypass defeats much of the isolator benefit.

37.23 Penetration registers and future capacity

A protected boundary should not be populated by many undersized sleeves that are later enlarged informally; a controlled service zone can concentrate pathways, provide spare capacity and preserve inspection access; spare capacity is sealed in the baseline state and reopened only under change control. Cable trays terminate before the boundary and transition through defined sleeves; conduits are not filled indiscriminately when electrical, communications or fire requirements prohibit it.

Every penetration receives a stable identifier tied to room, grid, elevation, service, approved detail, photograph, installer, inspection, repair, test and

future change; the register is reconciled against drawings and physical survey before acceptance; a penetration absent from the register is a nonconformance even when it appears neatly sealed, because the evidence chain and authority disposition are missing. The record distinguishes a verified closure from an inaccessible condition carried as a limitation.

Inspection effort is risk based but not casual. High-consequence and concealed penetrations receive complete inspection. Repetitive low-risk work may be sampled only under an approved plan that accounts for installer, shift, location, material lot and defect clustering. One serious defect expands the sample. Sampling provides evidence about a process; it does not prove every unobserved item.

Worked example 37.23. Risk-ranked penetration inspection

A project contains 120 small one-sided conduits, 18 large cable sleeves, 12 sprinkler crossings and 8 duct penetrations; the plan inspects all 38 large or high-consequence crossings and a stratified 25 per cent sample of the 120 small conduits, giving 68 inspected items. If three defects are found in one installer's 10 sampled conduits, the plan expands to every conduit installed by that crew and reopens the related hold-point release; the percentage inspected is an administrative measure; the causal grouping controls the escalation.

37.24 Audiovisual systems and amplified source states

Audiovisual equipment changes the acoustic source, the boundary and the operating state at the same time; loudspeakers can produce higher levels and lower frequencies than ordinary speech; wall-mounted displays and soundbars can excite structure through brackets; microphones, cameras,

control processors and network interfaces create penetrations, power supplies and software states. A conferencing endpoint can remain active or change gain through remote management even when local users believe it is idle.

The design basis identifies each authorised mode, source level, spectrum, limiting function, mute state, remote-control permission, recording function, firmware version and failure response. High-level loudspeakers are placed away from vulnerable boundaries where practical. Mounts are supported from the intended structure without bridging isolated leaves. Cable pathways use controlled service zones. Emergency and accessibility functions remain operable.

Commissioning exercises ordinary calls, maximum authorised gain, local presentation, far-end speech, alarm states, power loss, network loss, mute, update and maintenance modes. The acoustic report identifies the exact mode measured. It does not infer cybersecurity from a sound test, nor does an electronic-security inspection replace acoustic measurement. The configuration baseline links equipment identity and software state to the accepted room condition.¹³

Worked example 37.24. Amplified source and receiving margin

Unaided raised speech produces 78 dB in a critical source band; the conferencing loudspeaker produces 88 dB at the same reference position; with measured room-to-corridor attenuation of 52 dB, the corresponding receiving levels are 26 dB and 36 dB. Corridor background is 31 dB. The unaided source lies 5 dB below background while amplified audio lies 5 dB

¹³ [MB-0790](#). IEC 60268-16:2020, ISO 19650.

above it; a room assessed only with unaided speech is not automatically acceptable in conferencing mode. Gain limits or stronger path control are required.

37.25 Sound masking and operational speech discipline

Masking can reduce detectability by raising receiving background in selected bands, but it does not repair the boundary; the design treats masking as a controlled system with zoning, spectrum, spatial uniformity, set points, credentials, monitoring, alarms and defined failure states. The source room is also examined because high internal noise can trigger Lombard vocal effort; a receiving-side benefit can be offset when occupants raise their voices.

Operational controls address doors, amplified audio, room occupancy, maintenance, cleaning, after-hours use, emergency modes and abnormal system states; procedures must be practical and trained; a rule that users routinely defeat is not a durable control; architecture and engineering should reduce dependence on perfect behaviour, then record the residual behaviours that still matter. Repeated opening for service, propped doors and ad hoc portable loudspeakers are technical states, not merely etiquette.

Masking acceptance requires both acoustic and operational evidence.

Spectrum, level, uniformity, audibility, comfort, alarms, zoning and fail-state behaviour are measured. Controls and logs are retained. An adjustment that improves corridor margin while making the protected room uncomfortably loud can increase source vocal effort and reduce net benefit. Masking is therefore optimised as part of the source-room-receiver system.

Worked example 37.25. Masking benefit with Lombard response

Receiving background rises from 28 dB to 34 dB after masking adjustment, suggesting a nominal 6 dB benefit; source-room monitoring shows that median talker level increases by 2.5 dB; the net level margin improves by only 3.5 dB. The analysis also checks spectrum and listener positions because a broadband level balance does not establish speech unintelligibility; the example shows why source adaptation and receiving masking must be measured together.

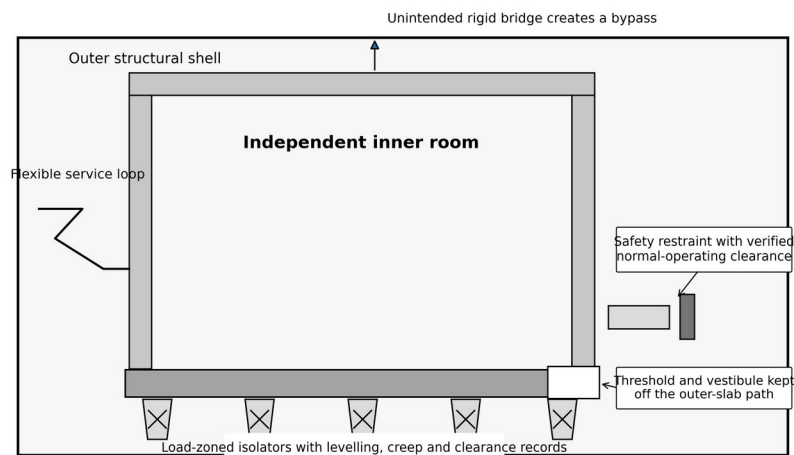
37.26 Room-within-room high-isolation suite

A high-consequence corporate research suite is designed as an isolated inner room within a reinforced-concrete shell; the inner floor rests on isolators, independent walls rise from the floating slab and the ceiling is supported from the inner walls. The system aims to reduce airborne and structure-borne transfer, but its integrity depends on every service, restraint and clearance; a single rigid pipe, conduit, seismic stop, door threshold or construction brace can bypass the isolation.

The isolator schedule identifies load, stiffness, deflection, natural frequency, damping, levelling, overload, creep and inspection access; loads include structure, finishes, furniture, occupants, equipment and foreseeable change; service loops accommodate movement and avoid contact; seismic and safety restraints retain clearance during normal operation. The access vestibule is supported so thresholds do not short-circuit the floor. The outer shell and inner room have separate identifiers so that every support and service can be assigned correctly.

High-isolation design must account for uneven load; a safe, equipment rack or compact shelving system can compress one zone, change local stiffness and close a perimeter gap; ceiling services can impose concentrated loads and rocking; the design therefore zones isolators and records actual levelling after permanent equipment is installed. A future equipment move triggers load and clearance review.

Room-Within-Room Support and Clearance System



Every isolator, edge gap, temporary brace, restraint, threshold and service crossing is inspected before closure.

Figure 37-7. The room-within-room system uses a floating floor, independent walls and ceiling, isolated services, controlled restraints and inspected clearances. Author's original diagram.

Worked example 37.26. Isolator load and natural-frequency check

An inner room weighs 110,000 kg including permanent contents and design occupancy. Forty isolators share load equally, giving approximately 27.0 kN per isolator. If each isolator has vertical stiffness $1.15 \times 10^6 \text{ N/m}$, total stiffness is $4.60 \times 10^7 \text{ N/m}$. Natural frequency is

$$f_n = \frac{1}{2\pi} \sqrt{\frac{4.60 \times 10^7}{110000}} = 3.25 \text{ Hz}.$$

At 31.5 Hz, the frequency ratio is 9.69, supporting strong ideal isolation.

Unequal load, floor flexibility, rocking, service bridges, restraints and isolator tolerance can govern the real result. Levelling and load verification remain part of commissioning.

37.27 Room-within-room construction and inspection

The room is built through controlled layers; a base-slab survey precedes isolator placement; isolator identity, location, load range and orientation are recorded; floating-floor reinforcement and edge clearances are inspected before casting. Inner wall tracks do not contact the outer shell. Cavity debris is removed. Services are looped and supported from the correct structure. Temporary bracing is inventoried and removed. Ceiling hangers, access panels, lights, sprinklers, ducts and cable pathways are inspected before closure.

A first-of-type bay includes floor edge, wall base, wall head, ceiling, duct, conduit, sprinkler, door threshold and seismic restraint; the mock-up is not a showroom fragment; it contains the interfaces most likely to defeat the design; inspection photographs use identifiers and scale. A missed hold point is recorded as missing evidence rather than silently converted into acceptance.

Diagnostic testing before final finishes can detect gross short circuits while repair remains economical. Local vibration transfer, controlled tapping, pressure scanning and source-response coherence may be used within their scopes. Final room-pair and speech-security testing follows only after the full

operating state is established. A successful local bridge repair does not replace whole-room recommissioning.

Worked example 37.27. One rigid bridge across an isolated floor

The intended isolated path transmits 4 per cent of source force. A rigid bridge carries 8 per cent of source force directly. If the remaining 92 per cent passes through the isolators, total transmitted fraction is

$$T_c = 0.08 + 0.92(0.04) = 0.1168.$$

This corresponds to 18.7 dB force reduction; without the bridge, 4 per cent corresponds to 28.0 dB reduction; one bridge reduces the ideal benefit by more than 9 dB; the calculation is a screening model and does not represent distributed modes or multiple phase-related bridges.

37.28 Diplomatic-facility integrated example

A new overseas diplomatic facility requires a briefing room for protected discussions. The engineering example begins with public institutional doctrine, but the actual acceptance criteria remain under competent-authority control. The room is placed away from uncontrolled façades and major plant where practicable. Its structural shell is reinforced concrete, with a controlled interior lining, two-door approach, separated supply and return routes, restricted service access and a configuration-managed audiovisual system. Construction surveillance and technical-security coordination begin before details are concealed.¹⁴

The public design narrative does not state a classified threshold. It states the evidence chain. The project establishes use, source states, listener-access

¹⁴ [MB-1222](#). UFC 4-010-05.

zones, controlled drawings, material and personnel controls, first-of-type details, concealed-work inspection, penetration and equipment registers, acoustic and operational testing, technical-security review, authority disposition and lifecycle change control. This approach remains useful when portions of the criteria are unavailable to the public author because the method does not pretend that consensus standards contain the protected decision.

Multinational delivery requires additional discipline. Local codes, products, labour, climate and construction practice can differ from the sponsoring authority's assumptions; equivalence is demonstrated through evidence, not vocabulary; a local product is not accepted merely because its catalogue rating resembles a specified product. The submittal identifies tested configuration, dimensions, supports, seals, environmental conditions and limitations; the authority decides whether the evidence supports use.

Worked example 37.28. Diplomatic-room acceptance ladder

Laboratory wall and door reports satisfy product-submittal requirements; field room-pair testing then meets the project criterion with a guarded 4 dB margin; closed-room speech testing at authorised listener positions meets the approved criterion under maximum credible vocal effort and quiet-night background. Construction and technical-security records are complete. The responsible authority accepts the room for its defined use; the four statements remain separate in the dossier. None is rewritten as proof of the others.

37.29 Commercial privileged-discussion room

A financial institution converts a tenant conference room into a space for board, transaction and regulatory discussions. The building is not a governmental secure facility, but the information consequence is high and the landlord controls the façade, structure, risers and common corridors. The design must therefore combine engineering performance with lease rights, access protocols and change notice.

The room is moved away from the public lift lobby and placed beside controlled offices; full-height walls, a maintainable doorset, an accessible service spine and separated conferencing source are provided; the landlord grants inspection rights for the adjacent plenum, façade cavity and riser. The lease requires notice before work affecting the boundary, shared services or access routes; after-hours cleaning, fire inspection and building maintenance are included in the operating-state and access model.

Commercial claims are framed carefully. A consultant can state the tested room-pair result, the source and receiver assumptions and the limits of the examination; the consultant should not use governmental terms or imply accreditation; attorney-client privilege and other legal protections depend on law and conduct beyond the acoustic measurement. The room can support confidential practice without being represented as a government-approved secure facility.

Worked example 37.29. Landlord alteration and path-budget consequence

The accepted room has corridor, plenum and façade contributions of 27 dB, 25 dB and 23 dB, giving a total of 29.7 dB; a landlord later adds a return grille whose predicted contribution is 34 dB. The new total becomes 35.4 dB,

an increase of 5.7 dB, and the added path controls the result; the lease-change clause therefore requires acoustic review before the grille is installed; the calculation supports urgency but does not replace field verification.

37.30 Medical consultation room, dignity and accessibility

A medical consultation room must support private discussion while remaining accessible to patients, carers and staff, including people using mobility aids, hearing devices or interpreters; it must tolerate cleaning, infection-control procedures, emergency response and frequent door operation. These requirements can conflict with heavy acoustic doors, deep thresholds, porous finishes and complex sound locks; the design must achieve a lawful, humane and maintainable balance rather than maximise one acoustic number.

The room uses a full-height boundary, accessible doorset, sealed but cleanable glazing, controlled return path and distributed interior absorption; the door approach, clear width, operating force, closer speed, latch and threshold are coordinated with access requirements; the corridor background is measured during ordinary clinic activity and during quiet periods. Clinical equipment, alarms, telehealth loudspeakers and portable devices are included in the source-state inventory.

Privacy assessment distinguishes conversation support from absolute claims; the room may be suitable for ordinary consultation but not for amplified telehealth at unrestricted gain; staff procedures address door closure, waiting-area access and interpretation; maintenance checks seal

condition and closer operation without creating a threshold or force that excludes users.

Worked example 37.30. Accessible door trade-off

Option A provides 44 dB field door performance but requires operating force above the accessibility limit; option B provides 40 dB and satisfies access requirements; adjacent wall and ceiling receiving contributions are 34 dB and 32 dB. With Option A, the door contribution is 28 dB and the total is 35.0 dB; with Option B, the door contribution is 32 dB and the total is 36.5 dB. The 1.5 dB whole-room difference may be recovered through frame adjustment, vestibule absorption, corridor masking or reduced adjacent paths while preserving lawful access.

37.31 New construction and retrofit comparison

New construction allows room placement, structural joints, wall continuity, service routing, door approaches and plant separation to be designed before constraints harden; retrofit must discover hidden conditions and often works around occupied operations, existing fire assemblies, heritage fabric, limited floor loading, inaccessible risers and landlord control. Retrofit is not simply new construction with smaller dimensions; its uncertainty and evidence burden are greater.

New work can use complete first-of-type assemblies; retrofit should use investigative openings, surveys, material tests and staged mock-ups; new work can place services outside the critical boundary; retrofit may require an accessible service spine and compensating linings. New work can provide a sound lock. Retrofit may need one high-performance doorset and

operational corridor control. Both require commissioning, but retrofit needs a stronger as-found record and explicit limitations.

The comparison also affects procurement and programme; new construction can place hold points into the main schedule; retrofit may require night work, temporary protection and rapid restoration; these constraints should be priced as part of the security system. An unrealistically short possession period encourages concealment before inspection and creates a false economy.

Table 37-2. Comparative assembly and project-condition study

Case	Principal assembly	Dominant design advantage	Principal uncertainty or weakness	Required evidence emphasis
New legal suite	Double-stud gypsum	Independent leaves and controlled services	Door and ceiling interfaces	Mock-up, concealed-work inspection, room-pair and speech testing
Occupied office retrofit	Independent lining and barriers	Limited demolition and path-specific treatment	Hidden existing construction	As-found survey, interventions, targeted opening and before-and-after tests
CMU executive room	Grouted masonry with independent lining	Mass, robustness and fire performance	Grout continuity, joints and frame	Material provenance, grout records and local verification
Concrete briefing room	Massive shell with selected inner isolation	Strong direct airborne boundary	Structure-borne flanking and services	Vibration model, service coordination and operating-state tests
Historic stone retrofit	Reversible freestanding lining	Conservation-compatible improvement	Voids, moisture, flues and concealed fabric	Heritage survey, reversible details, local scans and monitoring
Room within room	Floating floor, independent walls and ceiling	Broad airborne and vibration decoupling	Rigid bridges, load variation and service restraints	Load verification, clearance inspection, vibration and whole-room tests

37.32 Comparative wall selection

Wall selection should begin with the path model and project obligations rather than a catalogue hierarchy; lightweight double-leaf systems offer high performance per unit mass and allow services to be organised, but they are workmanship-sensitive and vulnerable to bridges. Masonry offers robustness and fire resistance but can hide porosity, incomplete joints, hollow cells and rigid structural coupling; concrete offers mass and continuity but transmits structure-borne vibration efficiently; historic stone can be massive yet internally voided and subject to conservation constraints.

The comparative study should retain surface mass, leaf stiffness, cavity, damping, critical frequency, mass-air-mass resonance, support, perimeter, penetrations, fire, moisture, movement, access, repairability and evidence. No material is universally superior. The best assembly is the one whose dominant failure modes can be controlled and verified within the project context.

Weighted decision tools can help expose trade-offs, but they do not convert mandatory requirements into preferences. Structural safety, egress, fire resistance, accessibility, heritage authority and competent security decisions remain constraints. Scores should be subjected to sensitivity analysis so that a small change in a subjective weight is not mistaken for an objective engineering result.

Worked example 37.31. Weighted assembly selection

Three wall options are scored from 0 to 5 on acoustic potential, field robustness, structural compatibility, service control, inspectability, fire coordination, programme and lifecycle repair; project weights are 0.25, 0.18, 0.10, 0.12, 0.12, 0.08, 0.07 and 0.08. Double-stud gypsum scores 4.35,

grouted CMU scores 3.92 and concrete with lining scores 4.18; a 20 per cent reduction in the gypsum inspectability score lowers it to 4.23; the screen supports discussion, but mandatory constraints can override the weighted preference.

37.33 Low-frequency design and structural flanking

Secure-room design often concentrates on speech bands, yet amplified audio, machinery, building services and structural modes can create lower-frequency paths. A low-frequency tonal or modulated signal may not produce conventional word intelligibility, but it can reveal cadence, activity or system operation and can drive nonlinear or rattling elements. The design should therefore examine frequencies below the rating range where source, structure and consequence justify it.

Concrete slabs, steel frames, risers, pipes, duct supports, lift rails and façades can carry vibration around strong walls. Structural path control requires force, mobility, transfer, damping and radiation analysis. The appropriate remedy may be plant isolation, support redesign, flexible connections, joint treatment or room relocation rather than more wall mass. Simultaneous source and response measurements, operating-state contrast and controlled intervention strengthen causal interpretation.¹⁵

The analyst should distinguish a room mode from greater transmission. A receiving microphone at a modal maximum can show a large local level even when boundary transfer is unchanged. Multiple positions, structural sensors and source-reference channels are therefore required. A narrow

¹⁵ [MB-0938](#). ISO 20816, ISO 5348:2021.

peak should not be assigned to the nearest wall merely because the microphone stands beside it.

Worked example 37.32. Plant isolation and residual structural flank

A fan produces a 31.5 Hz force path. Its intended isolator has $f_n = 5.0 \text{ Hz}$ and damping ratio 0.10. The frequency ratio is 6.3, giving ideal force transmissibility about 0.034, or 29.4 dB reduction. A rigid electrical conduit carries 6 per cent of source force directly. The combined screened fraction is $0.06 + 0.94(0.034) = 0.092$, equivalent to 20.7 dB reduction. Removing the conduit bridge can recover nearly 9 dB of ideal force isolation without adding wall mass.

37.34 Openings and service-path comparative controls

Openings and services should be compared by function, not by superficial size; a small unsealed conduit can carry upper-band speech efficiently; a large duct with a properly designed silencer may provide better attenuation; a door is large but can be tested and maintained. A hidden wall-head gap may be small but continuous. A window may have adequate glass and weak perimeter gaskets. Every path therefore requires a design intent, expected failure modes, inspection method, verification evidence and lifecycle access.

The comparison should also consider observability. A maintainable door gives visible seals and repeatable operational tests; a concealed joint may require a hold point because later access is destructive; a duct can be inspected through an access door but only if the access remains available. A modular cable seal can support change control when fill and module identity are managed; designing for evidence can be as important as designing the nominal attenuation.

Repairs should alter the verified mechanism. A frame leak is repaired at the frame; a duct cross-talk path is corrected through routing, silencing or casing treatment; a rigid pipe bridge is redesigned structurally; an inaccessible hidden condition is not automatically treated with broad demolition when narrower evidence can resolve it. Proportionate intervention protects both the room and the record.

Table 37-3. Openings and service-path controls

Path	Governing mechanism	Design control	Construction evidence	Commissioning and lifecycle control
Door	Leaf transmission, perimeter leakage, pressure and operation	Tested doorset, controlled frame, seals, threshold and hardware	Rough-opening, anchor, seal and contact records	Functional cycles, contact map, field door test and maintenance schedule
Glazing	Pane bending, coincidence, cavity, frame and gaskets	Asymmetric or laminated panes, independent frames and sealed perimeter	Pane identity, edge support, gasket and frame inspection	Local scan, field test, condensation and replacement control
Duct	Cross-talk, insertion loss, regenerated noise and breakout	Separated branches, silencers, transitions and casing treatment	Silencer identity, orientation, duct gauge, support and damper records	Airflow, pressure, noise, cross-talk and maintenance-state testing
Pipe	Air opening, structural force and water-borne excitation	Sleeve, flexible connection, isolated support and compatible closure	Sleeve, backing, firestop, clamp and support inspection	Vibration, operational-state test, leak and repair control
Conduit and data	Opening, rigid bridge and future alteration	Defined sleeve, bend radius, separation, spare capacity and seal	Cable and sleeve register, photograph and firestop inspection	Change permit, reinspection and targeted acoustic check
Wall head and joint	Air leakage, movement and structural coupling	Tested moving joint with defined backing and clearances	Layered hold-point photographs and movement record	Local scan, seasonal inspection and repair trigger

37.35 Cost, disruption and lifecycle value

The least expensive initial assembly is not necessarily the least costly secure-room solution. Cost includes design coordination, floor area, structural support, specialised products, inspection, testing, business interruption, repair access, energy, maintenance, replacement cycles and consequences of failure. A high-performing wall that requires demolition whenever a cable changes may be less economical than a serviceable system with controlled accessible pathways.

Lifecycle analysis should follow causal differences. A door with replaceable seals and accessible adjustment may have lower lifecycle cost than a nominally stronger door whose proprietary parts are unavailable; a large reversible historic lining may cost more initially but avoid irreversible stone work. A longer silencer may save wall reconstruction but increase fan energy; cost models must disclose assumptions and must not reduce mandatory security or life-safety requirements to preference weights.

Uncertainty in cost should be visible. Retrofit probabilities, maintenance intervals, energy prices, disruption costs and consequence estimates can dominate the result. Sensitivity analysis identifies whether a recommendation is robust or depends on one speculative input. The cheapest expected value may not be selected where consequence, observability or authority constraints favour a different option.

Worked example 37.33. Expected lifecycle cost

Option A costs £140,000 initially, has an estimated 0.25 probability of major retrofit within ten years at £90,000, and annual maintenance of £4,000.

Undiscounted ten-year expected cost is

$$C_A = 140000 + 0.25(90000) + 10(4000) = GBP 202500.$$

Option B costs £175,000, has a 0.06 retrofit probability at £60,000, and annual maintenance of £2,500, giving £203,600. The monetary results are close. If Option B provides better observability, less operational disruption and lower consequence of failure, those non-monetary factors may govern. Probability estimates require sensitivity analysis.

37.36 Integrated commissioning architecture

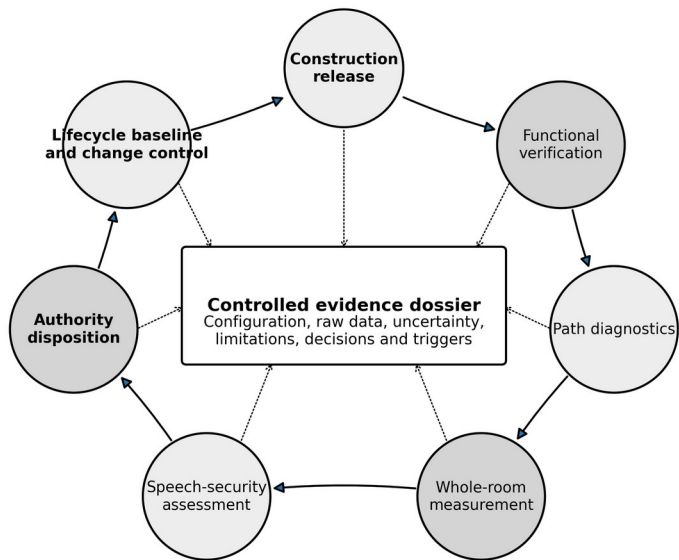
Commissioning should verify the room in layers rather than leap directly to one final test; the first layer confirms construction and configuration; the second confirms functional operation of doors, dampers, HVAC, masking, audiovisual systems, power, alarms and access control. The third performs component or path-specific diagnostics; the fourth measures room-pair and speech-security performance under defined states. The fifth documents uncertainty, residual risk and authority disposition. The sixth establishes deferred durability checks and change triggers.

The sequence matters. Acoustic testing before HVAC balance can test an irrelevant pressure and noise state; testing before door adjustment can waste a full campaign; closing ceilings before path diagnosis can destroy observability; waiting until every finish is complete can make repair costly. The commissioning plan therefore identifies preliminary, intermediate, final and deferred gates, together with the evidence required to release each one.

Commissioning records should support reproduction. Coordinates, source orientation, room contents, system settings, calibration, weather where relevant, pressure, access, photographs, software versions and raw data are preserved; the final report distinguishes required method measurements

from supplementary diagnostics; a local scan is not substituted for the room average, and a room average is not used to conceal a known local weak path.

Commissioning and Lifecycle Evidence Loop



A change reopens only the propositions and paths it can affect, unless uncertainty requires a broader campaign.

Figure 37-8. Integrated commissioning links construction, functional systems, path diagnostics, whole-room performance, authority disposition and lifecycle recommissioning. Author's original diagram.

Table 37-4. Integrated commissioning schedule

Gate	Principal question	Required state	Evidence	Release consequence
Constructi on release	Does the installed configuration match approved details?	Concealed work open and identified	Inspection, photographs, material and penetration records	Permit closure or require correction

Gate	Principal question	Required state	Evidence	Release consequence
Functional verification	Do doors, HVAC, masking, AV, dampers and controls operate as designed?	Representative operating modes	Functional tests and logs	Permit acoustic testing
Diagnostic verification	Are dominant paths consistent with the design model?	Controlled source and accessible paths	Local pressure, intensity, vibration, airflow and interventions	Repair or refine model
Whole-room measurement	Does installed room-pair performance meet the defined requirement?	Furnishing, pressure, background and systems controlled	Field spectra, ratings and uncertainty	Quantitative conformity decision
Speech-security assessment	Is information recovery bounded under authorised assumptions?	Approved source, listener and quiet states	Closed-room speech metrics and listener-position records	Operational or authority decision
Lifecycle baseline	What configuration remains authorised, and what changes trigger review?	Final as-built and as-operated state	Drawings, software, registers, limits and checksums	Controlled use and recommissioning plan

37.37 Measurement uncertainty and acceptance

Acceptance should not be invented after results are known; the project defines the measurand, method, configuration, uncertainty treatment and decision rule in advance; a lower-is-better quantity and an upper-is-better quantity require opposite guard-band direction; integer ratings can change discontinuously when one-third-octave values shift slightly. A result near a boundary should therefore preserve band data and should not hide behind decimal precision applied to the rating.

Before-and-after comparisons require correlation analysis. Shared instruments, positions, source calibration and processing can cause uncertainties to cancel partly. Different rooms, teams or states can make them independent. Configuration change can dominate measurement

dispersion. The report states what the uncertainty model includes and excludes. A calculated small standard uncertainty is not meaningful when the source state or hidden construction is unknown.¹⁶

Acceptance language should match the evidence. “The measured field quantity satisfied the declared decision rule under the recorded state” is stronger than a vague “the room passed”. The former identifies the proposition. The latter invites readers to infer accreditation, universal security or permanence. Formal disposition records the authority, use, limitations and change triggers separately from the numerical result.

Worked example 37.34. Uncertainty of an improvement

Before and after results differ by 5.2 dB. Standard uncertainties are 1.1 dB and 0.9 dB. If independent, the standard uncertainty of the difference is

$$u_{\Delta} = \sqrt{1.1^2 + 0.9^2} = 1.42 \text{ dB}.$$

If the correlation coefficient is $r = 0.65$, then

$$u_{\Delta} = \sqrt{1.1^2 + 0.9^2 - 2(0.65)(1.1)(0.9)} = 0.86 \text{ dB}.$$

The stronger conclusion is justified only when shared systematic contributors and correlation are documented. Unknown source relocation or room furnishing remains outside the calculation.

37.38 Comparative acceptance register

A completed design should leave a register showing which proposition was tested, what evidence supports it, what remains uncertain, who decided and what change invalidates the disposition. This is more useful than a list of “passes” because different methods answer different questions. A

¹⁶ [MB-0954](#). ISO/IEC 17025:2017, ISO 12999-1:2020.

laboratory wall report, field door test, room-pair test, speech metric, construction inspection, technical-security review and authority approval should not be collapsed into one status.

The register also prevents institutional memory from shrinking to the final certificate. Later staff can identify the exact specimen represented by a laboratory report, the room state represented by field data, the listener assumptions used for a speech assessment and the authority limitation attached to use. When a door, silencer, software package or penetration changes, the register identifies which propositions must be reopened.

A disposition may be conditional. The authority may accept a concealed uncertainty with an operational restriction, a monitoring interval or a mandatory retest after related work; conditional acceptance should not be described as defect-free construction; it is a documented decision about bounded residual risk. The engineering record must remain available so that the condition can be reviewed rather than forgotten.

Table 37-5. Case-study acceptance and lifecycle register

Proposition	Evidence	Limitation	Responsible decision	Change trigger
Wall assembly laboratory performance	Complete ASTM E90 or ISO 10140 report for tested specimen	Test belongs to specimen and laboratory boundary	Design and submittal approval	Product, dimension, framing, fastener or mounting change
Installed room-pair isolation	ASTM E336 or ISO 16283 field spectra and uncertainty	Includes direct and flanking paths under measured state	Project conformity authority	Boundary, furnishing, pressure or adjacent-space change
Installed door performance	ASTM E2964 field result, contact map and functional record	Primarily doorset and immediate surround; field flanking remains	Door and room acceptance authority	Seal, hardware, frame, threshold, pressure or cycling change

Proposition	Evidence	Limitation	Responsible decision	Change trigger
Closed-room speech privacy	ASTM E2638 or approved speech-security method	Listener and source assumptions are bounded	Security or privacy authority	Source, masking, background, access or room-use change
Construction configuration	Inspection, photographs, registers and as-built reconciliation	Inaccessible conditions remain bounded uncertainties	Construction release authority	Penetration, repair, concealment or undocumented alteration
Formal authorised use	Complete dossier and competent-authority disposition	Applies only to defined use, jurisdiction and configuration	Responsible governmental or institutional authority	Change of use, threat, criteria, configuration or incident

37.39 Comparative synthesis across room types

The legal suite is controlled by lightweight-wall workmanship, door condition, conferencing source state and landlord access; the CMU room is controlled by joints, grout, frames, services and structural coupling; the concrete briefing room is controlled by openings, duct paths, pressure and structure-borne vibration. The historic stone room is controlled by hidden voids, reveals, moisture, conservation constraints and reversible interfaces; the medical room is controlled by accessibility, operations, glazing, corridor background and clinical equipment. The room-within-room suite is controlled by bridges, support load, services and restraints.

The comparison yields no universal preferred assembly. It yields a universal method: define use, source, receiver and consequence; map all paths; preserve band data; coordinate every obligation; design for inspection and maintenance; verify in layers; state uncertainty; separate engineering evidence from authority decision; and control change. Materials matter deeply, but their value is realised only through interfaces that preserve the intended mechanism.

37.39.1 Structural, fire, smoke and acoustic obligations

No integrated design is complete when acoustics is permitted to consume structural or life-safety margins; a wall-head joint may require movement capacity under gravity, thermal, wind or seismic action; filling the joint rigidly can improve one acoustic scan while causing cracking, load transfer or loss of fire-resistive performance. A floating floor may require seismic restraints that remain clear during ordinary movement but engage under the design event; a door may require smoke seals, latching, operating force, closer speed and egress hardware that alter acoustic contact. A duct silencer may affect pressure and smoke-control calculations.

The design team uses an interface schedule naming the structural, fire, smoke, accessibility, security and acoustic functions at each critical detail; the schedule identifies which tested system or engineering judgement supports each function, what dimensions and movement ranges are permitted, who may approve change and what must be inspected before concealment. A surface bead of acoustic sealant is not added across an unreviewed fire-resistive joint; an acoustic door bottom does not create an inaccessible threshold; a pipe isolator does not remove required seismic restraint.

37.39.2 Hygrothermal, environmental and durability conditions

Temperature, moisture, pressure and ageing can alter the system; seal compression changes with temperature and wear; timber and historic masonry move with moisture; mineral fibre can slump or become wet. resilient materials creep under load. Duct liners erode. Firestop and sealant systems age differently. Condensation can develop within deep glazed cavities or behind impermeable linings. The design must therefore address

environmental state and inspection access, not merely initial dry laboratory performance.

Durability evidence includes material compatibility, expected movement, service temperature, ultraviolet exposure where relevant, cleaning, corrosion, pests, water incidents and replacement availability. A high-performing product that cannot be inspected or replaced without destroying the boundary creates a lifecycle vulnerability. Baseline photographs and measurements support trend review after years of use.

37.39.3 Maintainability, supply chain and competence

Maintainability begins in design. Seals, hinges, closers, silencers, dampers, isolators, modules and controls require access, identifiers, spares and competent service. Proprietary components may provide excellent performance but create risk when parts or authorised technicians are unavailable. Substitution control therefore addresses both technical equivalence and long-term support.

Competence is task specific. A laboratory accreditation does not establish competence for every field diagnosis; a firestop inspector does not automatically assess acoustic closure; a security official does not replace an acoustical engineer; the project identifies roles, qualifications, supervision, independence and escalation. Complex causation or high-consequence acceptance may require independent review beyond the original design team.

37.39.4 Model completeness before numerical refinement

A design model should be challenged for omitted paths before it is refined numerically; the team reviews every boundary, adjoining volume, service

route, structural connection, electronic source, access state and future change; sensitivity analysis identifies whether uncertain inputs can change the decision. A one-decibel difference between elaborate models is not meaningful when an unrepresented return path contributes six decibels.

37.39.5 Occupied speech consequence, event duration and listener opportunity

Occupied speech-security analysis requires more than a steady source and a room-average receiving value; human speech is intermittent, spectrally structured and information bearing. Vowels carry energy and cadence. Consonants carry much of the lexical distinction; names, numbers and short commands can be understood from fragments even when long-term averages appear favourable; the design should therefore consider source distributions, event duration, repetition, listener opportunity and the possibility that a short adverse state carries disproportionate consequence.

A credible source distribution includes ordinary conversational effort, raised discussion, emotional emphasis, remote participants, installed loudspeakers and accidental replay; the source position and orientation matter; a talker facing a glazed panel or door can create a different local field from a talker at the far end of the table. A wall-mounted loudspeaker can concentrate energy near a boundary and extend bandwidth below ordinary speech; the design does not need to predict every utterance. It must represent states capable of controlling the decision and explain why lesser states are bounded by them.

Listener opportunity is similarly variable. A corridor passer-by has less observation time than a person working in an adjacent office; a service cupboard may be accessible only during maintenance, while a ceiling void

can connect several rooms; background can change with doors, traffic, ventilation and time of day. Repetition increases the chance that partial fragments become meaningful; a bounded assessment therefore records listener position, access duration, orientation, background, hearing assumptions and whether electronic assistance lies inside or outside the method's scope.

The information consequence can also change independently of acoustic level; a repeated project name, access code or negotiation figure may be consequential even when only one phrase is understood; a rhythmic or low-frequency cue can reveal occupancy or equipment operation without revealing words. The engineering report should not convert consequence into a universal decibel threshold; it should state the physical result and provide the responsible authority with the assumptions needed to make the institutional decision.

Operational scenarios are tested as events rather than as one average; door entry, conference connection, alarm response, night setback, maintenance and cleaning can create brief states; a time-weighted average is useful for energy and exposure, but it can conceal a five-second opening during which speech is direct. The test plan therefore includes state transitions, not merely stable endpoints; logs and observations identify how often the transitions occur and whether procedures, automation or architecture can reduce them.

A strong design controls consequence through several layers; it reduces source demand by good interior acoustics and gain limits; it controls direct and flanking paths; it manages receiving access and background through authorised means. It trains users on residual states. It records the limits of

each layer. None is represented as infallible, and no single layer is allowed to carry an undisclosed assumption about the others.

37.39.6 Design for observability, controlled intervention and forensic recovery

A room that cannot be inspected, tested or repaired is difficult to govern; observability is therefore a design property; critical joints, doors, silencers, dampers, service seals, isolators, restraints and control settings should be accessible or captured through reliable hold-point evidence before concealment. Stable identifiers connect the physical item to drawings, photographs, submittals, test results and maintenance records; without this chain, a later discrepancy becomes an expensive search through anonymous construction.

Observability does not require exposing every protected detail; records can be controlled, minimised and distributed according to need; a public publication can describe the method without disclosing a facility configuration; a project record can use identifiers and authorised access. The principle is that the responsible reviewer can determine what was installed, what was measured and what changed. Security is not strengthened by destroying the evidence needed to distinguish a sound baseline from a later defect.

The design should also support discriminating interventions; a removable local seal, temporary isolation release, controlled damper position, source relocation or reversible service closure can test a hypothesis without broad demolition; the intervention plan predicts the direction and approximate frequency signature of change. It records collateral effects such as pressure, damping or source redistribution; a change that produces the expected

contrast strengthens the causal explanation. A change that does not should redirect the investigation rather than be ignored.

Minimally destructive openings are designed as evidentiary acts; the location follows a ranked hypothesis; the authority to open, safety controls, fire and structural precautions, photography, measurements, sample custody and restoration are established in advance; the opening is large enough to answer the question but no larger. Concealed conditions are documented before disturbance. Removed fasteners, seals or materials are retained when their condition may matter to responsibility or litigation. Restoration returns every structural, fire, acoustic and finish obligation to a controlled state.

Forensic recoverability also affects selection. A modular service seal with visible modules can be easier to inspect and alter lawfully than an anonymous field foam; a doorset with replaceable seals and accessible adjustment can be more resilient than a marginally stronger system with unavailable parts. An isolated ceiling with accessible hangers and clear service ownership can be maintained better than a concealed web of shared supports; the comparison includes the cost of future diagnosis, not merely first installation.

The final evidence dossier should permit another competent team to reconstruct the reasoning; it contains the authorised question, as-found and as-left states, methods, raw data, calibration, source and receiver coordinates, operating conditions, interventions, uncertainty, photographs, drawings, limitations and disposition. Reproducibility does not mean that another team will obtain an identical value under every room state; it means

that differences can be traced to method, configuration or environment rather than hidden by an incomplete record.

37.39.7 Data integrity, stable identifiers and configuration control

The physical room and its digital record form one lifecycle system; drawings, photographs, instrument files, software exports, control logs, submittals, test reports and authority dispositions must remain linked to stable room, boundary, path and asset identifiers; file names such as “final test” or “door photo” are insufficient. The record should state location, date, state, author, instrument, version and relation to the approved baseline; the same identifier should appear on drawings, penetration registers, photographs and test channels wherever practicable.

Raw data are preserved in documented formats together with processing instructions; a printed single-number result cannot support later reprocessing when a method changes or a dispute arises; frequency spectra, time histories, position data, calibration records and environmental states should remain available according to the project’s retention and security rules. Derived tables identify the script, software or manual process used; any correction is traceable to the original rather than overwriting it silently.

Checksums can detect later alteration, but they do not establish that the original evidence was complete or correct; a hash belongs to a file, not to the truth of a measurement; data integrity therefore combines capture controls, access control, version history, review, metadata, reproducible processing and cryptographic verification where proportionate. A checksum register is especially useful at acceptance, transfer between organisations,

litigation hold and publication release because it fixes the exact evidence set being discussed.

Software-defined systems need configuration records comparable to physical drawings; masking controllers, conferencing endpoints, digital signal processors, building automation, access control and remote-management platforms can change source level, background, schedule, pressure and alarm behaviour; the baseline records firmware, configuration export, credentials or custody arrangements, network dependency, authorised remote access, gain limits, mute behaviour, logging and recovery. A firmware update is treated as a potential technical change even when no wall is touched.

The change process classifies work by physical and functional effect; replacing a seal with the accepted part may require inspection and functional test; changing a door leaf, frame or automatic bottom can require field measurement; adding a conduit or cable bundle requires penetration-register update and closure inspection. Changing HVAC controls or masking software requires state testing. A major room-use or source change can reopen the complete speech-security proposition. Emergency work is documented immediately and reviewed retrospectively.

Configuration control also resolves discrepancies among states; the approved design may show one silencer, the submittal another, the as-built drawing a third and the room a fourth; the project does not select the most convenient record; it identifies the actual item, determines how the discrepancy arose, assesses equivalence, measures where necessary and records the authority disposition. This discipline prevents an accepted test from becoming detached from the room it was meant to represent.

37.39.8 Programme governance, competence and independent review

An organisation operating several protected or privileged-discussion rooms should govern them as a programme without erasing room-specific differences; common registers, naming rules, inspection forms, source-state definitions, calibration controls and change classifications improve consistency; programme analytics can identify recurring doorset, seal, firestop, software, silencer or contractor issues. The analysis must account for age, workload, exposure, inspection intensity and sample size so that raw defect counts are not mistaken for comparative performance.

Governance begins with ownership. One role should maintain the room baseline, but multidisciplinary decisions remain with their proper authorities; facilities staff manage access and maintenance; acoustical specialists define and interpret measurements; structural and fire professionals govern their systems. Information-technology and security teams manage electronic configurations. Counsel may govern privilege and preservation. The competent authority decides formal use where applicable. A responsibility matrix makes hand-offs and escalation visible.

Competence is demonstrated for the task. A technician may perform a standard field test competently but lack experience in structural-vibration causation; a laboratory may be accredited for one method but not another; a commissioning provider may understand HVAC operation but not closed-room speech inference. The engagement identifies method competence, equipment, supervision, relevant experience, independence and limitations; high-consequence or disputed matters may require a second team or an independent reviewer with access to raw evidence.

Independent review should challenge assumptions rather than merely repeat arithmetic. The reviewer examines whether the authorised question is clear, whether source and receiver states are credible, whether paths are complete, whether methods support the claimed propositions, whether uncertainty and configuration are treated separately, and whether the conclusion exceeds the evidence. Where the original design team also tests its remedy, independent examination of the test plan and raw data can reduce shared-assumption risk without duplicating every measurement.

Training converts the design into durable practice; users need concise instruction on doors, conferencing, masking, after-hours conditions and incident reporting; maintenance personnel need controlled procedures for seals, access panels, filters, dampers, penetrations and software; contractors need pre-work review and hold points. Inspectors need identifiers and acceptance criteria. Training records and periodic drills show whether the operating model exists beyond the final report.

Programme assurance uses trends and triggers rather than arbitrary calendar repetition alone; annual walkdowns may confirm doors, seals, penetrations, equipment and records. Targeted indicators can reveal drift. Major retesting follows source, path, receiver, use or authority changes, significant adverse trends, incidents or unresolved evidence gaps; the programme records both failures and stable rooms; positive evidence can identify maintainable products, competent processes and details that should become organisational standards.

37.39.9 Climate, overseas logistics and operational resilience

Environmental and logistical conditions can alter both the design and the credibility of its evidence; a room built in a dry temperate laboratory context

may be installed in a humid coastal, tropical, arctic, desert or high-altitude setting. Temperature and moisture affect seal compression, timber movement, masonry drying, corrosion, resilient-material stiffness, electronic equipment, microphone response and HVAC operation; external pressure, wind and rain can change façade and door states; the design basis therefore identifies environmental ranges and does not assume that one commissioning day represents every credible season.

Overseas and remote projects also face substitutions, long lead times, limited specialist labour and restricted access to calibration or repair services; the procurement plan identifies critical products, approved alternatives, spare seals and hardware, test-equipment support and the evidence required when local supply differs. Shipment damage, storage temperature, moisture and site handling can invalidate otherwise satisfactory products; receiving inspection records packaging, condition, identity, batch and quarantine decisions before installation.

Commissioning resilience requires contingency planning. A failed analyser channel, unavailable specialist, delayed authority witness or inaccessible adjoining room should not force the team to accept an improvised method; the plan identifies minimum equipment, backup channels, calibration checks, data redundancy, secure storage and decision points for suspension. Where a required state cannot be tested, the limitation is recorded and the affected proposition remains open; schedule pressure does not transform missing evidence into compliance.

Operational resilience extends beyond routine use. Power loss, fire alarm, smoke control, emergency ventilation, network outage, extreme weather and temporary plant can change source, path and receiver conditions; the

room may need to remain usable under some states and be suspended under others. The authority and operator define those boundaries; controls should fail visibly where protection is reduced, with alarms, logs or procedures that prevent an adverse state from remaining unnoticed.

Recovery after an incident or disaster requires a protected baseline; water intrusion can wet linings, corrode frames and alter seals; seismic movement can close isolation gaps or damage joints; emergency cable and pipe work can create new penetrations. Temporary generators and air-handling units can introduce structural or duct paths. Reoccupation therefore follows triage, inspection, controlled repair and proportionate recommissioning rather than a visual assumption that the room appears intact.

Climate and logistics do not justify weaker analysis; they increase the need for bounded claims, robust details, accessible maintenance and competent local support; a design intended for sustained institutional use should remain understandable and repairable after the original consultant, contractor and product representative have departed. Resilience is the ability to preserve the evidence chain under change, not merely the ability to endure one favourable test.

37.39.10 Computational reproducibility and model governance

Integrated design increasingly depends on spreadsheets, scripts, finite-element models, building-acoustic prediction tools and digital commissioning platforms; these instruments can improve consistency, but they can also conceal assumptions behind a polished output; every consequential model should therefore have a declared purpose, owner, version, input set, unit convention, numerical method, acceptance use and known limitation. The record should preserve the calculation file or source

code, not merely a printed result; it should also identify the software version, libraries, solver settings, rounding, filters and any manual intervention that materially affects the result.

Reproducibility has several levels. Arithmetic replication repeats the calculation with the same inputs; independent implementation expresses the same physical model in a separate workbook, script or programme; measurement corroboration compares the model with observed room behaviour; model falsification identifies results that would contradict the proposed mechanism. Agreement at one level does not establish the others. Two spreadsheets can agree because both copied the same mistaken assumption. A field result can disagree because the configuration changed rather than because the equation is wrong. The review record should state which form of agreement was obtained.

Model governance also requires test cases. A path-addition routine should reproduce known limiting cases, such as one dominant path, two equal incoherent paths and an extremely weak secondary path; unit checks should reject incompatible quantities; sensitivity analysis should reveal whether a modest input change can reverse the decision. Stored input tables should use stable identifiers tied to drawings, equipment schedules and test records; cryptographic hashes can detect later byte-level change, while revision notes explain why the model changed. Neither device proves that the physical assumptions are correct, but together they preserve the computational evidence for later examination.

37.39.11 Controlled information, redaction and release-copy integrity

The design dossier can contain drawings, path maps, room adjacencies, equipment configurations, residual limitations, test positions and operational states that should not circulate without control; information protection must therefore be designed into the evidence process; the project should define the authoritative master, authorised recipients, storage location, retention period, derivative-copy rules, destruction method and incident response. Public or broadly distributed reports should disclose enough method and limitation to remain technically honest without reproducing protected criteria or facility-specific vulnerabilities.

Redaction is a technical act rather than a black rectangle placed over visible text; a release copy should be generated from the controlled master through a documented process; hidden layers, comments, tracked changes, attachments, metadata, alternative text, bookmarks and searchable text beneath visual masks must be examined. Images should be reviewed for background details, drawing numbers, coordinates, badges, screens and reflections; tables and cross-references should be checked after removal so that the released document does not disclose omitted content through numbering, captions or residual links. The unredacted master remains preserved under appropriate authority, while the derivative receives its own identifier and checksum.

Distribution records should identify which version each recipient received; later corrections require withdrawal or supersession rather than quiet replacement; where counsel, security officials, engineers and publishers review different propositions, their dispositions should remain separate;

legal review does not certify acoustic performance. Technical review does not decide public release. Security review does not determine copyright permission. The final publication record should show that each authority acted within its role and that unresolved restrictions were carried forward. This discipline protects both the room and the credibility of the scholarship, because a carefully bounded release is more useful than an apparently complete document whose provenance and omissions cannot be reconstructed.

Worked example 37.35. Option ranking after a missing path is discovered

Three room concepts initially predict whole-room receiving levels of 30 dB, 28 dB and 27 dB. Concept C appears strongest. A later interface review discovers that Concept C omitted a return-air path contributing 34 dB; energetic combination raises its total to 34.8 dB; concept B includes all services and remains at 28 dB; the result illustrates a basic rule: a complete moderate model is more valuable than an optimistic model that omits one path.

37.40 Conclusions and transfer to failure analysis

The final strength of a secure-room design is not a dramatic number. It is a coherent chain from requirement to configuration, from configuration to measurement, from measurement to bounded speech consequence, from consequence to competent decision, and from decision to a maintained baseline. The chain remains visible because laboratory evidence, installed field evidence, occupied speech-security evidence and formal acceptance are not blended into one ambiguous claim.

The integrated studies demonstrate recurring rules. Whole-room performance is an energetic network. Frequency bands matter. Doors, glazing, ducts, joints and services can dominate large strong boundaries; structural and airborne paths require different evidence; operating state can change the source and receiver without changing construction; measurement uncertainty does not cure configuration uncertainty. Fire, structure, smoke, accessibility, heritage and security remain parallel obligations. Commissioning must be layered, and change control must begin before acceptance rather than after the first failure.

The integrated method also disciplines professional language; design predictions are labelled as predictions; inspections state what was visible and what remained concealed; measurements identify the quantity obtained and the state represented. Diagnostic interventions support mechanisms without pretending to prove intent or exploitation. Authority dispositions identify the use accepted and the limitations carried forward. This layered vocabulary is not administrative caution. It is the means by which later engineers, operators, counsel and officials can understand what the room was actually shown to do.

A durable publication should teach that discipline as clearly as it teaches equations. Readers should be able to trace every calculation to variables and assumptions, every requirement to an owner, every figure to a physical mechanism, every table to an evidence decision, and every conclusion to a stated scope; where evidence is missing, the gap remains visible. Where the project chooses a residual risk, the choice is recorded rather than disguised as physics; the resulting design may be complex, but it is auditable, repairable and honest.

A room is therefore not finished when construction stops or when one test report is issued. It is finished only to the extent that its configuration, evidence, authority disposition, maintenance and change triggers agree. Chapter 38 turns from these designed examples to failure cases, showing how ordinary omissions, workmanship, later alterations, narrow tests and institutional habits can defeat otherwise sophisticated systems.

Chapter 37 Glossary

Acceptance register. Controlled record linking each proposition to evidence, limitation, decision authority, disposition and change trigger.

As-built state. Documented physical condition of the completed construction, including materials, dimensions, interfaces, penetrations, repairs and deviations.

As-designed state. Intended configuration expressed by the approved design basis, drawings, specifications, calculations and controlled criteria.

As-operated state. Actual combination of room configuration, occupants, electronic settings, pressure, HVAC, masking, access and use during operation or testing.

As-submitted state. Products, assemblies and methods proposed by suppliers and contractors for approval before installation.

As-tested state. Exact physical and operating condition represented by a measurement campaign.

Composite boundary. Separating construction formed from elements with different areas and transmission coefficients, such as wall, door, glazing, joints and openings.

Configuration uncertainty. Uncertainty caused by incomplete knowledge of the physical or operating state rather than instrument dispersion alone.

Design-basis matrix. Structured record relating protected function, source, path, receiver, measurand, method, evidence, authority and change control.

Dominant-path migration. Change in the path controlling the total result after a stronger path is reduced.

Guard band. Deliberate interval between a measured result and a decision boundary used to manage conformity risk in view of uncertainty.

Integrated commissioning. Layered verification of construction, functional systems, local paths, whole-room performance, speech consequence, authority decision and lifecycle baseline.

Listener-access assumption. Defined physical and operational condition determining where a potential listener can be located and for how long.

Mass-air-mass resonance. Coupled resonance of two leaves and the compressible air cavity between them, subject to finite size, support, damping, leakage and structural coupling.

Model discrepancy. Difference between the behaviour of the real system and the mathematical or conceptual model selected to represent it.

Path register. Controlled list of direct, flanking, service, structural, electronic and operational routes with identifiers, evidence, status and controls.

Protected function. Authorised use and information consequence that establish the security and privacy design basis.

Reversible retrofit. Intervention designed to improve performance while allowing removal with limited damage and preserving significant existing fabric.

Room within room. Inner floor, walls and ceiling arranged to reduce coupling to an outer shell, with performance dependent on supports, services, restraints, clearances and openings.

Source-state matrix. Record of source level, spectrum, direction, position, duration, amplification, processing and operating mode for credible conditions.

Speech-security proposition. Bounded statement concerning information audibility or intelligibility under defined source, boundary, background, listener and operational assumptions.

Substitution equivalence. Demonstrated functional and evidentiary correspondence between proposed and specified products or assemblies, not merely equal nominal ratings.

Weakest-path analysis. Evaluation of the complete transfer network to identify contributions that control or materially limit the system result.

Chapter 38. Failure Case Studies and Lessons for Institutional Practice

A secure room rarely fails with theatrical clarity. The first sign may be one surname recognised beside a door, a faint cadence in a ceiling void, a low-frequency pulse felt through a slab, a result that changes when the air-handling plant stops, or a maintenance record that no longer agrees with the room in front of the investigator. Each observation matters. None identifies the cause by itself.

Failure analysis must therefore resist two opposite temptations; the first is to dismiss a local symptom because a wall carries an impressive laboratory rating or because the room once passed a field test; the second is to treat every defect as proof of compromise, malicious action or institutional negligence. A defective seal can create susceptibility without establishing that anyone exploited it; an overheard fragment can justify immediate protective action without proving the entire conversation was intelligible; a nonconformance can be serious even when no information loss is demonstrated. The language of the conclusion must remain proportionate to the evidence.¹⁷¹⁸

The cases in this chapter are expressly labelled as composite, hypothetical or modelled; they draw upon recurring mechanisms recognised in building acoustics, construction inspection, commissioning and forensic engineering, but they do not disclose controlled criteria or purport to describe a particular protected facility; numerical values are illustrative unless the text identifies a measured project value. Public standards define methods within

17 [MB-0240](#). ASTM International, ASTM E2713-25.

18 [MB-0249](#). ASTM International, ASTM E3176-24.

their scopes; they do not establish project-specific adequacy, governmental accreditation or universal protection.¹⁹²⁰

Every case preserves the four-proposition separation. Laboratory assembly performance is one proposition. Installed field performance is another. Occupied speech-security performance under defined source and listener assumptions is a third; formal authorisation remains a fourth institutional act; failure can occur in any one of these domains while another remains sound; the purpose of the case study is to identify which proposition is actually affected, what evidence supports the causal explanation, what remains unresolved and what change should trigger renewed review.

19 [MB-0317](#). ASTM International, ASTM E90-23, ASTM E336-25a.

20 [MB-0901](#). International Organization for Standardization, ISO 717-1:2020, ISO 16283-1:2014.

Failure Analysis Evidence Chain

Case studies move from reported symptom to a bounded causal conclusion and controlled lifecycle response.

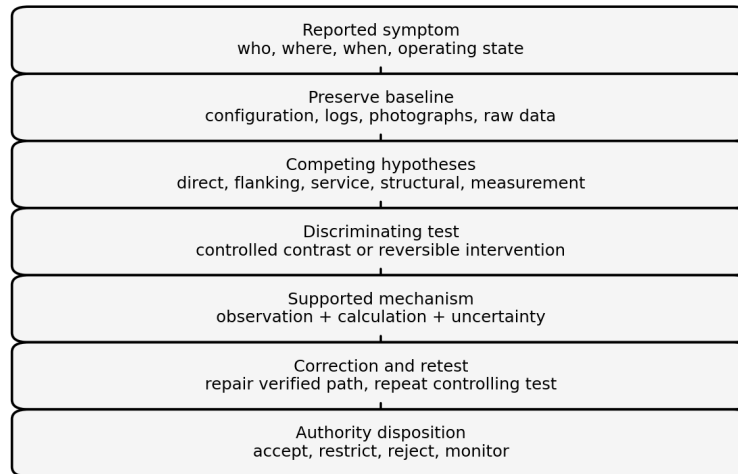


Figure 38-1. Failure analysis proceeds from reported symptom through baseline preservation, competing hypotheses, discriminating tests, supported mechanism, correction, retest and authority disposition. Author's original diagram.

38.1 Case-study status, evidence classes and limits of inference

A technical case study is useful only when the reader can distinguish what was seen from what was inferred. This chapter uses five evidence classes; **observed fact** means a condition recorded by inspection, instrument, document or controlled witness within the stated scope; **calculated result** means a value obtained from disclosed inputs and assumptions. **Supported inference** means an explanation that fits the observations better than identified alternatives, usually after a discriminating test; **composite illustration** means a synthetic case assembled from common mechanisms for teaching; **not established** identifies propositions for which the record is insufficient, such as intent, exploitation, complete conversation recovery or formal authorisation.

These classes are not a hierarchy in which every observation automatically matures into certainty; a photograph can establish that a gasket was torn at a particular time; it does not establish how long the damage existed, whether the door was used during a protected discussion, or what a listener could recover outside. A measured level difference can establish a bounded field quantity; it does not prove the hidden construction matches a laboratory specimen. A temporary seal that improves one band can support leakage as a mechanism, but collateral changes in pressure, damping or source distribution must still be considered.

Case files should record the authorised question, room and boundary identifiers, relevant time interval, source state, receiver access, operating condition, configuration baseline, instruments, calibration, raw data, photographs, drawings, interventions, uncertainty and decision authority. If litigation or an incident inquiry is possible, original files and physical items may require controlled custody. The engineering team should avoid converting a security concern into an accusation before the physical and documentary sequence is established.²¹²²

Table 38-1. Evidence status and permissible conclusion

Evidence status	Typical record	Permissible conclusion	Prohibited leap
Observed fact	Photograph, dimensional survey, raw spectrum, access log	The stated condition was observed under the recorded circumstances	The condition caused every reported consequence
Calculated result	Inputs, equation, units, assumptions and sensitivity	The model gives the stated value within its assumptions	The real room must behave identically
Supported inference	Competing hypotheses, discriminating test, uncertainty	One mechanism is better supported than identified alternatives	No other mechanism exists

21 [MB-1050](#). National Institute of Standards and Technology, NISTIR 8387, Digital Evidence Preservation: Considerations for Evidence Handlers.

22 [MB-0813](#). ISO/IEC 27037:2012, ASTM E3176-24.

Evidence status	Typical record	Permissible conclusion	Prohibited leap
Composite illustration	Explicitly synthetic facts and numbers	The case demonstrates an engineering principle	The event occurred at a named or real facility
Not established	Stated evidentiary gap	The proposition remains unresolved	Absence of evidence proves absence or presence

Worked example 38.1. A temporary seal as discriminating evidence

A local door-jamb microphone records 38 dB in a selected band during a controlled source test; temporary removable sealing lowers the level to 30 dB while the source reference changes by only 0.3 dB; the observed reduction is 8 dB. That contrast strongly supports a leakage contribution at the treated interface; it does not establish that every remaining path is controlled, that the permanent repair will produce the same result, or that protected speech was previously understood. The temporary state must be removed, the doorset repaired in its normal operating configuration and the controlling field test repeated.

38.2 From symptom to causal mechanism

The causal chain begins with a symptom but cannot end there. “Speech heard in corridor” can arise from door leakage, a transfer grille, a shared plenum, structural radiation, an open adjoining door, a conferencing loudspeaker, an unusually quiet receiving state, or a measurement error in the original acceptance record. “Low STC” is even less precise because it may refer to a laboratory specimen, an apparent field rating, a door classification or an informal estimate; the first task is to translate the report into measurable alternatives.

A broad-to-narrow strategy is normally the most efficient; the investigator first preserves the room and reproduces the relevant operating state; whole-room and adjoining-zone measurements establish consequence and frequency signature; boundary and service-family scans then identify where energy is concentrated. Reversible interventions test specific paths. Targeted opening follows only where the evidence predicts a concealed condition and less intrusive methods cannot answer the question; this order prevents a visually striking but irrelevant defect from capturing the investigation.²³

Causation is strengthened by four forms of agreement; **temporal agreement** asks whether the suspected condition existed when the symptom occurred. **Spatial agreement** asks whether the response is strongest along the proposed path; **spectral agreement** asks whether peaks, slopes or modulations correspond between source and receiver; **intervention agreement** asks whether altering the proposed mechanism changes the consequence in the predicted direction; no single form is invariably sufficient, but their convergence can support a bounded conclusion.

The investigation should also seek evidence that could reverse the preferred hypothesis; if a door seal appears defective, the team should ask whether the same receiving signature persists after a competent temporary seal; if a duct path is suspected, it should examine source-receiver coherence, fan and damper states, branch geometry and alternative plenum routes. A hypothesis that survives only because contrary tests were never attempted is weak.

²³ [MB-0082](#). ASTM E2713-25; Carl Hopkins, ASTM E2713-25.

Worked example 38.2. Parallel-path reduction after a local intervention

Three uncorrelated receiving contributions are estimated as 37 dB from a door, 31 dB from a plenum and 29 dB from structural radiation. The initial total is

$$L_{tot} = 10 \log_{10} (10^{37/10} + 10^{31/10} + 10^{29/10}) = 38.5 \text{ dB}.$$

A reversible door treatment lowers the door contribution to 27 dB; the new total is 34.1 dB, an improvement of only 4.4 dB rather than the 10 dB local change; the result supports the door as the former dominant path and shows that the plenum now controls the residual. The calculation assumes energetic independence and compatible reference conditions.

38.3 Composite case A. Door-seal failure under frame distortion

Case status: composite illustration. A legal meeting room uses a heavy acoustic doorset in a lightweight separating wall. The wall field performs strongly in local tests, yet raised speech is intermittently recognisable near the latch jamb. The complaint is more frequent during winter and when the corridor is under negative pressure. Maintenance records show repeated closer adjustment but no complete doorset survey.

Inspection finds that the frame is out of plane; the latch engages, but the leaf contacts the head and hinge-jamb seals before sufficient compression develops along the lower latch jamb; the automatic bottom operates, although its contact varies across a slightly uneven threshold. A smoke pencil is not used as proof of acoustic performance, but controlled pressure and contact-film checks reveal the same local discontinuity identified by the acoustic scan; the leaf, frame, seals, threshold, closer, hinges and

surrounding wall are therefore treated as one mechanical system rather than separate products.²⁴

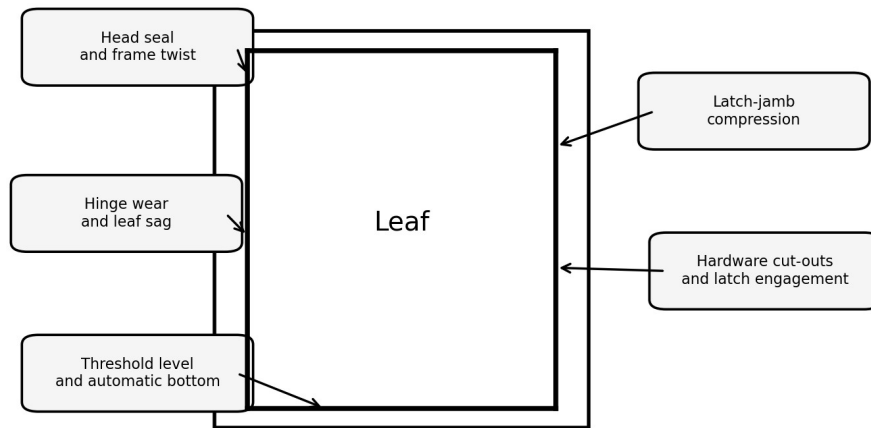
The investigation compares three hypotheses: inadequate leaf transmission loss, local perimeter leakage and an overhead flanking path; surface response on the leaf is modest; receiving level is sharply localised at the latch jamb; a removable compression aid reduces the critical bands without materially changing source level or overhead response. The evidence supports local seal contact as the principal mechanism under the tested state. It does not establish that the leaf equals its laboratory specimen or that no ceiling path exists.

The permanent correction realigns the frame within structural and fire constraints, replaces damaged seals, adjusts hinges and latch, verifies closer force and confirms accessible operation; the automatic bottom is reset against the finished threshold; the doorset is then cycled repeatedly before local and room-pair retesting. The final record includes frame measurements, contact maps, pressure state, hardware settings, seal identity and maintenance triggers.

²⁴ [MB-0244](#). ASTM International, ASTM E2964-26, ASTM E336-25a.

Door-System Failure Map

A doorset is a mechanical, geometric and operational system, not merely a rated leaf.



Failure may be local, intermittent and pressure dependent. Functional cycling and contact mapping remain essential.

Figure 38-2. Door-system failure can arise at the head, jambs, threshold, hinges, latch, hardware preparations and surrounding frame. Author's original diagram.

Worked example 38.3. Area of a narrow perimeter discontinuity

A 900 mm wide door has a 2 mm high incomplete-contact strip along 600 mm of the automatic bottom. The geometric open area is

$$S_o = (0.002)(0.600) = 0.0012 \text{ m}^2.$$

The area is only 0.12 per cent of a 1.0 m² reference boundary, yet an ideal open-path screen assigns it a transmission coefficient far larger than that of a high-isolation opaque field; real flow resistance, tortuosity and seal motion reduce the ideal value. The calculation nevertheless explains why a visually narrow gap can dominate an otherwise substantial doorset.

38.4 Composite case B. Automatic bottom, threshold transition and operational wear

Case status: composite illustration. A medical consultation room passes its initial room-pair test but develops local audibility eighteen months later.

The complaint appears after flooring replacement in the corridor. The door leaf and perimeter seals are unchanged, and the maintenance team initially assumes the complaint cannot involve the doorset because the product remains within its warranty period.

The new flooring assembly changes threshold geometry; its transition strip sits slightly proud at the hinge side and slightly low at the latch side; the automatic bottom drops, but its mechanism reaches full travel before uniform contact develops. Repeated cycling produces polishing on one end of the seal and little witness marking on the other; the closer also permits occasional rebound when users release the door from a short distance. These conditions are operational, not merely geometric. A static photograph of a closed leaf would miss them.

The test programme records closing from normal user positions, latch engagement, rebound, operating force, pressure differential and contact over thirty cycles; local acoustic response varies with each closure; the evidence supports incomplete and inconsistent threshold contact; it does not justify increasing closer force beyond accessibility or egress limits. The remedy must satisfy acoustic, fire, smoke, safety and access obligations together.

The floor transition is reconstructed to the approved geometry, and the automatic bottom is serviced rather than merely lowered; the team verifies that the seal retracts fully when open, deploys without dragging and contacts the threshold across its width. The maintenance schedule is changed to include functional cycling and contact mapping after flooring, hardware or pressure changes.

Worked example 38.4. Time exposure from intermittent closure failure

A door closes correctly during 94 per cent of protected-use minutes; during the remaining 6 per cent, receiving level at a nearby position rises from 28 dB to 49 dB. The energetic time average is

$$L_{eq} = 10 \log_{10} \left[0.94 \left(10^{28/10} \right) + 0.06 \left(10^{49/10} \right) \right] = 37.3 \text{ dB}.$$

The average rises by about 9.3 dB; more importantly, the short defective intervals may contain complete names or numbers; an energy average cannot represent the information consequence of a brief open or poorly sealed state.

38.5 Composite case C. Duct cross-talk between adjoining rooms

Case status: composite illustration. Two executive meeting rooms share a mechanical riser. Their separating wall continues to the deck, but each room connects through short return branches to a common duct. Daytime testing with the central fan operating shows acceptable room-pair isolation. After-hours staff report that speech is clearer when the plant enters setback mode.

The initial design record contains laboratory silencer data but no complete branch-path model; inspection shows that the return branches join upstream of the silencers shown on one drawing revision; a later coordination drawing moved one silencer to solve a ceiling conflict, yet the acoustic submittal and commissioning plan were not revised. When the fan runs at daytime speed, airflow noise raises receiving background; in setback, the background falls and a damper position creates a more direct

acoustic path. The same change that removes masking also changes transfer.

Testing separates source-to-receiver attenuation from background. Reference microphones track the source. Branch pressure and damper states are recorded. A temporary lined blank at an accessible branch reduces speech-correlated energy, while the wall-field response remains stable. The evidence supports duct-borne cross-talk as a dominant after-hours mechanism; it does not establish the installed silencer insertion loss directly because casing breakout, branch geometry and regenerated noise remain part of the system.²⁵²⁶

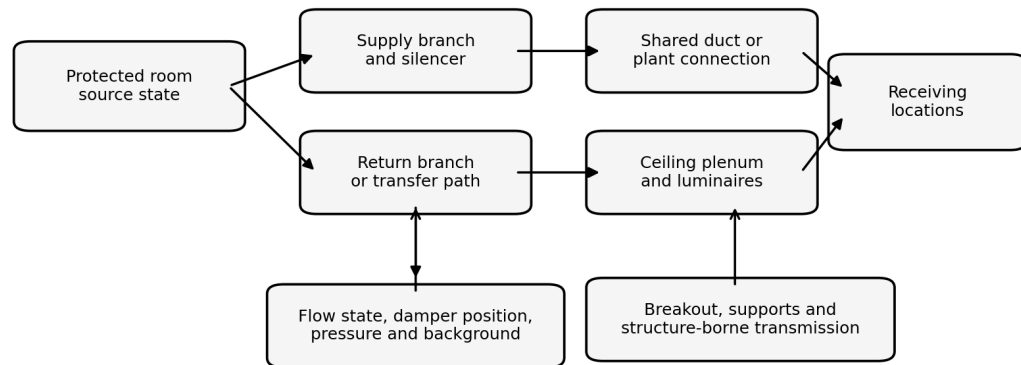
The remedy reconfigures the branch to restore acoustic separation, installs the reviewed silencer arrangement with service access, and coordinates pressure drop, airflow, smoke-control and maintenance requirements; commissioning covers normal, setback, purge and failure states; the as-built duct path and control sequence become part of the room baseline.

²⁵ [MB-0291](#). ASTM International, ASTM E477-26.

²⁶ [MB-0210](#). ASTM International, ASTM E1414, ASTM E336-25a.

HVAC and Plenum Failure Network

Transmission can pass through ducts, plenums, casing breakout, structural supports and regenerated flow noise.



Laboratory insertion loss does not establish installed path attenuation, casing radiation, airflow noise or operational privacy.

Figure 38-3. HVAC transmission may follow supply branches, returns, shared plenums, casing breakout, structural supports and operating-state changes. Author's original diagram.

Worked example 38.5. Wall and duct contributions

At 1 kHz, the wall path contributes 29 dB at the receiver and the shared return path contributes 38 dB; their energetic total is 38.5 dB; a duct correction lowers the return contribution by 14 dB to 24 dB. The new total is 30.2 dB, an 8.3 dB whole-room improvement; the wall becomes dominant after repair. The local 14 dB duct improvement cannot be reported as a 14 dB room improvement.

38.6 Composite case D. Shared ceiling plenum and quiet-state reversal

Case status: composite illustration. A commercial privileged-discussion suite uses partitions that stop at the structural deck, but several ceiling zones contain common access routes, luminaires and return-air openings. A daytime acceptance test is performed with office occupancy, masking and

normal ventilation. A later audit in a quiet evening state identifies strong local response above a demountable ceiling tile near the partition line.

The investigation distinguishes a shared plenum path from ordinary ceiling attenuation. The laboratory rating for the ceiling product was obtained under a prescribed test arrangement; the field plenum contains cable trays, access panels, diffusers, partition-head discontinuities and a return-air route that differ materially from that arrangement; ceiling attenuation class, where available, cannot be treated as a field room guarantee. The real path includes the ceiling on each side, plenum volume, absorption, leakage, services and the extent of the partition.²⁷

A source-position series shows that the response is strongest near the return opening and one recessed light; removing a tile increases level broadly, confirming that the ceiling participates, but this diagnostic state is not an acceptance condition. A temporary plenum barrier segment near the partition reduces the local response, although airflow and fire conditions prevent it from serving as a permanent remedy; the evidence supports a composite ceiling-plenum-service path.

The final correction extends and seals the intended boundary where permitted, treats service interfaces, revises the return path and replaces damaged ceiling components. The design retains inspection access. Formal retesting includes the quiet receiving state because daytime background had concealed, rather than corrected, the path.

²⁷ [MB-0041](#). American Society of Heating, Refrigerating and Air-Conditioning Engineers, current public handbook guidance on HVAC acoustics.

Worked example 38.6. Day and night speech margin

A transmitted speech band is 34 dB at a receiving position; daytime background is 39 dB, giving a simple level margin of -5 dB; night background falls to 27 dB, giving +7 dB; the transfer path is unchanged, yet detectability changes by 12 dB. The example is not an intelligibility calculation. It shows why operating background must be treated as a controlled state rather than a permanent property.

38.7 Composite case E. Silencer substitution, casing breakout and regenerated noise

Case status: composite illustration. A specialist silencer specified for a secure meeting room is substituted during construction because of lead time. The replacement has a similar mid-band laboratory insertion-loss curve and lower pressure drop. It is accepted through a submittal summary that omits casing gauge, length, splitter geometry, flow velocity and low-frequency data.

After occupation, testing reveals strong transfer in lower speech bands and elevated self-noise at high airflow; the replacement is shorter and lighter. Its casing radiates into the ceiling void, and an abrupt transition creates turbulence downstream; the laboratory report for the substitute remains valid for its tested configuration; the failure lies in transferring that evidence to a different installed path without accounting for breakout, flow-generated noise, transitions and surrounding construction.²⁸

The investigation uses fan-speed contrasts, duct surface vibration, in-duct levels and local receiving measurements; a lagging intervention on an accessible casing section reduces one component but does not correct the

²⁸ [MB-0291](#). ASTM International, ASTM E477-26.

branch path; a lower-flow test reduces regenerated noise but changes ventilation and pressure. These contrasts separate mechanisms without pretending that one intervention represents the final state.

The remedy is selected through a system model; options include a longer silencer, improved casing, smoother transitions, reduced face velocity, branch separation or enclosure treatment; the final choice must satisfy ventilation, smoke control, maintenance and spatial constraints. The accepted configuration is identified by model, orientation, airflow range, adjacent ductwork and access condition.

Worked example 38.7. Bypass limits insertion-loss benefit

A silenced path would contribute 22 dB at the receiver. Casing breakout contributes 31 dB. The total is 31.5 dB. Improving the internal silencer path by a further 10 dB changes the total only to 31.1 dB; the 0.4 dB whole-system benefit is negligible because casing breakout controls; a component curve cannot justify replacement until the dominant installed mechanism is identified.

38.8 Composite case F. Incomplete masonry joints and porous interfaces

Case status: composite illustration. A fully grouted concrete-masonry room is believed to provide a robust boundary. Field testing shows unexpectedly poor upper-band isolation along one vertical line and at the wall-to-deck interface. The visible faces are painted, and the contractor points to the unit mass and grout certificates as proof that the wall cannot be the problem.

Borescope examination from an authorised opening and review of construction photographs show incomplete head joints in a concealed chase. At the deck, mortar and sealant do not form a continuous closure around irregular flutes and embedded services. Several cells are grouted, but the local air path bypasses the mass. Product compliance and compressive strength do not establish joint continuity or acoustic closure.²⁹

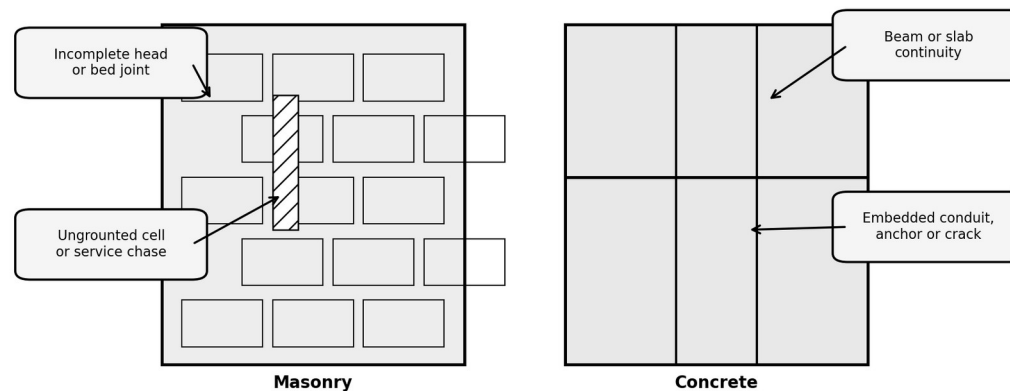
The investigation avoids indiscriminate injection. Pressure scanning, local sound-intensity measurements and reversible surface sealing identify the most responsive joints; the team also examines whether the finish is vapour compatible and whether the wall carries structural or fire functions; the preferred repair reconstructs accessible joints, applies an appropriate parge or lining where justified, and rebuilds the head detail through observed hold points.

The case demonstrates why massive construction can fail through workmanship that occupies a small fraction of the area. The masonry remains heavy. The direct field is not the controlling path; the conclusion is limited to the treated boundary and tested states; hidden joints elsewhere remain subject to the sampling plan.

²⁹ [MB-1185](#). The Masonry Society, ASTM C90-24a.

Hidden Paths in Masonry and Concrete

Massive construction can be weakened by incomplete joints, voids, embedded services and connected structure.



Surface appearance and material mass do not establish continuity. Investigation must preserve structural, fire, moisture and heritage obligations.

Figure 38-4. Massive walls can contain incomplete joints, ungrouted cells, service chases, cracks, embedded elements and structural continuity that bypass surface mass. Author's original diagram.

Worked example 38.8. Continuous open-joint screen

A wall area is 24 m². A concealed discontinuity is modelled as a 3 mm wide open strip extending 2.4 m, with area 0.0072 m²; if the wall field has 58 dB loss and the strip is conservatively treated as an open path, the area-weighted screen gives

$$\tau_c = \frac{(23.9928)(10^{-5.8}) + (0.0072)(1)}{24}, R_c \approx 35.2 \text{ dB}.$$

The ideal-open assumption is deliberately severe. Mortar roughness and path tortuosity reduce transmission. The calculation shows why continuity deserves direct inspection rather than inference from wall mass.

38.9 Composite case G. Grout voids and false confidence from wall mass

Case status: composite illustration. A reinforced concrete-masonry wall separates a protected briefing room from a controlled service corridor;

design documents require grouted cells at reinforcement and selected full-height zones; the contractor's submittal includes grout mix data and delivery records. After completion, vibration and acoustic observations show a repeatable mid-frequency anomaly along one vertical strip; the project team argues that the total delivered grout volume was adequate; volume reconciliation is useful, but it does not prove distribution, consolidation or absence of voids at the critical location.

The investigation first determines whether the anomaly is an air path, a local panel-like resonance, a structural connection or a measurement artefact; surface vibration under controlled airborne excitation is higher over the strip than over adjacent grouted cells; impact-echo or other non-destructive methods may assist when used by qualified personnel and interpreted within their limitations. They do not automatically establish the exact acoustic consequence; targeted openings, approved by the structural engineer, reveal honeycombing and an incompletely filled cell near a bond beam.³⁰³¹

The acoustic inference is not simply that a void leaks; a closed void can reduce local mass and stiffness, alter modal response and couple through connected block webs; if it connects to a joint or service chase, it can also participate in an air path. The investigation therefore records geometry, whether the void is connected, reinforcement, moisture and adjacent construction; a local intervention using a reversible surface-mass patch changes the resonance but does not eliminate the full anomaly. A controlled

30 [MB-0153](#). ASTM International, ASTM C476-24, ASTM C1019-20.

31 [MB-0020](#). American Concrete Institute and The Masonry Society guidance on assessment and repair, used within structural scope. Non-destructive evaluation requires qualified interpretation and does not automatically establish acoustic consequence.

cavity treatment produces an additional reduction. The combined evidence supports both local dynamic weakness and connection to an adjoining void network.

Remediation is designed as a structural and acoustic operation; pressure grouting, local reconstruction or an independent lining may be appropriate depending on reinforcement, access, moisture and code obligations; the repair specification defines injection points, materials, verification, cure, photographs and retesting. It does not rely on total grout consumption as the sole completion criterion; the final report states which cells were observed, which were inferred and which remain outside the sample.

Institutional lesson. Material quantity is not spatial evidence. Grout placement records, lift heights, cleanouts, consolidation, obstructions and inspection observations should be linked to wall coordinates. Repeated voids in a sample should trigger population review rather than isolated cosmetic repair.

Worked example 38.9. Local mass deficit and resonance screen

A wall region has designed surface density $m'_d = 360 \text{ kg/m}^2$; a grout void reduces the local effective surface density to $m'_v = 230 \text{ kg/m}^2$; for a simplified mass-controlled comparison at fixed frequency, the ideal change is

$$\Delta R \approx 20 \log_{10} \left(\frac{m'_v}{m'_d} \right) = 20 \log_{10} \left(\frac{230}{360} \right) = -3.9 \text{ dB}.$$

m'_d and m'_v are surface densities in kilograms per square metre. ΔR is the ideal local mass-law change in decibels; the calculation ignores

stiffness, boundary conditions, block webs, coincidence, connected voids and flanking; it is a sensitivity screen, not a prediction of the whole wall.

38.10 Composite case H. Concrete flanking through slab and column continuity

Case status: composite structure-borne transmission case. A reinforced-concrete room has substantial walls and a heavy slab; a low-frequency tonal component remains audible in an adjoining office when nearby mechanical plant operates; the first assumption is that a service penetration has been missed. Inspection finds no corresponding air path; the tone appears at the same frequency in accelerometers mounted on the protected-room slab edge, a continuous column and the receiving-room wall; phase and coherence vary with position but remain consistent with structural propagation from the plant support.

The mechanism is a flanking network. Force enters the building structure at the plant base, travels through slab and column junctions, and radiates from receiving surfaces; the massive separating wall does not interrupt this route because it participates in the same structure; airborne source control alone produces little change; a controlled reduction in plant forcing, followed by a temporary isolation change under mechanical supervision, reduces both structural velocity and receiving sound. This supports causal attribution to the plant-structure path.³²³³

Alternative explanations remain important. Electrical interference can contaminate sensors. A room mode can amplify receiving pressure without corresponding high structural motion; a duct can carry the same fan

³² [MB-0886](#). International Organization for Standardization, ISO 20816.

³³ [MB-0443](#). Fahy and Gardonio, Sound and Structural Vibration.

frequency; the investigation uses reference channels, coherence, multiple sensor orientations, background states and controlled changes to discriminate among them. No single accelerometer trace is treated as proof of the complete path.

Remediation can involve source balancing, resilient supports, inertia bases, flexible connections, support relocation, structural breaks or receiving-surface treatment; each option changes loads, movement, safety and maintenance; the selected repair targets the force input while preserving mechanical alignment and seismic or safety restraints. The retest compares force or source state, structural response and receiving pressure before and after; the report avoids claiming that a pressure reduction alone proves the precise internal force path.

Institutional lesson. Concrete is not an automatic acoustic terminus. Structural continuity can carry energy around or through a massive enclosure. Plant, stairs, façades, slabs, columns, beams and equipment supports should be included in the path model. Baseline vibration data are especially valuable because later tonal complaints can then be compared with a known accepted state.

Worked example 38.10. Two structural flanking paths

A slab path contributes receiving level $L_1 = 31$ dB, and a column path contributes $L_2 = 28$ dB in the same band under the same reference state. The energetic total is

$$L_{tot} = 10 \log_{10} (10^{L_1/10} + 10^{L_2/10}) = 32.8 \text{ dB}.$$

If the slab path is reduced by 10 dB, the new total is 28.8 dB; L_1 , L_2 and L_{tot} are sound-pressure levels in decibels referenced consistently; the

improvement is only 4.0 dB because the column path becomes dominant. Coherence and phase can matter in deterministic structures, so simple energetic addition is a screening model.

38.11 Composite case I. Glazing frame and mullion cavities

Case status: composite façade and interior-glazing case. A laminated glazing lite is supported by a laboratory report that appears adequate for the protected-room requirement; the installed room nevertheless shows a narrow band of speech transmission near the base of a mullion; the initial proposal is to replace the glass with a thicker laminate. That proposal is paused because the local evidence points toward the frame system rather than the pane field.

The frame contains pressure-equalisation cavities, drainage routes, setting blocks, gaskets, anchors and perimeter seals; these features have legitimate façade and service functions; they can also form interconnected acoustic paths. The lite report does not include the installed frame, mullion, perimeter, adjacent wall or field dimensions; a local pressure scan and listening observation identify the mullion base as the principal radiation region; a removable perimeter treatment reduces the level, but a residual component remains within the hollow mullion.³⁴³⁵

A second intervention closes an accessible cavity opening without obstructing permanent drainage. The receiving spectrum falls further. The two interventions show that perimeter leakage and mullion communication both contribute; pane bending remains present but is not controlling in the critical band; the case illustrates why replacing the pane alone could have

34 [MB-0103](#). ASTM E90-23, ISO 10140.

35 [MB-1014](#). Marshall Long, Architectural Acoustics, 2nd ed.

consumed cost, changed weight and created condensation or structural issues without correcting the dominant path.

Permanent remediation uses an approved frame detail that preserves water management, thermal movement, glazing support, fire or smoke requirements and access; an independent secondary glazing system is considered where the existing frame cannot be altered safely; the final system is retested at the critical local positions and as a complete room pair. Condensation and cleaning access are included in lifecycle review.

Institutional lesson. Glazing evidence belongs to the tested specimen. Procurement should require complete reports showing pane, frame, dimensions, seals, supports and method. Field drawings should identify mullion cavities, drainage and perimeter interfaces. Replacement control matters because a visually similar gasket or sealant can have different compression, movement or adhesion.

Worked example 38.11. Glazing-frame penalty

A glazed assembly has pane area $S_p = 5.4 \text{ m}^2$ at $R_p = 46 \text{ dB}$ and effective frame-path area $S_f = 0.12 \text{ m}^2$ at $R_f = 28 \text{ dB}$. Composite attenuation is

$$R_c = -10 \log_{10} \left[\frac{S_p 10^{-R_p/10} + S_f 10^{-R_f/10}}{S_p + S_f} \right] = 41.2 \text{ dB}.$$

S_p and S_f are areas in square metres; r_p , R_f and R_c are attenuation values in decibels; the model treats the frame contribution as an equivalent area and does not reproduce cavity resonances, line junctions or field incidence.

38.12 Composite case J. Resilient-system bridging by backing and fasteners

Case status: composite lightweight-construction case. A double-layer gypsum lining on isolation clips and channels is intended to decouple the finish from the structural wall. Field testing shows less improvement than the laboratory assembly evidence suggested. The discrepancy is not proof that the clip product is defective. The tested specimen, field framing, board layers, fasteners, backing, junctions and services must be compared as complete configurations.

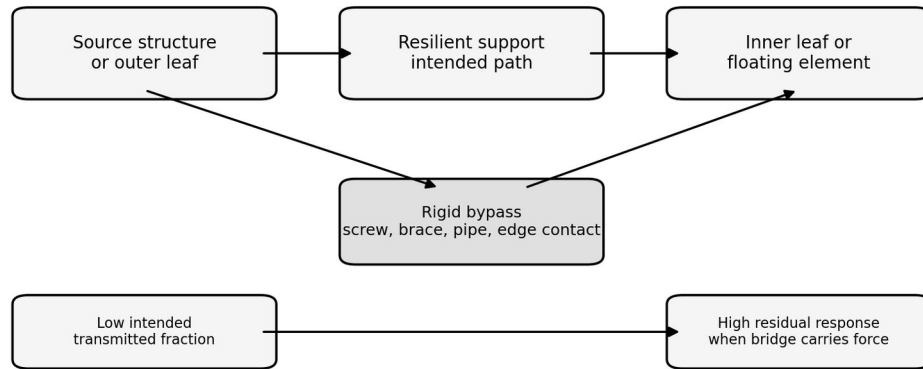
Surface-vibration mapping under controlled airborne excitation reveals a vertical strip with higher velocity and stronger correlation to the base wall; targeted review of photographs shows that plywood backing for a display was installed continuously from studs to the finish layer; several outer-layer screws are long enough to contact the structural studs through the resilient channel. A conduit saddle also bears on both leaves; these conditions create parallel rigid bridges with different stiffness and spatial extent.³⁶³⁷

36 [MB-0067](#). ASTM C754-20, ASTM C840-23.

37 [MB-1146](#). Research and engineering literature on resilient channels, clips, fastener bridging and double-leaf systems as cited in Chapters 12 through 14. Product and laboratory evidence apply only to the represented configuration.

Resilient-System Bridge Mechanisms

Isolation can be defeated by small rigid contacts that bypass the intended spring path.



One contact may dominate because the rigid bypass and resilient path combine in force or energy, not by averaging their decibel benefits.

Figure 38-5. Fasteners, backing, pipework and restraints can create rigid force paths across an otherwise resilient system. Author's original diagram.

The investigation releases one bridge at a time where safe and practicable; shortening selected screws reduces local upper-band response; isolating the backing connection changes a broader frequency range; relieving the conduit contact reduces a narrow tonal feature. These observations show that the failure is distributed rather than attributable to one item. They also demonstrate why a single exploratory opening can miss the population.

Repair requires a coordinated backing design that supports equipment without short-circuiting the isolation; fastener schedules specify type, length, spacing and layer ownership. Service restraints retain required clearances. The work is observed before closure and followed by local vibration and room-pair acoustic retesting; the comparison uses the same source and room states because changes in furnishings or loudspeaker position could otherwise mimic improvement.

Institutional lesson. Resilient construction is a controlled mechanical system. Product substitution, continuous backing, cabinet support, ceiling perimeter, electrical boxes, service restraints and screw lengths must be coordinated. A first-of-type mock-up should include the real equipment backing and penetrations, not merely an empty wall field.

Worked example 38.12. Bridge stiffness and isolation-loss screen

An intended resilient connection has dynamic stiffness $k_r = 1.8 \times 10^6 \text{ N/m}$. A rigid backing bridge adds effective stiffness $k_b = 9.0 \times 10^6 \text{ N/m}$ in parallel. Total stiffness is

$$k_t = k_r + k_b = 1.08 \times 10^7 \text{ N/m}.$$

For supported mass $m = 1200 \text{ kg}$, natural frequency rises from

$$f_{n,r} = \frac{1}{2\pi} \sqrt{\frac{k_r}{m}} = 6.16 \text{ Hz}$$

to

$$f_{n,t} = \frac{1}{2\pi} \sqrt{\frac{k_t}{m}} = 15.1 \text{ Hz}.$$

k_r , k_b and k_t are stiffnesses in newtons per metre. m is mass in kilograms and f_n is natural frequency in hertz; the single-degree model does not predict panel transmission loss, but it shows how one stiff parallel bridge can move the isolation system toward an unfavourable operating range.

38.13 Composite case K. Floating-floor perimeter bridge and concentrated loading

Case status: composite floor-isolation case. A protected conference suite is built over an occupied technical floor. The design uses a floating screed on

a resilient layer to reduce impact and structure-borne transmission. Commissioning shows acceptable impact performance in the central test area, but low-frequency vibration remains elevated near one wall and increases when a heavy evidence safe is loaded.

The first inspection finds that the resilient perimeter strip has been compressed and locally displaced by the screed; at two locations, levelling compound has flowed across the strip and hardened against the structural wall; the safe stands close to the perimeter and concentrates load over a smaller area than the design assumed. These conditions change both force transmission and local stiffness; the central tapping-machine result did not sample the edge bridge or the actual equipment loading.³⁸³⁹

The investigation separates three possible mechanisms. The first is direct rigid contact at the perimeter; the second is excessive compression of the resilient layer under the safe; the third is slab and wall flanking independent of the floating floor; controlled vibration sources are applied at central and edge locations. Local mobility and transfer functions show a strong edge response. Removing the safe load temporarily, under structural and operational controls, changes the local natural frequency but does not eliminate the bridge signature. A small authorised opening confirms hardened contact at the perimeter.

Repair removes the rigid contact, reinstates the edge separation and redistributes the safe load through a designed plinth that remains within resilient-system capacity; the work avoids creating a new bridge through anchors, skirtings, thresholds or services; retesting includes central and

38 [MB-0101](#). ASTM E492-25, ASTM E1007-25.

39 [MB-0947](#). ISO 9052 series, ISO 9052.

perimeter source positions, the loaded operating state and the adjacent structural paths. The final record identifies permissible concentrated loads and requires review before future equipment moves.

Institutional lesson. Floor isolation is governed by the actual load map, edge clearance and service connections. Average dead load is not enough. The room data sheet should identify heavy safes, racks, furniture, movable partitions and foreseeable equipment, while the construction-surveillance plan should capture the perimeter before finishes conceal it.

Worked example 38.13. Local resilient-pad pressure

A safe and plinth impose load $F = 28 \text{ kN}$ over effective resilient area $A = 0.32 \text{ m}^2$. The average pressure is

$$p = \frac{F}{A} = \frac{28000}{0.32} = 87.5 \text{ kPa}.$$

p is pressure in kilopascals, F is force in newtons and A is area in square metres; if the resilient product was characterised at 40 kPa, the local condition lies outside that evidence; the calculation does not establish dynamic stiffness, creep or bottoming, but it identifies a mandatory product and structural review.

38.14 Composite case L. Later cable penetration and configuration drift

Case status: composite post-acceptance alteration case. A room performs acceptably at commissioning. Eighteen months later, a display upgrade requires a new data conduit through the protected wall. The opening is neat on the occupied side, and a firestop label appears beside it. No penetration identifier, photograph, revised drawing, acoustic detail or security disposition is entered in the controlled record.

A later local test finds an upper-band weakness near the display; competing explanations include the conduit annulus, rigid conduit bridging, display backing, changed loudspeaker gain, cable-tray continuation and a pre-existing wall defect. The investigator freezes the electronic settings and compares the room with the commissioning photographs; the new conduit crosses both leaves, its sleeve is oversized, and the fill material does not continue through the full depth of the controlled closure; the firestop record addresses its own listed system. It does not establish acoustic equivalence or the absence of a rigid mechanical path.⁴⁰⁴¹

Temporary treatment around the annulus reduces the local pressure response; resiliently decoupling the conduit at one support changes a lower-frequency vibration component; reducing loudspeaker gain alters the source but does not remove the path; the case therefore contains both an opening and a structural bridge, while the equipment change increases excitation. No one observation should be made to carry all three conclusions.

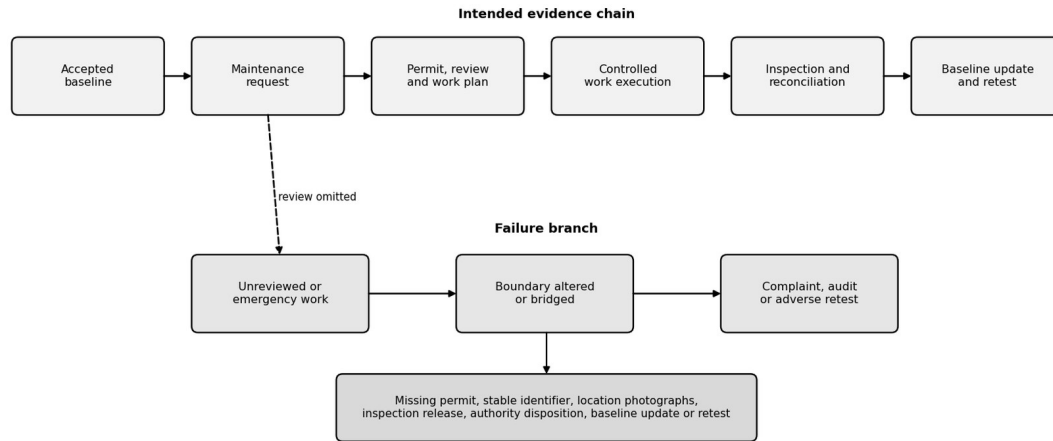
Permanent work reconstructs the penetration under a coordinated detail, changes the support arrangement and restores the approved equipment gain limits; the penetration register, as-built drawing, photographs, firestop inspection, acoustic evidence and authority disposition are updated; the room is retested in the original baseline mode and in the new amplified mode. The alteration is not complete until the documentary and physical states agree.

40 [MB-0310](#). ASTM International, ASTM E814, ASTM E2174-24.

41 [MB-0935](#). ISO 19650 series, ISO 19650.

Post-Acceptance Change-Control Failure

A later alteration can sever the evidence chain even when the original room was properly designed and tested.



Emergency work may change sequence, but it does not cancel documentation, reconciliation, inspection or retest duties.

Figure 38-6. Unreviewed changes can move a room from accepted configuration through undocumented work to latent weakness, complaint, investigation and controlled recommissioning. Author's original diagram.

Institutional lesson. Configuration drift is usually incremental. The project must define which changes are pre-authorised, which require technical review, and which require retesting. A contractor's belief that work is minor does not determine its acoustic or security consequence.

Worked example 38.14. Open annular-area screen

A circular sleeve has inside diameter $D_s = 50$ mm, while the cable bundle has equivalent diameter $D_c = 32$ mm. The annular area is

$$A_a = \frac{\pi}{4} (D_s^2 - D_c^2) = 1.16 \times 10^{-3} \text{ m}^2.$$

A_a is open area in square metres after converting diameters to metres; a tortuous filled sleeve will transmit less than an ideal opening, but the calculation shows that a visually small annulus can be large compared with cracks and seal gaps that dominate high-isolation boundaries.

38.15 Composite case M. Sprinkler alteration and rigid support coupling

Case status: composite fire-protection alteration case. A sprinkler contractor relocates a branch line after furniture coordination. The change introduces a new wall sleeve and a trapeze support connected to structure on both sides of an isolated boundary. The sprinkler work passes pressure and visual fire-protection checks. Several weeks later, a mechanical pulse and speech-correlated vibration are detected near the crossing.

The system must be examined without compromising life safety; the investigation begins with drawings, permits, support details and operating states; it does not loosen hangers, drain piping or alter fire protection without the responsible specialists. Accelerometer and pressure measurements show that the pipe and support respond strongly when the source-room loudspeaker operates and when a remote pump cycles; a temporary non-structural contact release, authorised by the fire-protection and structural teams, reduces the local speech-correlated vibration while leaving the hydraulic system intact.⁴²

The sleeve closure also contains a small peripheral gap; airborne and structure-borne routes therefore coexist. The repair separates the functions. The listed firestop system is restored within its tested configuration; acoustic closure is added only where compatible and permitted; the support is redesigned so that required loads, movement and seismic restraint are carried without creating an uncontrolled bridge during normal operation. Flexible geometry and clearances are documented.

⁴² [MB-1027](#). National Fire Protection Association, ASTM E2174-24, ASTM E2393-24.

Retesting includes representative water state, pump operation, alarm or test modes where authorised, and the protected-room acoustic source; a quiet, depressurised pipe would not represent the operational system; the final record identifies inspection access and future triggers, including pipe replacement, seismic-restraint adjustment, hanger work and new branches.

Institutional lesson. Fire protection and acoustic security are parallel obligations. Passing one inspection does not waive the other. Coordination must occur before installation because later correction can require shutdowns, fire watches, ceiling removal and operational disruption.

Worked example 38.15. Rigid and resilient force paths in parallel

An intended flexible pipe path transmits fraction $T_r = 0.06$ of source force; a rigid restraint carries fraction $b = 0.18$ directly; if the remaining force passes through the resilient path, the screened total fraction is

$$T_c = b + (1 - b)T_r = 0.18 + 0.82(0.06) = 0.229.$$

The corresponding force reduction is $-20 \log_{10}(T_c) = 12.8$ dB, compared with 24.4 dB for the resilient path alone; t_r , b and T_c are dimensionless; the model is a screening calculation and does not represent distributed piping, multiple supports or hydraulic excitation.

38.16 Composite case N. Ceiling access, displaced barriers and maintenance damage

Case status: composite maintenance and concealed-boundary case; a protected room uses full-height walls, a suspended architectural ceiling and selected plenum barriers around services. Routine maintenance requires access to valves and network equipment above the ceiling; over several

years, tiles are removed repeatedly, barrier panels are shifted, one access hatch is enlarged and sealant is cut to pass a temporary cable; the visible room remains orderly, but quiet-state testing reveals increased transmission above the ceiling line.

The original acceptance record contains photographs of the completed barrier, yet the current configuration differs; some panels have lost fasteners; mineral fibre has fallen away from a junction. A cable tray has been extended through a cut opening; the ceiling tiles themselves were never the primary security boundary, but their removal gave uncontrolled access to the elements that were; a maintenance permit system existed for electrical safety but did not trigger acoustic or secure-boundary review.⁴³

The investigation maps every access route and compares photographs, work orders and physical condition; local source scans identify several contributors rather than one dramatic opening; reinstalling a panel improves one band; closing the cable opening improves another. Restoring a head-of-wall seal changes a broader range. The cumulative room improvement is smaller than the sum of local changes because residual duct and structural paths remain.

Repair reinstates the designed barrier and creates maintainable access panels with stable identifiers, clear opening limits and replaceable seals; services likely to require future attention are rerouted or provided with controlled access; the maintenance procedure requires photographs before and after work, reconciliation to the boundary register and defined retest

⁴³ [MB-0072](#). ASTM E1414, ASTM E336-25a.

triggers. Training makes clear that a neat ceiling tile does not prove the plenum condition.

Institutional lesson. Maintainability is a security property. Systems that require technicians to disturb hidden boundaries without clear access and restoration details will drift. Design should reduce the need for improvised openings and make correct reinstatement easier than expedient bypass.

Worked example 38.16. Combined effect of three maintenance openings

Three small plenum defects contribute receiving levels of 29, 27 and 25 dB in a critical band. Their energetic total is

$$L_{tot} = 10 \log_{10} (10^{2.9} + 10^{2.7} + 10^{2.5}) = 32.1 \text{ dB}.$$

Repairing only the 29 dB defect leaves 29.1 dB from the other two, so whole-room improvement is 3.0 dB; the example shows why inspection should treat the population of maintenance changes rather than the first visible gap.

38.17 Composite case O. Masking dependence and quiet-state failure

Case status: composite operational-state case. A legal meeting room appears private during ordinary daytime use. Corridor masking and office activity raise receiving background. At night, the masking system enters setback and adjacent occupancy disappears. A cleaner recognises names and dates outside the room. The organisation initially concludes that the wall has suddenly failed.

Comparison with the baseline shows that the boundary has not changed materially. The receiving background has. The original commissioning

tested only the daytime mode and treated existing office noise as part of the favourable condition. The masking controls, setback schedule, alarm state, spatial uniformity and credential ownership were not included in the acceptance baseline. The protected-room users also speak more loudly during hybrid meetings because of conferencing delay and source-room noise.⁴⁴⁴⁵

The investigation measures source levels, transfer, receiving background and speech metrics in day, night, masking-on, masking-off and conferencing states; it distinguishes masking benefit from structural isolation; raising masking may improve receiving margin but can interfere with alarms, accessibility, comfort and adjacent work, and can induce increased vocal effort. A repaired programme therefore combines physical-path improvement, governed masking and operational source control.

The authority defines whether protected discussion is permitted during a masking fault or setback mode; monitoring detects output drift and controller changes; set points, spectrum, zones, credentials and failure responses are recorded; the room is not described as secure because one favourable background condition exists.

Institutional lesson. Background noise is a state variable, not a structural property. Any acceptance that credits masking or environmental background must identify the minimum state, monitoring, failure response and authority responsible for maintaining it.

44 [MB-0074](#). ASTM E2638-24, IEC 60268-16:2020.

45 [MB-0941](#). ISO 3382-2:2008.

Worked example 38.17. Net masking benefit after vocal response

Receiving masking rises by 6 dB. Source-room monitoring shows that median talker level rises by 2.5 dB through Lombard response. For an unchanged transfer path, the simple net receiving-margin improvement is

$$\Delta M = 6.0 - 2.5 = 3.5 \text{ dB}.$$

\Delta M is a level-margin change, not a direct intelligibility or word-recovery probability. Spectrum, modulation, listener position, language and repetition remain relevant.

38.18 Composite case P. Conferencing software, gain limits and amplified source drift

Case status: composite electronic operating-state case. A room is accepted using unaided and raised human speech. Months later, a firmware update changes automatic gain control, loudspeaker equalisation and default volume. The physical boundary remains unchanged, yet corridor receiving levels increase during remote conferences. The change log records the software update but does not identify acoustic consequences.

The investigation preserves the current configuration and retrieves the accepted equipment baseline; reference measurements show that the loudspeaker can now exceed the source level used in commissioning by 9 dB in several speech bands; beam steering and equalisation direct greater energy toward a glazed wall. A mute indicator controls network audio but does not remove local microphone monitoring; these observations involve

acoustic source state and equipment function; they do not by themselves establish cybersecurity, unauthorised collection or TSCM conclusions.⁴⁶⁴⁷

A controlled rollback and gain-limit intervention reduce the receiving level in the predicted bands; the physical room-pair transfer remains stable; the causal mechanism is therefore amplified source drift rather than structural degradation; the permanent response establishes approved firmware, gain ceilings, equalisation, routing, mute behaviour, remote-support permissions and update review. The test plan includes maximum credible authorised source output rather than a nominal conversational condition.

The case also demonstrates the danger of separating technology commissioning from architectural acceptance; equipment can alter the excitation of every path; a room that performs under unaided speech may fail under amplified programme sound even though every wall, door and seal remains as built.

Institutional lesson. The as-operated baseline includes software. Asset identity, firmware, gain, routing, processing, network state and remote management should be linked to the room's source-state matrix. Updates that can increase acoustic output require review and, where necessary, targeted retesting.

Worked example 38.18. Amplified source and residual margin

Unaided raised speech produces source level $L_s = 78$ dB in a selected band; the accepted room transfer is 52 dB, giving 26 dB at the corridor; background is 31 dB, so the simple signal margin is -5 dB. An updated

46 [MB-0789](#). IEC 60268-16:2020.

47 [MB-0417](#). Chapters 26 and 37 of this work, controlled treatments of audiovisual equipment, source-state matrices.

loudspeaker produces 88 dB, giving 36 dB at the same position and +5 dB margin; the 10 dB source increase reverses the sign of the margin without any boundary change.

38.19 Composite case Q. Erroneous reliance on headline STC

Case status: composite design and procurement case. A project specifies “STC 60 walls” around a privileged-discussion room; the selected gypsum assembly has suitable laboratory evidence, and the field wall areas are built carefully; the completed room nevertheless performs poorly because the boundary includes a 38 dB door, a transfer grille, a shared ceiling path and an unsealed service opening. The contractor argues that the wall complied with the stated requirement.

The dispute arises from an incomplete requirement rather than a mysterious acoustic failure. A laboratory wall classification describes the tested specimen under its method. It does not establish the composite boundary, installed flanking, doorset, HVAC path, speech source, receiving background or formal acceptance. The phrase “STC 60 room” concealed these distinctions and allocated no responsibility for weak paths.⁴⁸⁴⁹

The forensic reconstruction combines each path in linear energy, reviews the specification, submittals, meeting minutes and shop drawings, and identifies where the requirement should have been translated into room, component and field propositions; the wall may be conforming while the room is not. Conversely, a room can satisfy a field criterion even when a concealed detail differs from the laboratory specimen; those conclusions answer different contractual and technical questions.

48 [MB-0093](#). ASTM E413-22, ISO 717-1:2020.

49 [MB-0923](#). ISO 12354-1:2017, ISO 10848.

Remediation prioritises the paths that govern the installed result; the door and service opening are corrected before adding wall layers; the transfer-air route is redesigned, and the ceiling path is controlled; the revised procurement language specifies complete-envelope responsibility, required methods, operating states, uncertainty, mock-ups, surveillance and retesting.

Institutional lesson. A headline rating is shorthand, not a basis of design. The owner must state what outcome is required, who controls each path, which evidence applies, and how acceptance will be decided. Ambiguous numbers create predictable disputes and often reward work on the strongest element while the weakest remains unowned.

Worked example 38.19. Composite wall and door

A boundary has wall area $S_w = 27.8 \text{ m}^2$ at $R_w = 60 \text{ dB}$ and door area $S_d = 2.2 \text{ m}^2$ at $R_d = 38 \text{ dB}$. The composite coefficient is

$$\tau_c = \frac{S_w 10^{-R_w/10} + S_d 10^{-R_d/10}}{S_w + S_d},$$

which gives $R_c = 49.1 \text{ dB}$ before flanking and leakage; the 38 dB door reduces the nominal boundary by almost 11 dB relative to the wall; the calculation does not establish a field rating, but it exposes the procurement error.

38.20 Composite case R. Insufficient commissioning and inadequate dynamic range

Case status: composite measurement and acceptance case; a consultant reports that a room exceeds its isolation requirement in every band; the source room was driven at modest level because occupants remained

nearby; the receiving room had active HVAC and masking; several reported differences approach the analyser's effective dynamic range. Background correction was applied without documenting whether the method's limit was exceeded.

A later complaint prompts review of the raw data; in critical bands, source-on receiving levels are less than 2 dB above background. Repeated source positions were not used. Door state, pressure, furnishings and quiet-night conditions were not recorded; the report provides a single-number rating but omits band flags, calibration drift, room decay traces and uncertainty; the attractive result is not necessarily false; it is unsupported in the bands where the measurement could not resolve the room.⁵⁰⁵¹

Recommissioning increases source capability within hearing and equipment limits, reduces receiving background where practicable, uses monitor channels and repeats positions; bands that remain background limited are reported as lower bounds or indeterminate according to the method; local diagnostics identify a door and plenum path that were hidden by the original background. The new report distinguishes measured values, limits, corrected results and authority decisions.

The case illustrates a general rule. Measurement cannot create information absent from the signal-to-background condition; an analyser with many decimal places does not overcome inadequate excitation, unstable source, spatial bias or a model outside its valid correction range; the commissioning plan should predict dynamic range before final testing and provide a contingency for unusually strong rooms.

50 [MB-0091](#). ASTM E336-25a, ISO 16283-1:2014.

51 [MB-0952](#). ISO/IEC 17025:2017, ISO 12999-1:2020.

Institutional lesson. Acceptance evidence must show what the instruments and environment could actually resolve. Raw spectra, background, calibration, source stability, positions, decay, corrections and band validity are part of the result. A favourable rating without that record should not be treated as a durable baseline.

Worked example 38.20. Source-on and background correction limit

A receiving source-on level is $L_{\text{on}} = 28.0$ dB, while background is $L_b = 27.0$ dB. Energetic correction would give

$$L_s = 10 \log_{10} \left(10^{L_{\text{on}}/10} - 10^{L_b/10} \right) = 21.1 \text{ dB}.$$

The source contribution is inferred from the difference of two similar energies and is highly sensitive to small errors; a 0.5 dB change in either input materially changes the corrected result; the applicable method's correction limits and uncertainty must govern; the arithmetic alone does not validate the band.

38.20.1 Repeatability, reproducibility and the misleading comfort of one successful campaign

A test can be internally repeatable and still fail to represent the operational question; repeating the same source, position, background and processing may produce closely grouped values while preserving the same spatial bias or configuration error; reproducibility asks a different question: whether another competent team, instrument chain, day or method implementation obtains a compatible result within stated conditions and uncertainty. Neither concept permits uncontrolled changes to be ignored.

Failure investigations should therefore preserve short-term repeats, position repeats and selected independent checks; short-term repeats reveal source or instrument instability; position repeats reveal spatial dependence. Reinstallation of sensors reveals mounting sensitivity. A second team or later campaign can reveal ambiguities in the method record; differences should be explained rather than averaged away; an apparent 3 dB disagreement may arise from a door being hand-pulled shut in one campaign, masking active in another, or a receiving microphone placed at a modal maximum.⁵²

Reproducibility is particularly important where the original acceptance team also designed the remedy; familiarity can improve efficiency, but it can also preserve shared assumptions; independent review of the test plan, raw data and configuration can expose a missing path without requiring a complete duplicate campaign. Independence should be proportionate to consequence and should not be claimed where the reviewer merely checks arithmetic without access to the evidence.

A strong record allows another team to reconstruct the test state; it includes room identifiers, drawings, door condition, source location and orientation, receiving coordinates, furnishings, temperature, pressure, HVAC, masking, electronics, calibration, firmware, processing, raw formats and decision rule. Photographs should show enough geometry to recover positions without disclosing protected details beyond authorised handling; where a condition cannot be reproduced, the comparison must state that limitation.

⁵² [MB-0953](#). ISO/IEC 17025:2017, ISO 12999-1:2020.

The institutional error is to treat one polished report as a timeless property of the room; the report is evidence of a defined campaign; its future value depends on whether the configuration, method and operating state remain recoverable and whether later results can be compared honestly.

Worked example 38.20A. Repeatability does not cure position bias

At one receiving position, five repeated level differences are 55.2, 55.4, 55.1, 55.3 and 55.2 dB, with very small spread; a second authorised position near a service junction gives 49.8 dB. The first series is highly repeatable but not representative of the weaker location; the correct conclusion is not that the instrument is unreliable; it is that the measurement population was incomplete.

38.20.2 Immediate protective actions while causation remains unresolved

A serious complaint may require action before the causal mechanism is established. The organisation can suspend protected use, relocate discussion, secure adjoining spaces, preserve access logs, freeze software and mechanical settings, restrict contractor activity and notify responsible officials. These measures manage consequence while the investigation remains open. They should not be written as proof that compromise occurred or that a particular person caused the condition.⁵³⁵⁴

The response should be threat neutral where the evidence is incomplete; a reported voice outside a room can arise from ordinary construction, an open door, a conference loudspeaker, unauthorised access or an intentional

53 [MB-1128](#). Public incident-management and facility-security principles. Immediate protective actions and notification duties remain organisation-, jurisdiction- and authority-specific.

54 [MB-0080](#). ASTM E2713-25 and ASTM E3176-24, ASTM E2713-25, ASTM E3176-24.

device; immediate control can address all of these possibilities without premature attribution. Security, legal, human-resources, facilities and technical teams should coordinate so that protective action does not destroy logs, overwrite software states, repair the defect before documentation or expose sensitive information unnecessarily.

Temporary operational restrictions need clear boundaries. The authority should identify which room uses are suspended, whether lower-consequence activity may continue, what adjoining zones must be controlled, how long the restriction lasts and what evidence is required for release; a sign on the door saying “do not use” is weak if booking systems, remote users and cleaning staff remain unaware. Conversely, closing an entire facility may be disproportionate where the verified concern is one local state and an alternative room is available.

Emergency work requires the same eventual evidentiary reconciliation as planned work; a leaking pipe may need immediate repair before acoustic observation is ideal; the team should preserve what it can, including photographs, removed materials, measurements, names, times and the reason sequence was altered. Retrospective review then determines whether the repaired room can return to service and whether the emergency revealed a broader process weakness.

Release from restriction should follow a documented gate; the defect is corrected or bounded; the physical and software configuration is reconciled; the controlling tests have adequate dynamic range. Residual limitations are stated. Responsible specialists sign their technical dispositions. The competent authority decides use. A favourable local scan alone does not automatically restore the full original authorisation.

Worked example 38.20B. Conditional operation during an unresolved plenum concern

A room shows a quiet-state weakness in a shared plenum; immediate full reconstruction would disrupt critical operations for two weeks; the authority permits only low-consequence meetings during daytime masking, controls access to the adjoining room, prohibits amplified conferencing and schedules repair within five days. These measures reduce exposure while preserving the distinction between temporary risk management and final acceptance; after repair, the quiet-state and amplified-source tests are repeated before unrestricted use resumes.

38.20.3 Human factors, operational discipline and design that tolerates ordinary behaviour

A protected room should not depend upon perfect users, yet user behaviour can alter every source and opening state. Doors are held for colleagues, conferencing volume is raised, furniture blocks a return path, absorptive panels are removed, masking is reduced after complaints, and cleaners prop doors while working. These actions may be reasonable in ordinary buildings. In a protected environment, the design and operating procedure must identify which behaviours materially change the accepted state.⁵⁵

Human-factors analysis begins by observing real tasks rather than drafting ideal instructions; a closer that requires excessive force will be defeated; a sound lock that delays movement may be bypassed during busy periods; a masking control accessible to every occupant may drift. A conference system whose default volume is inadequate will be raised. A maintenance hatch without room to work will be enlarged. Engineering should remove

⁵⁵ [MB-0783](#). Human-factors and facilities-operation principles applied to doors, controls, maintenance and protected use. Accessibility.

avoidable incentives for circumvention, then reserve procedures for the residual behaviours that cannot be designed away.

Training should explain consequence in operational language; users need not learn mass-air-mass resonance, but they should understand why both sound-lock doors cannot remain open, why amplified audio matters, how to report a seal fault and when an alternative room is required. Facilities personnel should know that an undocumented penetration or software update can invalidate evidence even when the work looks neat; procedures should be brief enough to use and specific enough to audit.

Observation after occupation is valuable. Door-open duration, repeated fault reports, controller changes and maintenance work orders can reveal where design conflicts with use; such data should be handled proportionately and lawfully, with privacy and personnel considerations separated from the engineering question; the objective is not surveillance of users. It is identification of systemic conditions that make noncompliant operation predictable.

Worked example 38.20C. Sound-lock exposure from ordinary traffic

A two-door vestibule achieves its intended benefit only when no more than one door is open; observation shows simultaneous opening during 6 of 120 passages because the closer delay and access-control timing overlap; the observed rate is 5 per cent. Adjustment of timing reduces the rate to 1 in 150 passages, or 0.67 per cent; the counts do not establish information exposure, but they show that hardware sequencing, not user admonition alone, materially improves the operating state.

38.21 Composite case S. False confidence from a narrow test population

Case status: composite sampling and spatial-variability case. A room is tested at one source position and one receiving position beside the centre of the separating wall. The result is favourable. Six months later, a listener near the latch jamb reports intelligible fragments. The organisation assumes that the door deteriorated after the test, but no baseline exists at the reported location.

A room is a spatially varying field; standing waves, source directivity, doors, corners, service routes, ceiling voids and structural junctions create local differences; standardised averages answer a method-defined room-pair question; targeted weak-path positions answer a diagnostic or access-specific question; neither should silently replace the other. The original campaign measured only one favourable combination and then generalised beyond its population.⁵⁶⁵⁷

The new investigation uses multiple source positions, distributed receiving positions and defined listener-access locations; it records distance from boundaries, height, source orientation, room furnishing and operating state; a high response appears at the latch jamb and another in the ceiling void. The central position remains favourable. This does not invalidate the central observation; it shows that the original conclusion was broader than the sampling supported.

56 [MB-0088](#). ASTM E336-25a and ISO 16283-1:2014+A1:2017, ASTM E336-25a, ISO 16283-1:2014.

57 [MB-0078](#). ASTM E2638-24, IEC 60268-16:2020.

Narrow-Test False Confidence

A passing result is bounded by source state, receiver location, frequency, time and configuration.

	Source states	Receiver positions	Frequency bands	System modes	Lifecycle states
Tested	ordinary speech	corridor average	125-4000 Hz	day HVAC	as-tested
Untested or limited	raised / amplified	door crack / void	low / high limits	night / failure	aged / altered

The empty cells are not failures by definition. They are untested propositions that must remain visible in the conclusion.

Figure 38-7. A narrow campaign can sample only favourable combinations while leaving doors, voids, structural junctions, quiet states and amplified sources untested. Author's original diagram.

The remedial programme adjusts the door, closes the ceiling path and repeats both the standardised room-pair method and the targeted listener-position checks; the final report states the inspected and measured population; it does not claim that every centimetre or every future state was tested. The lifecycle plan identifies positions and modes that should be repeated after relevant change.

Institutional lesson. Sampling design belongs in the acceptance criteria. A project should identify whether it needs a standardised average, a worst-accessible-position search, a speech-security assessment, a component test or all of them. A single number cannot represent an undefined population.

Worked example 38.21. Position-to-position variability

Five receiving positions produce band level differences of 54, 57, 51, 58 and 49 dB; the arithmetic mean is 53.8 dB, while the weakest position is 49 dB;

the standard deviation is approximately 3.7 dB. A requirement concerning a spatial average may be satisfied while a listener-access criterion at the weakest position is not; the decision rule must state which population governs before the data are reviewed.

38.22 Composite case T. Undocumented maintenance and progressive seal ageing

Case status: composite lifecycle-maintenance case. An acoustic doorset receives frequent use. Over four years, cleaners apply different products, the closer is adjusted twice, hinges wear, the latch is replaced and the automatic bottom is serviced by three contractors. No single change appears dramatic. Annual room tests are not performed because the door still closes and the perimeter looks intact.

A later complaint reveals reduced contact at the upper latch jamb and inconsistent bottom-seal deployment; the gasket has hardened and taken a compression set. The frame has shifted slightly under repeated cycling; the replacement latch does not draw the leaf as tightly as the original; each alteration lies within ordinary facilities work, but together they change the acoustic operating geometry; the as-built schedule no longer describes the as-operated doorset.⁵⁸

The investigation uses functional cycles, contact mapping, dimensional survey, closer-force and latch observations, local acoustic scans and comparison with the original field test; the result varies between cycles, which explains why occasional listening checks produced conflicting accounts. A single carefully hand-pulled closure performs better than

⁵⁸ [MB-0084](#). ASTM E2964-26.

normal use, demonstrating that test technique can conceal operational failure.

Repair replaces compatible seals, restores alignment, adjusts hardware and verifies accessibility, egress and fire-door obligations; the permanent maintenance plan records seal model, installation date, cleaning restrictions, inspection interval, cycle count where available, replacement criteria and retest triggers. Facilities personnel receive a simple escalation route for hardware substitutions.

Institutional lesson. Durability evidence is part of design. A high-performing doorset that cannot be maintained, adjusted or supplied with compatible parts is not a durable control. Maintenance records should connect ordinary facilities work to the accepted acoustic configuration.

Worked example 38.22. Intermittent bottom-seal failure over repeated meetings

A bottom seal fails to deploy during 2 per cent of door cycles; a protected meeting involves 30 entry or exit cycles; assuming independent identical probability solely for illustration, the probability of at least one failed cycle is

$$P = 1 - (1 - 0.02)^{30} = 0.455.$$

The result is 45.5 per cent; real failures can be correlated by debris, pressure, user behaviour and hardware state, so the independent model may understate clustering; the calculation demonstrates why a small per-cycle defect rate can become operationally important.

38.23 Composite case U. Product substitution and configuration drift before handover

Case status: composite procurement and construction-control case. A

contractor substitutes a gypsum board, isolation clip, sealant and door gasket through separate requests. Each product is described as equal or better based on one headline property. No one reviews the cumulative assembly. The mock-up used the specified products, while the production rooms use the substitutes.

Equivalence is configuration dependent. Surface density, stiffness, damping, dimensions, fastener pattern, framing, seal movement, adhesion, fire classification, durability and installation sequence can alter the mechanism. A clip with greater static capacity may also have different dynamic stiffness. A denser board may shift coincidence. A sealant may cure harder. A gasket may require different compression. Separate substitutions can interact even when each catalogue sheet appears favourable.⁵⁹⁶⁰

The discrepancy is discovered during as-built reconciliation; rather than reject everything reflexively, the project creates a configuration matrix comparing the tested assembly, approved design, accepted mock-up and installed production rooms; missing evidence is identified by proposition; a representative production room is inspected and tested. One substitute proves immaterial within the stated use. Another requires revised fasteners. The gasket fails cyclic contact and is replaced. The sealant cannot be accepted without compatibility and movement evidence.

59 [MB-0066](#). ASTM C754-20, ASTM C840-23.

60 [MB-0934](#). ISO 19650.

The final decision is recorded by item and assembly; where performance evidence remains incomplete, the authority may require correction, additional testing or a stated limitation; the project does not use a favourable room test to retroactively prove every hidden product equivalent, nor does it use a paperwork discrepancy to assert acoustic failure without evidence.

Institutional lesson. Substitution control must occur at the assembly level. Procurement schedules should identify critical features and interactions. The as-submitted, as-mocked-up and as-installed states should be reconciled before repetitive work is concealed.

Worked example 38.23. Dynamic-stiffness sensitivity after clip substitution

A lining mass per unit area remains constant, but substituted clips increase effective support stiffness by 60 per cent. In a simplified single-degree screen, natural frequency varies with the square root of stiffness. Thus

$$\frac{f_{n,2}}{f_{n,1}} = \sqrt{\frac{k_2}{k_1}} = \sqrt{1.60} = 1.265.$$

A 10 Hz screened resonance would move to approximately 12.7 Hz. This does not predict wall transmission loss, but it shows why equal load rating is not dynamic equivalence.

38.24 Composite case V. Contractor access and a forgotten temporary bridge

Case status: composite construction-surveillance case. During installation of an isolated ceiling, temporary timber props and steel braces stabilise the framing. The completion checklist records their planned removal. One prop remains concealed above a lighting raft because access

closes early. Final room-pair testing shows a narrow structural response that varies with source position.

The investigation examines hangers, perimeters, services and restraints before assuming a defective isolator; construction photographs show the temporary prop before closure but no corresponding removal photograph. A borescope view confirms contact between the isolated ceiling frame and the structural deck; the prop is not malicious, and the ceiling otherwise matches the drawings; it is a temporary construction aid that became a permanent rigid path because release evidence was incomplete.⁶¹

Removal produces a marked reduction in ceiling-frame vibration; the room-pair improvement is smaller because a duct path remains; the corrective record therefore distinguishes the local bridge correction from the total result; the project inspects other rooms built by the same sequence, not because the defect is known to recur everywhere, but because the process created a plausible common cause.

The case also raises access-control questions. Restricted work areas can limit photography, tool use and personnel; those controls are legitimate, but they must be incorporated into the surveillance plan rather than allowing critical evidence to disappear; trusted observers, approved cameras, tagged temporary works and hold-point release can preserve both security and quality.

Institutional lesson. Temporary works need stable identifiers and closure evidence. The final state cannot be inferred from intention. A checklist

⁶¹ [MB-0425](#). Construction Specifications Institute specification practice, public UFGS quality-control and commissioning sections, and Chapter 34 of this work concerning temporary works.

signed after concealment is weaker than an observed removal linked to location, photograph and responsible person.

Worked example 38.24. Local bridge and residual duct path

Before removal, the ceiling bridge contributes 34 dB and the duct contributes 29 dB at the receiver. Total is 35.2 dB. Removing the bridge lowers its contribution to 22 dB, leaving total 29.8 dB; the local bridge improves by 12 dB, but the whole result improves by 5.4 dB because the duct becomes dominant.

38.25 Distinguishing complaint, defect, nonconformance, vulnerability and compromise

Institutional response weakens when unlike concepts are merged; a **complaint** is a reported observation or concern requiring triage; a **defect** is a physical or functional departure from intended condition. A **nonconformance** is a departure from a specified requirement, approved submittal, procedure or accepted baseline; a **vulnerability** is a condition that could permit an adverse consequence under a defined threat and state; a **compromise** is an event in which protected information or function was actually lost, exposed or adversely affected under the applicable authority.

These categories overlap but do not imply one another automatically; a torn seal is a defect and may be a nonconformance. It can create vulnerability. It does not prove that anyone listened or recovered information; a listener's accurate recollection can support compromise inquiry even where the construction later appears intact; an undocumented penetration is a nonconformance even if testing finds no material acoustic effect; a

complaint can be mistaken while still deserving a respectful, documented investigation.⁶²⁶³

Table 38-2. Institutional classification of an adverse observation

Classification	Controlling question	Minimum evidence	Immediate response
Complaint	What was reported, by whom, when and under what state?	Interview, location, time, operating conditions	Preserve state and triage
Defect	What physical or functional condition departs from intended operation?	Inspection, measurement or functional test	Correct or bound the defect
Nonconformance	Which controlled requirement or baseline was not met?	Requirement, approved record and observed state	Record, disposition and verify
Vulnerability	What adverse consequence could occur under a defined threat and state?	Path, source, access, consequence and uncertainty	Restrict use and mitigate as authorised
Compromise	What protected information or function was actually exposed or lost?	Incident evidence under competent authority	Incident response, legal and security action

Reports should use the narrowest term supported; overstatement can unjustly attribute wrongdoing and weaken later testimony; understatement can leave the organisation operating in an unsafe state; engineering evidence informs these classifications but does not replace legal, security or organisational authority.

Worked example 38.25. Bounded classification

A new penetration is found without a register entry. Inspection confirms an incomplete seal. Testing shows a 6 dB local increase but no authorised evidence addresses whether protected speech occurred during the interval; the supported statements are: observed defect, documented nonconformance and demonstrated susceptibility under the test state.

62 [MB-0079](#). ASTM E2713-25 and ASTM E3176-24, ASTM E2713-25, ASTM E3176-24.

63 [MB-1129](#). Public security and facility doctrine discussed in Chapters 28 through 32. Engineering susceptibility, authority authorisation and demonstrated compromise remain separate propositions.

Compromise is not established. The distinction directs immediate repair and review without asserting an event the record cannot prove.

38.26 Evidence custody, destructive opening and expert reporting

When a failure may enter litigation, contractual dispute or incident review, the room becomes both an engineering system and an evidentiary scene. The investigator should preserve photographs, notes, native measurement files, calibration records, software versions, drawings, samples, removed hardware and correspondence according to the applicable authority. SHA-256 or another approved digest can make later byte changes detectable, but it does not prove authorship, calibration or truth of content.⁶⁴⁶⁵

Destructive opening should be hypothesis driven. The proposed location, question, expected observation, safety controls, witnessing, sample handling and restoration duty should be documented before disturbance; openings should be large enough to answer the question, not merely to create an ambiguous glimpse; fire, structure, moisture, hazardous materials, utilities and controlled-information exposure require their respective specialists.

Chain of custody should be proportionate. A discarded gasket retained for ordinary quality review may need a simple identifier and photograph; a component central to litigation or a security incident may require sealed packaging, transfer records, access logs and controlled storage; sampling should record what population the item represents and what remains

64 [MB-1093](#). ISO/IEC 27037:2012.

65 [MB-0086](#). ASTM E3176-24; applicable evidence law, ASTM E3176-24.

unexamined. The investigator should avoid implying that one retrieved fastener proves every fastener is identical.

The expert report separates instruction, documents, observations, methods, results, calculations, assumptions, alternative hypotheses, supported mechanism, limitations, remediation, residual risk and authority disposition; it should identify facts supplied by others and distinguish technical opinion from legal conclusion; reproducible appendices should allow another competent reviewer to trace the reasoning without exposing information that cannot lawfully be released.

Institutional lesson. Evidence preservation should begin before the first repair. Once a seal is removed, a wall opened or software updated, the original state may be unrecoverable. Speed matters, but uncontrolled correction can destroy causal evidence and leave the organisation unable to explain what happened.

Worked example 38.26. Hash verification of raw measurement files

A manifest contains 240 raw files. On handover, 238 digests match. Two do not. The mismatch establishes that the byte streams differ from the recorded originals; it does not establish whether the cause is corruption, conversion, metadata rewriting or deliberate alteration; the files are quarantined, provenance is investigated, and no accusation is made from the hash result alone.

38.27 Before-and-after comparison, covariance and causal strength

Remediation is often judged by subtracting an after value from a before value. That difference is useful only when the source, positions, room states,

instruments, processing and configuration are comparable. Moving a loudspeaker, changing furniture, reducing background or adjusting HVAC can create an apparent improvement unrelated to the repair. Conversely, correlated calibration and geometry can cause some uncertainty to cancel when the comparison is well controlled.⁶⁶

A strong causal comparison has three layers; first, a local indicator changes at the treated mechanism; second, the whole-room consequence changes in the expected bands and state; third, alternative causes remain stable or are measured. A door repair that improves contact mapping and local pressure response but not the room pair may still be technically successful if a plenum dominates the total. The report should not call it ineffective merely because the system-level benefit is masked.

The uncertainty of a difference should include covariance where contributors are shared; if before and after use the same calibrated microphones, source monitor and geometry, treating every uncertainty as independent can overstate difference uncertainty; if different teams, seasons or configurations are used, assuming cancellation can understate it. Configuration uncertainty and model discrepancy remain separate from measurement dispersion.

Worked example 38.27. Correlated uncertainty of an improvement

Before and after results differ by 5.2 dB. Standard uncertainties are $u_1 = 1.1$ dB and $u_2 = 0.9$ dB. With correlation coefficient $r = 0.65$, uncertainty of the difference is

⁶⁶ [MB-0985](#). JCGM 100:2008, JCGM 106:2012.

$$u_{\Delta} = \sqrt{u_1^2 + u_2^2 - 2r u_1 u_2} = 0.86 \text{ dB}.$$

If independence were assumed, the result would be 1.42 dB; the lower value is justified only when the shared contributors and correlation are documented; unknown source relocation or furnishing changes remain outside this calculation.

38.28 Dominant-path migration and the danger of symptom repair

A room behaves as a network. Repairing the strongest path can expose a secondary path that was always present. This **dominant-path migration** explains why a local 15 dB repair may produce only 4 dB whole-room improvement, and why successive improvements become progressively more expensive. It also explains why repeated treatment of the same visible surface can become wasteful after another path controls.

A path budget should be updated after each material intervention; the investigator estimates or measures contributions, identifies uncertainty, predicts the new dominant path and chooses whether the remaining consequence warrants further work; the process should not chase decimal differences below measurement capability or ignore a local high-consequence listener position merely because the room average changes little.

Table 38-3. Example path-migration ledger

Stage	Door	Plenum	Structure	Services	Energetic total	Dominant path
As found	38 dB	34 dB	30 dB	27 dB	39.7 dB	Door
Door repaired	25 dB	34 dB	30 dB	27 dB	35.7 dB	Plenum
Plenum repaired	25 dB	24 dB	30 dB	27 dB	32.5 dB	Structure

Stage	Door	Plenum	Structure	Services	Energetic total	Dominant path
Structural source controlled	25 dB	24 dB	23 dB	27 dB	31.2 dB	Services

The ledger is illustrative. Contributions can be correlated, frequency dependent and difficult to separate; its value is conceptual and managerial: it prevents the team from treating the original dominant path as the permanent explanation of every residual result.

Institutional lesson. Remediation should target a demonstrated mechanism and anticipate what will dominate next. Local verification and whole-room retesting answer different questions. Both belong in the closeout record.

Worked example 38.28. Maximum possible benefit from one path

A dominant path contributes 36 dB, while all other paths together contribute 32 dB; initial total is 37.5 dB; even eliminating the 36 dB path entirely leaves 32 dB, so maximum possible whole-room improvement is 5.5 dB. This bound can prevent unrealistic promises before repair begins.

38.29 Failure clustering across interfaces, changes and institutional processes

The individual cases differ in material and mechanism, yet their organisational patterns repeat; failures cluster at interfaces rather than uniform fields, at transitions between trades, at concealed conditions, at substitutions, at operating-state changes and at later maintenance. They also cluster where evidence ownership is ambiguous; the wall contractor assumes the door specialist owns the frame return; the mechanical

contractor assumes the architect owns the plenum barrier. Facilities staff assume a software update is outside acoustic control.

A useful failure taxonomy separates **physical mechanism**, **project phase**, **evidence failure** and **governance failure**. A cable penetration is an air path and possible rigid bridge. It arises during alteration. The evidence failure is an absent penetration record. The governance failure is lack of a change trigger. Correcting only the seal leaves the process ready to repeat.

Near misses deserve attention. A missed hold point discovered before closure, a gasket substitution rejected during review or a background-limited preliminary test can reveal weak controls without producing a completed failure. Recording those events supports prevention. Punitive treatment of every report can suppress early disclosure and leave only serious failures visible.

Worked example 38.29. Pareto screen of failure causes

A programme reviews 80 findings: 28 involve penetrations or interfaces, 19 involve doors and seals, 14 involve services or plenums, 9 involve substitutions, 6 involve instrumentation or test planning and 4 involve uniform wall fields; the first three categories contain 61 findings, or 76.25 per cent. The count does not measure consequence, but it supports prioritising interface surveillance, doorset maintenance and service coordination.

38.30 Governance controls and lifecycle change triggers

A mature programme converts case lessons into controls that operate before the next failure; the governing record should identify the protected function, configuration baseline, responsible authority, change categories,

required review, inspection, measurement and return-to-service decision; emergency work may change sequence, but it does not cancel retrospective reconciliation.

Table 38-4. Lifecycle change-trigger matrix

Change	Primary risk	Minimum pre-work control	Post-work evidence	Retest trigger
Door hardware or seal	Contact, operation and perimeter leakage	Approved component and doorset review	Model, alignment, contact and cycles	Material hardware or seal-line change
New cable or conduit	Opening, rigid bridge and later capacity	Penetration permit and coordinated detail	Register, photographs, closure and inspection	New or enlarged boundary crossing
HVAC balancing or silencer work	Cross-talk, breakout, pressure and background	State matrix and mechanical review	Airflow, pressure, noise and identity	Path geometry, silencer or operating-range change
Masking or AV software	Source level, routing and receiving background	Configuration backup and authority review	Firmware, gain, spectrum and functional test	Change capable of altering source or background
Ceiling or raised-floor access	Barrier displacement and concealed damage	Access plan and boundary identifiers	Before-and-after photographs and reconciliation	Unplanned opening or damaged barrier
Heavy equipment move	Resilient loading and structural excitation	Load and support review	Location, load, clearance and vibration check	New concentrated load or mounting
Emergency repair	Uncontrolled configuration change	Immediate authority notification	Retrospective full record	Any protected-boundary disturbance

The matrix should be tailored to the room; a small consultation room and a room-within-room suite do not require identical controls; the principle is constant: changes are screened by mechanism and consequence, not merely by contract value or physical size.

Institutional lesson. Change control is part of engineering, not an administrative appendix. A technically sound acceptance result decays in

value when the organisation cannot determine whether the tested state still exists.

Worked example 38.30. Risk-ranked retest decision

A change score uses consequence C, path sensitivity P, evidence deficit E and reversibility R, each rated 1 to 5, with screening sum $S = C + P + E + (6-R)$; a new wall conduit receives 5, 5, 4 and 2, giving $S = 18$. A like-for-like carpet replacement receives 2, 1, 1 and 5, giving $S = 5$; the score is a project-management screen, not a universal risk equation; it directs the first change to full review and retest while allowing proportionate control of the second.

38.30.1 Periodic inspection and condition-based retesting

A periodic assurance programme should not repeat the entire original acceptance campaign mechanically every year; it should combine inexpensive, frequent observations with deeper testing when evidence or consequence justifies it; door contact, visible seals, penetration registers, masking status, software baselines, ceiling access, equipment mounts and change logs can be reviewed more often than full room-pair or speech-security measurements. The frequency follows wear, use, consequence, detectability and change rate rather than a universal calendar.

Condition-based triggers are particularly important. A doorset with high cycling, pressure change and replaceable seals may require frequent functional checks. A massive concrete shell with stable services may need less routine acoustic testing but immediate review after coring, plant replacement or structural alteration. A room dependent on masking or conferencing controls needs configuration monitoring because software can change between physical inspections. Heritage construction may require

seasonal moisture and crack review before invasive testing is contemplated.⁶⁷

Trend data should preserve comparability. The same local indicator, position, source, instrument configuration and state can reveal gradual deterioration before the formal criterion is crossed; a slow 1 dB annual decline may be obscured by ordinary field variability unless repeated measurements and uncertainty are considered. Conversely, a single adverse value should not trigger dramatic reconstruction before calibration, background and configuration are checked.

Periodic inspection also needs an escalation ladder; level 1 may be a trained facilities walkdown and record reconciliation; level 2 may add functional tests and local acoustic indicators; level 3 may involve a specialist room-pair, vibration, intensity or speech-security campaign. Level 4 may require forensic opening, incident coordination or competent-authority restriction. The baseline states which observations move the room from one level to another.

Worked example 38.30A. Trend threshold with measurement variability

A local door-jamb indicator is 31.0, 31.4, 32.1 and 33.0 dB over four annual checks; repeatability standard deviation is estimated as 0.6 dB; the total rise of 2.0 dB is more informative than any single annual increment, particularly because contact measurements also show declining compression. The organisation schedules specialist adjustment and a comparable field check;

⁶⁷ [MB-1125](#). Public commissioning, maintenance and facilities-management guidance, together with Chapters 34 through 36 of this work. Inspection interval and retest scope remain project- and consequence-specific.

the trend does not by itself establish a speech-security failure, but it supplies rational evidence for intervention before gross deterioration.

38.30.2 Multi-room programme analytics and common-cause review

An organisation operating several protected rooms should analyse findings at programme level without erasing room-specific differences; stable identifiers allow findings to be grouped by doorset model, seal batch, wall type, contractor, silencer family, software version, maintenance vendor, construction phase and failure mechanism. A common pattern can justify broader inspection even when only one room has produced a complaint.

Programme analytics must remain cautious. Ten findings associated with one contractor may reflect the contractor's larger workload rather than poorer performance. A product family installed in older rooms may appear less reliable because it has more service years. Severity, exposure, sample size and inspection intensity should accompany raw counts. Statistical sophistication does not compensate for inconsistent classification or missing baseline data.⁶⁸

Common-cause review is strongest when a process link exists; if three rooms built during the same week contain overlong fasteners, the organisation should examine the crew, fastener supply, detail, training and inspection release; if multiple rooms drift after one audiovisual firmware package, the update process becomes the unit of analysis. If firestop labels are consistently present while acoustic records are absent, the governance interface between life-safety inspection and acoustic closure needs correction.

⁶⁸ [MB-0944](#). ISO 9001:2015, ISO 19650.

The programme should also preserve positive evidence; rooms that remain stable under heavy use can reveal effective details, maintainable products and competent processes; comparative learning should avoid copying a successful detail into a different structural or jurisdictional context without equivalence review. A robust lesson identifies why the control worked, which conditions were necessary and what evidence would show that transfer is inappropriate.

Worked example 38.30B. Common-cause screen by installation cohort

Forty rooms contain one doorset model. Eight were installed by Crew A, and three show the same upper-jamb contact defect; thirty-two were installed by other crews, and two show that defect; observed proportions are 37.5 per cent and 6.25 per cent. The difference warrants cohort review, but the sample is small and may reflect building movement or frame type; the organisation inspects the remaining Crew A doors, compares frame geometry and training records, and avoids declaring individual fault from the proportions alone.

38.30.3 Competence, handoffs and ownership of the complete boundary

Many failures occur not because every participant lacks skill, but because each participant controls only a fragment; the architect owns the wall geometry; the structural engineer owns movement and loads; the mechanical engineer owns airflow and vibration isolation; the fire-protection engineer owns sprinklers and life safety. The audiovisual integrator owns gain and routing. The acoustical specialist owns measurement and path analysis. Security officials own protected use and authority; the contractor

owns sequencing and workmanship; facilities staff own the room after handover; the complete boundary can fall between these competent disciplines.

Responsibility matrices should therefore identify interfaces and decisions, not merely organisations; someone must own the wall-to-door frame, the duct penetration, the raised-floor perimeter, the software update trigger and the final as-operated reconciliation; delegated design must define inputs, output evidence and professional responsibility; witnessing roles should not be confused with approval. A laboratory may be competent to perform a method while having no authority to accept the room; a security official may authorise use while relying on engineering evidence produced by others.⁶⁹⁷⁰

Training should be role specific. Installers need details, sequence and prohibited bridges; inspectors need observable criteria and escalation rules; facilities staff need change triggers and maintenance limits; users need operational controls that are practical, such as door closure, amplified-audio limits and fault reporting. Senior decision makers need the four-proposition distinction so that a test report is not mistaken for accreditation or an authorisation is not mistaken for physical evidence.

Handoffs should include a live demonstration of registers, access points, equipment states and change procedures; a binder left in a cupboard is not institutional knowledge; the receiving team should locate a penetration, retrieve its evidence, identify a doorset component, restore an approved

69 [MB-0951](#). ISO/IEC 17025:2017.

70 [MB-0416](#). Chapter 33 procurement and responsibility doctrine, Chapter 34 construction surveillance, and Chapter 35 commissioning. Internal cross-references do not replace independent external authority for technical propositions.

software baseline and initiate a change review. Inability to perform those tasks is itself a handover finding.

Worked example 38.30C. Responsibility gap in a duct penetration

A silencer is correctly selected, the wall opening is correctly framed and the firestop is correctly inspected; no party owns the short unlined duct between the silencer and wall, whose casing radiates into the plenum; every individual scope is locally complete, yet the installed path fails. A responsibility matrix assigns future ownership of the full source-to-receiver route, including transitions and surrounding construction, rather than dividing acceptance at trade boundaries.

38.30.4 Commercial incentives, schedule pressure and evidence quality

Secure-room defects often develop within ordinary commercial pressures rather than exceptional misconduct; long-lead doors, silencers, glazing and controls collide with programme dates; concealed work closes before specialists can attend; a substitute appears cheaper because the bid excludes mock-up testing, escorts, after-hours access or corrective retesting. The project then treats evidence as delay rather than as part of the work product.

Contracts should allocate the cost and schedule consequences of inspection, missed hold points, rejected substitutions, failed tests and corrective work before bidding. Otherwise, the party who reports a defect may bear the immediate penalty while the party who conceals it preserves programme appearance. Clear release gates reduce this perverse incentive. Work may

proceed when the required evidence exists, not merely when the programme wishes the condition to be complete.⁷¹

Commercial control also requires proportion. Not every minor discrepancy justifies demolition. The nonconformance process can accept repair, alternative evidence, conditional use or accepted-as-is disposition when competent reviewers understand the consequence; however, “accepted as is” should not become a schedule convenience; it should identify the requirement, observed condition, technical analysis, uncertainty, responsible authority and lifecycle restriction. A cost saving has no technical meaning until the altered risk and future maintenance burden are disclosed.

Delay analysis should preserve cause. If a doorset arrives late because its submittal was incomplete, the record differs from a delay caused by a newly discovered controlled requirement; if testing is repeated because the first campaign lacked dynamic range, the cause is measurement planning rather than construction. Accurate classification supports fair commercial resolution and more effective prevention.

Worked example 38.30D. Apparent saving after excluded assurance work

Bid A is £820,000 and includes mock-up testing, two inspection shifts and one retest allowance valued at £48,000; bid B is £795,000 but excludes those items; normalised Bid B is £843,000 before risk contingency. The lower tender is not the lower comparable scope; the arithmetic does not select the contractor, but it prevents assurance obligations from disappearing inside an apparent saving.

⁷¹ [MB-1126](#). Public construction-contracting and specification-practice principles concerning scope definition, submittals, quality control.

38.30.5 Public-source boundaries, anonymisation and responsible case publication

Published failure cases can improve professional practice, but sensitive-room details require disciplined abstraction. A useful case can explain the mechanism, measurement logic, uncertainty and institutional lesson without naming a facility, publishing controlled thresholds, reproducing restricted drawings or revealing exploitable access conditions.

Anonymisation must consider combinations of facts. A rare room type, city, date, contractor and distinctive defect can identify a project even when the name is removed.⁷²

Case preparation should classify each fact by source, ownership, release authority and technical necessity; public standards and generic equations can be cited openly; project-specific dimensions may be rounded or replaced with clearly labelled illustrative values; controlled criteria can be represented by variables or bounded statements owned by the authorised project official. Photographs may require redaction, redrawing or omission. The public version should preserve the distinction between what happened, what is modelled and what is deliberately withheld.

Responsible publication also avoids converting a defect into a how-to guide for defeating a facility; the emphasis belongs on assurance, detection, correction and lifecycle governance; exact listener locations, uncorrected path dimensions, authority procedures and site-specific countermeasures may be unnecessary to the lesson. The publication record should document the review that authorised release and the limitations introduced by abstraction.

⁷² [MB-1145](#). Public-source and controlled-document boundaries developed in Chapters 2 and 28 through 32.

Anonymisation does not excuse invention. A composite case should be labelled composite; a hypothetical number should be labelled illustrative; a historical case should cite the public record and distinguish later interpretation; readers should never be invited to believe that a synthetic example occurred at an unnamed government site merely because the prose sounds forensic.

Worked example 38.30E. Abstraction without losing the mechanism

A real project contains a 2.7 mm continuous head gap over 4.3 m at a distinctive diplomatic facility; the publishable teaching case replaces the site, changes dimensions to an explicitly illustrative 3 mm by 4 m gap, omits the jurisdiction-specific criterion and retains the area-weighted transmission calculation. The mechanism and engineering lesson survive, while the text does not claim that the illustrative dimensions are historical fact.

38.31 Institutional learning, assurance review and feedback to design

The final purpose of failure analysis is not merely to close one nonconformance; it is to improve design, procurement, surveillance, commissioning, maintenance and governance; a learning review should ask why the physical condition arose, why earlier controls did not detect it, why the evidence chain permitted uncertainty and whether the same process exists elsewhere.

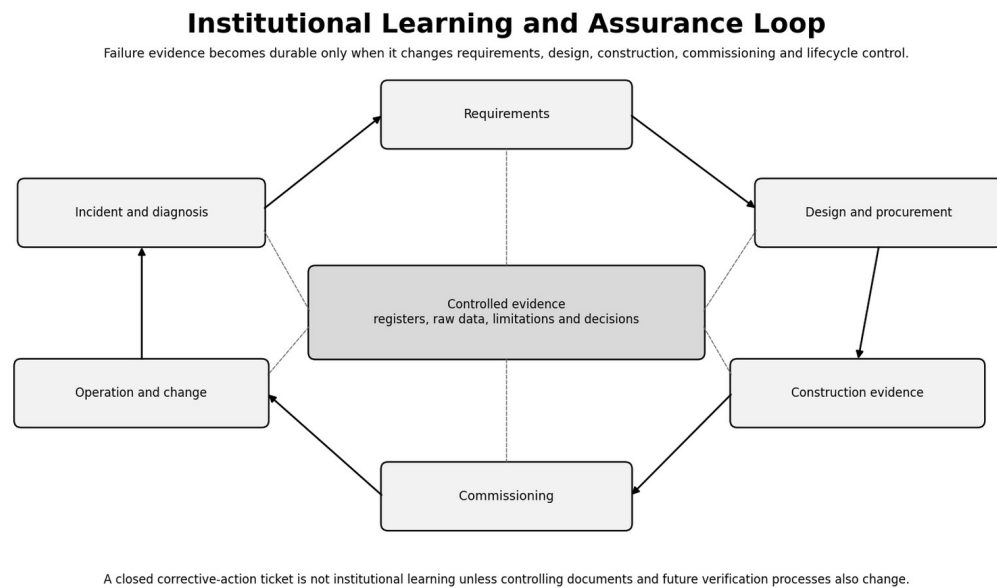


Figure 38-8. Institutional learning turns an observation into investigation, correction, verified closeout, programme change and renewed assurance rather than allowing the same process to recur. Author's original diagram.

The review should distinguish local cause from systemic cause; the local cause may be one long screw; the systemic causes may include an incomplete fastener schedule, absent mock-up backing, untrained labour and missed inspection; the local correction removes the screw. The systemic correction changes drawings, submittals, training and hold points. Both are necessary.

Learning records should not become repositories of vague admonitions; each lesson should identify the mechanism, applicable project stage, control change, owner, effective date, affected documents, training need and verification method; lessons should be reviewed after enough time to determine whether the change worked. A new checklist that no one uses is not an improvement.

Independent review can strengthen the programme, particularly where the organisation designed, built and accepted its own work; reviewers should receive the evidence necessary to test the reasoning, not merely the final summary; their role does not displace the competent authority. Nor does internal QA become external peer review by being described enthusiastically.

Institutional lesson. A failure programme should reward early, accurate reporting and disciplined correction. Concealing near misses creates brittle confidence. Treating every report as blameworthy discourages the observations that allow prevention.

Worked example 38.31. Verification of a corrective programme

After introducing penetration permits, a programme audits 120 later penetrations; all have identifiers, 116 have complete photographs and 114 pass first inspection; the documentation completion rate is 96.7 per cent, while first-pass conformity is 95.0 per cent. The programme has improved observability but has not achieved perfection; the six failed inspections are analysed for common causes, and missing photographs remain nonconformances even where physical closure is acceptable.

38.32 Final synthesis and transition to Part XII

The case studies show that acoustic-security failure is rarely a simple contest between a sound source and a wall; it is a breakdown in the alignment of physics, configuration, evidence, operating state and authority; a heavy wall can be bypassed by a joint; a high-performance door can fail through frame distortion or ordinary wear; a silencer can be overwhelmed by casing breakout. A floating floor can be bridged by levelling compound; a room can

pass in daytime and fail at night; a stable boundary can become inadequate when software raises source level; a favourable test can be meaningless where dynamic range is absent.

These cases also show what disciplined practice looks like. Preserve the state. Define the question. Maintain competing hypotheses. Use broad tests to establish consequence and local methods to identify mechanism; prefer reversible discriminating interventions before destructive opening. Repair the demonstrated path. Retest under comparable and adverse credible states; preserve raw data and as-built evidence. State uncertainty and residual limitations. Obtain the decision from the competent authority; then control every later change that can invalidate the baseline.

Table 38-5. Chapter 38 release gate for a failure investigation

Gate	Controlling question	Minimum evidence	Failure response
Scope	What question, room, state and authority govern?	Written instruction and protected-function statement	Clarify before intrusive work
Preservation	Has the original configuration been frozen and recorded?	Photographs, logs, settings, drawings and access control	Preserve before correction
Hypotheses	Are plausible direct, flanking, service, structural, operational and measurement causes retained?	Hypothesis matrix and reversal tests	Expand the investigation
Measurement	Do instruments, sampling and dynamic range support the conclusion?	Calibration, raw data, positions, backgrounds and uncertainty	Correct method or qualify bands
Causation	Does spatial, spectral, temporal and intervention evidence support the mechanism?	Convergent observations and alternatives considered	Limit the conclusion
Remediation	Does the repair change the demonstrated mechanism without violating other obligations?	Approved design, inspection and local verification	Redesign or restore

Gate	Controlling question	Minimum evidence	Failure response
Recommissioning	Was the controlling field and operating-state result repeated comparably?	Before-and-after data and decision rule	Retest before return to service
Lifecycle	Are drawings, registers, software, maintenance and change triggers reconciled?	Final dossier and authority disposition	Keep the condition open

The enduring institutional rule is restrained but demanding; do not infer more than the evidence supports; do not accept less evidence than the consequence requires; a secure room remains a controlled configuration only while the organisation can demonstrate what it is, how it performs, which use is authorised and what changes require renewed review.

Part XII now consolidates the series into design rules, equations, registers, schedules, uncertainty templates, inspection instruments, commissioning forms and lifecycle controls; its purpose is to make the reasoning in Chapters 1 through 38 operational, auditable and reproducible rather than leaving the lessons as prose alone.

Chapter 38 Glossary

As-found state. Physical, documentary and operating condition observed when an investigation begins, before corrective disturbance.

Causal mechanism. Physical or operational process that produces the observed consequence within the supported scope.

Complaint. Reported observation or concern requiring triage, not itself proof of defect or compromise.

Compromise. Actual loss, exposure or adverse effect involving protected information or function, determined under the applicable authority.

Configuration drift. Accumulation of physical, software or operational changes that causes the current room to differ from its accepted baseline.

Configuration uncertainty. Incomplete knowledge of the physical or operating state represented by a calculation, observation or measurement.

Defect. Physical or functional departure from intended condition.

Discriminating intervention. Controlled, preferably reversible change designed to distinguish among competing causal hypotheses.

Dominant-path migration. Transfer of system control from one path to another after the original dominant path is reduced.

Dynamic-range limitation. Condition in which source contribution cannot be separated reliably from background, noise or instrument limits in the required band.

Evidence status. Classification distinguishing observed fact, calculated result, supported inference, composite illustration and unresolved proposition.

Failure population. Set of items, locations, rooms, states or changes to which an observation or sample might apply.

Guard band. Deliberate decision interval used to manage conformity risk in view of measurement uncertainty.

Hypothesis matrix. Controlled comparison of possible mechanisms, supporting observations, contradicting observations and proposed discriminating tests.

Nonconformance. Departure from a controlled requirement, approved submittal, procedure or accepted baseline.

Path budget. Frequency- and state-specific account of direct, flanking, service, structural and operational contributions to the total result.

Recommissioning. Controlled verification after repair, alteration, degradation or incident, establishing a new or restored baseline.

Residual risk. Risk remaining after investigation, correction, measurement and authority disposition, stated with assumptions and limitations.

Source-state drift. Change in human, electronic or mechanical excitation relative to the accepted source condition.

Supported inference. Explanation better supported than identified alternatives by convergent evidence, without claiming certainty beyond the record.

Temporary bridge. Construction aid, support, restraint or contact intended to be removed but capable of becoming a permanent transmission path.

Vulnerability. Condition that can permit an adverse consequence under a defined threat, access and operating state, without proving exploitation.

PART XII. FINAL SYNTHESIS AND TECHNICAL APPARATUS

Part XII recombines the monograph's physics, construction, measurement, evidence, authority and lifecycle controls into a usable system. The synthesis states the governing propositions, then converts them into design rules, calculation records, schedules, registers, checklists and decision forms. These instruments are intended to preserve the distinction between laboratory evidence, installed performance, occupied speech consequence and formal authority while keeping source state, path geometry, receiver access, uncertainty and configuration visible. The apparatus is not decorative end matter. It is the operational bridge from a scholarly account to project requirements, construction surveillance, commissioning, forensic diagnosis, change control and later recommissioning.

XII.1 The system-level thesis

For design review, the system model should be tested with at least one ordinary state, one credible adverse state and one change state. The team asks whether the same requirement, path ownership and evidence remain valid when doors operate, plant changes mode, a remote participant raises programme level, or an adjacent service area becomes accessible. This exercise often reveals that a nominal wall target has no corresponding listener-access assumption or that an electronic source was omitted from the commissioning plan. The review record assigns the gap to a named owner before procurement or construction converts it into an expensive field uncertainty.

A useful system model begins with a coordinate system and a state vector, not with a product schedule. The source vector records position, orientation,

vocal or electronic level, spectrum, time history and processing. The transfer representation records each boundary field, opening, junction, service and structural route by band. The receiver vector records background, absorption, access point, dwell time and instrumentation. Configuration and authority are additional state variables because identical acoustic data can support different decisions when the room, use or governing criterion differs. This representation makes omissions visible. A drawing that shows partitions but omits plenum continuity, door pressure, conferencing gain or after-hours background is not a complete model of the protected discussion system. System verification should proceed in both directions. A requirement can be traced forward through design, submittal, construction, test and decision. An installed feature can be traced backward through its identifier to approved evidence and governing need. Broken forward links indicate that a requirement may not have reached the work. Broken backward links indicate that the tested or inspected object may not be the authorised object. This bidirectional trace is especially valuable after repair, because the energetic path balance may change while the administrative record still points to the earlier dominant weakness. The system thesis therefore treats acoustical performance and evidentiary continuity as coupled but non-identical controls.

Figure XII-1. The secure-room result is produced by a coupled source, transfer-network, receiver, evidence and authority system. Author's original diagram.

The system-level thesis is that acoustic security exists only in a declared state. The model should identify a coordinate system, source vector, transfer network, receiver vector, configuration state, evidence state and decision owner. Human speech, amplified programme audio and alarms differ in spectrum, directivity, duration and control. Boundaries likewise comprise

parallel fields, junctions, openings, services and structural routes whose relative importance changes with frequency and operation. Receiver conditions include background, absorption, listener access, dwell time and the possibility of recording or repeated exposure. A design review should therefore test an ordinary operating state, at least one credible adverse state and a change state. The purpose is not to produce an elaborate diagram for its own sake. It is to expose omissions, such as an unmodelled maintenance cupboard, a quiet night condition, a loudspeaker source, or a door pressure regime. Every shorthand result should be traceable back to this declared system. Where the state is incomplete, the conclusion is correspondingly bounded rather than expanded by institutional confidence.⁷³

XII.1.1 Integration gate and evidence protocol

At the integration gate, the entire room, its adjoining spaces, building services, electronics, people, records and authority must be represented as one declared assurance system rather than as a catalogue of individually respectable products. The physical and evidentiary mechanism requiring control is a coordinate model, state vector and directed path graph in which every source, boundary field, opening, junction, service route, receiver and decision owner has a stable identifier. This treatment forces the team to describe identified objects, interfaces and states rather than relying on adjectives such as robust, secure, compliant or high performing. The model should be proportionate to consequence, yet it must remain sufficiently explicit that an independent reviewer can discover an omitted route, unowned interface or unsupported transfer of evidence.

⁷³ [MB-0963](#). JCGM 100:2008, JCGM 106:2012.

The nominal account is challenged against door cycling, quiet night operation, remote-participant gain changes, emergency plant modes, maintenance access and later equipment installation. The retained evidence comprises the system boundary drawing, ordinary and adverse-state matrix, path ledger, interface responsibility schedule, configuration baseline and bidirectional requirement trace. Each record should carry a stable identifier, author, date, revision and disposition, and it should be linked to the configuration actually represented. Where evidence is missing, the gap remains visible with a responsible owner and due date; it is not converted into implied conformity by an attractive drawing, an isolated number or the passage of time.

Closure requires that every material requirement can be followed forward into design and evidence, and every installed object can be followed backward to an approved need and disposition. The model organises reasoning, but it does not convert an unmeasured path or an undisclosed authority criterion into proof. The final record distinguishes observation, calculation, inference and authority action, states residual uncertainty, and identifies the event that reopens review. Corrective work must also preserve structural duty, life safety, accessibility, maintainability, cyber and technical-security boundaries, because improvement in one narrow path does not authorise damage to another essential function.

Table XII.1-G. Integration gate for The system-level thesis

Gate	Required record	Typical defect	Required response
Definition	Declare the entire room, its adjoining spaces, building services, electronics, people, records and authority must be represented as one declared assurance system rather than as a catalogue of individually respectable products.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine door cycling, quiet night operation, remote-participant gain changes, emergency plant modes, maintenance access and later equipment installation.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	The system boundary drawing, ordinary and adverse-state matrix, path ledger, interface responsibility schedule, configuration baseline and bidirectional requirement trace.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	Every material requirement can be followed forward into design and evidence, and every installed object can be followed backward to an approved need and disposition.	The model organises reasoning, but it does not convert an unmeasured path or an undisclosed authority criterion into proof.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.2 The four-proposition doctrine

A proposition matrix can prevent category error during meetings and reports. Rows identify each claimed outcome; columns identify object, method, source state, receiver state, uncertainty, limitation and decision owner. A blank cell is not filled by copying evidence from another row. For example, a laboratory doorset report cannot populate the installed-room

field, and a room-pair level difference cannot populate the formal-authority field. This simple matrix provides a visible reason for requesting missing evidence and gives counsel, engineers and officials a common vocabulary without collapsing their roles.

Laboratory performance belongs to a defined specimen, mounting and method. It may establish transmission loss, insertion loss or another component quantity under controlled boundary conditions. Installed field performance belongs to a room pair, facade, door, duct or other actual relationship, with flanking, background, geometry and workmanship included. Occupied speech-security performance adds source behaviour, language, listener access, repetition, context and receiving background. Formal acceptance or accreditation adds institutional authority, mission, residual risk and controlled criteria. The four propositions form an evidentiary ladder, but the rungs are not interchangeable. A strong laboratory report can support design selection without proving the installed room, and a favourable field result can support use without granting authority. Reports should identify the proposition in their title, methods and conclusion. A table headed merely 'pass/fail' conceals whether the test concerned a specimen, a field quantity, a speech trial or an authority rule. The decision record should instead state the object, configuration, source and receiver states, frequency range, uncertainty, limitations and person empowered to decide. This discipline also prevents reverse inference. An accredited facility is not evidence that every component equals its laboratory rating, and a failed local diagnostic does not by itself revoke an institutional decision. Each proposition remains reviewable on its own evidence while the authority considers their combined consequence.

Figure XII-2. Laboratory, field, occupied speech-security and authority are separate propositions. Author's original diagram.

The four-proposition doctrine prevents evidence from migrating beyond its scope. Laboratory specimen performance concerns a defined construction, mounting and method. Installed field performance concerns the actual rooms, interfaces, flanking and operating conditions. Occupied speech-security performance introduces source behaviour, listener access, background, context and repetition. Formal acceptance or accreditation is an institutional decision made by the authorised body. A proposition matrix should identify the object, measurand, method, source state, receiver state, uncertainty, limitation and decision owner for every important claim. Blank cells are not filled by copying evidence from another row. This discipline is especially important when a high laboratory rating, a favourable field difference and a use decision appear numerically compatible. Compatibility does not make them equivalent. The final report may connect the propositions through explicit reasoning, but it should not collapse them into one statement that the room is secure. Such language is retained only where the competent authority has defined its meaning and the evidence chain is complete.⁷⁴

XII.2.1 Integration gate and evidence protocol

laboratory specimen performance, installed field performance, occupied speech consequence and formal authority must remain separately named propositions throughout procurement, testing and reporting. The controlling mechanism is a proposition matrix that binds each claim to an object, measurand, method, source state, receiver state, uncertainty, limitation and decision owner. A mature assurance programme therefore

⁷⁴ [MB-0924](#). ISO 12354-1:2017, ISO 12354-2:2017.

begins with an explicit scope and an ownership map, then tests whether the proposed evidence actually answers the decision question. This approach prevents a component label, professional reputation or institutional custom from becoming a substitute for a measurable and traceable relationship among source, path, receiver, configuration and authority.

Challenge cases include a high catalogue rating being treated as room acceptance, a field level difference being described as speech security, or an accreditation record being cited as proof of component performance.

Evidence should include claim-specific report titles, method statements, specimen or room identifiers, frequency-resolved results, speech-state records and authority dispositions. The reviewer examines not only whether each item exists, but whether it describes the same object, time and operating state. A complete file assembled from mismatched states can be more misleading than an openly incomplete file, because apparent documentary weight may conceal the absence of configuration identity.

A defensible disposition is reached when the conclusion uses verbs no stronger than the evidence, such as measured, calculated, observed, supported, accepted or authorised. No rung in the evidentiary ladder silently supplies a missing rung, even when the numerical results appear compatible. Any condition, exclusion or deferred item is carried into operations and maintenance with a named custodian. The closeout statement uses bounded language and records the next inspection, retest or authority trigger, so that later users do not mistake a time-limited and state-specific result for a permanent property of the room.

Table XII.2-G. Integration gate for The four-proposition doctrine

Gate	Required record	Typical defect	Required response
Definition	Declare laboratory specimen performance, installed field performance, occupied speech consequence and formal authority must remain separately named propositions throughout procurement, testing and reporting.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine a high catalogue rating being treated as room acceptance, a field level difference being described as speech security, or an accreditation record being cited as proof of component performance.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Claim-specific report titles, method statements, specimen or room identifiers, frequency-resolved results, speech-state records and authority dispositions.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	The conclusion uses verbs no stronger than the evidence, such as measured, calculated, observed, supported, accepted or authorised.	No rung in the evidentiary ladder silently supplies a missing rung, even when the numerical results appear compatible.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.3 The weakest-path doctrine

The path ledger should be maintained by one system owner even though individual routes belong to several trades. Each entry receives a band-specific screening level or qualitative rank, confidence, diagnostic method and next action. When two routes are correlated, the ledger says so rather than assuming independence. The ledger is revised after a design change,

field observation or repair. In this way, the weakest-path doctrine becomes a controlled decision instrument rather than a slogan used only after failure. It also supports cost decisions by showing when another route limits the value of further treatment.

The weakest path is frequency dependent and state dependent. A door perimeter can control upper speech bands, a slab or rigid service support can control lower bands, and a quiet receiving state can expose a route that is masked during ordinary occupancy. Parallel contributions must be compared in the linear energetic domain before returning to decibels. A narrow opening with a large transmission coefficient can dominate a broad, high-performing wall. Several moderate paths can also combine so that no single repair delivers the promised whole-room improvement. The path register should therefore contain geometry, mechanism, band behaviour, source coupling, receiver access, evidence quality and uncertainty for each credible route. Remediation requires a second path analysis after the first repair. When the original dominant route is reduced, a plenum, service sleeve, frame cavity or structural junction may become controlling. This is not evidence that the repair failed. It is the expected migration of dominance in a parallel network. Before authorising costly work, the team can calculate the maximum possible whole-room benefit from removing one contribution and compare that bound with the decision need. Local verification confirms that the intended mechanism changed. Whole-room retesting determines the new combined consequence. Both records are necessary for honest closure.

Figure XII-3. The complete boundary is a network of parallel and state-dependent paths. Author's original diagram.

The weakest-path doctrine is a network calculation coupled to an inspection strategy. Each airborne, structural, service, opening, electronic and operational route is represented by frequency band, state, estimated contribution, confidence and next verification step. Contributions are compared in linear energy units before returning to decibels, and correlated routes are not treated casually as independent. The ledger is revised after design changes, field observations and remediation because control can migrate from one path to another. A small gap can dominate an otherwise strong enclosure, while several moderate routes can combine to the same effect. The controlling route can also change with source position, plant state, pressure, masking or listener access. The practical consequence is that procurement by headline rating is insufficient. Ownership, inspection, diagnostic access and retest criteria must be assigned to interfaces and service paths, not merely to broad wall fields. A remedy is judged both by its local effect and by the new whole-system balance it creates.⁷⁵

XII.3.1 Integration gate and evidence protocol

The purpose of this control is that the controlling transmission route must be ranked by frequency band and operating state, with parallel contributions considered in linear energetic terms before a whole-room conclusion is drawn. Its engineering basis is a path budget that records geometry, transfer mechanism, source coupling, receiving access, confidence, uncertainty and the maximum whole-room benefit available from treating one route. The design team should translate that basis into drawings, schedules, data fields and review questions that can survive

⁷⁵ [MB-0949](#). ISO/IEC 17025:2017 addresses competence, ISO/IEC 17025:2017.

procurement and construction. An idea that remains only in narrative is vulnerable to substitution, fragmented responsibility and loss during later change, however persuasive the original explanation may have sounded.

The control is stress-tested by considering a repaired door perimeter revealing a duct branch, frame cavity, service sleeve or structural junction that was previously masked by the original dominant path. The evidence set consists of local scans, band spectra, pressure or intensity observations, vibration and mobility data, controlled interventions and repeat whole-room tests. The comparison should be frequency resolved and state aware wherever the mechanism requires it, and the quality of the evidence should be stated separately from the magnitude of the result. Contradictory observations are retained and investigated rather than discarded because they disturb a preferred explanation.

Technical closure means that remediation is authorised when the verified mechanism and its bounded benefit are sufficient for the project decision, followed by a new path ranking after the work. Correlated or phase-sensitive paths are not forced into an independence assumption merely because an energetic screen is convenient. The issue register then records residual risk, limitations, reliance on operational controls and the authority action still required. Where a later alteration changes an assumption, the earlier conclusion is not edited retrospectively; the change receives a new evidence state and, where material, a new commissioning or acceptance decision.

Table XII.3-G. Integration gate for The weakest-path doctrine

Gate	Required record	Typical defect	Required response
Definition	Declare the controlling transmission route must be ranked by frequency band and operating state, with parallel contributions considered in linear energetic terms before a whole-room conclusion is drawn.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine a repaired door perimeter revealing a duct branch, frame cavity, service sleeve or structural junction that was previously masked by the original dominant path.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Local scans, band spectra, pressure or intensity observations, vibration and mobility data, controlled interventions and repeat whole-room tests.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	Remediation is authorised when the verified mechanism and its bounded benefit are sufficient for the project decision, followed by a new path ranking after the work.	Correlated or phase-sensitive paths are not forced into an independence assumption merely because an energetic screen is convenient.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.4 Source states and information consequence

Source-state governance can be embedded in room technology. Approved conference presets, maximum gain, mute behaviour, remote administration and emergency overrides are documented and protected. A commissioning source should reproduce the relevant output at the installed loudspeakers, not merely inject a convenient test signal into the room. Human trials, where authorised, should account for position and vocal effort. The

operating procedure identifies states that require suspension of protected use, such as an unverified firmware change or a failed output limiter. This turns the source model into a lifecycle control rather than a one-time design assumption.

Human speech is not a stationary broadband test signal. Vocal effort changes with room absorption, distance, hearing ability, group behaviour, stress and electronic reinforcement. Talkers move, turn their heads and repeat salient tokens. Conference systems add automatic gain, echo cancellation, compression, loudspeaker equalisation, mute logic and remote presets. Emergency messages and maintenance modes create additional source states. The source-state matrix should identify which conditions are authorised, which are stress cases, which are prohibited and which remain untested. Source evidence should include level and spectrum at defined positions, not a vague label such as normal conversation. Information consequence should be described without requiring disclosure of protected content. Categories can distinguish continuous narrative, names, dates, numbers, authentication phrases, legal strategy, medical information and operational schedules. A short distinctive token may be consequential even when average intelligibility is poor. Repetition, familiarity and contextual inference can increase recovery opportunity. Design and test therefore need duration and access assumptions as well as acoustic level. A single successful or unsuccessful listening trial should not be generalised beyond its language, talkers, listeners, material, state and statistical design.

A source state is a distribution, not a single calibration level. Human speech varies with talker, language, vocal effort, orientation, posture, emotion, repetition and room response. Electronic systems can extend bandwidth,

increase level, alter directivity and remain active in software states that are not obvious at the room controls. The source-state matrix should therefore include ordinary seated speech, raised discussion, credible maximum vocal effort, conferencing, playback, alarms and any authorised emergency mode. Information consequence also varies. Names, numbers, passwords, negotiation positions and short commands can remain consequential when only fragments are recovered, and repeated exposure can convert uncertain fragments into intelligible content. Design and testing should state the source reference position, spectrum, temporal characteristics and control status. The accepted state should also identify the operational discipline that limits sources outside the engineered range. This approach avoids the false precision of designing to one convenient loudspeaker spectrum while leaving the real human and electronic source population undefined.⁷⁶

XII.4.1 Integration gate and evidence protocol

human speech, amplified programme audio, alarms, loudspeakers, telephones and other intentional or incidental emitters must be treated as distinct source states with declared spectra, directivity, duration and control. This proposition is governed by a source-state matrix linking maximum credible vocal effort, participant location, electronic gain, automatic processing, room response and operational discipline to each test or design case. The practical requirement is to make the relationship inspectable before it becomes hidden inside a rating, a software output or a final signature. Every discipline should be able to identify its input, the interface it hands to another discipline, and the evidence by which that hand-off will be accepted.

⁷⁶ [MB-0087](#). ASTM E336-25a, ISO 16283-1:2014.

A nominal design is insufficient unless it is examined under raised remote-participant level, microphone or automatic-gain-control changes, emergency announcements, excited speech, an open microphone and an after-hours meeting in a quieter building. Required evidence includes calibrated source records, equipment settings, software versions, loudspeaker and talker positions, time histories and representative operational scripts. The record should preserve raw observations as well as derived summaries, because later disagreement often concerns processing, state or scope rather than the underlying instrument reading. The evidence package should also reveal exclusions and inaccessible conditions so that absence of data is not confused with absence of risk.

Disposition follows only when the controlling source set is selected by consequence and credibility rather than by whichever source is easiest to reproduce. A nominal conversational level cannot stand for every foreseeable information-bearing source, and maximum credible effort is not an invitation to invent an unlimited source. A failed or uncertain gate produces a defined response, such as redesign, additional inspection, controlled test, temporary restriction or referral to the competent authority. Closure is therefore an evidentiary act linked to the accepted configuration, not a ceremonial declaration issued because the project has reached a contractual milestone.

Table XII.4-G. Integration gate for Source states and information consequence

Gate	Required record	Typical defect	Required response
Definition	Declare human speech, amplified programme audio, alarms, loudspeakers, telephones and other intentional or incidental emitters must be treated as distinct source states with declared spectra, directivity, duration and control.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine raised remote-participant level, microphone or automatic-gain-control changes, emergency announcements, excited speech, an open microphone and an after-hours meeting in a quieter building.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Calibrated source records, equipment settings, software versions, loudspeaker and talker positions, time histories and representative operational scripts.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	The controlling source set is selected by consequence and credibility rather than by whichever source is easiest to reproduce.	A nominal conversational level cannot stand for every foreseeable information-bearing source, and maximum credible effort is not an invitation to invent an unlimited source.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.5 Receiver access and operating states

Listener access can change faster than construction. A locked cupboard may become routinely accessible to a new contractor; a neighbouring tenancy may change; a roof route may open during works; or an underfloor space may be connected by later cabling. Access review should therefore

accompany lease change, maintenance contracts, construction permits and incident response. The room record maps controls to physical positions and specifies which positions were represented in tests. Where access cannot be eliminated, design, background control, monitoring or operational restriction should address the actual opportunity rather than the nominal room boundary.

Receiver analysis begins with access, not with a convenient microphone grid. Corridors, offices, service cupboards, ceiling voids, underfloor plenums, roofs, balconies and exterior maintenance routes can have different backgrounds and different opportunities for sustained listening or equipment placement. Some points are inaccessible during normal occupation but available during maintenance. Some are quiet only after HVAC setback. The listener-access schedule should record who can reach each point, for how long, under which controls and in which operating states. Standard room-average measurements remain useful, but they answer a different question from a local accessible hot spot. Background should be measured as a distribution across time and state. Traffic, weather, masking, plant, occupancy and cleaning can raise or lower detectability. Crediting a favourable daytime background without governance creates operational dependence that may disappear at night or during fault conditions. A robust design either maintains and supervises the credited state or preserves sufficient physical isolation in the credible quiet condition. When masking is part of the authorised control, the baseline includes spectrum, spatial uniformity, alarms, controller credentials, failure response and periodic verification.

Receiver access defines where the protection problem must be solved. Standard microphone positions are method positions, not a complete threat map. Corridors, adjoining rooms, service cupboards, ceiling voids, raised floors, facade areas, plant spaces and maintenance routes may present different backgrounds, distances and dwell opportunities. Quiet conditions at night or during plant setback can be more demanding than occupied daytime states. Conversely, a local position can show a strong hotspot that is diluted by a room-average quantity. The receiver matrix should identify access authority, duration, expected background, ability to touch or instrument a surface, line of sight, recording opportunity and state changes that alter the route. Measurement locations can then be selected to answer the authorised question while preserving the standard method where conformity is required. A conclusion should never imply protection at unexamined positions merely because a prescribed room average was favourable.⁷⁷

XII.5.1 Integration gate and evidence protocol

At the integration gate, receiving positions must be selected from an access model that includes ordinary neighbours, maintenance spaces, common voids, remote structural receivers and technically aided conditions where the threat assessment requires them. The physical and evidentiary mechanism requiring control is receiver mapping combines geometry, access authority, dwell time, repetition, background spectrum, absorption, contact opportunities and the possibility of recording or signal enhancement. This treatment forces the team to describe identified objects, interfaces and states rather than relying on adjectives such as robust,

⁷⁷ [MB-0925](#). ISO 12999-1:2020, JCGM 100:2008.

secure, compliant or high performing. The model should be proportionate to consequence, yet it must remain sufficiently explicit that an independent reviewer can discover an omitted route, unowned interface or unsupported transfer of evidence.

The nominal account is challenged against a plant cupboard becoming routinely accessible, a corridor becoming quiet at night, a ceiling void being opened for maintenance, or a listener gaining repeated exposure near a localised leak. The retained evidence comprises access drawings, keys and control boundaries, occupancy schedules, background surveys, receiving-point grids, local diagnostic locations and threat-class definitions. Each record should carry a stable identifier, author, date, revision and disposition, and it should be linked to the configuration actually represented. Where evidence is missing, the gap remains visible with a responsible owner and due date; it is not converted into implied conformity by an attractive drawing, an isolated number or the passage of time.

Closure requires that acceptance is tied to the most consequential credible receiving condition within scope, with excluded technical threats stated expressly. Standard microphone positions provide reproducible measurement geometry, but they do not by themselves exhaust the security-relevant receiving domain. The final record distinguishes observation, calculation, inference and authority action, states residual uncertainty, and identifies the event that reopens review. Corrective work must also preserve structural duty, life safety, accessibility, maintainability, cyber and technical-security boundaries, because improvement in one narrow path does not authorise damage to another essential function.

Table XII.5-G. Integration gate for Receiver access and operating states

Gate	Required record	Typical defect	Required response
Definition	Declare receiving positions must be selected from an access model that includes ordinary neighbours, maintenance spaces, common voids, remote structural receivers and technically aided conditions where the threat assessment requires them.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine a plant cupboard becoming routinely accessible, a corridor becoming quiet at night, a ceiling void being opened for maintenance, or a listener gaining repeated exposure near a localised leak.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Access drawings, keys and control boundaries, occupancy schedules, background surveys, receiving-point grids, local diagnostic locations and threat-class definitions.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	Acceptance is tied to the most consequential credible receiving condition within scope, with excluded technical threats stated expressly.	Standard microphone positions provide reproducible measurement geometry, but they do not by themselves exhaust the security-relevant receiving domain.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.6 Configuration lifecycle and evidence chain

Configuration reconciliation should be performed before every material acceptance decision. The reviewer selects representative assets and traces them across drawings, submittals, photographs, registers and the physical

room. Discrepancies are classified by potential effect, not by administrative convenience. A product name mismatch can be harmless if equivalence is complete, while a seemingly minor fastener or firmware difference can be material. The reconciliation report identifies which earlier tests remain applicable and which require targeted repetition. This prevents historical evidence from being carried forward after the configuration that gave it meaning has disappeared.

The configuration lifecycle separates intent from evidence. The as-designed state records calculations and coordinated details. The as-submitted state records proposed products, reports, alternatives and delegated design. The as-built state records observed installation, including inaccessible conditions and unresolved departures. The as-tested state records the exact doors, furnishings, HVAC, masking, electronics, software and environmental condition measured. The as-operated state records actual use and later change. These states may agree, but agreement must be demonstrated rather than assumed from a final drawing stamp. A material change is any alteration capable of changing source, path, receiver, access, evidence or authority assumptions. New cables, display mounts, replacement seals, balancing work, sprinkler repairs, software updates and furniture can all qualify. The change request should identify affected propositions and prescribe review, inspection, testing and record updates. Emergency work receives temporary controls and retrospective review. Closure occurs only when physical work, drawings, asset and software inventories, test evidence, limitations and authority disposition agree. A checksum identifies byte change in a record, while the configuration process determines whether the technical meaning changed.

Figure XII-4. Design, submittal, construction, testing, operation and change form a controlled configuration loop. Author's original diagram.

Configuration is the temporal spine of the evidence chain. The as-designed, as-submitted, as-built, as-tested, as-authorised and as-operated states should be separately identifiable and linked through controlled changes. Drawings, schedules, asset identifiers, software versions, set points, penetration records, photographs, inspection results and native test data give that chain substance. Discrepancies are classified by their effect on source, path, receiver or authority rather than resolved by choosing the newest document. The accepted baseline states what physical and operating configuration the evidence represents and what changes reopen review. Later cabling, displays, door hardware, plant balancing, masking, firmware and maintenance can alter the condition without changing the room name. A lifecycle record is therefore not clerical overhead. It is the means by which an earlier result retains, or loses, its technical meaning.⁷⁸

XII.6.1 Integration gate and evidence protocol

the as-designed, as-submitted, as-built, as-tested, as-authorised and as-operated states must be separately identifiable and joined by controlled changes. The controlling mechanism is stable object identifiers, revision-controlled drawings, photographs, schedules, software versions, set points, test data and approval records create a temporal chain for every material feature. A mature assurance programme therefore begins with an explicit scope and an ownership map, then tests whether the proposed evidence actually answers the decision question. This approach prevents a component label, professional reputation or institutional custom from

⁷⁸ [MB-0083](#). ASTM E2964-26, ASTM C919-24.

becoming a substitute for a measurable and traceable relationship among source, path, receiver, configuration and authority.

Challenge cases include an undocumented cable, display bracket, door-hardware adjustment, plant rebalance, masking change, firmware update or tenant alteration that leaves the room name unchanged while altering the evidence state. Evidence should include configuration indexes, transmittals, hashes, penetration and equipment registers, nonconformance dispositions, test-state photographs and change-impact reviews. The reviewer examines not only whether each item exists, but whether it describes the same object, time and operating state. A complete file assembled from mismatched states can be more misleading than an openly incomplete file, because apparent documentary weight may conceal the absence of configuration identity.

A defensible disposition is reached when a change is classified by its effect on source, path, receiver, evidence or authority, and the required inspection or retest follows that classification. The newest document is not automatically the accepted baseline, and an unchanged room designation does not prove an unchanged system. Any condition, exclusion or deferred item is carried into operations and maintenance with a named custodian. The closeout statement uses bounded language and records the next inspection, retest or authority trigger, so that later users do not mistake a time-limited and state-specific result for a permanent property of the room.

Table XII.6-G. Integration gate for Configuration lifecycle and evidence chain

Gate	Required record	Typical defect	Required response
Definition	Declare the as-designed, as-submitted, as-built, as-tested, as-authorized and as-operated states must be separately identifiable and joined by controlled changes.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine an undocumented cable, display bracket, door-hardware adjustment, plant rebalance, masking change, firmware update or tenant alteration that leaves the room name unchanged while altering the evidence state.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Configuration indexes, transmittals, hashes, penetration and equipment registers, nonconformance dispositions, test-state photographs and change-impact reviews.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	A change is classified by its effect on source, path, receiver, evidence or authority, and the required inspection or retest follows that classification.	The newest document is not automatically the accepted baseline, and an unchanged room designation does not prove an unchanged system.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.7 Evidence hierarchy and public-source boundaries

A source conflict register is useful when authorities or standards appear to disagree. The entry records the proposition, each source, edition, jurisdiction, scope and reason for conflict. Some conflicts disappear when one document is a test method and another a project criterion. Others reflect supersession, national adoption or a genuinely different institutional decision. The design team should not average conflicting requirements. It

should obtain a disposition from the competent owner and preserve the rationale. This process also prevents a secondary summary from quietly displacing a primary source.

Evidence weight depends on authority, currency, applicability, granularity and provenance. Law, regulation and government policy may control institutional duties without defining a test method. Consensus standards define quantities and procedures within scope without setting a project criterion unless adopted. Laboratory reports describe particular specimens. Field data describe particular configurations and states. Scholarly texts explain mechanisms but do not override controlling requirements. Manufacturer summaries can assist procurement only when the complete report, specimen and limitation are available. The source register should preserve these distinctions rather than flattening every citation into an undifferentiated bibliography. Public-source discipline is essential in secure-facility work. The public existence of controlled criteria may be acknowledged, yet their content must not be reconstructed from procurement fragments, historical documents or unofficial summaries. A public monograph can explain physics, measurement, evidence architecture and disclosed institutional roles. It should stop where the public record stops and assign the unresolved requirement to the competent authority. This boundary protects security and scholarship simultaneously, because a plausible inferred threshold can be obsolete, context dependent or simply wrong.

Figure XII-5. Source authority and technical evidence occupy different layers. Author's original diagram.

Evidence strength depends on authority, currency, applicability, granularity and reproducibility. Current primary law, policy and standards govern within

their scope; consensus methods define particular measurements; accredited reports describe defined specimens; peer-reviewed research supports mechanisms and bounded transfer; manufacturer material requires complete configuration and test context. Historical and declassified records can explain development without becoming current criteria. Publicly acknowledged but access-limited material establishes existence and institutional role, not undisclosed thresholds. The source register should be created before reliance and should record exact issuer, title, number, edition, status, jurisdiction, locator, proposition supported, limitation and conflict. Citation belongs at the proposition supported, with clause, page, table or figure where available. Where public sources stop, the manuscript should stop as well and assign the unresolved criterion to the competent authority. This boundary protects both scholarship and security.⁷⁹

XII.7.1 Integration gate and evidence protocol

The purpose of this control is that every external proposition must be supported by a source fit for the precise claim, while protected or unavailable criteria remain assigned to the competent authority rather than reconstructed by inference. Its engineering basis is source fitness is evaluated through authority, currency, applicability, granularity, provenance and reproducibility, with conflicts recorded rather than averaged. The design team should translate that basis into drawings, schedules, data fields and review questions that can survive procurement and construction. An idea that remains only in narrative is vulnerable to substitution, fragmented responsibility and loss during later change, however persuasive the original explanation may have sounded.

⁷⁹ [MB-0919](#). ISO 10005:2018, ISO 10006:2017.

The control is stress-tested by considering a withdrawn edition, secondary summary, manufacturer headline, historical manual or foreign jurisdiction being allowed to displace a current controlling source. The evidence set consists of a source-status register, proposition-level citations, access dates, edition histories, lawful archived copies or hashes, limitation notes and conflict dispositions. The comparison should be frequency resolved and state aware wherever the mechanism requires it, and the quality of the evidence should be stated separately from the magnitude of the result. Contradictory observations are retained and investigated rather than discarded because they disturb a preferred explanation.

Technical closure means that the controlling source is selected by scope and authority, and unresolved conflicts are returned to the responsible owner before a requirement is declared. Public acknowledgement of a programme or controlled document establishes its existence and role, not its undisclosed thresholds or project-specific decision rules. The issue register then records residual risk, limitations, reliance on operational controls and the authority action still required. Where a later alteration changes an assumption, the earlier conclusion is not edited retrospectively; the change receives a new evidence state and, where material, a new commissioning or acceptance decision.

Table XII.7-G. Integration gate for Evidence hierarchy and public-source boundaries

Gate	Required record	Typical defect	Required response
Definition	Declare every external proposition must be supported by a source fit for the precise claim, while protected or unavailable criteria remain assigned to the competent authority rather than reconstructed by inference.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine a withdrawn edition, secondary summary, manufacturer headline, historical manual or foreign jurisdiction being allowed to displace a current controlling source.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	A source-status register, proposition-level citations, access dates, edition histories, lawful archived copies or hashes, limitation notes and conflict dispositions.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	The controlling source is selected by scope and authority, and unresolved conflicts are returned to the responsible owner before a requirement is declared.	Public acknowledgement of a programme or controlled document establishes its existence and role, not its undisclosed thresholds or project-specific decision rules.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.8 Design principles for lightweight construction

A lightweight mock-up should include the difficult interfaces, not merely a pristine wall panel. The first-of-type can incorporate a deflection head, base, corner, electrical box, conduit, backing, service sleeve and representative finish. Inspection records verify fastener length, isolation clearances, seal depth, cavity condition and product identity. Where feasible, a local or room

test establishes whether the construction sequence reproduces the intended mechanism. Corrections made before production are recorded so that the mock-up becomes a learning instrument rather than a showroom specimen disconnected from field work.

Lightweight isolation derives from a controlled mass-spring-mass system rather than from board count alone. Surface mass, cavity depth, framing stiffness, stud sharing, leaf spacing, cavity absorption, damping and boundary restraint shape the response. Mass-air-mass resonance controls the low-frequency screen, while coincidence and panel modes influence higher bands. Resilient channels, clips and independent studs can reduce coupling only when fastener length, backing, trim, services and ceiling interfaces do not create rigid bridges. The design should show permissible contacts and required clearances in dimensions that can be inspected before closure. Workmanship evidence is particularly important because a small number of bridges or gaps can defeat an otherwise sophisticated assembly. First-of-type bays establish sequence and inspection criteria. Layer joints, perimeter seals, box locations, cavity fill, deflection heads and support loads receive stable identifiers and photographs. Substitutions require comparison of mass, stiffness, geometry, fire duty, moisture behaviour and tested mounting. A headline STC value is inadequate where specimen size, framing, edge conditions or field flanking differ materially. Lightweight construction is governed by the coupled behaviour of mass, stiffness, cavity compliance, damping, framing and edge restraint. A double-leaf system can perform well only when the leaves remain sufficiently independent, the cavity is appropriately absorbed, resilient elements are not

short-circuited and perimeters are continuously closed. Added layers can change mass, coincidence and damping, but can also introduce thin gaps or unintended contact. Fasteners, bracing, backing, equipment mounts, head tracks and service supports often determine the installed result more strongly than nominal board type. Design should retain band predictions, clearances, attachment schedules, movement allowances and inspectable first-of-type details. Laboratory evidence is compared by dimensions, materials, support conditions, edges and penetrations rather than by rating alone. Construction surveillance then verifies the conditions that calculations assume before finishes conceal them.⁸⁰

XII.8.1 Integration gate and evidence protocol

lightweight assemblies must preserve the intended mass, cavity compliance, damping, framing separation and edge conditions through every attachment and construction operation. This proposition is governed by mass-air-mass resonance, coincidence, panel modes and mechanical bridges interact with fasteners, backing, boxes, trim, deflection heads, ceilings and services. The practical requirement is to make the relationship inspectable before it becomes hidden inside a rating, a software output or a final signature. Every discipline should be able to identify its input, the interface it hands to another discipline, and the evidence by which that hand-off will be accepted.

A nominal design is insufficient unless it is examined under a resilient channel being short-circuited by long screws, a display backing plate tying leaves together, a box cluster reducing cavity continuity, or a perimeter joint losing movement capability. Required evidence includes laboratory

⁸⁰ [MB-0047](#). ANSI/ASHRAE/IES Standard 202-2024, ANSI/ASHRAE/IES Standard, ASHRAE Guideline 0-2019.

specimen comparison, first-of-type mock-ups, dimensioned clearances, fastening schedules, concealed-work photographs, material records and local verification. The record should preserve raw observations as well as derived summaries, because later disagreement often concerns processing, state or scope rather than the underlying instrument reading. The evidence package should also reveal exclusions and inaccessible conditions so that absence of data is not confused with absence of risk.

Disposition follows only when field equivalence is accepted only when the material, geometry, support, edge, opening and workmanship conditions important to the mechanism are demonstrated. A single STC value is not a transferable property of gypsum board, clips or insulation divorced from the tested assembly and the installed path network. A failed or uncertain gate produces a defined response, such as redesign, additional inspection, controlled test, temporary restriction or referral to the competent authority. Closure is therefore an evidentiary act linked to the accepted configuration, not a ceremonial declaration issued because the project has reached a contractual milestone.

Table XII.8-G. Integration gate for Design principles for lightweight construction

Gate	Required record	Typical defect	Required response
Definition	Declare lightweight assemblies must preserve the intended mass, cavity compliance, damping, framing separation and edge conditions through every attachment and construction operation.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.

Gate	Required record	Typical defect	Required response
Challenge state	Examine a resilient channel being short-circuited by long screws, a display backing plate tying leaves together, a box cluster reducing cavity continuity, or a perimeter joint losing movement capability.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Laboratory specimen comparison, first-of-type mock-ups, dimensioned clearances, fastening schedules, concealed-work photographs, material records and local verification.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	Field equivalence is accepted only when the material, geometry, support, edge, opening and workmanship conditions important to the mechanism are demonstrated.	A single STC value is not a transferable property of gypsum board, clips or insulation divorced from the tested assembly and the installed path network.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.9 Masonry, concrete, stone and massive construction

Massive-wall investigation should combine quantity reconciliation with local evidence. Grout volume, lift records, unit count, cleanout photographs and reinforcement records can reveal whether the claimed configuration was physically possible. Acoustic and vibration measurements then test consequences rather than attempting to see through the wall by sound alone. A controlled opening is selected only where the expected information justifies damage and restoration. The final conclusion distinguishes verified material condition, inferred continuity and inaccessible zones. This prevents a smooth finish from becoming an unsupported declaration that every joint and cell is complete.

Massive construction can fail through mechanisms that are less visible than low surface mass. Masonry depends on complete bed and head joints, grout placement, cell continuity, parging where justified, reinforcement and interfaces with decks, frames and services. Concrete can transmit structure-borne energy through slabs, columns, curbs, anchors and rigid supports even when airborne transmission through the field is small. Stone and historic composite walls may contain rubble cores, voids, moisture paths, timber inclusions and irregular leaves whose behaviour cannot be inferred from external appearance alone. Assessment should distinguish material field performance from junction and service behaviour. Local pressure scans, intensity, vibration, mobility, thermography, borescopes and controlled openings answer different questions and carry different ambiguities. Repairs must also respect structure, moisture, fire, conservation and reversibility. Dense infill can create a rigid bridge or trap moisture. A compatible intervention records substrate condition, movement, curing, provenance, access and later inspection. Historic fabric should not be sacrificed to an unsupported assumption that greater mass automatically produces the desired room result.

Massive construction offers high nominal mass but remains heterogeneous. Hollow or partly grouted masonry, mortar joints, porosity, cracks, bond beams, pilasters, coatings and service chases create local changes in mass and stiffness. Concrete transmits structure-borne energy through slabs, columns and rigid attachments even where direct airborne transmission is small. Historic stone adds rubble cores, timber pockets, chimneys, moisture and conservation constraints that may prevent invasive work. The design model should therefore separate field transmission, junction transmission

and openings and should record the actual grouting, reinforcement, joints and interfaces. Remediation must preserve structural, fire, moisture and heritage obligations. Where the installed construction cannot be confirmed without disproportionate harm, a reversible inner boundary and a stated configuration uncertainty may be more defensible than an asserted property for the original fabric.⁸¹

XII.9.1 Integration gate and evidence protocol

At the integration gate, massive construction must be analysed as a heterogeneous field joined to structural and service networks, not as an automatically continuous barrier because its nominal surface density is high. The physical and evidentiary mechanism requiring control is voids, incomplete joints, cracks, grouting, tie holes, panel joints, slab and column continuity, embedded steel and attached finishes govern local airborne and structure-borne behaviour. This treatment forces the team to describe identified objects, interfaces and states rather than relying on adjectives such as robust, secure, compliant or high performing. The model should be proportionate to consequence, yet it must remain sufficiently explicit that an independent reviewer can discover an omitted route, unowned interface or unsupported transfer of evidence.

The nominal account is challenged against partly grouted cells, shrinkage cracking, concealed rubble cores, rigid service anchors, water damage, post-fire change or a conservation constraint that prevents direct confirmation. The retained evidence comprises construction records, quantity reconciliation, surveys, non-destructive observations, local acoustic and vibration tests, controlled openings and restoration records. Each record

⁸¹ [MB-0945](#). ISO 9001:2015 with Amendment 1:2024, ISO 9001:2015, ISO 10005:2018.

should carry a stable identifier, author, date, revision and disposition, and it should be linked to the configuration actually represented. Where evidence is missing, the gap remains visible with a responsible owner and due date; it is not converted into implied conformity by an attractive drawing, an isolated number or the passage of time.

Closure requires that the team distinguishes verified material condition, supported inference and inaccessible uncertainty, then selects repair, reversible lining or operational control proportionate to consequence. Mass can support isolation, but neither appearance nor thickness alone establishes continuity, flanking control or authority for protected use. The final record distinguishes observation, calculation, inference and authority action, states residual uncertainty, and identifies the event that reopens review. Corrective work must also preserve structural duty, life safety, accessibility, maintainability, cyber and technical-security boundaries, because improvement in one narrow path does not authorise damage to another essential function.

Table XII.9-G. Integration gate for Masonry, concrete, stone and massive construction

Gate	Required record	Typical defect	Required response
Definition	Declare massive construction must be analysed as a heterogeneous field joined to structural and service networks, not as an automatically continuous barrier because its nominal surface density is high.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.

Gate	Required record	Typical defect	Required response
Challenge state	Examine partly grouted cells, shrinkage cracking, concealed rubble cores, rigid service anchors, water damage, post-fire change or a conservation constraint that prevents direct confirmation.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Construction records, quantity reconciliation, surveys, non-destructive observations, local acoustic and vibration tests, controlled openings and restoration records.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	The team distinguishes verified material condition, supported inference and inaccessible uncertainty, then selects repair, reversible lining or operational control proportionate to consequence.	Mass can support isolation, but neither appearance nor thickness alone establishes continuity, flanking control or authority for protected use.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.10 Doors, glazing and movable boundaries

Door and glazing interfaces should be included in preventive maintenance budgets from the outset. Specialist adjustment, replacement seals, calibrated force tools, approved gaskets and access to concealed anchors may be necessary years after handover. The owner should receive tolerances, photographs, part identities and retest triggers, not merely warranties. A failure response identifies when the room can remain in restricted use and when protected discussion must stop. Maintainability is

therefore a design parameter, because an impressive initial test has little value if ordinary servicing cannot preserve the verified configuration.

A doorset is an operating mechanism. Leaf construction, frame profile, anchors, grout or fill, hinges, pivots, latch engagement, closer, automatic bottom, threshold, perimeter seals, meeting stile, access-control wiring and pressure state act together. Excessive seal compression can raise opening force and accelerate wear, while insufficient compression leaves a local path. Frame twist, floor tolerance and pressure reversal can make performance direction dependent. Commissioning therefore includes gap and contact maps, operating force, latch sequence, pressure, local acoustic scans and complete-room testing. Glazing is likewise a pane-frame-perimeter system. Pane thickness, lamination, interlayer, cavity, modal behaviour, setting blocks, gaskets, mullion cavities, anchors, sealants, drainage and facade continuity require coordinated evidence. Replacing a pane cannot cure an open mullion or frame-to-wall route. Secondary glazing helps only when supports, reveals, blinds, cables and trim preserve independence. Maintenance criteria should identify gasket shrinkage, seal cracking, frame movement, condensation, damage and approved replacement materials, with inspection and targeted retest after material work.

Doors and glazing are complete installed systems. Door performance depends on leaf, frame, anchors, hinges, latch, closer, threshold, perimeter seals, pressure and ordinary user operation. Glazing depends on pane make-up, interlayer, cavity, frame, mullion, gaskets, anchors, drainage and perimeter junctions. Local defects can dominate the composite boundary, and maintenance can change contact conditions gradually. Schedules

should record tested configuration, installed identity, adjustment limits, operating force, inspection method, approved spares and replacement controls. Field diagnosis should use contact mapping, directional tests, local scans, vibration comparison and reversible interventions before assuming that the leaf or pane itself controls. Acceptance should include normal cycling and relevant pressure states, not a single carefully prepared closure that occupants cannot reproduce.⁸²

XII.10.1 Integration gate and evidence protocol

doors, vision systems and movable closures must be treated as dynamic assemblies whose performance depends on frames, seals, hardware, pressure, wear, operation and adjoining interfaces. The controlling mechanism is leaf or pane transmission combines with perimeter leakage, frame cavities, thresholds, mullions, structure, latching force, automatic bottoms and, for glazing, vibration and external line of sight. A mature assurance programme therefore begins with an explicit scope and an ownership map, then tests whether the proposed evidence actually answers the decision question. This approach prevents a component label, professional reputation or institutional custom from becoming a substitute for a measurable and traceable relationship among source, path, receiver, configuration and authority.

Challenge cases include hold-open practice, warped leaves, access-control retrofits, worn seals, pressure reversal, misaligned automatic bottoms, replacement glass or a newly exposed optical collection path. Evidence should include opening schedules, gap and compression measurements, operating-force records, pressure states, hardware configuration,

⁸² [MB-0081](#). ASTM E2713-25, ASTM E3176-24.

laboratory reports, local scans and field tests. The reviewer examines not only whether each item exists, but whether it describes the same object, time and operating state. A complete file assembled from mismatched states can be more misleading than an openly incomplete file, because apparent documentary weight may conceal the absence of configuration identity.

A defensible disposition is reached when acceptance states the tested direction, operating condition, hardware and pressure, and maintenance limits are tied to observable adjustment criteria. A rated leaf, pane or seal product cannot establish the installed opening as a whole, particularly after operational hardware or later maintenance changes the geometry. Any condition, exclusion or deferred item is carried into operations and maintenance with a named custodian. The closeout statement uses bounded language and records the next inspection, retest or authority trigger, so that later users do not mistake a time-limited and state-specific result for a permanent property of the room.

Table XII.10-G. Integration gate for Doors, glazing and movable boundaries

Gate	Required record	Typical defect	Required response
Definition	Declare doors, vision systems and movable closures must be treated as dynamic assemblies whose performance depends on frames, seals, hardware, pressure, wear, operation and adjoining interfaces.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.

Gate	Required record	Typical defect	Required response
Challenge state	Examine hold-open practice, warped leaves, access-control retrofits, worn seals, pressure reversal, misaligned automatic bottoms, replacement glass or a newly exposed optical collection path.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Opening schedules, gap and compression measurements, operating-force records, pressure states, hardware configuration, laboratory reports, local scans and field tests.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	Acceptance states the tested direction, operating condition, hardware and pressure, and maintenance limits are tied to observable adjustment criteria.	A rated leaf, pane or seal product cannot establish the installed opening as a whole, particularly after operational hardware or later maintenance changes the geometry.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.11 Building services and the acoustic boundary

Service-route planning should reserve controlled capacity for foreseeable change. Limited, inspectable pathways with labelled sleeves and spare capacity are preferable to repeated field drilling. The design allocates space for firestop backing, acoustic treatment, movement and later inspection. Cable and pipe owners use permits linked to the penetration register, and closure photographs are taken before access is lost. This strategy reduces both technical risk and operational disruption. It also makes unauthorised or undocumented work more detectable because every approved route and change has a stable identity and expected condition.

Building services cross the enclosure because the room must breathe, drain, receive power, communicate and meet life-safety duties. Each crossing can create an airborne opening, duct route, structural bridge, casing radiator or electronic source. HVAC analysis includes duct-borne speech, breakout and break-in, regenerated noise, fan and damper states, pressure effects, supports, flexible connectors, access doors and shared plenums. Silencer data must be examined by band and flow condition, with casing transmission, pressure loss and installation bypass included. Pipes, sprinklers, drains, conduits, cable trays and firestop systems need registered routes and defined ownership. A listed firestop and an acoustically adequate closure are coordinated but separate propositions. Dense cable fill can disturb annular seals and transmit vibration. Abandoned services can preserve an uncontrolled route, while removal can damage the closure. The penetration register follows one identifier through design, installation, inspection, test, change and maintenance, and records the exact restoration method after later work.

Building services cross the boundary because they must perform other functions. Ducts, pipes, sprinklers, conduits, cables, firestop, supports, access panels and control wiring therefore require planned acoustic interfaces rather than late sealing. Duct networks can carry cross-talk, breakout, break-in, regenerated noise and vibration. Rigid pipe and support connections can transmit force even when annular gaps are closed. Firestop and movement systems must retain listing, movement and inspection requirements while controlling air and structural paths. A service register

should identify route, sleeve, closure, support, life-safety system, inspection hold point, test evidence and change trigger. Coordination is complete only when the acoustic detail can be built, maintained and lawfully altered without improvising a new opening.⁸³

XII.11.1 Integration gate and evidence protocol

The purpose of this control is that mechanical, electrical, plumbing, fire-protection, data and control systems must be modelled as networks that cross, excite or bypass the nominal enclosure. Its engineering basis is airborne propagation, casing breakout, turbulent self-noise, pipe and duct vibration, conduit communication, rigid support and changing service geometry produce state-dependent paths. The design team should translate that basis into drawings, schedules, data fields and review questions that can survive procurement and construction. An idea that remains only in narrative is vulnerable to substitution, fragmented responsibility and loss during later change, however persuasive the original explanation may have sounded.

The control is stress-tested by considering emergency fan operation, an open drain or trap, a fire damper position, filter loading, cable growth, a removed access panel, a rigid replacement support or a spare conduit left open. The evidence set consists of service topology, operating-mode matrices, penetration registers, support and silencer details, airflow and pressure records, firestop evidence, photographs and retest triggers. The comparison should be frequency resolved and state aware wherever the mechanism requires it, and the quality of the evidence should be stated

⁸³ [MB-1092](#). NIST FIPS PUB 180-4 supports SHA-256 integrity practice. A hash detects byte-level difference but does not establish accuracy, provenance or meaning.

separately from the magnitude of the result. Contradictory observations are retained and investigated rather than discarded because they disturb a preferred explanation.

Technical closure means that service treatment is accepted only when life safety, maintainability, airflow, movement, fire duty and acoustic continuity are all preserved in the installed state. A firestop listing, silencer insertion-loss value or fibre substitution answers a bounded question and does not prove complete room isolation or wider technical security. The issue register then records residual risk, limitations, reliance on operational controls and the authority action still required. Where a later alteration changes an assumption, the earlier conclusion is not edited retrospectively; the change receives a new evidence state and, where material, a new commissioning or acceptance decision.

Table XII.11-G. Integration gate for Building services and the acoustic boundary

Gate	Required record	Typical defect	Required response
Definition	Declare mechanical, electrical, plumbing, fire-protection, data and control systems must be modelled as networks that cross, excite or bypass the nominal enclosure.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine emergency fan operation, an open drain or trap, a fire damper position, filter loading, cable growth, a removed access panel, a rigid replacement support or a spare conduit left open.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.

Gate	Required record	Typical defect	Required response
Evidence	Service topology, operating-mode matrices, penetration registers, support and silencer details, airflow and pressure records, firestop evidence, photographs and retest triggers.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	Service treatment is accepted only when life safety, maintainability, airflow, movement, fire duty and acoustic continuity are all preserved in the installed state.	A firestop listing, silencer insertion-loss value or fibre substitution answers a bounded question and does not prove complete room isolation or wider technical security.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.12 Room acoustics, masking and operational control

Operational controls need measurable failure states. A masking alarm should identify the affected zone and preserve logs. A conferencing limit should fail visibly rather than reset silently after updates. Door-use procedures should address propping, simultaneous sound-lock opening and after-hours conditions. Training should be short enough to use but linked to the technical baseline. Audits can test whether staff understand when protected use must stop. These controls do not replace isolation, but they prevent human and electronic states from quietly invalidating the source and receiver assumptions on which the room was accepted.

Interior acoustics alter source behaviour and the receiving signal-to-noise ratio without changing the transmission loss of the boundary directly.

Reverberation time, absorption distribution, scattering, room volume and source position affect speech build-up and clarity. Excessive reverberation can encourage higher vocal effort and distribute energy to weak boundaries. Excessive absorption can make conversation comfortable but

does not seal a gap or interrupt a structural path. Design should therefore coordinate interior treatment with the source-state model and with fire, durability, cleanability and attachment controls. Masking is an operational system, not free transmission loss. Its value depends on spectrum, level, spatial uniformity, temporal stability, zoning, supervision, credentials and failure response. A quiet pocket near a door or service cupboard can control practical exposure. Commissioning maps credible occupied and quiet states and verifies alarms and logs. Users need training about doors, conference gain, after-hours operation and fault reporting. The institution should know which proposition remains supported when masking is unavailable and whether protected use must be suspended.

Room acoustics and masking affect both source and receiver. Reverberation, absorption and internal noise influence vocal effort, intelligibility and the likelihood that occupants raise their voices. Masking can improve privacy by increasing receiving background, but it does not repair transmission and may fail by power loss, zoning, level drift, spectrum change or unauthorised adjustment. The design should establish internal communication quality, approved masking states, supervision, alarms, access control and quiet-state performance. Testing should include ordinary, fault, emergency and maintenance conditions where the system is credited. Operational rules for door use, conferencing, mobile devices and maximum source level should be treated as controlled components of the assurance case, with training and periodic verification rather than informal custom.⁸⁴

⁸⁴ [MB-0104](#). ASTM E90-23, ISO 10140-2:2021.

XII.12.1 Integration gate and evidence protocol

reverberation, absorption, background and masking must be controlled as source and receiver variables without permitting an operational system to conceal an ungoverned structural weakness. This proposition is governed by talker effort, source directivity, room gain, decay, masking spectrum, spatial uniformity and background stability alter the information available at the receiver. The practical requirement is to make the relationship inspectable before it becomes hidden inside a rating, a software output or a final signature. Every discipline should be able to identify its input, the interface it hands to another discipline, and the evidence by which that hand-off will be accepted.

A nominal design is insufficient unless it is examined under masking failure, quiet night operation, furniture change, an altered ceiling, occupancy drift, a local hot or cold spot, or users raising vocal effort because the room is excessively absorptive or noisy. Required evidence includes reverberation and background surveys, calibrated masking settings, zoning maps, temporal logs, equipment maintenance, speech-state observations and failure alarms. The record should preserve raw observations as well as derived summaries, because later disagreement often concerns processing, state or scope rather than the underlying instrument reading. The evidence package should also reveal exclusions and inaccessible conditions so that absence of data is not confused with absence of risk.

Disposition follows only when masking is credited only when its configuration, availability, supervision, failure response and minimum operating state are governed and tested. Background sound may reduce audibility or intelligibility, but it cannot repair an open path, grant formal

authority, or justify reporting a non-representative operating state. A failed or uncertain gate produces a defined response, such as redesign, additional inspection, controlled test, temporary restriction or referral to the competent authority. Closure is therefore an evidentiary act linked to the accepted configuration, not a ceremonial declaration issued because the project has reached a contractual milestone.

Table XII.12-G. Integration gate for Room acoustics, masking and operational control

Gate	Required record	Typical defect	Required response
Definition	Declare reverberation, absorption, background and masking must be controlled as source and receiver variables without permitting an operational system to conceal an ungoverned structural weakness.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine masking failure, quiet night operation, furniture change, an altered ceiling, occupancy drift, a local hot or cold spot, or users raising vocal effort because the room is excessively absorptive or noisy.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Reverberation and background surveys, calibrated masking settings, zoning maps, temporal logs, equipment maintenance, speech-state observations and failure alarms.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.

Gate	Required record	Typical defect	Required response
Disposition	Masking is credited only when its configuration, availability, supervision, failure response and minimum operating state are governed and tested.	Background sound may reduce audibility or intelligibility, but it cannot repair an open path, grant formal authority, or justify reporting a non-representative operating state.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.13 Measurement architecture and metrology

A reproducible campaign should include a data dictionary and processing record. File names, channel identities, coordinates, calibration factors, exclusions, averaging and scripts are controlled before collection. The team retains unprocessed originals and writes derived outputs to new identifiers. Time synchronisation is checked where acoustic, vibration, pressure, access and system logs are compared. A later reviewer should be able to reproduce the reported table from the retained files without relying on undocumented manual steps. This is particularly important where litigation or incident review occurs long after the original instruments and software have changed.

Metrology begins with the measurand. Sound pressure level, level difference, apparent transmission loss, reverberation time, sound intensity, vibration velocity, mobility and speech metrics are not interchangeable. The test plan specifies frequency bands, time weighting, averaging, source and receiver positions, geometry, operating states, corrections and decision rule before data are collected. Instrument specifications support range selection but do not prove correct mounting, calibration, synchronisation or processing. Pre-test and post-test checks, raw file retention and software version records make later review possible. Sampling must represent spatial, temporal and operational variability. More repetitions at one point

can demonstrate repeatability while leaving position bias untouched. A monitor channel can distinguish source drift from room change. Background and reverberation corrections become unstable near method limits and should be reported as censored or limited where appropriate. Diagnostic methods such as intensity, vibration, airflow and temporary sealing are valuable when labelled separately from the standard result. Their purpose is to reveal mechanism, not to manufacture a conformity value outside their scope.

Metrology begins with the measurand and decision, not with the available instrument. The plan should define source and receiver geometry, frequency range, filters, sampling, averaging, room state, background, reverberation or absorption treatment, processing and uncertainty before results are known. Calibration, field checks, firmware, serial numbers and time-base synchronisation establish traceability and reproducibility, but they do not validate an unsuitable method or poor placement. Formal standard measurements and local diagnostic scans answer different questions and should be reported separately. Native data, scripts, settings and derivation records must remain linked to the published result. Bands limited by background, saturation or other dynamic-range constraints are reported as bounds rather than transformed into precise-looking values.⁸⁵

XII.13.1 Integration gate and evidence protocol

At the integration gate, each investigation or acceptance exercise must begin with the question and measurand, then select instrumentation, excitation, sampling and processing suited to that question. The physical and evidentiary mechanism requiring control is calibration, dynamic range,

⁸⁵ [MB-0075](#). ASTM E2638-24, IEC 60268-16:2020.

bandwidth, spatial statistics, temporal averaging, background correction, reverberation correction and environmental state jointly determine the reported quantity. This treatment forces the team to describe identified objects, interfaces and states rather than relying on adjectives such as robust, secure, compliant or high performing. The model should be proportionate to consequence, yet it must remain sufficiently explicit that an independent reviewer can discover an omitted route, unowned interface or unsupported transfer of evidence.

The nominal account is challenged against microphone overload, analyser noise-floor limitation, non-stationary plant, sparse sampling, source drift, synchronisation error, inappropriate averaging or retrospective selection of the most favourable metric. The retained evidence comprises approved test plans, calibration certificates, pre and post checks, raw native data, instrument settings, position records, environmental logs, processing scripts and repeatability observations. Each record should carry a stable identifier, author, date, revision and disposition, and it should be linked to the configuration actually represented. Where evidence is missing, the gap remains visible with a responsible owner and due date; it is not converted into implied conformity by an attractive drawing, an isolated number or the passage of time.

Closure requires that the method is accepted when another competent practitioner can reconstruct the quantity, configuration and limitations from the retained record. A diagnostic scan and a standard acceptance measurement may both be valuable, but their results must not be exchanged merely because both are expressed in decibels. The final record distinguishes observation, calculation, inference and authority action, states

residual uncertainty, and identifies the event that reopens review. Corrective work must also preserve structural duty, life safety, accessibility, maintainability, cyber and technical-security boundaries, because improvement in one narrow path does not authorise damage to another essential function.

Table XII.13-G. Integration gate for Measurement architecture and metrology

Gate	Required record	Typical defect	Required response
Definition	Declare each investigation or acceptance exercise must begin with the question and measurand, then select instrumentation, excitation, sampling and processing suited to that question.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine microphone overload, analyser noise-floor limitation, non-stationary plant, sparse sampling, source drift, synchronisation error, inappropriate averaging or retrospective selection of the most favourable metric.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Approved test plans, calibration certificates, pre and post checks, raw native data, instrument settings, position records, environmental logs, processing scripts and repeatability observations.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.

Gate	Required record	Typical defect	Required response
Disposition	The method is accepted when another competent practitioner can reconstruct the quantity, configuration and limitations from the retained record.	A diagnostic scan and a standard acceptance measurement may both be valuable, but their results must not be exchanged merely because both are expressed in decibels.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.14 Uncertainty and decision rules

Uncertainty review should occur before expensive additional testing. The team ranks contributors and asks which action changes the decision risk most. If receiving-position variation dominates, another calibrator provides little value. If configuration uncertainty dominates, controlled opening or document reconciliation may be more useful than another room-average measurement. If the result is far from the decision boundary, precision work may not change disposition. This allocation of effort keeps uncertainty analysis connected to engineering judgement and avoids both ritual calculation and unnecessary disruption of a secure space.

Measurement uncertainty quantifies dispersion associated with a stated measurand and model. Calibration, linearity, spatial sampling, temporal stability, background, decay, geometry and processing can contribute, with covariance where causes are shared. Configuration uncertainty concerns incomplete knowledge of the physical or operating state. Model discrepancy concerns omitted or simplified mechanisms. A precise numerical measurement can coexist with serious uncertainty about a concealed bridge or an unrepresented listener position. These categories should not be buried in one convenient expanded uncertainty number. Decision rules allocate risk. Rounding, guard bands and uncertainty treatment affect false

acceptance and false rejection, so they should be agreed before results are known. A borderline outcome can require additional evidence, restriction or retest rather than retrospective adjustment of the criterion. Sensitivity analysis should identify which contributor actually controls the decision. Additional microphone positions may reduce sampling uncertainty but cannot reveal an inaccessible wall cavity. Better calibration reduces traceability uncertainty but not source-state ambiguity.

Decision quality depends on keeping distinct uncertainty classes visible. Statistical and calibration contributions may be combined within a declared measurement model, including covariance where justified. Configuration uncertainty concerns what physical or operating state was actually represented. Model discrepancy concerns the difference between the selected representation and the real network. These limitations should not be forced into one number unless a defensible model exists. A decision rule states how result, uncertainty, guard band and requirement interact and who owns the consequence of false acceptance or rejection. The report should show sensitivity to dominant contributors and identify the observation most likely to reduce decision uncertainty. A narrow numerical interval cannot cure an undefined source state, an uninspected path or an authority question.⁸⁶

XII.14.1 Integration gate and evidence protocol

measurement uncertainty, configuration variability and model discrepancy must be exposed before a numerical result is compared with a criterion or used to rank remediation. The controlling mechanism is Type A and Type B contributions, sensitivity coefficients, covariance, distribution assumptions,

⁸⁶ [MB-0920](#). ISO 10848, ASTM E1414.

state variation and guard bands connect observed data to decision risk. A mature assurance programme therefore begins with an explicit scope and an ownership map, then tests whether the proposed evidence actually answers the decision question. This approach prevents a component label, professional reputation or institutional custom from becoming a substitute for a measurable and traceable relationship among source, path, receiver, configuration and authority.

Challenge cases include a result close to a threshold, a strong covariance between corrections, an unstable background, an incomplete configuration or a model whose assumptions fail near a resonance or dominant flank. Evidence should include an uncertainty budget, sensitivity analysis, repeated observations, state records, declared decision rule, false-acceptance and false-rejection considerations and residual-risk statement. The reviewer examines not only whether each item exists, but whether it describes the same object, time and operating state. A complete file assembled from mismatched states can be more misleading than an openly incomplete file, because apparent documentary weight may conceal the absence of configuration identity.

A defensible disposition is reached when the disposition may be pass, conditional use, additional evidence, retest or rejection, but the rule is selected before the result is known and applied consistently. Uncertainty is not a rhetorical discount applied after an unfavourable result, nor does a narrow instrument tolerance prove that configuration and model uncertainty are small. Any condition, exclusion or deferred item is carried into operations and maintenance with a named custodian. The closeout statement uses bounded language and records the next inspection, retest

or authority trigger, so that later users do not mistake a time-limited and state-specific result for a permanent property of the room.

Table XII.14-G. Integration gate for Uncertainty and decision rules

Gate	Required record	Typical defect	Required response
Definition	Declare measurement uncertainty, configuration variability and model discrepancy must be exposed before a numerical result is compared with a criterion or used to rank remediation.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine a result close to a threshold, a strong covariance between corrections, an unstable background, an incomplete configuration or a model whose assumptions fail near a resonance or dominant flank.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	An uncertainty budget, sensitivity analysis, repeated observations, state records, declared decision rule, false-acceptance and false-rejection considerations and residual-risk statement.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	The disposition may be pass, conditional use, additional evidence, retest or rejection, but the rule is selected before the result is known and applied consistently.	Uncertainty is not a rhetorical discount applied after an unfavourable result, nor does a narrow instrument tolerance prove that configuration and model uncertainty are small.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.15 Construction surveillance and concealment

Surveillance effectiveness can be tested by blind or independent checks. A second reviewer samples released work, compares photographs with physical locations, and traces selected entries through the register.

Discrepancies reveal whether the control system detects defects or merely records planned activity. The sample should include work by different crews, shifts and trades, especially after corrective action. Findings are used to adjust hold points and training. The aim is not punitive inspection. It is evidence that the process can find the failure modes for which it was designed before they are concealed across a larger population.

Construction surveillance converts design intent into observed evidence before conditions disappear behind finishes. The plan identifies high-consequence interfaces, prerequisite submittals, first-of-type work, hold and witness points, competent observers, photographic rules, security controls and nonconformance authority. Daily records describe locations, crews, materials, measurements and actual observations rather than repeating checklist headings. Absence of a defect in a sample is not rewritten as universal compliance. The sample and inaccessible population remain explicit. Missed hold points require technical disposition, not a signature added later. Alternative evidence may include controlled opening, borescope, quantity reconciliation, testing or other methods, with residual uncertainty retained. Repeated defects trigger population review by installer, detail, product, shift or material lot. Corrective action should address the cause through revised details, tools, sequence, procurement, training or supervision. Cosmetic restoration and completed paperwork do

not establish closure unless the repaired condition is inspected and, where necessary, retested.

Construction surveillance creates evidence before decisive work disappears. The plan identifies first-of-type assemblies, material identity, mock-ups, hold points, photographs, measurements, sample locations, nonconformance workflow and corrective verification. Inspection intensity is allocated by consequence, concealment and common-cause risk. Images require stable location, orientation, time and subject identifiers; a photograph without context is weak evidence. Missed hold points are recorded as missing observations, not closed retrospectively by signature. Resolution may require reopening, testing, an engineered alternative or an explicit limitation. The as-built dossier should show not merely that work was observed, but which requirement and path proposition each observation supports.⁸⁷

XII.15.1 Integration gate and evidence protocol

The purpose of this control is that the project must capture evidence while critical interfaces remain visible, with surveillance proportionate to consequence and coordinated with ordinary quality, safety and inspection duties. Its engineering basis is hold points, witness points, stable identifiers, first-of-type work, photographic context, material verification, nonconformance control and evidence custody preserve what later testing cannot uniquely reconstruct. The design team should translate that basis into drawings, schedules, data fields and review questions that can survive procurement and construction. An idea that remains only in narrative is

⁸⁷ [MB-1144](#). Public United States, United Kingdom and Canadian governmental sources establish disclosed terminology and authority structures. Protected criteria and formal decisions remain with competent authorities.

vulnerable to substitution, fragmented responsibility and loss during later change, however persuasive the original explanation may have sounded.

The control is stress-tested by considering schedule pressure, unapproved substitution, premature board closure, inaccessible fasteners, concealed bridges, changed personnel, incomplete photographs or a signature entered without direct observation. The evidence set consists of inspection and surveillance plans, access records, date and location metadata, labelled photographs, checklists, material records, witness signatures and linked corrective actions. The comparison should be frequency resolved and state aware wherever the mechanism requires it, and the quality of the evidence should be stated separately from the magnitude of the result. Contradictory observations are retained and investigated rather than discarded because they disturb a preferred explanation.

Technical closure means that work proceeds beyond a hold point only after the responsible reviewer has the evidence required to accept, reject or impose a controlled condition. A later favourable room test may support performance, but it does not recreate missing construction evidence needed for lifecycle diagnosis, equivalence or authority review. The issue register then records residual risk, limitations, reliance on operational controls and the authority action still required. Where a later alteration changes an assumption, the earlier conclusion is not edited retrospectively; the change receives a new evidence state and, where material, a new commissioning or acceptance decision.

Table XII.15-G. Integration gate for Construction surveillance and concealment

Gate	Required record	Typical defect	Required response
Definition	Declare the project must capture evidence while critical interfaces remain visible, with surveillance proportionate to consequence and coordinated with ordinary quality, safety and inspection duties.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine schedule pressure, unapproved substitution, premature board closure, inaccessible fasteners, concealed bridges, changed personnel, incomplete photographs or a signature entered without direct observation.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Inspection and surveillance plans, access records, date and location metadata, labelled photographs, checklists, material records, witness signatures and linked corrective actions.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	Work proceeds beyond a hold point only after the responsible reviewer has the evidence required to accept, reject or impose a controlled condition.	A later favourable room test may support performance, but it does not recreate missing construction evidence needed for lifecycle diagnosis, equivalence or authority review.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.16 Commissioning and acceptance

Acceptance meetings should use a requirements-to-evidence matrix rather than a sequence of presentations. Each requirement is marked satisfied, conditional, open or not applicable, with links to construction and test evidence. Conditions identify owner, date, operational control and closure

test. The authority can then see which uncertainties are physical, metrological, documentary or institutional. This format prevents polished summary slides from obscuring untested states or missing as-built evidence. The signed disposition becomes a controlled record that future changes and recommissioning can reopen intelligently.

Commissioning begins in design, when source positions, test access, control states, temporary closures, raw formats and authority witnessing can still be accommodated. Readiness review confirms that doors, seals, glazing, services, ceilings, finishes, HVAC, masking and electronics are in the intended final state. Open nonconformances are either closed or expressly accepted for the test. Premature testing can create attractive data for a temporary configuration and obscure defects behind construction noise or incomplete systems. The commissioning dossier connects requirements to functional checks, standard measurements, local diagnostics, uncertainty, repairs, retests and authority disposition. Summary tables link every result to raw files, calibration, coordinates and configuration evidence. Acceptance language states which proposition passed, under which states, and what remains excluded. A commissioning agent or laboratory reports evidence but does not self-accredit the room. The final baseline includes inspection and maintenance indicators, software and masking settings, open limitations and triggers for later review.

Figure XII-6. Commissioning connects requirements, observed construction, calibrated evidence, limitations and authority. Author's original diagram.

Commissioning is a staged evidentiary process. Readiness review confirms construction closure, systems, documentation, safe access, instruments and approved operating states. Functional checks establish doors, masking, HVAC, audiovisual and control behaviour. Diagnostic scans locate

correctable defects before formal acceptance measurements. Whole-room tests then address the defined field and speech propositions, with background, uncertainty and limitations retained. Deficiencies are classified by mechanism, corrected under surveillance and retested at the appropriate scope. The final dossier reconciles as-designed, as-installed, as-tested and as-operated states and presents the evidence to the competent authority. A favourable reading does not self-authorise the facility, and an authority decision does not alter the physical result.⁸⁸

XII.16.1 Integration gate and evidence protocol

commissioning must establish a representative, controlled and reproducible baseline after the relevant construction, services, electronics and operational states are ready. This proposition is governed by readiness gates, system functional checks, calibrated measurement, adverse-state challenge, deficiency control, retest and authority disposition connect design intent to the accepted operating state. The practical requirement is to make the relationship inspectable before it becomes hidden inside a rating, a software output or a final signature. Every discipline should be able to identify its input, the interface it hands to another discipline, and the evidence by which that hand-off will be accepted.

A nominal design is insufficient unless it is examined under temporary seals, disabled plant, unfinished finishes, unbalanced airflow, borrowed furniture, incomplete access controls, provisional software or test personnel using an unrecorded room configuration. Required evidence includes readiness certificates, state matrices, witness records, photographs, raw data,

⁸⁸ [MB-1119](#). Part XII provenance and recovery history are preserved in the controlled production dossier. Its technical propositions depend upon the cited primary and secondary sources, not upon internal recovery records.

deficiency logs, corrective evidence, retest results and an accepted baseline dossier. The record should preserve raw observations as well as derived summaries, because later disagreement often concerns processing, state or scope rather than the underlying instrument reading. The evidence package should also reveal exclusions and inaccessible conditions so that absence of data is not confused with absence of risk.

Disposition follows only when acceptance is issued only for the stated configuration and use, with conditions, exclusions, retest triggers and responsible authority identified. A successful test under an artificial or incompletely documented state cannot be carried forward as ordinary operational performance by administrative convenience. A failed or uncertain gate produces a defined response, such as redesign, additional inspection, controlled test, temporary restriction or referral to the competent authority. Closure is therefore an evidentiary act linked to the accepted configuration, not a ceremonial declaration issued because the project has reached a contractual milestone.

Table XII.16-G. Integration gate for Commissioning and acceptance

Gate	Required record	Typical defect	Required response
Definition	Declare commissioning must establish a representative, controlled and reproducible baseline after the relevant construction, services, electronics and operational states are ready.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.

Gate	Required record	Typical defect	Required response
Challenge state	Examine temporary seals, disabled plant, unfinished finishes, unbalanced airflow, borrowed furniture, incomplete access controls, provisional software or test personnel using an unrecorded room configuration.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Readiness certificates, state matrices, witness records, photographs, raw data, deficiency logs, corrective evidence, retest results and an accepted baseline dossier.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	Acceptance is issued only for the stated configuration and use, with conditions, exclusions, retest triggers and responsible authority identified.	A successful test under an artificial or incompletely documented state cannot be carried forward as ordinary operational performance by administrative convenience.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.17 Forensic diagnosis and remediation

A forensic investigation should define criteria for stopping as well as advancing. Work may stop when the authorised question is answered, when further intrusion is disproportionate, when safety or privilege requires suspension, or when another discipline becomes controlling. The report explains why alternative hypotheses were not pursued further and what evidence would justify reopening them. This is more rigorous than searching indefinitely for every imaginable weakness. It also protects the room from unnecessary alteration and preserves scarce samples or data for a later qualified examination if new information appears.

Forensic work preserves the state before it seeks a cause. The authorised question, privilege, safety, access and information controls are established first. Requirements, drawings, submittals, commissioning, maintenance, software logs and interviews reconstruct the baseline. Competing hypotheses are written with predicted observations, confounders and disconfirming evidence. Reversible interventions are preferred because they provide information while limiting disturbance. A temporary seal, branch shutdown or latch adjustment must record every collateral change that could influence interpretation. Causal language should distinguish consistent with, supported contributor, probable dominant mechanism, strongly supported mechanism and excluded within tested scope. Chronology alone is insufficient. A condition can be contributory without being dominant, and a physical defect can coexist with an operational or management failure. Repair targets the supported mechanism and anticipates path migration. Before-and-after comparison uses comparable source, geometry, background and processing. Residual risk, inaccessible conditions and alternative explanations remain visible in the closure record.

Forensic diagnosis proceeds from preservation to competing hypotheses, discriminating observations, controlled intervention, causal conclusion, remedy and retest. The scene is altered only to the extent required by the next inference. Local pressure, intensity, vibration, airflow, thermography, optical inspection, borescopes and controlled openings each have particular strengths and ambiguities. Evidence custody covers native files, photographs, samples and the history of handling. Remediation targets the supported mechanism while preserving fire, structure, moisture, accessibility and electronic function. Before-and-after comparisons use

comparable states and a declared decision rule. Closure records residual conditions and open questions rather than converting an incomplete investigation into categorical assurance.⁸⁹

XII.17.1 Integration gate and evidence protocol

At the integration gate, failure analysis must preserve the room and records, develop competing hypotheses, select discriminating tests and repair the verified mechanism without overstating causation or compromise. The physical and evidentiary mechanism requiring control is complaint triage, baseline reconstruction, local and whole-room measurements, reversible perturbations, evidence custody, uncertainty and causal comparison convert an observation into a bounded inference. This treatment forces the team to describe identified objects, interfaces and states rather than relying on adjectives such as robust, secure, compliant or high performing. The model should be proportionate to consequence, yet it must remain sufficiently explicit that an independent reviewer can discover an omitted route, unowned interface or unsupported transfer of evidence.

The nominal account is challenged against immediate destructive opening, unrecorded adjustment, overwritten building data, changed equipment state, motivated reasoning, confirmation bias or a repair that removes evidence before alternatives are considered. The retained evidence comprises authority and scope, scene photographs, configuration and access history, native measurements, hypothesis matrix, intervention logs, samples, chain of custody and residual-risk analysis. Each record should carry a stable identifier, author, date, revision and disposition, and it should be linked to the configuration actually represented. Where evidence is

⁸⁹ [MB-0963](#). JCGM 100:2008, JCGM 106:2012.

missing, the gap remains visible with a responsible owner and due date; it is not converted into implied conformity by an attractive drawing, an isolated number or the passage of time.

Closure requires that the report identifies what was observed, what mechanism is best supported, what alternatives remain, what was corrected and what evidence is still required for recommissioning. A defect or vulnerability does not by itself prove exploitation, information loss, intent or responsibility, and legal conclusions remain with the proper forum and authority. The final record distinguishes observation, calculation, inference and authority action, states residual uncertainty, and identifies the event that reopens review. Corrective work must also preserve structural duty, life safety, accessibility, maintainability, cyber and technical-security boundaries, because improvement in one narrow path does not authorise damage to another essential function.

Table XII.17-G. Integration gate for Forensic diagnosis and remediation

Gate	Required record	Typical defect	Required response
Definition	Declare failure analysis must preserve the room and records, develop competing hypotheses, select discriminating tests and repair the verified mechanism without overstating causation or compromise.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.

Gate	Required record	Typical defect	Required response
Challenge state	Examine immediate destructive opening, unrecorded adjustment, overwritten building data, changed equipment state, motivated reasoning, confirmation bias or a repair that removes evidence before alternatives are considered.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Authority and scope, scene photographs, configuration and access history, native measurements, hypothesis matrix, intervention logs, samples, chain of custody and residual-risk analysis.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	The report identifies what was observed, what mechanism is best supported, what alternatives remain, what was corrected and what evidence is still required for recommissioning.	A defect or vulnerability does not by itself prove exploitation, information loss, intent or responsibility, and legal conclusions remain with the proper forum and authority.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.18 Lifecycle governance and change control

Lifecycle programmes should keep a risk-ranked backlog. Open limitations, deferred repairs, unavailable spares, overdue reviews, unverified software changes and repeated minor defects are visible to management. Each item carries consequence, interim control, owner and review date. The backlog is compared with room use and access so that limited resources address the highest practical exposure. Closing an item requires evidence, not merely completion of a work order. This makes maintenance and recommissioning

part of technical assurance rather than a separate facilities administration function.

Lifecycle governance recognises that different assets age at different rates.

Masonry may remain stable until damaged, while seals, closers, masking emitters, controllers, dampers, flexible connectors and software can drift frequently. Baseline indicators should correspond to failure mechanisms: door contact and force, masking spectrum and alarms, pressure, silencer condition, isolator clearance, penetration status and configuration logs.

Calendar inspections provide routine, while event-driven triggers respond to changes, complaints, incidents and adverse trends. Maintenance contracts should define secure access, approved parts, remote diagnostics, evidence fields and post-work verification. A visually similar substitute may differ in hardness, profile, mass, stiffness, listing, firmware or source output.

Emergency work receives temporary protection and retrospective evidence.

Trend comparison uses like states and known repeatability. A small persistent spectral change can be more significant than a larger change obtained with different background or geometry. The authority decides when drift requires restriction, targeted test or full recommissioning.

Lifecycle governance protects the accepted state against time. Seals wear, closers drift, filters load, fans are replaced, software changes, masking is adjusted and new services are installed. The change process should screen every proposal by source, path, receiver, evidence and authority effect and should assign review, inspection and retest accordingly. Calendar inspection is supplemented by event triggers and trend indicators such as door force, seal contact, masking level, plant vibration and selected acoustic bands.

Emergency work is reconciled promptly. Approved spares and maintenance

procedures preserve tested interfaces. Where a change falls outside the baseline, the earlier acceptance remains evidence of the earlier state and is not represented as evidence of the new one.⁹⁰

XII.18.1 Integration gate and evidence protocol

accepted performance must be sustained through inspection, maintenance, trend analysis, controlled alteration and event-driven recommissioning over the room life. The controlling mechanism is risk-based intervals, condition indicators, drift limits, material-change categories, recurring-defect analysis and accountable custodians connect the baseline to later states. A mature assurance programme therefore begins with an explicit scope and an ownership map, then tests whether the proposed evidence actually answers the decision question. This approach prevents a component label, professional reputation or institutional custom from becoming a substitute for a measurable and traceable relationship among source, path, receiver, configuration and authority.

Challenge cases include seal wear, door sag, water intrusion, tenant work, new cabling, equipment replacement, plant rebalance, emergency event, vibration exposure, firmware change or institutional reclassification.

Evidence should include inspection schedules, maintenance logs, trend plots, configuration deltas, work orders, photographs, calibration records, retest decisions and authority notifications. The reviewer examines not only whether each item exists, but whether it describes the same object, time and operating state. A complete file assembled from mismatched states can be more misleading than an openly incomplete file, because apparent documentary weight may conceal the absence of configuration identity.

⁹⁰ [MB-0924](#). ISO 12354-1:2017, ISO 12354-2:2017.

A defensible disposition is reached when the programme distinguishes routine maintenance, local verification, partial recommissioning and full reacceptance according to the mechanism and consequence of change. A calendar interval alone is neither risk analysis nor evidence of continuing performance, and absence of complaints is not proof that a quiet or inaccessible failure has not developed. Any condition, exclusion or deferred item is carried into operations and maintenance with a named custodian. The closeout statement uses bounded language and records the next inspection, retest or authority trigger, so that later users do not mistake a time-limited and state-specific result for a permanent property of the room.

Table XII.18-G. Integration gate for Lifecycle governance and change control

Gate	Required record	Typical defect	Required response
Definition	Declare accepted performance must be sustained through inspection, maintenance, trend analysis, controlled alteration and event-driven recommissioning over the room life.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine seal wear, door sag, water intrusion, tenant work, new cabling, equipment replacement, plant rebalance, emergency event, vibration exposure, firmware change or institutional reclassification.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Inspection schedules, maintenance logs, trend plots, configuration deltas, work orders, photographs, calibration records, retest decisions and authority notifications.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.

Gate	Required record	Typical defect	Required response
Disposition	The programme distinguishes routine maintenance, local verification, partial recommissioning and full reacceptance according to the mechanism and consequence of change.	A calendar interval alone is neither risk analysis nor evidence of continuing performance, and absence of complaints is not proof that a quiet or inaccessible failure has not developed.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.19 Governmental comparison and authority boundaries

Jurisdictional overlays should be version controlled. A project spanning several countries can preserve one engineering core while maintaining separate schedules for authority, terminology, records, approved laboratories, public-source boundaries and formal acceptance. Changes in one overlay do not silently alter another. The project records which edition and interpretation governed each decision date. This is important when construction, commissioning and continued use occur years apart. A current public source may affect future work without retroactively changing the meaning of a historical decision, unless the competent authority so determines.

Comparative governmental analysis should begin with issuer, legal status, protected function, terminology, public accessibility and decision authority. Similar words such as secure room, speech room, zone, accreditation, approval and authorisation can describe materially different institutional acts. Public documents may disclose programme roles and general engineering duties while controlled criteria remain unavailable. The crosswalk should therefore mark convergence, partial correspondence and non-equivalence rather than translating labels directly. A multinational project can use a common engineering core: source-state matrix, listener-

access schedule, path register, frequency-resolved evidence, uncertainty, configuration control, commissioning and change management.

Jurisdictional overlays then add the correct authority, forms, access rules, protected criteria, records and acceptance language. Conflicts are referred to competent authorities rather than averaged by the design team. No public consensus standard should be described as granting governmental approval merely because its methods are used in the evidence programme.

Governmental comparison should be functional and authority-aware. Public United States, United Kingdom and Canadian materials can be cross-walked by protected function, terminology, governance, design process, construction control, testing, lifecycle and public-source boundary. Similar words can carry different legal or institutional meanings, and one jurisdiction's room category may not correspond to another's technical service or accreditation status. A multinational project can define a common engineering core of source states, path registers, frequency-resolved evidence, configuration control, uncertainty and change management. Jurisdictional overlays then add authority, protected criteria, forms, security controls and records. Conflicts are referred to competent authorities rather than averaged into a hybrid rule invented by the design team.⁹¹

XII.19.1 Integration gate and evidence protocol

The purpose of this control is that United States, United Kingdom, Canadian and other governmental frameworks must be compared by function, authority, terminology, evidence route and jurisdiction without manufacturing equivalence. Its engineering basis is a neutral engineering core is overlaid with jurisdiction-specific roles, controlled documents, facility

⁹¹ [MB-0949](#). ISO/IEC 17025:2017 addresses competence, ISO/IEC 17025:2017.

categories, release boundaries and approval acts. The design team should translate that basis into drawings, schedules, data fields and review questions that can survive procurement and construction. An idea that remains only in narrative is vulnerable to substitution, fragmented responsibility and loss during later change, however persuasive the original explanation may have sounded.

The control is stress-tested by considering legacy labels, casual translation, reciprocity assumptions, partner-nation release, mixed procurement language or a public programme description being treated as a transferable numerical criterion. The evidence set consists of authority maps, dated terminology registers, source-status records, jurisdictional overlays, conflict logs, local approvals and controlled-document references. The comparison should be frequency resolved and state aware wherever the mechanism requires it, and the quality of the evidence should be stated separately from the magnitude of the result. Contradictory observations are retained and investigated rather than discarded because they disturb a preferred explanation.

Technical closure means that the competent authority for the actual facility and mission resolves applicability, equivalence, reciprocity and residual conditions. Shared physics and similar institutional objectives permit comparison, but they do not make room categories, accreditation acts or protected technical criteria interchangeable. The issue register then records residual risk, limitations, reliance on operational controls and the authority action still required. Where a later alteration changes an assumption, the earlier conclusion is not edited retrospectively; the change receives a new

evidence state and, where material, a new commissioning or acceptance decision.

Table XII.19-G. Integration gate for Governmental comparison and authority boundaries

Gate	Required record	Typical defect	Required response
Definition	Declare United States, United Kingdom, Canadian and other governmental frameworks must be compared by function, authority, terminology, evidence route and jurisdiction without manufacturing equivalence.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine legacy labels, casual translation, reciprocity assumptions, partner-nation release, mixed procurement language or a public programme description being treated as a transferable numerical criterion.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Authority maps, dated terminology registers, source-status records, jurisdictional overlays, conflict logs, local approvals and controlled-document references.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	The competent authority for the actual facility and mission resolves applicability, equivalence, reciprocity and residual conditions.	Shared physics and similar institutional objectives permit comparison, but they do not make room categories, accreditation acts or protected technical criteria interchangeable.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.20 Programme assurance and institutional learning

Portfolio review should include near misses and successful controls, not only failures. A hold point that found a bridge before closure provides evidence about defect opportunity and inspection value. A room that remains stable after repeated changes can reveal maintainable details and effective governance. These observations help estimate where prevention works and where hidden populations may remain. The programme should protect confidentiality while preserving enough causal detail for learning. Aggregate dashboards are useful only when reviewers can drill back to controlled records and understand the denominator behind each rate.

Programme assurance defines populations before drawing conclusions. Rooms can share an installer, door family, detail, controller version, maintenance contractor or climatic exposure. A serious local defect can justify forward and backward tracing through those factors, while one isolated failure should not be extrapolated without a defined basis. Sampling is stratified by causal opportunity rather than selected for convenience. Clear observations as well as defects are retained, so prevalence and inspection effectiveness are not distorted by reporting bias. Useful metrics measure prevention, early detection, causal closure, change-review compliance, baseline drift, evidence completeness and recurrence after corrective action. Simple counts can mislead. Fewer reported defects may indicate weak surveillance, and faster closure may indicate premature disposition. Lessons become durable only when they change controlled requirements, details, submittal checklists, tools, hold points, maintenance or training. Effectiveness review asks whether the same causal family recurs

after sufficient opportunity, not whether a meeting minutes document was completed.

Programme assurance extends beyond individual rooms. Portfolio registers identify common designs, products, installers, software, maintenance practices and known failure modes. Findings are screened for population relevance and investigated through stratified sampling that reflects common-cause risk and consequence. Corrective actions change requirements, details, training, surveillance or maintenance and are later tested for effectiveness. Metrics should reveal prevention, detection, correction and recurrence without rewarding under-reporting. Lessons can be shared in a controlled form that removes site-specific vulnerability while preserving the mechanism and process improvement. Programme learning is complete only when the action has altered both the physical condition and the system that permitted it.⁹²

Programme metrics require restraint

Counting open defects can reward non-reporting. Counting passing tests can ignore untested states. Counting completed inspections can conceal weak sampling. Stronger measures include recurrence by causal family, detection before concealment, time to supported cause and verified remedy, proportion of material changes receiving review, baseline indicators within tolerance, unresolved source or configuration gaps and effectiveness of corrective action. Metrics support learning only when populations and opportunities are defined.

⁹² [MB-0087](#). ASTM E336-25a, ISO 16283-1:2014.

XII.20.1 Integration gate and evidence protocol

portfolio governance must convert recurring defects, successful controls, near misses and change outcomes into better requirements, training and resource allocation. This proposition is governed by leading indicators, lagging outcomes, denominator control, independent audit, corrective-action effectiveness and common-cause analysis reveal whether the programme process is improving. The practical requirement is to make the relationship inspectable before it becomes hidden inside a rating, a software output or a final signature. Every discipline should be able to identify its input, the interface it hands to another discipline, and the evidence by which that hand-off will be accepted.

A nominal design is insufficient unless it is examined under metric gaming, counting activity as effectiveness, excluding failed projects from denominators, treating one favourable test as a portfolio result or repeatedly repairing symptoms without revising the process. Required evidence includes defined metrics, data provenance, audit samples, recurrence registers, root-cause records, training evidence, trend analysis and verified corrective-action closure. The record should preserve raw observations as well as derived summaries, because later disagreement often concerns processing, state or scope rather than the underlying instrument reading. The evidence package should also reveal exclusions and inaccessible conditions so that absence of data is not confused with absence of risk.

Disposition follows only when management acts when the evidence shows a systemic design, procurement, construction, testing or maintenance weakness, and later data are used to test whether the intervention worked.

A dashboard is a management instrument, not a substitute for room-specific evidence, and aggregate improvement cannot authorise a particular facility. A failed or uncertain gate produces a defined response, such as redesign, additional inspection, controlled test, temporary restriction or referral to the competent authority. Closure is therefore an evidentiary act linked to the accepted configuration, not a ceremonial declaration issued because the project has reached a contractual milestone.

Table XII.20-G. Integration gate for Programme assurance and institutional learning

Gate	Required record	Typical defect	Required response
Definition	Declare portfolio governance must convert recurring defects, successful controls, near misses and change outcomes into better requirements, training and resource allocation.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine metric gaming, counting activity as effectiveness, excluding failed projects from denominators, treating one favourable test as a portfolio result or repeatedly repairing symptoms without revising the process.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Defined metrics, data provenance, audit samples, recurrence registers, root-cause records, training evidence, trend analysis and verified corrective-action closure.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.

Gate	Required record	Typical defect	Required response
Disposition	Management acts when the evidence shows a systemic design, procurement, construction, testing or maintenance weakness, and later data are used to test whether the intervention worked.	A dashboard is a management instrument, not a substitute for room-specific evidence, and aggregate improvement cannot authorise a particular facility.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.21 Final synthesis

The principal rules should be treated as design-review questions. For each rule, the project identifies where the answer appears, who owns it and what evidence will close it. Rules that do not apply receive a reason, not an empty check mark. Conflicts among rules are resolved openly, such as accessibility versus threshold geometry or fire access versus acoustic closure. This transforms the synthesis into a practical review architecture. It also makes omissions visible early, when revision is less costly and before procurement language hardens an incomplete assumption into a contractual requirement.

The synthesis favours controlled simplicity over ornamental complexity. Independent leaves need observable clearances. Doors need measurable contact and maintainable parts. Glazing needs complete build-up and perimeter evidence. Services need limited registered routes. Masking and electronics need approved states and visible failure. Records need stable identifiers and owners. Complexity is justified only when its mechanisms, interfaces, maintenance and verification can be understood by the people who must operate the room years after construction. Testing is likewise selected for information value. Standard methods support comparability, diagnostics support mechanism, speech methods support information

consequence, and authority review assigns institutional meaning. No method should be required to prove a proposition beyond its scope. The most durable forensic strategy is restraint, and the most durable governance strategy is a controlled loop from requirement through change. The final rules are therefore practical constraints on overclaiming as much as design recommendations.

The final synthesis is controlled simplicity. Define the protected function and credible states. Model the complete frequency-dependent network. Design interfaces and services as carefully as broad fields. Preserve configuration and concealed-work evidence. Measure quantities whose scope matches the decision. Carry uncertainty and limitation openly. Repair only supported mechanisms and anticipate path migration. Separate engineering result from authority disposition. Maintain the baseline through change control and recommissioning. These propositions are mutually reinforcing. A sophisticated equation cannot compensate for an undefined receiver, and a meticulous register cannot compensate for an open path. The durable room is one whose physics, evidence, operation and governance remain aligned and whose limitations are visible to the people responsible for its use.⁹³

Twenty-three principal design and evidentiary rules

Rule 1. Define the protected function before selecting a rating

State information consequence, authorised users, source states, listener access, operating states and the decision owner. Convert the function into a source-state matrix, listener-access map, consequence statement and named decision owner. Ratings are selected only after those variables are

⁹³ [MB-0925](#). ISO 12999-1:2020, JCGM 100:2008.

fixed, because the same partition evidence can support very different conclusions under ordinary speech, amplified audio or quiet-night access.

Rule 2. Keep the four propositions separate

Do not describe laboratory, field, speech-security and authority evidence as interchangeable. Use separate report headings and evidence tables for laboratory, installed field, occupied speech and authority decisions. Cross-reference them explicitly, but never allow a favourable result in one column to populate another column by implication.

Rule 3. Model the complete transfer network

Include direct, flanking, structural, service, opening, electronic and operational paths. Maintain a band-specific path ledger covering fields, openings, junctions, structure, services, electronics and operations. Revise the ledger after each design change or repair so that dominant-path migration is visible.

Rule 4. Retain frequency-resolved evidence

Use single-number ratings for communication only after the controlling band behaviour is understood. Archive octave or one-third-octave values, source spectra, backgrounds and limitations behind each rating. Band data are required for diagnosis, speech relevance and comparison when the source or receiving state changes.

Rule 5. Treat small discontinuities as high-transmission paths

Inspect perimeters, joints, services and frames with methods capable of revealing local weaknesses. Inspect gap length, width, depth, backing, pressure and cavity connection. Use reversible contrasts where appropriate

and record collateral changes, because a temporary treatment can alter mass or damping as well as close the intended opening.

Rule 6. Design interfaces before broad fields

Allocate ownership, movement, fire, moisture, structural and acoustic duties at every junction. Give junctions named multidisciplinary owners and show movement, fire, moisture, structure, access and acoustic duties on the same detail. Broad-field performance is useful only when the edges and services preserve the assumed independence.

Rule 7. Use tested assemblies only within demonstrated equivalence

Compare dimensions, materials, supports, edges, seals, hardware and mounting, not headline ratings alone. Prepare a specimen crosswalk that classifies every material, dimension, support, edge, seal, penetration and mounting attribute as identical, bounded, different or unknown. Unknowns become project risk or test requirements, not silent equivalence.

Rule 8. Define source states, including amplified audio

Commission the actual approved electronic and human source conditions rather than one convenient loudspeaker setting. Commission human and electronic sources in normal, credible maximum, fault and emergency states. Record gain, directivity, processing, mute logic and reference position so that the accepted excitation can be reproduced.

Rule 9. Map listener access separately from standard microphone positions

Include service spaces, voids, exterior and maintenance access where authorised by the threat model. Map authorised and credible access

independently of method-prescribed positions. Service spaces, voids, exterior locations and maintenance routes may require additional diagnostic or consequence measurements without changing the formal standard result.

Rule 10. Separate physical isolation from masking dependence

Measure normal, quiet, failure and maintenance states and supervise any operational system credited. State separately the physical isolation margin and any privacy credit arising from background or active masking.

Supervision, alarms, access, quiet-state performance and recovery time are required where an operational system carries material reliance.

Rule 11. Preserve as-designed through as-operated states

Resolve discrepancies or carry them as explicit uncertainty and limitation. Give each state a versioned dossier containing drawings, assets, software, set points, penetrations, inspections and tests. A discrepancy is resolved, bounded or accepted by authority; it is never erased merely to make the records agree.

Rule 12. Inspect concealed work before concealment

Use first-of-type work, hold points, material identity, measurements and indexed photographs. Create first-of-type releases and hold points at backing, seals, resilient gaps, penetrations, firestop, supports and closures. Missed observations are treated as evidence gaps requiring reopening, alternative verification or an explicit limitation.

Rule 13. Match the measurement model to the question

Define the measurand, geometry, instruments, processing, uncertainty and decision rule before results are known. Write the measurand, geometry, source, receiver, state, processing, uncertainty and decision rule before collecting results. This prevents retrospective method selection and makes later reproduction possible.

Rule 14. Distinguish standard tests from diagnostics

Local scans and perturbations can identify mechanism without becoming the standard conformity result. Label local scans, perturbations and comparative measurements as diagnostic evidence. Preserve the formal conformity measurement unchanged unless the governing method expressly permits the diagnostic intervention.

Rule 15. Use uncertainty to improve decisions, not decorate reports

Identify dominant contributors, covariance, configuration gaps and model discrepancy. Use sensitivity analysis to identify the contributors that control the decision. Reduce calibration, sampling, background, covariance, configuration or model uncertainty where that reduction could change the action, and avoid ornamental budgets that do not affect judgement.

Rule 16. Write authority dispositions separately from engineering results

The technical reviewer supports a decision but does not self-accredit the room. Place the technical result and the institutional disposition in separate signed records. The engineering record states the measured and inferred condition; the authority record states permitted use, restrictions, residual risk and review triggers.

Rule 17. Repair the verified mechanism and anticipate path displacement

Update the path budget and retest both the local condition and whole-room proposition. Tie each remedy to the evidence for a path and predict the new path balance. Verify workmanship before concealment, then retest the local mechanism and the whole-room proposition at comparable states.

Rule 18. Distinguish measurement uncertainty, configuration uncertainty and model discrepancy

Do not combine unlike limits into one number without a defensible model. Report these three limitation classes separately. Measurement uncertainty can often be quantified; configuration uncertainty may require inspection; model discrepancy may require a different representation. A single combined figure is used only where the relationship is defensible.

Rule 19. Preserve as-designed, as-submitted, as-built, as-tested and as-operated states

Acceptance states what configuration it covers and which changes reopen review. State exactly which configuration the acceptance covers and preserve the links among design, submittal, construction, testing and operation. Changes that break those links reopen review even where the room appears visually unchanged.

Rule 20. Make change control part of technical design

New cables, displays, software, HVAC, masking and maintenance can invalidate earlier evidence. Screen proposed and emergency work for effects on source, path, receiver, evidence and authority. Assign approval, inspection, baseline update and retest before work whenever practicable, and reconcile emergency work immediately afterwards.

Rule 21. Use comparative governmental doctrine without manufacturing equivalence

Compare disclosed functions and processes while leaving protected criteria with competent authorities. Cross-walk disclosed functions, methods and governance while retaining jurisdiction-specific authority and terminology. Non-equivalence is a valid result and is preferable to a convenient but unsupported hybrid requirement.

Rule 22. Bound electronic and non-acoustic questions explicitly

Acoustic evidence does not prove control of microphones, radios, optical paths, compromising emanations or cyber functions. Identify the boundary of the acoustic conclusion. Microphones, radios, optical paths, compromising emanations, cyber functions and other non-acoustic mechanisms require their own qualified methods and authority records.

Rule 23. Write conclusions at the strength supported by evidence

State observation, measurand, state, result, uncertainty, mechanism, limitation, residual risk and authority disposition. Use bounded causal language. A conclusion should identify observation, state, measurand, calculation, uncertainty, mechanism, alternatives, residual condition and decision owner, and should say expressly what was not established.

XII.21.1 Integration gate and evidence protocol

At the integration gate, the final technical conclusion should be expressed as an assurance case that connects bounded claims to reasoning and evidence across physics, construction, operation, metrology and authority. The physical and evidentiary mechanism requiring control is claims,

arguments, evidence, rebuttals, assumptions, unresolved issues and decision ownership are arranged so that a later reviewer can see why the conclusion follows and where it stops. This treatment forces the team to describe identified objects, interfaces and states rather than relying on adjectives such as robust, secure, compliant or high performing. The model should be proportionate to consequence, yet it must remain sufficiently explicit that an independent reviewer can discover an omitted route, unowned interface or unsupported transfer of evidence.

The nominal account is challenged against contradictory measurements, incomplete construction records, mixed operating states, unresolved source status or a management desire for a single unqualified declaration that the room is secure. The retained evidence comprises the complete system model, path and configuration registers, test data, uncertainty, inspection record, authority criteria, nonconformance dispositions and lifecycle controls. Each record should carry a stable identifier, author, date, revision and disposition, and it should be linked to the configuration actually represented. Where evidence is missing, the gap remains visible with a responsible owner and due date; it is not converted into implied conformity by an attractive drawing, an isolated number or the passage of time.

Closure requires that the final statement names the protected function, configuration, source and receiver conditions, evidence date, limitations, residual risk and authority action. The strength of the conclusion cannot exceed the weakest essential link in the assurance case, and an honest conditional statement is superior to an absolute claim unsupported by the record. The final record distinguishes observation, calculation, inference and authority action, states residual uncertainty, and identifies the event that

reopens review. Corrective work must also preserve structural duty, life safety, accessibility, maintainability, cyber and technical-security boundaries, because improvement in one narrow path does not authorise damage to another essential function.

Table XII.21-G. Integration gate for Final synthesis

Gate	Required record	Typical defect	Required response
Definition	Declare the final technical conclusion should be expressed as an assurance case that connects bounded claims to reasoning and evidence across physics, construction, operation, metrology and authority.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine contradictory measurements, incomplete construction records, mixed operating states, unresolved source status or a management desire for a single unqualified declaration that the room is secure.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	The complete system model, path and configuration registers, test data, uncertainty, inspection record, authority criteria, nonconformance dispositions and lifecycle controls.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.

Gate	Required record	Typical defect	Required response
Disposition	The final statement names the protected function, configuration, source and receiver conditions, evidence date, limitations, residual risk and authority action.	The strength of the conclusion cannot exceed the weakest essential link in the assurance case, and an honest conditional statement is superior to an absolute claim unsupported by the record.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.22 Publication and authority boundary

Publication release should include a defect register that survives the final editorial meeting. Open source editions, unresolved permissions, renderer substitutions, unavailable original source objects and external reviews are listed with consequence and disposition. The release note distinguishes restored content from exact-source recovery where provenance differs. This permits readers to separate content integrity from provenance limitations. Silent repair of a missing source or retrospective invention of a checksum would create a more serious evidentiary failure than a candidly documented restoration supported by available records.

Publication control follows the same evidentiary discipline as facility control. Every material claim should trace to a current or deliberately historical source, a calculation, a table, a figure or a defined professional inference. Editions, jurisdictions and limitations remain visible. Quotations are exact and limited. Technical images retain provenance or are original. Protected criteria, facility-specific vulnerabilities and authority-only decisions are not reconstructed for narrative completeness. A public gap is recorded as a boundary, not filled with plausible invention. A release is not final because the prose is long or the pages are polished. The source register, claim links, equations, figures, tables, glossary, index, OOXML structure, rendered PDF,

manifest, checksums and release identifier must agree. Changes after sealing create a new revision. A checksum detects byte difference but cannot prove technical truth, source competence or lawful release. Those propositions require separate review and responsible authority.

A public engineering monograph must explain without certifying. It can describe acoustic physics, standard measurement scopes, evidence methods, generic construction practice and documented public doctrine. It should not reproduce protected thresholds, infer missing criteria, disclose site-specific paths or represent similarity as accreditation. Copyright and permissions control applies to tables, figures, standards text, photographs and manufacturer reports independently of security review. Redaction removes underlying content and metadata rather than merely covering it. Authority records should be retained outside the public publication where necessary. The publication statement should therefore identify the source-status date, public-source boundary, professional limitations and the fact that formal use decisions remain with the competent authority.⁹⁴

XII.22.1 Integration gate and evidence protocol

publication must preserve technical usefulness while respecting security review, legal restrictions, copyright, privacy, contractual limits and the aggregation risk created by otherwise public fragments. The controlling mechanism is source classification, public-release review, redaction verification, metadata inspection, permissions control, version freezing and audience-specific distribution establish a controlled release chain. A mature assurance programme therefore begins with an explicit scope and an ownership map, then tests whether the proposed evidence actually answers

⁹⁴ [MB-0083](#). ASTM E2964-26, ASTM C919-24.

the decision question. This approach prevents a component label, professional reputation or institutional custom from becoming a substitute for a measurable and traceable relationship among source, path, receiver, configuration and authority.

Challenge cases include controlled thresholds inferred from fragments, sensitive facility detail exposed by aggregation, hidden metadata, unlicensed normative text, identifiable case facts or a draft circulated after the approved version changed. Evidence should include release checklists, reviewer identities and authority, source and permissions records, redaction logs, comparison proofs, hashes, manifests and distribution decisions. The reviewer examines not only whether each item exists, but whether it describes the same object, time and operating state. A complete file assembled from mismatched states can be more misleading than an openly incomplete file, because apparent documentary weight may conceal the absence of configuration identity.

A defensible disposition is reached when the authorised release body determines what may be published, while the engineering author retains enough bounded explanation to prevent the public text from becoming misleading. Public wording does not create authority to build or use a protected facility, and removal of a marking does not prove that aggregation or contextual sensitivity has been resolved. Any condition, exclusion or deferred item is carried into operations and maintenance with a named custodian. The closeout statement uses bounded language and records the next inspection, retest or authority trigger, so that later users do not mistake a time-limited and state-specific result for a permanent property of the room.

Table XII.22-G. Integration gate for Publication and authority boundary

Gate	Required record	Typical defect	Required response
Definition	Declare publication must preserve technical usefulness while respecting security review, legal restrictions, copyright, privacy, contractual limits and the aggregation risk created by otherwise public fragments.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine controlled thresholds inferred from fragments, sensitive facility detail exposed by aggregation, hidden metadata, unlicensed normative text, identifiable case facts or a draft circulated after the approved version changed.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Release checklists, reviewer identities and authority, source and permissions records, redaction logs, comparison proofs, hashes, manifests and distribution decisions.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	The authorised release body determines what may be published, while the engineering author retains enough bounded explanation to prevent the public text from becoming misleading.	Public wording does not create authority to build or use a protected facility, and removal of a marking does not prove that aggregation or contextual sensitivity has been resolved.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.23 Closing design and evidentiary propositions

Closing propositions should be tested against a hypothetical material change. The reviewer asks whether the conclusion would survive a new penetration, door adjustment, HVAC setback, software update or changed listener access. Where the answer is no, the baseline should contain a

trigger that reopens the relevant evidence. This counterfactual check reveals whether the stated conclusion is truly bounded or written as a timeless guarantee. It also connects the final chapter to operating procedures, work permits and incident response, where most long-term degradation begins.

Strong design begins with source and listener models, continues through frequency-resolved path analysis, and produces details whose critical interfaces can be inspected. Strong construction preserves material identity and concealed-work evidence. Strong testing matches the measurand to the decision and retains raw data. Strong operation trains users, maintains settings and controls change. Strong forensic work preserves alternatives and repairs causes. Strong governance records limitations and assigns continuing ownership. The room remains a dynamic system. Weather, pressure, moisture, wear, software, maintenance and new services can invalidate earlier assumptions without visible damage. Accordingly, no single product, certificate, measurement or inspection can serve as a timeless guarantee. The defensible objective is a continuing relationship among physics, evidence, operation and authority. Every conclusion should state what was actually examined, which state was represented, what remains uncertain and who has power to decide the consequence.

The closing propositions are evidentiary as well as technical. Every claimed outcome should name the object, state, method, result, uncertainty, limitation and decision owner. Every material interface should have an owner, inspection point and change trigger. Every calculation should retain assumptions, units, source data and independent check. Every source should have status and applicability. Every repair should connect a demonstrated mechanism to a verification method. Every accepted state

should be reproducible from the dossier and distinguishable from later states. These controls do not eliminate uncertainty. They make uncertainty governable and prevent confidence from outrunning evidence.⁹⁵

XII.23.1 Integration gate and evidence protocol

The purpose of this control is that the closing propositions must translate the monograph into an owner-ready disposition that exposes open conditions, assigns responsibility and prevents schedule pressure from converting uncertainty into implied acceptance. Its engineering basis is a closure matrix links each requirement and material nonconformance to evidence, reviewer, disposition, condition, due date, residual risk and reopening trigger. The design team should translate that basis into drawings, schedules, data fields and review questions that can survive procurement and construction. An idea that remains only in narrative is vulnerable to substitution, fragmented responsibility and loss during later change, however persuasive the original explanation may have sounded.

The control is stress-tested by considering punch-list fatigue, conditional items losing owners, temporary controls becoming permanent, unresolved tests being described as administrative, or an authority memorandum being separated from its technical qualifications. The evidence set consists of requirement and deficiency registers, signed dispositions, outstanding-action schedules, test and inspection attachments, use restrictions and final configuration identifiers. The comparison should be frequency resolved and state aware wherever the mechanism requires it, and the quality of the evidence should be stated separately from the magnitude of the result.

⁹⁵ [MB-0919](#). ISO 10005:2018, ISO 10006:2017.

Contradictory observations are retained and investigated rather than discarded because they disturb a preferred explanation.

Technical closure means that the room is accepted, conditionally used, restricted, remediated or rejected through an explicit act by the empowered authority, not through silence or occupation. An open issue remains open until its evidence and authority gate close, even when construction is complete or operational demand is pressing. The issue register then records residual risk, limitations, reliance on operational controls and the authority action still required. Where a later alteration changes an assumption, the earlier conclusion is not edited retrospectively; the change receives a new evidence state and, where material, a new commissioning or acceptance decision.

Table XII.23-G. Integration gate for Closing design and evidentiary propositions

Gate	Required record	Typical defect	Required response
Definition	Declare the closing propositions must translate the monograph into an owner-ready disposition that exposes open conditions, assigns responsibility and prevents schedule pressure from converting uncertainty into implied acceptance.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.

Gate	Required record	Typical defect	Required response
Challenge state	Examine punch-list fatigue, conditional items losing owners, temporary controls becoming permanent, unresolved tests being described as administrative, or an authority memorandum being separated from its technical qualifications.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Requirement and deficiency registers, signed dispositions, outstanding-action schedules, test and inspection attachments, use restrictions and final configuration identifiers.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	The room is accepted, conditionally used, restricted, remediated or rejected through an explicit act by the empowered authority, not through silence or occupation.	An open issue remains open until its evidence and authority gate close, even when construction is complete or operational demand is pressing.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.24 Final research and professional agenda

Research programmes should publish negative and boundary results as carefully as favourable ones. Models improve when investigators report configurations in which assumptions failed, instruments reached dynamic-range limits, listeners varied, seals behaved nonlinearly or field conditions prevented laboratory transfer. Shared datasets should protect facility identity and sensitive criteria while preserving enough geometry and metadata for scientific use. Professional bodies can support common reporting schemas, reference implementations and interlaboratory

comparison. Better evidence architecture is as important as more elaborate prediction because untraceable data cannot sustain cumulative learning.

Research needs datasets that preserve geometry, materials, junctions, services, source and receiver states, uncertainty, workmanship, change and failure, rather than isolated headline ratings. Prediction models need validation for local openings, nonlinear seals, intermittent contact, resilient-device variability, large panes, historic composite walls, duct networks, structural mobility and hybrid airborne-structure-borne systems. Statistical studies should represent clustered defects and imperfect inspection instead of assuming independent uniform workmanship. Professional education should connect acoustics with structures, building services, fire, accessibility, electronic systems, metrology, uncertainty, forensics, contracts, security governance and technical writing. No individual must master every discipline, but each must recognise interfaces and limits. Institutions should reward accurate limitation statements, independent checking and controlled learning. Future digital twins and automated registers are valuable only when they remain linked to observed construction and can be audited after the physical room changes.

The research agenda should concentrate on data and models that improve system decisions. Needed work includes modern speech-source distributions, listener and repetition studies, validated low-frequency and flanking models, installed performance of doors and services, long-term ageing of seals and resilient components, interoperable digital configuration records and uncertainty methods for mixed physical and operational states. Shared datasets should preserve geometry, materials, boundaries, raw signals, processing and negative results so that models can

be independently tested. Professional education should join acoustics, structures, building services, metrology, forensic method, information security and lifecycle governance. Progress will be measured not by more single-number claims, but by more reliable transitions from requirement to design, construction, evidence, operation and change.⁹⁶

Figure XII-7. Full-volume validation proceeds through architecture, technical content, equations, sources, objects, editorial quality, apparatus, document integrity, rendering and package verification. Author's original diagram.

Figure XII-8. A checksum-sealed publication chain connects frozen text, rendered pagination, validated apparatus, manifest, member hashes and a release identifier. Author's original diagram.

XII.24.1 Integration gate and evidence protocol

future research should address real uncertainty in transfer mechanisms, source and receiver behaviour, field prediction, instrumentation, digital records and lifecycle reliability rather than merely attaching novelty language to familiar tests. This proposition is governed by open methods, interlaboratory comparison, validated simulation, uncertainty reporting, representative field datasets, reproducible code and ethically governed human-speech studies permit cumulative knowledge. The practical requirement is to make the relationship inspectable before it becomes hidden inside a rating, a software output or a final signature. Every discipline should be able to identify its input, the interface it hands to another discipline, and the evidence by which that hand-off will be accepted.

A nominal design is insufficient unless it is examined under small unrepresentative samples, proprietary black boxes, hidden preprocessing, selective publication, simulated precision, uncontrolled security disclosure or machine-learning results detached from physical interpretation. Required

⁹⁶ [MB-0047](#). ANSI/ASHRAE/IES Standard 202-2024, ANSI/ASHRAE/IES Standard, ASHRAE Guideline 0-2019.

evidence includes preregistered questions where appropriate, retained raw data, software and version records, validation against independent observations, sensitivity studies, peer review and explicit transfer limits. The record should preserve raw observations as well as derived summaries, because later disagreement often concerns processing, state or scope rather than the underlying instrument reading. The evidence package should also reveal exclusions and inaccessible conditions so that absence of data is not confused with absence of risk.

Disposition follows only when a research result enters professional practice only after its domain, uncertainty, failure modes and compatibility with existing standards and authority structures are understood. Research may illuminate public physics and engineering methods, but it must not be used to infer protected criteria or bypass the competent authority responsible for a real facility. A failed or uncertain gate produces a defined response, such as redesign, additional inspection, controlled test, temporary restriction or referral to the competent authority. Closure is therefore an evidentiary act linked to the accepted configuration, not a ceremonial declaration issued because the project has reached a contractual milestone.

Table XII.24-G. Integration gate for Final research and professional agenda

Gate	Required record	Typical defect	Required response
Definition	Declare future research should address real uncertainty in transfer mechanisms, source and receiver behaviour, field prediction, instrumentation, digital records and lifecycle reliability rather than merely attaching novelty language to familiar tests.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine small unrepresentative samples, proprietary black boxes, hidden preprocessing, selective publication, simulated precision, uncontrolled security disclosure or machine-learning results detached from physical interpretation.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Preregistered questions where appropriate, retained raw data, software and version records, validation against independent observations, sensitivity studies, peer review and explicit transfer limits.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	A research result enters professional practice only after its domain, uncertainty, failure modes and compatibility with existing standards and authority structures are understood.	Research may illuminate public physics and engineering methods, but it must not be used to infer protected criteria or bypass the competent authority responsible for a real facility.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.25 Unified-book architecture: secure construction, acoustic security, STC, and sound engineering

XII.25.1 Integration gate and evidence protocol

At the integration gate, the four former workstreams are governed as one monograph because each describes a different layer of the same protected-location system. The physical and evidentiary mechanism requiring control is secure construction owns physical continuity and controlled execution; acoustic security owns mission, threat and information consequence; STC and related ratings own bounded specimen and field classifications; sound engineering owns system behaviour, services, measurement, commissioning and lifecycle control. This treatment forces the team to describe identified objects, interfaces and states rather than relying on adjectives such as robust, secure, compliant or high performing. The model should be proportionate to consequence, yet it must remain sufficiently explicit that an independent reviewer can discover an omitted route, unowned interface or unsupported transfer of evidence.

The nominal account is challenged against duplicated chapters, conflicting terminology, repeated examples, inconsistent source freezes, separate glossaries and a reader being invited to treat one workstream as independent proof of another. The retained evidence comprises a single subject-ownership matrix, canonical chapter register, shared notation, unified source register, cross-reference map, duplicate audit and one publication master. Each record should carry a stable identifier, author, date, revision and disposition, and it should be linked to the configuration actually represented. Where evidence is missing, the gap remains visible with a responsible owner and due date; it is not converted into implied

conformity by an attractive drawing, an isolated number or the passage of time.

Closure requires that material is retained once in its strongest location, cross-referenced where another discipline needs it, and rewritten only when a distinct question or evidentiary proposition requires separate treatment. Integration does not erase disciplinary boundaries. An STC result remains a bounded rating, secure construction remains broader than acoustics, and sound engineering does not confer governmental authorisation. The final record distinguishes observation, calculation, inference and authority action, states residual uncertainty, and identifies the event that reopens review. Corrective work must also preserve structural duty, life safety, accessibility, maintainability, cyber and technical-security boundaries, because improvement in one narrow path does not authorise damage to another essential function.

Table XII.25-G. Integration gate for Unified-book architecture: secure construction, acoustic security, STC, and sound engineering

Gate	Required record	Typical defect	Required response
Definition	Declare the four former workstreams are governed as one monograph because each describes a different layer of the same protected-location system.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine duplicated chapters, conflicting terminology, repeated examples, inconsistent source freezes, separate glossaries and a reader being invited to treat one workstream as independent proof of another.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.

Gate	Required record	Typical defect	Required response
Evidence	A single subject-ownership matrix, canonical chapter register, shared notation, unified source register, cross-reference map, duplicate audit and one publication master.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	Material is retained once in its strongest location, cross-referenced where another discipline needs it, and rewritten only when a distinct question or evidentiary proposition requires separate treatment.	Integration does not erase disciplinary boundaries. An STC result remains a bounded rating, secure construction remains broader than acoustics, and sound engineering does not confer governmental authorisation.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

XII.26 Continuous revision, source freeze, and immutable release practice

XII.26.1 Integration gate and evidence protocol

the book must remain capable of incorporating new standards, technologies, laws, threats, equipment and national practices without turning the published edition into an untraceable perpetual draft. The controlling mechanism is development remains live between releases, while each issued edition receives a source-status freeze, immutable text identifier, rendered pagination, manifest, checksums, validation reports and a controlled errata record. A mature assurance programme therefore begins with an explicit scope and an ownership map, then tests whether the proposed evidence actually answers the decision question. This approach prevents a component label, professional reputation or institutional custom from becoming a substitute for a measurable and traceable relationship among source, path, receiver, configuration and authority.

Challenge cases include silent edits, stale citations, changed web pages, replacement files carrying old names, pagination drift, an updated bibliography masking unchanged technical claims, or several nominal masters circulating at once. Evidence should include change requests, source-delta reviews, claim-to-source mappings, regression tests, comparison reports, release notes, member hashes and a declared supersession chain. The reviewer examines not only whether each item exists, but whether it describes the same object, time and operating state. A complete file assembled from mismatched states can be more misleading than an openly incomplete file, because apparent documentary weight may conceal the absence of configuration identity.

A defensible disposition is reached when a material change creates a new revision and repeats the affected technical, editorial, rendering and package gates before the edition is designated authoritative. Continuous scholarship is represented by successive controlled releases. It is not represented by claiming that an unseen process continues indefinitely or that an earlier sealed edition has changed without a new identifier. Any condition, exclusion or deferred item is carried into operations and maintenance with a named custodian. The closeout statement uses bounded language and records the next inspection, retest or authority trigger, so that later users do not mistake a time-limited and state-specific result for a permanent property of the room.

Table XII.26-G. Integration gate for Continuous revision, source freeze, and immutable release practice

Gate	Required record	Typical defect	Required response
Definition	Declare the book must remain capable of incorporating new standards, technologies, laws, threats, equipment and national practices without turning the published edition into an untraceable perpetual draft.	Requirement expressed only as a label or headline rating.	Return the requirement to the system model and name the object, state and owner.
Challenge state	Examine silent edits, stale citations, changed web pages, replacement files carrying old names, pagination drift, an updated bibliography masking unchanged technical claims, or several nominal masters circulating at once.	Evidence covers only a favourable nominal condition.	Add the adverse or change state, or record a bounded exclusion approved by the authority.
Evidence	Change requests, source-delta reviews, claim-to-source mappings, regression tests, comparison reports, release notes, member hashes and a declared supersession chain.	Documents describe different versions, locations or operating states.	Reconcile identifiers and preserve contradictions until the configuration is established.
Disposition	A material change creates a new revision and repeats the affected technical, editorial, rendering and package gates before the edition is designated authoritative.	Continuous scholarship is represented by successive controlled releases. It is not represented by claiming that an unseen process continues indefinitely or that an earlier sealed edition has changed without a new identifier.	Issue a bounded disposition, retain residual risk, and define the reopening trigger.

APPENDIX A. NOTATION, SYMBOLS, UNITS, AND CONVENTIONS

A prepublication notation audit should compare the register against every displayed equation, table header and worked example. Undefined symbols, duplicated meanings and missing reference quantities are defects. Software code and spreadsheets should use names traceable to the same definitions. Where typography cannot express a symbol reliably, an ASCII alias is recorded. The final register should therefore function as a bridge among prose, mathematics, software and field forms rather than as an isolated list. Notation control should resolve reused symbols before calculation review. Pressure, particle velocity, mobility, stiffness and uncertainty require explicit units and context; angular frequency and ordinary frequency must not be interchanged silently. Reference quantities, logarithmic bases, complex sign conventions, coordinate axes, averaging intervals and environmental conditions belong in the record. A symbols table is useful only when each chapter equation and spreadsheet uses it consistently. Local departures should be declared beside the equation and reflected in software variable names.

Appendix A establishes a controlled record for canonical variables, SI units, reference quantities, sign conventions and symbol conflicts. For Appendix A, the minimum controlled fields are symbol, definition, unit, domain, sign convention and reference plane. The principal quality control for Appendix A is dimensional consistency and avoidance of reused symbols. In Appendix A, a blank or unknown entry remains visible and is assigned to an owner; it is

not converted into implied conformity. The Appendix A closeout test is that every equation can be read without importing an unstated convention.⁹⁷

Project-specific fields, markings and controlled references may be added to Appendix A, but the core evidence for symbol, definition, unit, domain, sign convention and reference plane should remain identifiable. In Appendix A, version, author, reviewer, date and disposition are recorded whenever the form changes. Superseded copies of Appendix A are retained or withdrawn under the document-control procedure so that a later user cannot mistake an obsolete state for the accepted one.

Table A-1. Notation, symbols, units and conventions

Symbol	Quantity	SI unit	Use and limitation
$p(t)$	Instantaneous acoustic pressure	Pa	Time-domain deviation from static pressure at a defined position
p_{rms}	Root-mean-square pressure	Pa	Requires time weighting or averaging interval
p_0	Reference pressure in air	20 microPa	Reference for sound-pressure level
L_p	Sound-pressure level	dB	State band, weighting and averaging
I	Acoustic intensity	W/m ²	Vector energy flux; define normal and sign
W	Sound power	W	Source property under stated operation
u	Particle velocity	m/s	Distinct from standard uncertainty $u(x)$ by context
Z	Acoustic or mechanical impedance	Pa s/m or N s/m	State the force, pressure, velocity and area convention
f	Frequency	Hz	Cycles per second
ω	Angular frequency	rad/s	$\omega = 2 \pi f$
λ	Wavelength	m	$\lambda = c/f$ in the stated medium
m'	Surface mass	kg/m ²	Mass per unit area of a leaf

⁹⁷ [MB-0945](#). ISO 9001:2015 with Amendment 1:2024, ISO 9001:2015, ISO 10005:2018.

Symbol	Quantity	SI unit	Use and limitation
zeta	Damping ratio	1	Viscous single-degree approximation
T	Transmissibility	1	State force, motion or power form

Application and quality-control protocol

Appendix A. Notation, Symbols, Units, And Conventions is a controlled project record, not a decorative blank form. Its purpose is that a controlled variable and unit registry prevents silent reuse of symbols and permits equations, software, spreadsheets and field forms to be checked against the same definitions. The designated custodian is the technical editor and calculation reviewer, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes symbol, definition, SI unit, reference quantity, sign convention, coordinate system, domain and any ASCII alias. Closure occurs only when every displayed equation and computational variable can be interpreted without importing an unstated convention. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX B. PRINCIPAL EQUATIONS, VALIDITY CONDITIONS, AND INTERPRETATION

Equation review should include at least one independent numerical example and one limiting-case check. Results should behave sensibly as mass, frequency, gap area, damping or sample size approaches a boundary. Unit conversions are performed explicitly, and customary units are secondary. A calculation that passes arithmetic but fails physical limiting behaviour remains defective. Dependent tables, figures and conclusions are revalidated after any equation repair.

Every equation should be accompanied by a validity statement. Ideal mass law excludes stiffness, coincidence, finite size, leakage and flanking. Sabine treatment assumes a sufficiently diffuse field. Isolation transmissibility assumes a represented single-degree-of-freedom system. Composite-boundary relations omit unrepresented structural routes. The calculation should preserve unrounded intermediate values, dimensional reduction, sensitivity and omitted mechanisms. A precise numerical output is not more authoritative than its assumptions and inputs.

Appendix B establishes a controlled record for screening equations that remain tied to assumptions, input provenance, valid range and omitted mechanisms. Completion of Appendix B requires equation, derivation source, assumptions, units, validity range and worked check. Review of Appendix B concentrates on independent recalculation and sensitivity to controlling inputs. Unknowns in Appendix B are carried as open conditions with a responsible person and review date rather than completed by

assumption. Appendix B may be closed when the expression is used only inside the physical model it represents.⁹⁸

Appendix B should be scaled to consequence and complexity without deleting the information needed for equation, derivation source, assumptions, units, validity range and worked check. For Appendix B, security markings and jurisdictional overlays are applied at field level where necessary. The Appendix B custodian verifies independent recalculation and sensitivity to controlling inputs and preserves the approved form with the records to which it refers.

Table B-1. Principal equations, validity conditions and interpretation

Equation	Variables	Principal assumption	Interpretive limit
Energetic level sum	Compatible levels L_i	Incoherent or suitably averaged contributions	Does not identify path
Background subtraction	Total L_t and background L_b	Stable independent source and adequate margin	Becomes unstable near correction limit
Composite boundary	Area S_i and transmission τ_i	Parallel represented areas	Omits unrepresented flanking
Mass-law screen	Surface mass m' and frequency f	Limp infinite non-porous leaf	Invalid near resonance, coincidence, leaks and edges
Mass-air-mass resonance	m_1' , m_2' , cavity d	Uniform leaves and cavity	Framing and finite geometry shift response
Plate critical frequency	m' and bending stiffness D	Isotropic thin plate	Orthotropy and support require specialist treatment
Sabine absorption	Volume V and decay T	Diffuse field and distributed absorption	Not a wall transmission model
Isolation transmissibility	Frequency ratio r and damping ζ	Linear single-degree support	Installed bypasses can dominate
Sampling detection	Defect probability p and samples n	Independent opportunities	Clustered work requires stratification

⁹⁸ [MB-0081](#). ASTM E2713-25, ASTM E3176-24.

Energetic level addition

Energetic addition is valid for compatible incoherent quantities. It is used to combine path or source contributions, but the sum cannot reveal which route is causal or whether contributions are correlated.

Background subtraction

Background subtraction becomes unstable as total and background converge. The applicable method limit, raw values and any censored band remain visible rather than forcing a precise source-only number.

Composite boundary

The composite-boundary screen treats represented areas as parallel energetic paths. Junction flanking, local source orientation, coherent coupling and unrepresented openings remain outside the simple area-weighted model.

Ideal mass-law screen

The mass-law expression illustrates trend in the mass-controlled region. It excludes stiffness, resonance, coincidence, finite size, edge restraint, leakage, framing and flanking, all of which can control a real assembly.

Mass-air-mass resonance

The resonance estimate assumes uniform leaves, cavity and simplified boundaries. Studs, ties, absorption, finite dimensions and leaks shift and broaden the installed response, so the value guides design and measurement rather than acceptance.

Thin-plate critical frequency

The critical-frequency screen depends on plate mass and bending stiffness under an isotropic idealisation. Lamination, support, damping, curvature and finite geometry can alter the coincidence region materially.

Sabine decay screen

The Sabine relation assumes an adequately diffuse field and distributed absorption. It estimates room decay and equivalent absorption, not transmission loss through the enclosure or speech-security performance by itself.

Isolation transmissibility

The transmissibility relation represents an ideal single-degree-of-freedom support. Multiple modes, piping, restraints, base flexibility, load error and nonlinear contact can dominate the installed vibration path.

Sampling detection probability

The detection expression assumes independent opportunities with constant prevalence. Construction defects often cluster by crew, detail, shift or material lot, so a stratified plan is required before the sample count has evidentiary meaning.

Worked example B-1. Composite opening

A 20 square metre boundary idealised at 60 dB includes an open-equivalent area of 0.001 square metres. Linear combination gives about 43 dB, illustrating why perimeter inspection matters. The example is illustrative and remains subordinate to the project-specific method and evidence.

Worked example B-2. Double-leaf resonance

Leaves of 24 and 30 kg/m² separated by 0.18 m give an ideal mass-air-mass estimate near 44 Hz. Framing, finite dimensions, cavity absorption and leaks can shift the response. The example is illustrative and remains subordinate to the project-specific method and evidence.

Worked example B-3. Equivalent absorption

A 180 m³ room with 0.90 s decay has about 32.2 m² equivalent absorption.

Adding 18 m² predicts about 0.58 s under the Sabine model, without changing wall transmission loss directly. The example is illustrative and remains subordinate to the project-specific method and evidence.

Worked example B-4. Isolation support

A machine at 30 Hz on supports with 6 Hz natural frequency and damping ratio 0.08 has ideal transmissibility near 0.074. Piping and restraints can dominate the installed result. The example is illustrative and remains subordinate to the project-specific method and evidence.

Worked example B-5. Sampling probability

For independently distributed defect prevalence 5 per cent and target detection probability 95 per cent, $n = \ln(0.05)/\ln(0.95) = 58.4$, so at least 59 independent observations are required. The example is illustrative and remains subordinate to the project-specific method and evidence.

Worked example B-6. Covariant uncertainty

Contributors 0.6, 0.9 and 0.7 dB with correlation 0.35 between the last two give combined standard uncertainty about 1.45 dB. Ignoring covariance would understate the result. The example is illustrative and remains subordinate to the project-specific method and evidence.

Application and quality-control protocol

Appendix B. Principal Equations, Validity Conditions, And Interpretation is a controlled project record, not a decorative blank form. Its purpose is that each equation must be paired with its assumptions, input definitions, sensitivity, valid frequency or geometric domain and the physical meaning of the result. The designated custodian is the discipline lead responsible for the calculation, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes equation source or derivation, variables, units, assumptions, boundary conditions, worked verification and limitation. Closure occurs only when an independent reviewer can reproduce the result and identify conditions in which the expression should not be used. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX C. CANONICAL CALCULATION RECORD

Calculation identifiers should be cited in drawings, reports and authority submissions so that a later change can locate every dependent decision. Superseded calculations remain retained with status and reason. Where judgement selects an input, the plausible range and influence are stated. Sensitivity tables are often more useful to design than one nominal answer because they reveal which dimensions, materials or operating states deserve tighter control.

The calculation record should permit independent recomputation without hidden spreadsheet logic. Each input is classified as measured, specified, assumed, selected or derived, with source and revision. Named ranges, hidden sheets, external links, volatile functions and software versions are audited. The checker repeats critical arithmetic independently and follows dependent conclusions when an input changes. Human-readable exports accompany native files so that long-term review does not depend on one application or licence.

Appendix C establishes a controlled record for a reproducible record of question, requirement, inputs, assumptions, steps, dimensional checks, uncertainty and review. The operative record in Appendix C captures question, requirement, inputs, source records, assumptions, substitutions, steps, checks and reviewer. The responsible reviewer for Appendix C verifies version control of data and calculation tools. Where an Appendix C field cannot be completed, the reason, consequence and next action are stated

directly in the record. The release condition for Appendix C is that another competent person can reproduce the numerical result.⁹⁹

Digital or paper implementation of Appendix C is acceptable provided stable identifiers link it to the relevant room, asset, path, test or decision.

Automation applied to Appendix C must preserve the visibility of unknowns and reviewer actions. The governing objective for Appendix C remains that another competent person can reproduce the numerical result.

Table C-1. Canonical calculation record

Field	Required entry	Control purpose
Calculation identifier	Stable project code and revision	Supports citation and supersession
Engineering question	One bounded question	Prevents unrelated use
Requirement	Identifier, criterion, state and authority	Connects arithmetic to need
Configuration	Drawing, room, assembly and operating state	Defines represented system
Equation and source	Formula, derivation, clause or text reference	Makes method reviewable
Variables	Symbol, value, unit and provenance	Prevents hidden assumptions
Assumptions	Geometry, field, incidence, independence and linearity	Defines validity
Steps	Unrounded intermediate values	Permits recomputation
Dimensional check	Unit reduction	Detects conversion error
Uncertainty	Contributors, correlation, distribution and coverage	Connects precision to evidence
Sensitivity	Influential variables and plausible range	Identifies fragile conclusions
Review	Preparer, checker, date and disposition	Establishes accountability

⁹⁹ [MB-1092](#). NIST FIPS PUB 180-4 supports SHA-256 integrity practice. A hash detects byte-level difference but does not establish accuracy, provenance or meaning.

Application and quality-control protocol

Appendix C. Canonical Calculation Record is a controlled project record, not a decorative blank form. Its purpose is that calculations require a reproducible record that links inputs to drawings, measurements, source versions, software and reviewer dispositions. The designated custodian is the calculation originator with independent checker, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes purpose, inputs, units, source identifiers, assumptions, equations, intermediate steps, software version, sensitivity and conclusion. Closure occurs only when all material inputs and transformations are traceable and the checked result is tied to the accepted project configuration. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX D. SOURCE-STATE MATRIX

The matrix should be rehearsed during commissioning. Operators confirm that each approved electronic state can be reproduced and that prohibited states are controlled. Source levels are monitored independently of room response. Where human talkers are used, ethical, privacy and repeatability constraints are recorded. Unreproducible states remain open rather than being represented by a convenient surrogate without analysis.

Source states should include credible combinations rather than a mechanical Cartesian product of every variable. High-energy, high-consequence, long-duration or difficult-to-detect states deserve priority. Electronic systems require logged gain, equalisation, limiting, mute, echo-control and remote functions. Emergency and maintenance modes are identified even when protected use is prohibited during them. The authority marks mandatory pass states, restricted states and states outside the approved use.

Appendix D establishes a controlled record for credible human, electronic and emergency source states, including level, spectrum, position, duration, processing and use status. Appendix D is complete only when it records human, electronic and emergency source level, spectrum, position, duration, processing and control state. Release of Appendix D is withheld until there is evidence of linkage to use cases and approved operating limits. Missing evidence in Appendix D is classified as a limitation, with any compensating inspection or test identified separately. Acceptance of Appendix D means that the controlling excitation is explicit rather than implied by a test loudspeaker.¹⁰⁰

¹⁰⁰ [MB-0104](#). ASTM E90-23, ISO 10140-2:2021.

The organisation may integrate Appendix D into its project-management or records system, but automatic completion, copied defaults and hidden fields require review. The final Appendix D record names the accountable owner, preserves revisions and demonstrates linkage to use cases and approved operating limits; otherwise it remains a draft rather than evidence of closure.

Table D-1. Source-state matrix

State ID	Source type	Position and orientation	Electronic processing	Evidence method
SS-01	Seated conversational speech	Principal seats and representative orientations	None	Calibrated human or validated source protocol
SS-02	Raised speech near boundary	Worst credible boundary positions	None	Controlled source with level monitoring
SS-03	Remote conference reproduction	Installed loudspeakers and presets	Gain, equalisation and echo control	System logs plus acoustic calibration
SS-04	Presentation or programme audio	Wall, ceiling or table arrays	Compression, limiting and spatial processing	Controlled programme and level record
SS-05	Emergency or public-address source	Installed emergency devices	Priority routing and override	Coordinated life-safety test
SS-06	Maintenance or vendor mode	Equipment locations	Diagnostic, update or remote state	Change permit and supervised test

Worked example D-1. Selecting a controlling source state

A room normally supports seated conversation through a conference system. The approved ordinary state is measured at the installed loudspeaker preset. Review identifies a credible raised-speech state near the doorset and a remote-participant state in which automatic gain can increase loudspeaker output. The ordinary state produces the largest average room level, but the raised-speech state directs more energy toward the door, while the remote state has longer duration and wider bandwidth. The source-state matrix therefore retains all three. Commissioning verifies the ordinary and raised states, locks the approved conference preset, records firmware and gain, and treats any later change to automatic gain as a material trigger. The example shows why one nominal source level cannot represent position, directivity, processing and duration simultaneously.

Application and quality-control protocol

Appendix D. Source-State Matrix is a controlled project record, not a decorative blank form. Its purpose is that human and electronic source cases must be selected deliberately and preserved with the test or design record. The designated custodian is the acoustic-security system owner, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes source type, location, orientation, level, spectrum, duration, processing, operating mode, credibility and consequence. Closure occurs only when ordinary, adverse and change states are covered or expressly excluded by the decision authority. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX E. TEST-PLANNING FORM

Deviation control should identify who may approve a change and how its effect is evaluated. A moved microphone, unavailable adjoining room, failed channel or altered fan state can change the proposition. Minor deviations are not automatically harmless. The final report lists planned tests not completed and explains which conclusions remain unsupported. Restoration after diagnostic work is verified before the accepted final state is measured.

A test plan should be approved before results are known. It identifies geometry, source and receiver coordinates, instrumentation, calibration, environmental state, sampling, processing, corrections, uncertainty, decision rule, deviations and restoration. Standardised measurements are separated from diagnostic perturbations. Safety, access, escorts, hearing protection, ladders, plant operation and information handling are part of the method because an improvised access change can alter the room or compromise the evidence.

Appendix E establishes a controlled record for translation of the authorised question into a reproducible measurement approved before results are known. For Appendix E, the minimum controlled fields are authorised question, measurand, geometry, instruments, states, sampling, processing, uncertainty and decision rule. The principal quality control for Appendix E is approval before results are known. In Appendix E, a blank or unknown entry remains visible and is assigned to an owner; it is not converted into implied conformity. The Appendix E closeout test is that the measurement remains reproducible and proposition-specific.¹⁰¹

¹⁰¹ [MB-0075](#). ASTM E2638-24, IEC 60268-16:2020.

Project-specific fields, markings and controlled references may be added to Appendix E, but the core evidence for authorised question, measurand, geometry, instruments, states, sampling, processing, uncertainty and decision rule should remain identifiable. In Appendix E, version, author, reviewer, date and disposition are recorded whenever the form changes. Superseded copies of Appendix E are retained or withdrawn under the document-control procedure so that a later user cannot mistake an obsolete state for the accepted one.

Table E-1. Test-planning form

Field	Required content
Test identifier	Project, room pair, boundary, method, revision and date
Authorised question	Exact proposition to be supported or rejected
Requirement and rule	Criterion, range, uncertainty, rounding, retest and authority
Configuration state	Drawings, photographs, doors, furnishings, services, pressure, masking and electronics
Source states	Matrix IDs, device, calibration, positions, levels, spectra and duration
Receiving states	Background, decay, HVAC, masking, access and adjacent occupancy
Instrumentation	Manufacturer, model, serial, firmware, microphones, calibrator and synchronisation
Geometry	Dimensions, positions, heights, distances and coordinate system
Sampling	Spatial, temporal, state, frequency and repeat plan
Processing	Bandwidth, averaging, windows, corrections, exclusions and raw formats
Uncertainty	Model, contributors, covariance, sensitivity, coverage and reporting
Data integrity	Naming, time source, metadata, logs, hashes, transfer and custody
Deviations	Approval route, effect analysis and report treatment

Worked example E-1. A test plan prevents retrospective method selection

A project criterion concerns a field room relationship in the quiet HVAC state. Before testing, the plan defines source positions, receiving grid, one local service-cupboard position, background correction limits, reverberation measurement, calibration checks, processing, uncertainty and a guard-band decision rule. During the campaign, the service cupboard is temporarily unavailable. The team does not omit it silently or substitute a corridor point. The deviation is recorded, the room-average result is reported for its proper proposition, and the access-position conclusion remains open. When access is restored, a targeted supplement completes the defined population. The sequence prevents a favourable partial data set from being enlarged after the result is known.

Application and quality-control protocol

Appendix E. Test-Planning Form is a controlled project record, not a decorative blank form. Its purpose is that measurement begins with an approved question, measurand, state and decision rule rather than with available instruments. The designated custodian is the test director, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes scope, object, method, edition, source, receiver, configuration, calibration, sampling, uncertainty, decision rule, safety and data controls. Closure occurs only when the planned procedure is fit for the proposition and deviations are controlled before conclusions are issued. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX F. UNCERTAINTY-BUDGET TEMPLATE

For classifications, the uncertainty budget should examine the probability of a class boundary changing under plausible inputs. Monte Carlo or repeated recalculation can be clearer than linear propagation when rounding and contour fitting create discontinuities. The report should not imply that the standard uncertainty of band data is identical to uncertainty in the final institutional decision. The authority may adopt a separate risk rule.

The uncertainty budget should identify the dominant contributor and the practical action capable of reducing it. Covariance is included where one source, room state, position set or processing chain affects several terms. Nonlinear classification and rounding may require repeated calculation or simulation rather than first-order propagation. Configuration uncertainty and model discrepancy remain separate unless a defensible probabilistic representation exists. Reporting more decimal places does not reduce any contributor.

Appendix F establishes a controlled record for contributors arising from calibration, sampling, background, decay, geometry, state, processing, repeatability, configuration and model discrepancy. Completion of Appendix F requires input quantity, estimate, unit, distribution, standard uncertainty, sensitivity, covariance and evidence. Review of Appendix F concentrates on separation of measurement, configuration and model limitations.

Unknowns in Appendix F are carried as open conditions with a responsible person and review date rather than completed by assumption. Appendix F may be closed when the decision shows which uncertainty contributors matter.¹⁰²

102 [MB-0920](#). ISO 10848, ASTM E1414.

Appendix F should be scaled to consequence and complexity without deleting the information needed for input quantity, estimate, unit, distribution, standard uncertainty, sensitivity, covariance and evidence. For Appendix F, security markings and jurisdictional overlays are applied at field level where necessary. The Appendix F custodian verifies separation of measurement, configuration and model limitations and preserves the approved form with the records to which it refers.

Table F-1. Uncertainty-budget template

Contributor	Estimate and distribution	Sensitivity or correlation	Control evidence
Source calibration	Certificate and field check	Common across positions	Calibration record
Receiving microphone calibration	Certificate and pre/post check	Instrument dependent	Certificate and drift record
Source spatial sampling	Position dispersion	May share room state	Position log and raw data
Receiving spatial sampling	Position dispersion	May correlate with background	Position and repeat record
Temporal source stability	Monitor-channel variance	Correlated between rooms if simultaneous	Reference channel
Background correction	Derived nonlinear contribution	Strong near correction limit	Raw total and background
Decay correction	Fit and position variability	Band and position correlation	Decay traces
Geometry	Survey uncertainty	Shared dimensions	Survey and drawings
Processing	Window, averaging and software	Common settings	Processing log
Configuration gap	Unverified physical state	Not ordinary instrument uncertainty	Gap register

Worked example F-1. Combined uncertainty with covariance

The combined standard uncertainty is 1.45 dB and an expanded value with coverage factor two is 2.90 dB. The selected correlation remains an evidentiary input requiring sensitivity analysis.

Application and quality-control protocol

Appendix F. Uncertainty-Budget Template is a controlled project record, not a decorative blank form. Its purpose is that uncertainty contributions must be expressed in the units of the measurand and combined with appropriate sensitivity and covariance treatment. The designated custodian is the metrology lead, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes contribution, estimate, distribution, divisor, standard uncertainty, sensitivity coefficient, covariance, contribution and evidence source. Closure occurs only when the expanded uncertainty and decision consequence can be reconstructed from retained observations and assumptions. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX G. PENETRATION REGISTER

Physical labels, where permitted, should correspond to drawing and database identifiers. Mobile inspection tools can validate location and required fields, but offline and secure workflows may be necessary. A register audit compares service schedules, cable counts, photographs and field walkdown. Discrepancies are investigated before new work uses apparently spare capacity. The current status must distinguish accepted, conditional, open, abandoned and removed routes.

The penetration register should reconcile drawing quantity with physical observation and later change. Clusters, crowded sleeves, movement joints and inaccessible locations receive enhanced scrutiny. Fill limits, spare capacity, supports, firestop identity, acoustic closure, photographs and inspection status are recorded. Removal of abandoned services is controlled because extraction can damage the approved seal. A clean visible face is not proof of complete concealed backing or annular treatment.

Appendix G establishes a controlled record for lifecycle identity of every opening, service, sleeve, support, closure, inspection, test and later change. The operative record in Appendix G captures opening identifier, route, sleeve, support, closure, listing, inspection, test, photograph and change history. The responsible reviewer for Appendix G verifies field reconciliation against drawings and service work. Where an Appendix G field cannot be completed, the reason, consequence and next action are stated directly in the record. The release condition for Appendix G is that every boundary crossing remains traceable throughout the lifecycle.¹⁰³

¹⁰³ [MB-1144](#). Public United States, United Kingdom and Canadian governmental sources establish disclosed terminology and authority structures. Protected criteria and formal decisions remain with competent authorities.

Digital or paper implementation of Appendix G is acceptable provided stable identifiers link it to the relevant room, asset, path, test or decision.

Automation applied to Appendix G must preserve the visibility of unknowns and reviewer actions. The governing objective for Appendix G remains that every boundary crossing remains traceable throughout the lifecycle.

Table G-1. Penetration register

Field	Required content	Typical evidence
Penetration ID	Stable unique identifier	Drawing tag and physical label where permitted
Location	Room, boundary, grid, elevation and face	Marked drawing and photographs
Service	Pipe, conduit, cable, fibre, duct, sprinkler or access	Approved schedule
Size and geometry	Opening, sleeve, annulus, orientation and cluster spacing	Survey and shop drawing
Boundary construction	Material, layers, cavity, rating and movement	Approved detail and as-built
Support and contact	Hangers, clamps, bridges and clearances	Concealed-work inspection
Fire and smoke system	Listed or engineered system and label	Submittal and inspection
Acoustic treatment	Seal, sleeve, wrap, box, silencer or isolation	Acoustic detail and inspection
Change history	Additions, removals, fill and repairs	Change log and permits
Current status	Accepted, conditional, open, abandoned or removed	Authority disposition

Worked example G-1. Cable growth changes an accepted penetration

A registered sleeve initially carries six data cables with documented backing and annular seal. Five years later, maintenance staff add twelve cables without a change permit. The visible face remains tidy, but cable crowding has displaced sealant and created rigid bundle contact with the sleeve. The register audit identifies a quantity mismatch. The room is placed under temporary operating control, the route is opened under fire and acoustic supervision, and the closure is rebuilt with approved capacity and support. A local scan and affected room test are repeated. The lesson is that penetration acceptance belongs to a controlled fill and support state, not permanently to the sleeve identifier.

Application and quality-control protocol

Appendix G. Penetration Register is a controlled project record, not a decorative blank form. Its purpose is that each boundary crossing must remain identifiable through design, installation, inspection, modification and removal. The designated custodian is the boundary or configuration custodian, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes identifier, location, service, sleeve, annulus, assembly, treatment, movement, fire duty, installer, inspection, photograph and retest trigger. Closure occurs only when the installed geometry and treatment match the accepted record and every later change receives a disposition. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX H. DOOR, FRAME, HARDWARE, AND SEAL SCHEDULE

Door inspection tools and methods should be specified so that different technicians obtain comparable maps. Contact media, feeler gauges, films, light, airflow indicators and acoustic scans reveal different aspects and can damage some seals. The schedule identifies the selected method, locations and tolerances. Pressure and floor condition are recorded because a door can pass under one direction or finish state and fail under another.

Door schedules should include the approved tested configuration and every field variable capable of changing contact. Gap locations use a repeatable coordinate convention. Pressure state, opening force, latch preload, automatic-bottom drop, floor tolerance and pair sequence are measured in the final condition. Replacement criteria identify compression set, tears, corner separation, hardware drift and approved parts. Maintenance work that changes profile, hardness, friction or listing is treated as a material configuration event.

Appendix H establishes a controlled record for the complete installed opening rather than a leaf rating. Appendix H is complete only when it records leaf, frame, anchors, hinges, latch, closer, threshold, seals, pressure, operating force and approved spares. Release of Appendix H is withheld until there is evidence of inspection under ordinary cycling and directional pressure states. Missing evidence in Appendix H is classified as a limitation, with any compensating inspection or test identified separately. Acceptance of Appendix H means that the installed doorset can be maintained without losing the accepted contact condition.¹⁰⁴

¹⁰⁴[MB-1119](#). Part XII provenance and recovery history are preserved in the controlled production dossier. Its technical propositions depend upon the cited primary and secondary sources, not upon internal recovery records.

The organisation may integrate Appendix H into its project-management or records system, but automatic completion, copied defaults and hidden fields require review. The final Appendix H record names the accountable owner, preserves revisions and demonstrates inspection under ordinary cycling and directional pressure states; otherwise it remains a draft rather than evidence of closure.

Table H-1. Door, frame, hardware and seal schedule

Field	Required content
Doorset ID	Room pair, door number, revision and authority classification
Tested configuration	Report, specimen, leaf, frame, seals, threshold, hardware and wall
Leaf	Construction, thickness, mass, core, skins, edges and preparations
Frame	Material, profile, anchors, fill, wall interface and head/jamb details
Hinges or pivots	Type, quantity, load, adjustment and maintenance
Latch and lock	Type, engagement, strike, preload and access-control interface
Closer or operator	Model, settings, sequence, power and failure state
Perimeter seals	Profile, compression, corners, joints and replacement criteria
Door bottom	Automatic bottom, sweep, threshold, drop and floor tolerance
Pressure state	Design differential, measured range and effect on force
Commissioning	Gap map, contact, force, latch, acoustic test and photographs
Change triggers	Hardware, floor, pressure, seal and access-control work

Worked example H-1. Door direction and pressure reveal an incomplete seal

A doorset appears uniformly closed and passes a visual inspection. Local scanning shows an upper-jamb hot spot only when the protected room is positively pressurised. A gap map and contact film reveal reduced compression over 180 mm near the closer reinforcement. Reversing pressure changes the result, confirming that the symptom is state dependent. The frame is surveyed, the closer and latch are adjusted, and the seal is replaced with the approved profile. Opening force, latching, contact and acoustic response are measured in both directions. The repair closes the verified perimeter mechanism but does not by itself certify every path through the room.

Application and quality-control protocol

Appendix H. Door, Frame, Hardware, And Seal Schedule is a controlled project record, not a decorative blank form. Its purpose is that movable closures require configuration and maintenance data beyond a leaf model number. The designated custodian is the door and opening custodian, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes leaf, frame, anchorage, hinges, latch, closer, threshold, automatic bottom, seals, hardware, pressure state, test evidence and adjustment limits. Closure occurs only when the opening operates, latches and seals in the accepted direction and state, with maintenance triggers documented. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX I. GLAZING AND FRAME SCHEDULE

Glazing replacements require structural and environmental review in addition to acoustic comparison. Pane mass, interlayer, support bite, edge clearance, thermal movement, drainage and safety treatment can change. Where heritage or blast duties apply, the accepted solution may require a different balance of risk. The schedule should preserve approved alternatives and the evidence needed to treat a future replacement as equivalent.

Glazing schedules need pane build-up, interlayer, cavity, frame, gasket, setting block, mullion, anchor, perimeter, drainage and movement information. Large panes may have different modal and support behaviour from small laboratory specimens. Secondary glazing records structural independence and every possible bridge through reveals, blinds, conduits and trim. Local scans at corners, mullions and perimeter joints complement room-average evidence and can reveal a frame route hidden by the pane field.

Appendix I establishes a controlled record for the complete pane, interlayer, cavity, frame, gasket, mullion, anchor, perimeter and drainage system. For Appendix I, the minimum controlled fields are pane make-up, interlayer, cavity, frame, mullion, gasket, anchor, drainage, perimeter and replacement rule. The principal quality control for Appendix I is coordination of movement, moisture and local vibration evidence. In Appendix I, a blank or unknown entry remains visible and is assigned to an owner; it is not converted into implied conformity. The Appendix I closeout test is that glazing performance is assigned to the complete installed system.¹⁰⁵

¹⁰⁵ [MB-0963](#). JCGM 100:2008, JCGM 106:2012.

Project-specific fields, markings and controlled references may be added to Appendix I, but the core evidence for pane make-up, interlayer, cavity, frame, mullion, gasket, anchor, drainage, perimeter and replacement rule should remain identifiable. In Appendix I, version, author, reviewer, date and disposition are recorded whenever the form changes. Superseded copies of Appendix I are retained or withdrawn under the document-control procedure so that a later user cannot mistake an obsolete state for the accepted one.

Table I-1. Glazing and frame schedule

Field	Required content
Glazing ID	Room, opening, revision and authority classification
Pane build-up	Thicknesses, type, lamination, heat treatment and dimensions
Cavity	Depth, gas, absorptive treatment, blinds and cleanliness
Frame and mullions	Material, profile, cavities, anchors, setting blocks and drainage
Perimeter	Gaskets, wet seals, backing, joints, movement and fire duties
Evidence	Laboratory report, specimen size, frame and mounting
Field review	Local frame, corner, pane and pressure-state observations
Maintenance	Gaskets, sealants, drainage, condensation and replacement control

Worked example I-1. Pane replacement does not cure a mullion route

A cracked laminated pane is replaced with an acoustically equivalent build-up. Whole-room results improve little, and a local scan remains weak at the vertical mullion. Inspection finds a continuous hollow frame cavity connected to the adjoining facade zone. The pane evidence was valid, but the dominant path was not the glass field. A controlled frame treatment and perimeter repair are designed with drainage and movement preserved. Local and room tests then show the expected change. The closeout distinguishes pane replacement, frame remediation and the resulting combined field performance, avoiding the misleading statement that new acoustic glass solved the original room condition.

Application and quality-control protocol

Appendix I. Glazing And Frame Schedule is a controlled project record, not a decorative blank form. Its purpose is that glazing evidence must cover panes, cavities, frames, mullions, perimeter seals, supports and external observation geometry. The designated custodian is the facade or glazing custodian, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes lite build-up, dimensions, frame, bite, setting blocks, mullions, seals, fixing, laboratory evidence, field state, sight lines and change history. Closure occurs only when the complete installed vision system and its surrounding interfaces are represented by the accepted evidence. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX J. HVAC AND AIR-PATH REGISTER

Field commissioning should isolate branch and casing effects where the method allows. Source and receiver background are recorded in each fan and damper state. Access doors, flexible links and supports receive local checks. A satisfactory terminal result does not prove that the same path remains controlled in emergency or maintenance mode. Those states are either tested, restricted or carried as explicit limitations.

The HVAC register should represent the network rather than one silencer. Duct geometry, branches, transitions, terminals, flow, pressure, damper state, casing, supports and surrounding rooms influence transfer. Insertion loss, regenerated noise and pressure loss are considered together. Fire and smoke devices remain inspectable and operational. Shared plenums receive distinct identifiers so that architectural barriers, returns, luminaires, cable trays and deck flutes are coordinated under one path owner.

Appendix J establishes a controlled record for every intended and unintended air route crossing or approaching the protected boundary. Completion of Appendix J requires air route, branch, duct, silencer, lining, damper, diffuser, airflow, pressure, support, access and operating mode. Review of Appendix J concentrates on state-controlled testing of cross-talk, breakout, break-in and regenerated noise. Unknowns in Appendix J are carried as open conditions with a responsible person and review date rather than completed by assumption. Appendix J may be closed when the network and its maintenance state are represented, not merely one component.¹⁰⁶

¹⁰⁶ [MB-0924](#). ISO 12354-1:2017, ISO 12354-2:2017.

Appendix J should be scaled to consequence and complexity without deleting the information needed for air route, branch, duct, silencer, lining, damper, diffuser, airflow, pressure, support, access and operating mode. For Appendix J, security markings and jurisdictional overlays are applied at field level where necessary. The Appendix J custodian verifies state-controlled testing of cross-talk, breakout, break-in and regenerated noise and preserves the approved form with the records to which it refers.

Table J-1. HVAC and air-path register

Field	Required content
Path ID	Stable branch, opening or equipment identifier
Served rooms	Source, receiving and intermediate zones
Geometry	Size, shape, length, liner, bends, branches, transitions and terminals
Airflow state	Design and measured flow, velocity, pressure, fan mode and balance
Acoustic elements	Silencer, lined section, plenum, cross-talk element and terminal attenuation
Evidence	Insertion loss, casing data, regeneration data and calculations
Fire and smoke devices	Damper, detector, access, fail state and inspection duty
Structural interfaces	Supports, flexible links, penetrations and vibration isolation
Breakout and break-in	Exposed casing areas and surrounding spaces
Commissioning	Flow, pressure, noise, attenuation, vibration and leakage
Change and maintenance	Filter, damper, liner, silencer, fan and balancing changes

Worked example J-1. Silencer data and installed network performance diverge

A selected silencer has strong laboratory insertion loss in the speech bands. Field testing nevertheless shows speech energy at an adjacent terminal. Branch muting, flow-state comparison and casing vibration identify a short bypass connection and a lightly supported access section. The laboratory report remains accurate for the tested product, but the installed path includes geometry and casing conditions absent from the specimen. The bypass is removed, supports are corrected, and the access door is resealed. Flow, pressure, regenerated noise, local path attenuation and the room relationship are retested. The example separates product evidence from network evidence and demonstrates why HVAC commissioning must reproduce credible damper and fan states.

Application and quality-control protocol

Appendix J. Hvac And Air-Path Register is a controlled project record, not a decorative blank form. Its purpose is that air systems require network-level records covering transmission, breakout, self-noise, vibration and operating change. The designated custodian is the mechanical system owner, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes branch topology, terminals, silencers, lining, casing, supports, flexible connectors, airflow, pressure, controls, modes, maintenance and test states. Closure occurs only when every credible speech and mechanical path is addressed in the representative operating matrix. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX K. INSPECTION HOLD-POINT SCHEDULE

Hold-point completion should include disposition of observed departures and verification that repair occurred before release. Photographs taken after concealment cannot replace missing evidence of the hidden layer. The programme records missed-point frequency and causal reasons. Repeated missed points may require schedule integration, clearer notice, authority escalation or altered sequencing rather than repeated administrative reminders.

A hold point is scheduled before the condition becomes inaccessible and includes prerequisites, notice, acceptance reference, observer and release authority. A witness point has a defined rule when the witness does not attend. Missed points cannot be cured administratively. Alternative evidence is assessed for its actual power to reveal the hidden condition, and residual uncertainty remains on the register. The construction programme should expose upcoming hold points to every affected trade.

Appendix K establishes a controlled record for mandatory stops before high-consequence conditions become inaccessible. The operative record in Appendix K captures hold point, responsible witness, observable condition, required record, release authority and missed-point response. The responsible reviewer for Appendix K verifies inspection before high-consequence work becomes inaccessible. Where an Appendix K field cannot be completed, the reason, consequence and next action are stated directly in the record. The release condition for Appendix K is that concealed conditions are supported by evidence rather than retrospective signature.¹⁰⁷

¹⁰⁷ [MB-0949](#). ISO/IEC 17025:2017 addresses competence, ISO/IEC 17025:2017.

Digital or paper implementation of Appendix K is acceptable provided stable identifiers link it to the relevant room, asset, path, test or decision.

Automation applied to Appendix K must preserve the visibility of unknowns and reviewer actions. The governing objective for Appendix K remains that concealed conditions are supported by evidence rather than retrospective signature.

Table K-1. Inspection hold-point schedule

Hold point	Work condition	Inspection focus	Required record
HP-01	Existing-condition opening	Hidden construction, voids, moisture and paths	Photographs, dimensions and samples
HP-02	First framing bay	Independence, gauge, spacing, restraint, head and base	Checklist and images
HP-03	Resilient supports	Identity, orientation, spacing, preload, contact and fasteners	Clearances and images
HP-04	Cavity before closure	Bridges, backing, services, absorber and debris	Panoramic and local evidence
HP-05	Masonry lift or grout stage	Joints, cells, consolidation, cleanouts and quantity	Logs, samples and images
HP-06	Door frame before closure	Plumb, square, anchors, fill, perimeter and threshold datum	Survey and photographs
HP-07	Glazing frame before setting	Anchors, independence, perimeter, drainage and movement	Inspection record
HP-08	Service before concealment	Annulus, support, backing, seal depth and labels	Penetration-register entry
HP-09	Silencer and branch	Orientation, bypass, casing, flexible links and access	Path-register update
HP-10	Floating floor before topping	Edge strip, services, bridges, load and moisture	Grid photographs and survey
HP-11	Ceiling closure	Wall heads, barriers, hangers, luminaires and access	Reflected-plan record
HP-12	Pre-finish boundary review	Continuity, openings, damage and unresolved departures	Pretest checklist

Worked example K-1. A missed hold point cannot be closed by signature

A wall cavity is boarded before the scheduled inspection of resilient supports and service clearances. The contractor submits photographs taken elsewhere and requests retrospective release. The reviewer rejects administrative closure because location and completeness cannot be established. Risk-based alternative evidence includes borescope sampling, fastener mapping, drawing and quantity reconciliation, and controlled opening at two high-risk interfaces. One opening reveals a rigid backing bridge. The affected population is expanded, repaired and reinspected before final closure. The missed-point record remains in the dossier, and the programme changes notice and sequence controls. The example shows that alternative evidence can reduce uncertainty but does not recreate an observation that never occurred.

Application and quality-control protocol

Appendix K. Inspection Hold-Point Schedule is a controlled project record, not a decorative blank form. Its purpose is that concealed or irreversible work must pause at defined gates until competent evidence exists. The designated custodian is the construction quality manager with security and acoustic witnesses as assigned, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes work package, prerequisite, witness, evidence, acceptance criterion, authority, nonconformance route and release signature. Closure occurs only when no critical condition is concealed without disposition and missed evidence is escalated rather than backfilled by assumption. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX L. COMMISSIONING CHECKLIST AND EVIDENCE DOSSIER

The dossier should include a concise configuration snapshot usable years later: drawing revisions, asset identities, software versions, door and pressure state, masking settings, furnishings and environmental condition. Raw-data links and checksums permit integrity review. A future campaign can then determine whether comparison is valid or whether the room has changed beyond the original evidence. This snapshot is often more valuable than a narrative claim that testing was completed.

Commissioning readiness should be a gate, not a courtesy checklist. Requirements, final construction, concealed-work records, doors, glazing, HVAC, services, electronics, masking, background states, safe access and calibrated equipment must be available. The dossier links raw data to every reported result and identifies repairs between tests. Witnesses and reviewers sign the proposition they reviewed, while the accepting authority records the separate institutional decision and any expiry or condition.

Appendix L establishes a controlled record for readiness, controlled states, measurements, diagnostics, raw data, limitations and authority. Appendix L is complete only when it records readiness, functional states, local diagnostics, formal tests, raw data, deficiencies, retests, limitations and authority disposition. Release of Appendix L is withheld until there is evidence of reconciliation of as-installed, as-tested and as-operated records. Missing evidence in Appendix L is classified as a limitation, with any compensating inspection or test identified separately. Acceptance of

Appendix L means that commissioning produces a durable evidence dossier rather than a ceremonial result.¹⁰⁸

The organisation may integrate Appendix L into its project-management or records system, but automatic completion, copied defaults and hidden fields require review. The final Appendix L record names the accountable owner, preserves revisions and demonstrates reconciliation of as-installed, as-tested and as-operated records; otherwise it remains a draft rather than evidence of closure.

Table L-1. Commissioning checklist and evidence dossier

Item	Verification question	Required evidence
Requirement baseline	Are measurable requirements, states and decisions identified?	Requirement matrix and room data sheet
Configuration	Does the room match the controlled as-built record?	Walkdown, drawings, photographs and registers
Concealed work	Are hold points released or alternatives accepted?	Hold-point log and dispositions
Doors and glazing	Are final seals, hardware, floor, pressure and controls present?	Schedules and local checks
HVAC and services	Are flow, silencers, supports and penetrations complete?	Mechanical records and path register
Electronics	Are equipment, firmware, gain, mute and networks baselined?	Asset and configuration inventory
Masking	Are zones, spectra, alarms and credentials commissioned?	Masking baseline and access record
Instrumentation	Are calibration, software, time and raw formats ready?	Instrument register and field checks
Decision rule	Is the conformity rule approved before testing?	Approved test plan

¹⁰⁸ [MB-0087](#). ASTM E336-25a, ISO 16283-1:2014.

Worked example L-1. Premature commissioning creates a false baseline

A room is tested before final floor finish, door-bottom adjustment and conference-system configuration. The result appears favourable because construction background is high and the electronic source is not at its approved maximum. Rather than treating the campaign as acceptance, the commissioning authority records it as preliminary diagnostic evidence. Final readiness is established after finishes, pressure, hardware, HVAC, masking and software are complete. The test plan is repeated with the authorised source states and quiet receiving condition. The final dossier retains both campaigns and explains why only the later state supports acceptance. This prevents an early convenient result from becoming the permanent baseline.

Application and quality-control protocol

Appendix L. Commissioning Checklist And Evidence Dossier is a controlled project record, not a decorative blank form. Its purpose is that commissioning records must join readiness, functional state, measurements, deficiencies, corrections and final authority action. The designated custodian is the commissioning authority or designated lead, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes readiness, configuration, test matrix, calibration, raw data, deficiency log, retest, operating restrictions, training and accepted baseline. Closure occurs only when the dossier supports the exact use and state authorised, with all conditions and reopening triggers visible. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX M. CONSTRUCTION-SURVEILLANCE CHECKLIST

Surveillance security controls should address cameras, networks, removable media, cloud services, redaction and distribution. Protecting facility information must not destroy the engineering context needed by authorised reviewers. Projects should define approved devices and transfer routes before work begins. Image capture restrictions can be met with controlled equipment, escorted workflows or alternative measurement records rather than undocumented personal devices.

Surveillance records should capture process indicators as well as finished appearance. Crew change, compressed schedule, wet materials, poor storage, missing approved products, unavailable tools and missed notifications can predict distributed defects. Photographs include context, location, orientation, scale, time source, device identity and file integrity. Excessive unindexed images are not evidence control. Sampling plans state populations and preserve clear observations as well as failures.

Appendix M establishes a controlled record for risk-based preparation, material identity, first-of-type release, sampling, photographs and nonconformance. For Appendix M, the minimum controlled fields are surveillance scope, first-of-type work, material identity, sampling, photographs, nonconformance and corrective verification. The principal quality control for Appendix M is risk-based allocation by concealment and common-cause consequence. In Appendix M, a blank or unknown entry remains visible and is assigned to an owner; it is not converted into implied conformity. The Appendix M closeout test is that observations support specific requirements and path propositions.¹⁰⁹

¹⁰⁹ [MB-0925](#). ISO 12999-1:2020, JCGM 100:2008.

Project-specific fields, markings and controlled references may be added to Appendix M, but the core evidence for surveillance scope, first-of-type work, material identity, sampling, photographs, nonconformance and corrective verification should remain identifiable. In Appendix M, version, author, reviewer, date and disposition are recorded whenever the form changes. Superseded copies of Appendix M are retained or withdrawn under the document-control procedure so that a later user cannot mistake an obsolete state for the accepted one.

Table M-1. Construction-surveillance checklist

Control	Questions for the plan
Scope	Which rooms, boundaries, trades, phases, interfaces and exclusions are covered?
Requirements	Which drawings, specifications, submittals, listings and authority criteria apply?
Roles	Who observes, records, releases, stops work, approves alternatives and closes findings?
Competence	What training, qualification, independence and security authorisation are required?
Sequence	Which conditions become inaccessible and when must notice be given?
Methods	Visual, dimensional, documentary, photographic, sampled, tested or controlled opening?
Evidence	Which identifiers, metadata, measurements, signatures and dispositions are mandatory?
Security	Which devices, storage, transfer, redaction and distribution controls apply?
Nonconformance	How are severity, population, immediate control, repair and retest determined?
Audit	How are missed observations, repeated defects and false closures reviewed?

Application and quality-control protocol

Appendix M. Construction-Surveillance Checklist is a controlled project record, not a decorative blank form. Its purpose is that surveillance must be planned around threats, critical interfaces and evidentiary opportunity rather than applied as undifferentiated observation. The designated custodian is the construction-security manager, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes personnel, access, shift, location, activity, materials, photographs, anomalies, custody, notification and disposition. Closure occurs only when surveillance records are complete, attributable, protected and linked to the work and issue they concern. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX N. FORENSIC EXAMINATION FORM

Interview records distinguish direct recollection from interpretation and later information. Witnesses are asked about time, position, source, state, recurrence and access without leading them toward a favoured mechanism. Digital and physical evidence are preserved before routine systems roll logs or maintenance changes the state. The form should also record when legal, security or medical specialists must control further questioning.

The forensic form should begin with neutral symptom language and the exact authority for examination. It records preservation, baseline documents, current configuration, methods, hypotheses, negative evidence, interventions, openings, causal analysis, temporary controls, remedy, verification, limitations and custody. Sensitive reported words are minimised and protected. The form should permit an unresolved conclusion where methods cannot discriminate among remaining explanations.

Appendix N establishes a controlled record for authority, symptom, configuration, evidence, hypotheses, intervention, cause, remedy, limitation and custody. Completion of Appendix N requires authority, symptom, scene state, evidence, hypotheses, methods, intervention, cause, remedy, limitation and custody. Review of Appendix N concentrates on separation of observation, inference and institutional classification. Unknowns in Appendix N are carried as open conditions with a responsible person and review date rather than completed by assumption. Appendix N may be closed when the investigation can be reviewed without reconstructing an altered scene.¹¹⁰

¹¹⁰ [MB-0083](#). ASTM E2964-26, ASTM C919-24.

Appendix N should be scaled to consequence and complexity without deleting the information needed for authority, symptom, scene state, evidence, hypotheses, methods, intervention, cause, remedy, limitation and custody. For Appendix N, security markings and jurisdictional overlays are applied at field level where necessary. The Appendix N custodian verifies separation of observation, inference and institutional classification and preserves the approved form with the records to which it refers.

Table N-1. Forensic examination form

Section	Required content
Authority and scope	Requestor, written authority, protected question, exclusions and stop conditions
Scene identity	Facility, room, boundary, date, occupants, access history and security state
Initial symptom	Who observed what, where, when, under which state and with what consequence
Preservation	Actions stabilising room, systems, logs, files, access and physical evidence
Baseline documents	Requirements, drawings, submittals, as-builts, commissioning, maintenance and changes
Current configuration	Physical, mechanical, electronic, software, masking, pressure and access states
Measurement plan	Measurands, source, receiver, instruments, geometry, calibration and uncertainty
Hypotheses	Candidate mechanisms, predictions, negative evidence, confounders and ranking
Interventions	Reversible change, intended contrast, collateral variables and restoration
Causal analysis	Supported physical, operational and management causes, alternatives and limits
Custody	File and item identifiers, transfer, storage, hashes, access and retention

Application and quality-control protocol

Appendix N. Forensic Examination Form is a controlled project record, not a decorative blank form. Its purpose is that forensic work requires authority, preservation and competing hypotheses before invasive action. The designated custodian is the forensic lead examiner, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes question, authority, scene state, access history, preservation, hypotheses, tests, interventions, samples, custody, findings, uncertainty and limitations. Closure occurs only when the evidence supports the stated inference and every destructive or irreversible action is justified and recorded. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX O. REMEDIATION REGISTER

Verification criteria are selected before the repair is installed. This prevents a remedy from being judged only by a convenient local observation. The plan can require material identity, concealed-work inspection, local diagnostic change, whole-room result and authority review. Where the predicted benefit is not achieved, the entry reopens causal analysis rather than simply adding more material to the same surface.

A remediation entry connects one finding to one supported mechanism and one verification plan. Predicted local benefit, expected whole-room benefit, path migration and adjacent fire, structural, moisture, accessibility and security duties are recorded. Broad upgrades can be justified, but the record distinguishes improvement from causal correction. Closure includes construction evidence, test results, residual condition, authority disposition and the updated baseline rather than a photograph of a finished surface alone.

Appendix O establishes a controlled record for each supported defect connected to a controlled technical response and verification. The operative record in Appendix O captures supported defect, mechanism, design response, collateral obligations, surveillance, local verification and whole-room retest. The responsible reviewer for Appendix O verifies prediction of dominant-path migration. Where an Appendix O field cannot be completed, the reason, consequence and next action are stated directly in the record. The release condition for Appendix O is that the repair changes the demonstrated cause and not merely the visible symptom.¹¹¹

¹¹¹ [MB-0919](#). ISO 10005:2018, ISO 10006:2017.

Digital or paper implementation of Appendix O is acceptable provided stable identifiers link it to the relevant room, asset, path, test or decision.

Automation applied to Appendix O must preserve the visibility of unknowns and reviewer actions. The governing objective for Appendix O remains that the repair changes the demonstrated cause and not merely the visible symptom.

Table O-1. Remediation register

Field	Required content
Finding ID	Link to nonconformance, complaint, test or forensic record
Supported mechanism	Air leakage, panel, structural flank, service, electronic or operational state
Evidence strength	Observations, interventions, measurements, uncertainty and alternatives
Affected scope	Room, boundary, bands, source states, population and related assets
Immediate control	Use restriction, temporary seal, shutdown, monitoring or evidence hold
Repair design	Detail, materials, sequence, adjacent obligations and responsible disciplines
Predicted effect	Local and whole-room benefit, path migration and uncertainty
Construction evidence	Materials, hold points, photographs and nonconformance control
Verification	Local check, field test, speech test, structural or service test and rule
Residual condition	Remaining paths, untested states and inaccessible construction
Baseline update	Drawings, registers, assets, software, tests, maintenance and hashes

Worked example O-1. Local repair and whole-room benefit answer different questions

A door perimeter is estimated to contribute 36 dB to a receiving point, while all other paths together contribute 32 dB. Energetic combination gives approximately 37.5 dB. Even complete removal of the door contribution leaves 32 dB, so the maximum possible whole-room improvement is about 5.5 dB. A repair that improves the door locally by 15 dB can therefore be technically successful while the room average improves far less. The remediation register records the local mechanism, predicted bound, actual local change, new dominant path and authority decision. This avoids unrealistic promises and guides whether further plenum or structural work is justified.

Application and quality-control protocol

Appendix O. Remediation Register is a controlled project record, not a decorative blank form. Its purpose is that repairs must be tied to verified mechanisms and distinguished between local correction and whole-room consequence. The designated custodian is the remediation manager with technical reviewer, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes defect, mechanism, scope, design, approvals, materials, installer, inspection, local verification, whole-room test, residual risk and warranty. Closure occurs only when the repaired mechanism and resulting system performance are both disposed, with new dominant paths and future triggers considered. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX P. CHANGE-CONTROL FORM

Change permits should be searchable by room, system, path and date. The facility custodian can then identify unclosed work and tests that predate a material alteration. Contractors receive only the information and access necessary for the task, with escort and device rules. Final closure includes removal of temporary work, restoration of seals and controls, and reconciliation of physical condition with the new baseline.

Change classification examines function and interfaces, not product labels. A nominally like-for-like display, seal, fan, cable or controller can differ in mass, stiffness, mounting, opening, source output, firmware or maintenance access. Pre-authorised minor work has narrow defined limits. Material and major changes receive multidisciplinary review, inspection and test. Emergency changes receive immediate authority, temporary controls and retrospective closure. Incident-related work also preserves evidence.

Appendix P establishes a controlled record for classification before work according to openings, mass, stiffness, junctions, flow, transducers, masking, access and invalidated assumptions. Appendix P is complete only when it records change description, assets, openings, mass, stiffness, junctions, flow, transducers, software, masking and access. Release of Appendix P is withheld until there is evidence of review and retest level assigned before work. Missing evidence in Appendix P is classified as a limitation, with any compensating inspection or test identified separately. Acceptance of Appendix P means that the accepted baseline is updated or expressly withdrawn for the changed state.¹¹²

112 [MB-0047](#). ANSI/ASHRAE/IES Standard 202-2024, ANSI/ASHRAE/IES Standard, ASHRAE Guideline 0-2019.

The organisation may integrate Appendix P into its project-management or records system, but automatic completion, copied defaults and hidden fields require review. The final Appendix P record names the accountable owner, preserves revisions and demonstrates review and retest level assigned before work; otherwise it remains a draft rather than evidence of closure.

Table P-1. Change-control form

Class	Typical examples	Minimum review	Evidence and closure
Pre-authorised minor	Approved cleaning or furniture movement outside defined limits	Facility custodian log	Record and periodic audit
Technical minor	Seal adjustment, approved filter change or non-functional software patch	Responsible discipline review	Before and after state and functional check
Material	New cable, equipment replacement, ceiling access, door hardware or balancing	Multidisciplinary security and engineering review	Approved detail, inspection, targeted test and closure
Major	Boundary reconstruction, new service, use change or new AV system	Formal design and project controls	Submittal, surveillance, commissioning and acceptance
Emergency	Life-safety or operational repair before normal approval	Immediate authority and temporary controls	Retrospective review, inspection and retest
Incident-related	Suspected unauthorised alteration, damage or evidence concern	Security incident and forensic controls	Preservation, investigation, remediation and new baseline

Worked example P-1. A nominally like-for-like display is material

A wall display is replaced by a heavier model using the same visible mounting plate. The new unit requires two anchors, adds ventilation slots, includes microphones and runs different firmware. The change is classified as material because it can alter panel loading, create penetrations, bridge an isolated lining, change source output and add remote functions. Review requires the mount and backing detail, cable route, asset and software baseline, ventilation treatment, security approval and targeted inspection. The work is not closed until drawings, penetration records, functional tests and affected acoustic evidence agree. Product category alone is rejected as proof of equivalence.

Application and quality-control protocol

Appendix P. Change-Control Form is a controlled project record, not a decorative blank form. Its purpose is that changes require technical materiality review even when described commercially as like-for-like. The designated custodian is the configuration control board or authorised custodian, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes request, reason, affected source or path, drawings, software, security, safety, test impact, approval, implementation, evidence and baseline update. Closure occurs only when the accepted post-change state is identified and all required verification and authority actions are complete. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX Q. GOVERNMENTAL CROSSWALK METHODOLOGY

Crosswalk tables should avoid implying that absence of public detail means absence of a requirement. The public-source gap is itself a field. Historical and declassified documents may explain institutional development but are not treated as current criteria. Where a term appears similar across jurisdictions, the commentary states the exact function compared and the aspects that remain non-equivalent. This protects readers from false portability.

The governmental crosswalk should cite exact public sources and dates, then compare authority, protected function, terminology, design role, construction control, measurement, decision, lifecycle and public-source gap. It should explain why similar words do not guarantee equivalent legal or technical status. Transferable engineering practices are separated from jurisdiction-specific criteria and approval. Controlled information is identified only to the extent lawfully disclosed and is never reverse engineered from analogy.

Appendix Q establishes a controlled record for comparison of disclosed functions and processes without assuming similar terms have identical legal or technical meaning. For Appendix Q, the minimum controlled fields are jurisdiction, term, protected function, authority, design process, testing, lifecycle and public-source boundary. The principal quality control for Appendix Q is classification as equivalent, partial correspondence or non-equivalent. In Appendix Q, a blank or unknown entry remains visible and is assigned to an owner; it is not converted into implied conformity. The

Appendix Q closeout test is that similar vocabulary is not mistaken for identical legal or technical effect.¹¹³

Project-specific fields, markings and controlled references may be added to Appendix Q, but the core evidence for jurisdiction, term, protected function, authority, design process, testing, lifecycle and public-source boundary should remain identifiable. In Appendix Q, version, author, reviewer, date and disposition are recorded whenever the form changes. Superseded copies of Appendix Q are retained or withdrawn under the document-control procedure so that a later user cannot mistake an obsolete state for the accepted one.

Table Q-1. Governmental crosswalk methodology

Field	Comparison question
Authority	Which organisation or official issues the requirement and decides acceptance or use?
Protected function	What information, activity, facility type or operational purpose is addressed?
Terminology	How are secure area, room, speech room, SCIF, zone, approval or authorisation defined?
Threat assumption	Which listener access, technical threats and environmental conditions are disclosed?
Design role	Is the source law, policy, specification, guidance, service description or method?
Construction control	What is public about surveillance, materials, access, records and hidden work?
Measurement	Which quantities, states, methods, positions and uncertainties are public?
Decision	Who reviews evidence and what limitations apply?
Lifecycle	Which maintenance, change, incident and continuing-use duties are disclosed?
Public-source gap	Which criteria are protected, access-limited or authority-only?
Transferability	Which practices can be common and which require jurisdiction-specific approval?

¹¹³ [MB-0945](#). ISO 9001:2015 with Amendment 1:2024, ISO 9001:2015, ISO 10005:2018.

Application and quality-control protocol

Appendix Q. Governmental Crosswalk Methodology is a controlled project record, not a decorative blank form. Its purpose is that comparisons must preserve jurisdiction, authority and terminology while separating neutral physics from programme-specific decisions. The designated custodian is the comparative-doctrine editor with jurisdictional reviewer, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes term, function, authority, public source, controlled source boundary, evidence route, lifecycle act, similarity, difference and non-equivalence warning. Closure occurs only when the crosswalk supports orientation without claiming reciprocity, approval or hidden technical equivalence. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX R. SOURCE-STATUS AND CITATION METHODOLOGY

Automated link checking can identify broken public locators but cannot determine whether an edition remains controlling. Source review needs human analysis of issuer status, amendments, withdrawal, national adoption and project incorporation. Archived copies or hashes are preserved where permitted. The release date of the manuscript becomes the source-status freeze, and later changes are handled through a new revision rather than silently altering the sealed register.

Source status is revalidated at release. A superseded standard can support historical discussion but should not be described as current control. A current replacement announced but not published does not make an earlier edition 'latest' without qualification. Pinpoint citation should sit beside the proposition supported. Manufacturer evidence identifies specimen, laboratory, method, report, date and limitation. Unresolved editions or conflicts remain open defects rather than disappearing into a consolidated bibliography.

Appendix R establishes a controlled record for an evidentiary register established before reliance, with exact issuer, title, edition, status, jurisdiction, use and limitation. Completion of Appendix R requires issuer, exact title, number, edition, date, status, jurisdiction, locator, use, limitation and conflict. Review of Appendix R concentrates on publication-date revalidation and proposition-level pinpoints. Unknowns in Appendix R are carried as open conditions with a responsible person and review date rather than completed by assumption. Appendix R may be closed when each claim is supported by a source fit for that claim.¹¹⁴

¹¹⁴ [MB-0081](#). ASTM E2713-25, ASTM E3176-24.

Appendix R should be scaled to consequence and complexity without deleting the information needed for issuer, exact title, number, edition, date, status, jurisdiction, locator, use, limitation and conflict. For Appendix R, security markings and jurisdictional overlays are applied at field level where necessary. The Appendix R custodian verifies publication-date revalidation and proposition-level pinpoints and preserves the approved form with the records to which it refers.

Table R-1. Source-status and citation methodology

Category	Meaning	Permitted use
Current primary authority	Current law, regulation, policy, official standard or government publication	Controlling within scope and jurisdiction
Current consensus standard	Published technical standard from a recognised body	Method, classification or practice within stated scope
Current professional guidance	Recognised engineering or commissioning guidance	Practice support; mandatory only if adopted
Peer-reviewed research	Scholarly work with defined methods and limitations	Mechanism, data and analysis with transferability assessed
Accredited laboratory report	Traceable report for a defined specimen and method	Configuration-specific evidence
Manufacturer report	Product evidence with specimen, laboratory, method and limitations	Procurement and comparison
Historical or superseded	Earlier authority no longer current	Historical development, not current control
Declassified source	Officially released historical material	Supported historical content within release scope
Secondary commentary	Textbook, handbook or synthesis	Explanation and corroboration
Access-limited acknowledged	Publicly acknowledged but unavailable or protected	Existence and role only; no inferred criteria

Application and quality-control protocol

Appendix R. Source-Status And Citation Methodology is a controlled project record, not a decorative blank form. Its purpose is that source status must be revalidated at release and citations placed beside the proposition actually supported. The designated custodian is the source and permissions editor, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes issuer, title, number, edition, date, status, jurisdiction, locator, access date, proposition, limitation, archive or hash and conflict. Closure occurs only when every material claim has a fit source or is marked as project-specific, controlled, unresolved or excluded. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX S. MODEL SPECIFICATION LANGUAGE

Performance language should state a decision rule and required evidence, not simply an aspirational adjective. The specification identifies who witnesses, who reviews and who accepts. It also preserves access for inspection and testing. Requirements that cannot be measured or observed should be revised or assigned to a controlled authority process. A contractor should not be asked to certify a governmental status outside its role.

Model specification language should create measurable obligations and traceability. It should require complete reports, coordinated shop drawings, stable penetration identifiers, material identity, first-of-type work, hold points, testing, uncertainty, nonconformance, retest, handover and change control. Bracketed selections are resolved before issue. Requirements for acoustics, fire, smoke, structure, moisture, accessibility and security are coordinated without allowing one discipline to waive another silently.

Appendix S establishes a controlled record for requirements that distinguish products, installation, field performance, evidence and authority. The operative record in Appendix S captures requirement, object, state, frequency range, product evidence, installation duty, field test, acceptance rule and submittal. The responsible reviewer for Appendix S verifies clear allocation of contractor, designer, tester and authority responsibilities.

Where an Appendix S field cannot be completed, the reason, consequence and next action are stated directly in the record. The release condition for Appendix S is that specification language distinguishes products, installed work and formal use decisions.¹¹⁵

¹¹⁵ [MB-1092](#). NIST FIPS PUB 180-4 supports SHA-256 integrity practice. A hash detects byte-level difference but does not establish accuracy, provenance or meaning.

Digital or paper implementation of Appendix S is acceptable provided stable identifiers link it to the relevant room, asset, path, test or decision.

Automation applied to Appendix S must preserve the visibility of unknowns and reviewer actions. The governing objective for Appendix S remains that specification language distinguishes products, installed work and formal use decisions.

Table S-1. Model specification language

Clause family	Required treatment
General performance	Complete enclosure, paths, source states and four separate propositions
Submittals	Requirement matrix, complete reports, coordinated drawings and evidence limitations
Quality and competence	Qualified installers, specialist design, independent review and security approval
First-of-type work	Representative interfaces released before production work
Concealed work	Hold points, identifiers, photographs and stop-work rules
Substitutions	Demonstrated equivalence in configuration, performance, maintenance and evidence
Field testing	Approved plan, states, uncertainty, raw data and decision rule
Nonconformance	Stable record, cause, population, corrective action, retest and closure
Handover	As-builts, registers, data, limitations, decisions, manifests and hashes

Application and quality-control protocol

Appendix S. Model Specification Language is a controlled project record, not a decorative blank form. Its purpose is that model clauses must express measurable performance, configuration, submittal, execution, inspection and acceptance duties without copying controlled or licensed text improperly. The designated custodian is the specification author and responsible design professional, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes scope, definitions, performance, products, equivalence, submittals, mock-ups, execution, hold points, testing, deficiencies and closeout. Closure occurs only when the clause is coordinated with drawings and authority requirements and can be enforced against identifiable evidence. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX T. EXPERT-REPORT OUTLINE

Report appendices should be indexed and cross-referenced to the conclusions they support. Large raw datasets can be delivered separately under manifest and checksum while the report identifies exact file IDs. Exhibits preserve scale and orientation. A reader should not need to infer which photograph, calculation or test trace supports an opinion. The report also states when counsel or authority has limited disclosure of underlying material.

An expert report should distinguish supplied facts, direct observations, calculations, professional opinions and authority decisions. The inferential chain from evidence to conclusion remains visible. Alternative explanations, sampling limits, inaccessible conditions, dynamic-range limits and reliance on other disciplines are stated. Photographs retain context, numerical values carry units and uncertainty where material, and later material information triggers a supplement or withdrawal rather than silent editing of the sealed report.

Appendix T establishes a controlled record for a report written for the decision it supports, with visible inferential steps and limitations. Appendix T is complete only when it records instructions, issues, materials considered, inspections, methods, calculations, assumptions, opinions, alternatives and limitations. Release of Appendix T is withheld until there is evidence of transparent inferential steps and exhibit provenance. Missing evidence in Appendix T is classified as a limitation, with any compensating inspection or test identified separately. Acceptance of Appendix T means that the report can be tested by another competent reviewer.¹¹⁶

¹¹⁶ [MB-0104](#). ASTM E90-23, ISO 10140-2:2021.

The organisation may integrate Appendix T into its project-management or records system, but automatic completion, copied defaults and hidden fields require review. The final Appendix T record names the accountable owner, preserves revisions and demonstrates transparent inferential steps and exhibit provenance; otherwise it remains a draft rather than evidence of closure.

Table T-1. Expert-report outline

Section	Content
Title and control	Project, report ID, revision, author, reviewer, distribution and marking
Instructions and authority	Requestor, question, scope, exclusions and privilege
Qualifications	Relevant competence, roles, independence, conflicts and reliance
Background	Facility, protected function, chronology, complaint or requirement
Sources reviewed	Drawings, standards, policies, records, data and source-status limits
Configuration	As-designed, submitted, built, tested and operated states
Methods	Measurements, inspections, calculations, sampling, software and deviations
Observations	Factual findings with identifiers, locations, units and raw-data links
Analysis	Mechanisms, path model, alternatives, uncertainty, sensitivity and causation
Conclusions	Proposition-specific opinions stated at supported strength
Limitations	Access, range, sampling, configuration, model, source and authority limits
Recommendations	Immediate controls, further evidence, remediation, retest and lifecycle actions

Application and quality-control protocol

Appendix T. Expert-Report Outline is a controlled project record, not a decorative blank form. Its purpose is that expert reports must separate facts, assumptions, methods, observations, calculations, opinions and limitations in a form suited to independent scrutiny. The designated custodian is the lead expert, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes instruction, qualifications, materials, chronology, questions, methods, data, analysis, alternative explanations, opinions, uncertainty, exhibits and declaration. Closure occurs only when each opinion is traceable to disclosed evidence and methodology and remains within the expert field and forum rules. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX U. LIFECYCLE INSPECTION AND RECOMMISSIONING SCHEDULE

Inspection frequency can change with evidence. Stable trends and low change intensity may justify longer intervals, while repeated seal drift, heavy maintenance or new software may require shorter review. The authority should document the basis rather than apply one arbitrary calendar to every room. Event triggers always override the routine interval when the affected proposition could have changed materially.

Lifecycle intervals are risk based and state based. Daily user checks, monthly operation, quarterly walkdowns, periodic measurements and authority-defined full reassessment serve different purposes. Event triggers include penetrations, doorset work, HVAC balancing, software or masking change, incident, water intrusion, seismic movement and structural work. Trend comparison uses like instruments and states. Overdue reviews, open changes, obsolete parts and expired calibrations remain visible in the portfolio register.

Appendix U establishes a controlled record for risk-based calendar and event-driven controls tied to baseline indicators and escalation. For Appendix U, the minimum controlled fields are asset, condition indicator, calendar interval, event trigger, method, threshold, escalation, owner and closeout. The principal quality control for Appendix U is coordination with maintenance and approved replacement parts. In Appendix U, a blank or unknown entry remains visible and is assigned to an owner; it is not converted into implied conformity. The Appendix U closeout test is that ageing and operational drift are detected before the baseline silently fails.¹¹⁷

¹¹⁷ [MB-0075](#). ASTM E2638-24, IEC 60268-16:2020.

Project-specific fields, markings and controlled references may be added to Appendix U, but the core evidence for asset, condition indicator, calendar interval, event trigger, method, threshold, escalation, owner and closeout should remain identifiable. In Appendix U, version, author, reviewer, date and disposition are recorded whenever the form changes. Superseded copies of Appendix U are retained or withdrawn under the document-control procedure so that a later user cannot mistake an obsolete state for the accepted one.

Table U-1. Lifecycle inspection and recommissioning schedule

Frequency or trigger	Inspection or test	Evidence	Escalation trigger
Each use or daily	Doors, obvious seal damage, masking alarm, unusual equipment and open access	User or custodian log	Damage, alarm, propped door or unapproved device
Monthly	Doorset operation, visible seals, threshold, access panels and room configuration	Checklist and exceptions	Contact loss, wear, controller change or repeated issue
Quarterly	Penetration and ceiling walkdown, equipment inventory, HVAC and masking trend	Register comparison and photographs	New opening, unexplained drift or missing asset
Semiannual	Door gap and force, masking spectrum, spatial sample and quiet background	Measured baseline comparison	Tolerance exceeded or adverse trend
Annual	Representative acoustic indicators, room response, service modes and configuration audit	Recommissioning report	Significant change, failed indicator or evidence gap
After material work	Affected path, registers, firestop, pressure, software and targeted test	Change package and closure	Incomplete work, new path or changed state
After incident or complaint	Preserve state, triage, forensic plan and temporary controls	Incident and forensic record	Supported compromise, unauthorised change or unresolved cause

Application and quality-control protocol

Appendix U. Lifecycle Inspection And Recommissioning Schedule is a controlled project record, not a decorative blank form. Its purpose is that intervals and triggers should be risk based and connected to observable degradation or change mechanisms. The designated custodian is the facility security and engineering custodian, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes asset, condition indicator, inspection method, interval, threshold, event trigger, responsible person, record, escalation and retest level. Closure occurs only when stable conditions may be trended efficiently while high-consequence or rapidly changing interfaces receive timely intervention. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX V. VALIDATION GATES AND PUBLICATION-EVIDENCE CHAIN

Gate records should identify the exact file or configuration reviewed. A PASS attached to an earlier binary or draft cannot be transferred to a changed release. Automated checks, visual inspection and independent technical review are complementary. The package verification confirms membership and hashes after the final archive is built. Any later correction creates new identifiers and repeats affected gates.

Validation gates should have evidence and failure responses. Architecture is checked before indexing. Equations are independently checked before dependent conclusions are frozen. Sources are revalidated before release. Tables and figures are inspected in rendered pages. Duplication, accessibility, OOXML, PDF geometry, package membership and hashes are verified reproducibly. A failed gate returns the affected material to repair and revalidation. No status label substitutes for the underlying record.

Appendix V establishes a controlled record for completion gates for architecture, technical accuracy, equations, sources, objects, editorial quality, apparatus, files and seal. Completion of Appendix V requires architecture, technical accuracy, equations, sources, editorial quality, duplication, apparatus, OOXML, PDF, package and seal gates. Review of Appendix V concentrates on documented evidence and failure response for every gate. Unknowns in Appendix V are carried as open conditions with a responsible person and review date rather than completed by assumption. Appendix V may be closed when a release state is reproducible and any later change requires a new identifier.¹¹⁸

¹¹⁸ [MB-0920](#). ISO 10848, ASTM E1414.

Appendix V should be scaled to consequence and complexity without deleting the information needed for architecture, technical accuracy, equations, sources, editorial quality, duplication, apparatus, OOXML, PDF, package and seal gates. For Appendix V, security markings and jurisdictional overlays are applied at field level where necessary. The Appendix V custodian verifies documented evidence and failure response for every gate and preserves the approved form with the records to which it refers.

Table V-1. Validation gates and publication-evidence chain

Gate	Principal question	Required evidence	Failure response
Architecture	Are all parts, chapters, sections and appendices present and coherent?	Heading and completeness audits	Restore, reorder or rewrite
Technical	Are mechanisms, units, configurations, jurisdictions and limitations correct?	Discipline review and defect register	Correct and revalidate
Equations	Are derivations, variables, units, calculations and interpretation sound?	Equation register and independent checks	Repair dependent conclusions
Sources	Does each material claim have accurate and current support?	Source register and claim matrix	Reverify, replace, qualify or delete
Tables and figures	Are objects relevant, correct, legible and cited?	Object registers and page review	Rebuild or remove
Editorial	Does the work read as one sustained monograph?	Developmental and line-edit record	Rewrite and harmonise
Duplication	Are exact, normalised, sentence, sequence, semantic and table repetitions controlled?	Reproducible duplicate report	Delete, merge or cross-reference
Apparatus	Are glossary, bibliography, contents, lists and index consistent?	Apparatus QA	Regenerate and proof
Document	Does the DOCX open, update, render and pass structural checks?	OOXML and accessibility audits	Repair document engineering
PDF	Are pages in bounds, legible and free of unexplained blanks?	Full-page raster inspection	Correct and rerender

Gate	Principal question	Required evidence	Failure response
Package	Do manifest, hashes, membership and CRC agree?	Package verification	Rebuild and rehash
Seal	Is the exact release frozen and detectable if altered?	Release identifier and SHA-256 register	Issue a new revision after change

Application and quality-control protocol

Appendix V. Validation Gates And Publication-Evidence Chain is a controlled project record, not a decorative blank form. Its purpose is that technical content, sources, objects, fields, layout and package integrity require separate gates before release. The designated custodian is the publication manager with independent QA reviewers, who controls identifiers, revision, security markings, required attachments, supersession and access.

Minimum completion evidence includes architecture, calculations, citations, duplicates, tables, figures, accessibility, OOXML, rendering, pagination, index, manifest and hashes. Closure occurs only when every gate records evidence, disposition and reviewer, and the released files match the validated bytes. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX W. OWNER'S PROJECT REQUIREMENTS AND ROOM-DATA-SHEET TEMPLATE

Room data sheets should be issued early enough to control coordination and updated through as-built and as-operated states. Conflicting values are resolved through the requirement owner. The sheet should link to detailed schedules rather than duplicate them inconsistently. Operators receive the final approved version with conditions and change triggers. A stale room data sheet can be more dangerous than no sheet because it presents obsolete assumptions as current fact.

The owner's requirements and room data sheet should identify protected use, source states, listener access, boundaries, services, electronics, room acoustics, masking, vibration, life safety, environmental range, construction controls, tests, acceptance and lifecycle. The listener-access schedule is separate from standard microphone positions. Each field names an owner and source. Unknown information is marked unknown rather than converted into a design assumption without approval.

Appendix W establishes a controlled record for room identity, protected function, source, listener access, boundaries, services, electronics, operating states, tests and acceptance. The operative record in Appendix W captures room identity, function, users, sources, listener access, boundary, services, electronics, states, tests and acceptance owner. The responsible reviewer for Appendix W verifies traceability from owner requirement to room data sheet and specification. Where an Appendix W field cannot be completed, the reason, consequence and next action are stated directly in the record. The

release condition for Appendix W is that the design team receives a complete question rather than a headline rating.¹¹⁹

Digital or paper implementation of Appendix W is acceptable provided stable identifiers link it to the relevant room, asset, path, test or decision. Automation applied to Appendix W must preserve the visibility of unknowns and reviewer actions. The governing objective for Appendix W remains that the design team receives a complete question rather than a headline rating.

Table W-1. Owner's project requirements and room-data-sheet template

Field group	Required content
Identity and authority	Facility, room, project, revision, owner, authority and distribution
Protected function	Information category, occupants, duration, consequence and authorised use
Source states	Human and electronic source levels, spectra, positions, directions and duration
Listener access	Corridor, adjoining room, exterior, plenum, underfloor, roof and service positions
Boundaries	Wall, floor, ceiling, roof, facade, door, glazing and junction identifiers
Services	Ducts, transfer paths, pipes, sprinklers, conduits, cable trays and access panels
Electronics	AV, telephones, displays, sensors, controls, networks and approved states
Masking and background	Zones, spectra, quiet state, normal state, alarms and failure response
Tests	Laboratory evidence, field quantities, speech methods, states and uncertainty
Acceptance	Criteria, decision rules, open conditions, authority language and review
Lifecycle	Inspection, maintenance, spares, training, change triggers and incident response

¹¹⁹ [MB-1144](#). Public United States, United Kingdom and Canadian governmental sources establish disclosed terminology and authority structures. Protected criteria and formal decisions remain with competent authorities.

Worked example W-1. Selecting the controlling listener position

A standard room-pair grid gives an average level difference of 54 dB. A corridor position near the latch jamb gives 47 dB, a locked service cupboard gives 44 dB during HVAC setback, and a ceiling-void point gives 49 dB. The service cupboard is accessible only during maintenance, but that access remains within the authorised threat model and its background falls materially at night. The room data sheet therefore identifies the cupboard as a controlling access position and assigns access, testing and operational controls. The room-average result remains valid for its standardised proposition, but it does not replace the local access analysis.

Application and quality-control protocol

Appendix W. Owner'S Project Requirements And Room-Data-Sheet Template is a controlled project record, not a decorative blank form. Its purpose is that the owner must define mission, source, receiver, operation, authority and change expectations before detailed design. The designated custodian is the owner representative and security authority, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes protected function, information class, users, source cases, adjacent access, operating states, criteria, jurisdiction, services, maintenance, evidence and authority. Closure occurs only when design teams receive a coherent, testable and version-controlled basis rather than a room label and aspirational rating. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX X. ACCEPTANCE, CONDITIONAL USE, AND AUTHORITY-DISPOSITION FORM

Conditional controls should be embedded in operating systems and procedures. A gain limit can be locked, a room-use restriction can appear in booking controls, and a maintenance condition can generate a work order and expiry alert. The authority record identifies evidence required for removal of the condition. Conditions that cannot be monitored or enforced should not be used to create nominal acceptance.

Authority disposition should state the exact proposition accepted, the evidence reviewed, configuration represented, unresolved conditions, compensating controls, validity period and change triggers. Conditions are testable and assigned to named owners with dates. The form permits acceptance, conditional use, limited use, deferment, rejection or further evidence. Technical reviewers sign their reviews, while the authorised official retains the decision. Distribution and protection markings follow the governing regime.

Appendix X establishes a controlled record for the institutional decision recorded without rewriting technical evidence. Appendix X is complete only when it records technical evidence, result, uncertainty, residual condition, restriction, permitted use, expiry, review trigger and signatory. Release of Appendix X is withheld until there is evidence of separation of engineering finding from institutional judgement. Missing evidence in Appendix X is classified as a limitation, with any compensating inspection or test identified

separately. Acceptance of Appendix X means that conditional use is explicit, time-bounded and auditable.¹²⁰

The organisation may integrate Appendix X into its project-management or records system, but automatic completion, copied defaults and hidden fields require review. The final Appendix X record names the accountable owner, preserves revisions and demonstrates separation of engineering finding from institutional judgement; otherwise it remains a draft rather than evidence of closure.

Table X-1. Acceptance, conditional use and authority-disposition form

Field	Required content
Decision identifier	Stable record, revision, date and authority
Facility and scope	Rooms, boundaries, systems, use and exclusions
Requirements	Governing identifiers and controlled references
Evidence reviewed	Design, construction, submittals, tests, uncertainty, incidents and open items
Proposition	Laboratory, field, occupied speech or formal use stated separately
Technical result	Values, bands, states, positions, uncertainty and rule result
Configuration evidence	As-built, hold points, photographs, registers and inaccessible conditions
Residual risk	Remaining paths, untested states, source gaps and lifecycle concerns
Compensating controls	Operational restrictions, masking, access, monitoring or maintenance
Decision	Accepted, conditional, limited, deferred, rejected or more evidence
Validity	Effective date, expiry, review, incident and change triggers
Signatures	Technical reviewers, security authority and accepting official

¹²⁰ [MB-1119](#). Part XII provenance and recovery history are preserved in the controlled production dossier. Its technical propositions depend upon the cited primary and secondary sources, not upon internal recovery records.

Worked example X-1. Conditional use after a low-frequency residual

Commissioning finds a low-frequency residual associated with one HVAC branch. The ordinary conversational state passes the defined decision rule, while amplified programme audio at a prohibited preset does not. The authority permits conditional use with the approved conference preset locked, masking supervision active, branch remediation scheduled, and amplified programme content prohibited. The condition has an owner, expiry date and retest requirement. Booking and operating procedures display the restriction. When the silencer and support work are completed, the targeted branch test and authorised source-state campaign are repeated before the condition is removed. The authority record does not rewrite the original technical evidence or imply that the residual never existed.

Application and quality-control protocol

Appendix X. Acceptance, Conditional Use, And Authority-Disposition Form is a controlled project record, not a decorative blank form. Its purpose is that engineering evidence and authority action should appear in connected but distinct fields. The designated custodian is the empowered acceptance authority, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes facility, configuration, evidence reviewed, unresolved items, uncertainty, residual risk, conditions, restrictions, expiry, retest triggers and signatures. Closure occurs only when the authorised state, use and duration are unmistakable and conditional items retain owners and due dates. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX Y. PROGRAMME METRICS, AUDIT, AND CORRECTIVE-ACTION EFFECTIVENESS

Metric definitions should remain stable across reporting periods, or changes should be documented so trends are not artificial. Outliers receive causal review. Portfolio exposure counts rooms sharing an open causal factor, not every room in the estate. Dashboards should permit review of underlying records and uncertainty. A favourable percentage cannot substitute for closure of a small number of high-consequence defects.

Programme metrics should resist incentives to under-report. Defects detected before concealment, missed hold points, repeat causal families, pre-work change review, baseline drift, evidence completeness and time to supported closure can reveal control quality when denominators are defined. Audits trace requirements forward and installed assets backward. Corrective-action effectiveness is reviewed after opportunity for recurrence. Training alone is inadequate when details, procurement, sequence, tools or supervision remain unchanged.

Appendix Y establishes a controlled record for measures that reveal prevention, detection, correction and recurrence without rewarding under-reporting. For Appendix Y, the minimum controlled fields are population, leading and lagging measures, defects, detection, correction time, recurrence, sampling and effectiveness. The principal quality control for Appendix Y is controls against incentives to suppress reporting. In Appendix Y, a blank or unknown entry remains visible and is assigned to an owner; it is not converted into implied conformity. The Appendix Y closeout test is

that programme metrics reveal whether corrective actions reduce actual risk.¹²¹

Project-specific fields, markings and controlled references may be added to Appendix Y, but the core evidence for population, leading and lagging measures, defects, detection, correction time, recurrence, sampling and effectiveness should remain identifiable. In Appendix Y, version, author, reviewer, date and disposition are recorded whenever the form changes. Superseded copies of Appendix Y are retained or withdrawn under the document-control procedure so that a later user cannot mistake an obsolete state for the accepted one.

Table Y-1. Programme metrics, audit and corrective-action effectiveness

Metric	Definition	Useful interpretation	Misuse to avoid
Defects detected before concealment	Detected construction defects found before closure	Surveillance timing and observability	Treating fewer reports as better
First-of-type correction rate	Material corrections before production release	Mock-up learning	Hiding informal corrections
Missed hold-point rate	Missed mandatory stops per applicable point	Sequence and communication weakness	Administrative closure after concealment
Repeat-defect rate	Recurrence of the same causal family after action	Corrective-action effectiveness	Counting symptoms instead of causes
Change-review compliance	Material changes reviewed before implementation	Lifecycle governance	Reclassifying material work as minor
Baseline drift rate	Indicators outside tolerance by room and system	Maintenance prioritisation	Comparing unlike states
Evidence completeness	Requirements with linked design, construction, test and decision evidence	Traceability	Counting documents without relevance
Time to causal closure	Time from finding to supported cause and verified remedy	Capacity and complexity	Rewarding premature closure

¹²¹ [MB-0963](#). JCGM 100:2008, JCGM 106:2012.

Metric	Definition	Useful interpretation	Misuse to avoid
Portfolio exposure	Rooms sharing a causal factor with an open defect	Risk-based review	Extrapolating without a defined population

Application and quality-control protocol

Appendix Y. Programme Metrics, Audit, And Corrective-Action Effectiveness is a controlled project record, not a decorative blank form. Its purpose is that metrics must use stable definitions and denominators and be tested for gaming or exclusion bias. The designated custodian is the programme assurance manager, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes metric, purpose, numerator, denominator, source, frequency, owner, target, limitation, audit result, corrective action and effectiveness check. Closure occurs only when management can distinguish activity, conformance, recurrence and actual improvement without substituting aggregate data for room evidence. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX Z. DATA INTEGRITY, FILE CONTROL, AND CHECKSUM PRACTICE

Format migration should preserve originals, metadata and verification.

When proprietary files are converted, the conversion tool and version are recorded, and important derived data are compared with the source.

Backups are tested by restoration. Access logs and permission reviews help distinguish authorised work from unexplained change. Disposal follows retention, litigation, security and privacy obligations rather than ordinary storage housekeeping.

File control preserves originals, working copies and derived products under stable identifiers. Time source, time zone, synchronisation and known clock offsets are recorded when acoustic, vibration, access and system logs are correlated. Processing records identify software, version, scripts and settings. Hashes verify byte identity during transfer and storage. They do not prove that a microphone was correctly positioned or that an interpretation is sound. Retention, access, backup and disposal follow legal and security holds.

Appendix Z establishes a controlled record for stable identifiers, time sources, original retention, working copies, access, manifests, hashes, backups and documented conversion. Completion of Appendix Z requires identifier, original file, working copy, time source, access, checksum, manifest, backup, conversion and retention. Review of Appendix Z concentrates on verification after transfer and before publication.

Unknowns in Appendix Z are carried as open conditions with a responsible person and review date rather than completed by assumption. Appendix Z

may be closed when silent substitution or loss can be detected without treating a hash as proof of truth.¹²²

Appendix Z should be scaled to consequence and complexity without deleting the information needed for identifier, original file, working copy, time source, access, checksum, manifest, backup, conversion and retention. For Appendix Z, security markings and jurisdictional overlays are applied at field level where necessary. The Appendix Z custodian verifies verification after transfer and before publication and preserves the approved form with the records to which it refers.

Table Z-1. Data integrity, file control and checksum practice

Field	Required content
Record ID	Stable identifier linked to project, room, activity and sequence
Original filename	Device or acquisition name preserved
Controlled filename	Human-readable convention without overwriting original identity
Type and format	Audio, image, data, drawing, document, database or archive and version
Creator and device	Person, instrument, camera, analyser, software and asset ID
Time	Time source, zone, synchronisation and known offset
Location and state	Room, coordinates, source, receiver and operating conditions
Transfer	From device to storage, person, date, method and verification
Checksum	Algorithm and digest for original and controlled copy
Access	Authorised users, permissions, exports and review log
Processing	Working copy, software, settings, scripts and derived record IDs
Retention	Custodian, location, backup, duration, disposal and legal or security hold

¹²² [MB-0924](#). ISO 12354-1:2017, ISO 12354-2:2017.

Worked example Z-1. Detecting silent substitution

A signed PDF has digest H1 in the release manifest. A later file with the same name has digest H2. The difference proves that the byte sequences are not identical. It does not identify whether the cause is malicious alteration, metadata rewrite, signature update or legitimate revision. The custodian compares versions and issues a new controlled revision where authorised.

Application and quality-control protocol

Appendix Z. Data Integrity, File Control, And Checksum Practice is a controlled project record, not a decorative blank form. Its purpose is that digital evidence must remain attributable, complete and detectably unchanged through collection, analysis, review and release. The designated custodian is the records and digital-evidence custodian, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes identifier, file name, format, source device, date, operator, software, version, parent, hash, storage, access, transformation and disposition. Closure occurs only when the exact object reviewed and released can be verified and derivative files remain linked to their sources. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX AA. MULTIDISCIPLINARY DESIGN-REVIEW CHECKLIST

Interface reviews should be scheduled at design maturity points and again after material submittals or changes. The matrix can expose a duct detail that is acoustically sound but uninspectable for fire purposes, or a threshold that conflicts with accessibility. Closure identifies the authorised resolution and revised documents. Unresolved interface risk remains visible to commissioning and the accepting authority.

Multidisciplinary review focuses on interfaces where duties meet.

Architecture, structure, mechanical, electrical, audiovisual, fire, accessibility, acoustics and security each identify requirements and evidence. The matrix records who prepares, checks, approves, observes, tests, witnesses, accepts, maintains and controls records. Unresolved conflicts are escalated to the correct design and authority roles. A coordinated drawing does not by itself prove that every discipline reviewed the final condition.

Appendix AA establishes a controlled record for architecture, structure, services, electronics, fire, accessibility, acoustics, security and authority reviewed at their interfaces. The operative record in Appendix AA captures architecture, structure, HVAC, plumbing, electrical, fire, accessibility, electronics, acoustics, security, commissioning and authority. The responsible reviewer for Appendix AA verifies interface questions assigned to named reviewers. Where an Appendix AA field cannot be completed, the reason, consequence and next action are stated directly in the record. The release condition for Appendix AA is that multidisciplinary conflicts are resolved before work is concealed.¹²³

¹²³ [MB-0949](#). ISO/IEC 17025:2017 addresses competence, ISO/IEC 17025:2017.

Digital or paper implementation of Appendix AA is acceptable provided stable identifiers link it to the relevant room, asset, path, test or decision. Automation applied to Appendix AA must preserve the visibility of unknowns and reviewer actions. The governing objective for Appendix AA remains that multidisciplinary conflicts are resolved before work is concealed.

Table AA-1. Multidisciplinary design-review checklist

Discipline or interface	Review focus	Evidence
Architecture and interiors	Geometry, full-height boundaries, junctions, doors, glazing, ceilings, furniture and maintenance	Coordinated drawings and room data sheet
Structural engineering	Loads, deflection, drift, anchors, slabs, isolated floors, supports and restraints	Calculations and details
Mechanical and plumbing	Air paths, silencers, pressure, vibration, pipes, drains, sprinklers and access	Path register and commissioning plan
Electrical and electronic systems	Power, conduits, cable trays, AV, sensors, networks, firmware and remote functions	Asset and configuration register
Fire and accessibility	Fire continuity, smoke, dampers, egress, hardware, thresholds, operators and inspection	Code and listing review
Acoustics and commissioning	Requirements, predictions, tests, uncertainty, diagnostics, raw data and lifecycle indicators	Basis of design and test plan
Security and authority	Protected function, access, controlled criteria, records, TSCM, EMSEC and acceptance roles	Authority and information-handling plan

Application and quality-control protocol

Appendix Aa. Multidisciplinary Design-Review Checklist is a controlled project record, not a decorative blank form. Its purpose is that architectural, structural, mechanical, electrical, fire, audiovisual, cyber, TSCM, security, operations and maintenance interfaces must be reviewed together. The designated custodian is the design manager, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes discipline, requirement, boundary interface, drawing or model location, conflict, decision, owner, due date, evidence and closeout. Closure occurs only when no discipline assumes that another has controlled an interface without an explicit assignment and verified resolution. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX AB. FAILURE-MODE, EFFECTS, AND CRITICALITY METHOD

Risk scales require definitions and examples so different reviewers use them consistently. Detectability should reflect routine controls, not an expert forensic campaign. The analysis records uncertainty in occurrence where data are sparse. Recommended actions can eliminate, reduce, detect, limit consequence or improve recovery. Residual ratings are assigned only after evidence shows the action was implemented and effective.

Failure-mode analysis should remain a living technical record. Severity reflects protected-function consequence, occurrence reflects a defined population, and detectability reflects the chance normal controls will find the condition before use. Numerical products can rank attention but should not override consequence, reversibility, cost, access or information value. Each recommended action identifies owner, evidence and residual condition. New incidents update the causal population and the effectiveness of existing controls.

Appendix AB establishes a controlled record for a living record of element, failure, cause, local effect, whole-room consequence, detection, control, action and residual condition. Appendix AB is complete only when it records element, function, failure mode, cause, local effect, whole-room consequence, detectability, control, action and residual state. Release of Appendix AB is withheld until there is evidence of ordinal ranking supported by stated assumptions rather than spurious precision. Missing evidence in Appendix AB is classified as a limitation, with any compensating inspection

or test identified separately. Acceptance of Appendix AB means that high-consequence and common-cause failures receive proportionate control.¹²⁴

The organisation may integrate Appendix AB into its project-management or records system, but automatic completion, copied defaults and hidden fields require review. The final Appendix AB record names the accountable owner, preserves revisions and demonstrates ordinal ranking supported by stated assumptions rather than spurious precision; otherwise it remains a draft rather than evidence of closure.

Table AB-1. Failure-mode, effects and criticality method

Element	Failure mode	Physical or process cause	Principal detection
Resilient wall	Rigid bridge between leaves	Overlong fastener, backing, conduit, ceiling or finish contact	Layer inspection, vibration scan and controlled opening
Door perimeter	Incomplete seal compression	Frame twist, latch drift, pressure, worn gasket or floor tolerance	Gap map, contact media and local scan
Masonry wall	Open or porous joints	Poor workmanship, shrinkage, damage or concealed void	Surface inspection, sealing contrast and opening
Concrete shell	Structural service bridge	Rigid support, curb, anchor or restraint	Mobility, coherence, phase and state contrast
Glazing	Frame or perimeter leakage	Gasket discontinuity, mullion cavity, seal or anchor bridge	Local scan, pressure contrast and frame inspection
HVAC	Cross-talk or insufficient attenuation	Short path, wrong silencer, bypass, flow or casing	Branch muting, path measurement and flow-state test
Penetration	Incomplete annular closure	Crowded cable, wrong backing, disturbed firestop or later work	Register, visual, airflow and acoustic scan
Masking	Quiet pocket or muted zone	Failed emitter, controller change, obstruction or set point	Spatial map, telemetry and quiet-state test
Records	Missing configuration evidence	Missed hold point, lost data or weak identifier	Traceability audit and controlled opening

¹²⁴ [MB-0087](#). ASTM E336-25a, ISO 16283-1:2014.

Worked example AB-1. Criticality ranking without false precision

Three findings are reviewed on a ten-point project scale. A door-seal defect has severity 8, occurrence 5 and detectability 3, giving a simple product of 120. A hidden resilient bridge has 7, 3 and 8, giving 168. A masking telemetry failure has 6, 4 and 7, also giving 168. The products suggest attention to the hidden bridge and telemetry, but the door affects daily use and can be repaired in one hour. The team repairs the door immediately, restores masking supervision, and schedules targeted bridge verification. The ranking supports prioritisation but does not dictate it. Consequence, reversibility, cost, access and information value remain part of the decision.

Application and quality-control protocol

Appendix Ab. Failure-Mode, Effects, And Criticality Method is a controlled project record, not a decorative blank form. Its purpose is that failure analysis should rank mechanisms transparently without disguising judgement as precise arithmetic. The designated custodian is the system safety or reliability lead with acoustic-security input, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes function, failure mode, cause, local effect, system effect, detectability, existing control, evidence, action, owner and residual state. Closure occurs only when high-consequence and poorly detectable mechanisms receive proportionate control and rankings are revisited when evidence changes. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX AC. COMPETENCE, TRAINING, AND RESPONSIBILITY MATRIX

Competence evidence can include education, supervised experience, calibrated performance, certification, manufacturer training and successful comparable work, depending on the task. The matrix should identify continuing competence and substitution of personnel. A qualified organisation does not guarantee every assigned individual is competent. Reviewers disclose conflicts and reliance on other disciplines so authority understands the boundaries of each opinion.

Competence is task specific. Acoustic modelling, structural supports, door installation, firestop inspection, HVAC testing, calibration, secure construction surveillance and authority acceptance require different evidence. Independence is proportionate to consequence. A contractor should not approve its own material deviation, and a laboratory should not self-accredit a facility. Where one person performs several roles, the record identifies the roles and any lost independence. Training records alone do not prove demonstrated competence.

Appendix AC establishes a controlled record for competence defined by task, independent review and acceptance role rather than general title. For Appendix AC, the minimum controlled fields are task, required knowledge, practical evidence, independence, supervision, review and acceptance authority. The principal quality control for Appendix AC is competence judged by role rather than title alone. In Appendix AC, a blank or unknown entry remains visible and is assigned to an owner; it is not converted into implied conformity. The Appendix AC closeout test is that critical

calculations, inspections and decisions receive qualified and independent scrutiny.¹²⁵

Project-specific fields, markings and controlled references may be added to Appendix AC, but the core evidence for task, required knowledge, practical evidence, independence, supervision, review and acceptance authority should remain identifiable. In Appendix AC, version, author, reviewer, date and disposition are recorded whenever the form changes. Superseded copies of Appendix AC are retained or withdrawn under the document-control procedure so that a later user cannot mistake an obsolete state for the accepted one.

Table AC-1. Competence, training and responsibility matrix

Task	Minimum competence evidence	Independent review	Authority or acceptance role
Acoustic basis of design	Relevant acoustical education and high-isolation experience	Senior acoustical reviewer	Project and security authority approve requirements
Structural isolation	Structural and vibration competence, load and movement analysis	Structural checker and acoustic interface review	Engineer of record accepts structural design
HVAC acoustic design	Mechanical systems, airflow, noise and vibration experience	Mechanical and acoustic coordination	Mechanical engineer and project authority
Firestop and joints	Applicable code, listing and inspection competence	Fire-protection reviewer	Code and project authorities
Doorset installation	Specialist training, hardware and seal competence	Door consultant or commissioning reviewer	Project release authority
Glazing system	Facade, glass, frame, seal and structural competence	Envelope and acoustic review	Design authority
Measurement	Metrology, method, instrumentation, uncertainty and data integrity	Independent technical checker	Laboratory reports; authority decides use

¹²⁵ [MB-0925](#). ISO 12999-1:2020, JCGM 100:2008.

Application and quality-control protocol

Appendix Ac. Competence, Training, And Responsibility Matrix is a controlled project record, not a decorative blank form. Its purpose is that roles must be assigned according to demonstrable competence, authority and limits, not merely organisational title. The designated custodian is the programme manager and professional leads, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes role, task, qualification, experience, training, authorisation, independence, supervision, limitation, refresher interval and evidence. Closure occurs only when each critical decision and activity has a competent named owner and unresolved capability gaps are closed before work proceeds. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX AD. INFORMATION-CONSEQUENCE AND SPEECH-EXPOSURE ASSESSMENT

Exposure categories can be tested with neutral, ethically approved material that represents length, phonetics and consequence without disclosing actual secrets. Listener selection, training and language are controlled. Results are interpreted statistically and with uncertainty. The assessment distinguishes unaided live listening from recording or assisted processing where those threats are within authorised scope. It does not generalise beyond the defined population and state.

Speech-exposure assessment includes source effort, spectrum, duration, repetition, context, familiarity, language, background, access and recording within the authorised threat model. It avoids pretending to calculate a universal compromise probability. Short consequential tokens can control despite poor continuous intelligibility. Sensitivity screens should state independence and correlation assumptions. The assessment can guide source limits, physical design, masking, access controls and test states without exposing actual protected content.

Appendix AD establishes a controlled record for source effort, spectrum, duration, repetition, context, familiarity, recording, language, background, listener position and consequence. Completion of Appendix AD requires source effort, spectrum, duration, repetition, context, familiarity, recording, language, background, position and consequence. Review of Appendix AD concentrates on explicit distinction between audibility, intelligibility and practical information harm. Unknowns in Appendix AD are carried as open conditions with a responsible person and review date rather than completed

by assumption. Appendix AD may be closed when speech-security conclusions reflect the real exposure scenario.¹²⁶

Appendix AD should be scaled to consequence and complexity without deleting the information needed for source effort, spectrum, duration, repetition, context, familiarity, recording, language, background, position and consequence. For Appendix AD, security markings and jurisdictional overlays are applied at field level where necessary. The Appendix AD custodian verifies explicit distinction between audibility, intelligibility and practical information harm and preserves the approved form with the records to which it refers.

Table AD-1. Information-consequence and speech-exposure assessment

Factor	Assessment question	Design or test implication
Source effort	How loud can authorised users or equipment become?	Include normal, raised and amplified states
Spectrum	Which bands carry dominant energy and important cues?	Preserve band data and low-frequency conditions
Duration	How long and how often can exposure occur?	Consider cumulative opportunity
Repetition	Are names, numbers, commands or phrases repeated?	Test representative consequential tokens cautiously
Context	Can a listener infer missing words from prior knowledge?	Avoid treating average intelligibility as complete protection
Familiarity	Could a listener recognise voices, names or routines?	Declare listener assumptions
Recording	Can a listener record for later review within the threat model?	Distinguish live and recorded access
Language	Are multiple languages or accents relevant?	Do not assume one-language testing generalises
Background	What is the quietest credible receiving state?	Include night, shutdown, maintenance and failure
Listener position	Which points are accessible and for how long?	Map local positions and access controls

¹²⁶ [MB-0083](#). ASTM E2964-26, ASTM C919-24.

Factor	Assessment question	Design or test implication
Consequence	What harm follows partial recovery?	Set evidence burden and controls proportionately

Worked example AD-1. Repetition changes practical consequence

At one listener position a controlled token is recognised in 15 per cent of independent trials. Under an independence screen, ten repetitions give $1 - (1 - 0.15)^{10} = 0.803$ probability of at least one recognition. Trials are rarely independent because context, learning and room state correlate, so the number is a sensitivity illustration rather than a compromise probability.

Application and quality-control protocol

Appendix Ad. Information-Consequence And Speech-Exposure Assessment is a controlled project record, not a decorative blank form. Its purpose is that audibility, intelligibility, repetition, context, voice identity and activity inference require separate consequence analysis. The designated custodian is the security risk owner with acoustic specialist, who controls identifiers, revision, security markings, required attachments, supersession and access. Minimum completion evidence includes information attribute, source state, receiver, access, dwell, repetition, background, aid, consequence, evidence, uncertainty and control. Closure occurs only when the protected objective and residual exposure are expressed in terms relevant to the mission rather than as an unqualified sound level. Every field is completed, marked not applicable with a reason, or carried as unknown or pending with an owner and review date. Local jurisdictional terms and protected references may be added as controlled overlays, but the neutral engineering fields remain visible so that a later reviewer can distinguish technical evidence from institutional authority.

APPENDIX AE. SYSTEM RELIABILITY AND MAINTENANCE LOGIC

Maintenance data should feed design and procurement. Repeated failures can justify different hardware, improved access, additional monitoring or revised stocking. Approved spares are stored under conditions that preserve material properties and firmware compatibility. Post-maintenance checks are proportionate to the path affected. The new service record links technician, parts, settings, observations and test evidence to the current configuration baseline.

Reliability logic links each asset to a failure indicator, threshold, preventive action, approved spare, technician competence and post-maintenance evidence. Door contact, glazing seals, silencers, resilient supports, masking, firestop, audiovisual systems and record repositories age differently. Remote diagnostics and software updates are authorised and logged. Obsolescence planning matters because unavailable seals, hardware or controllers can force unreviewed substitution. Maintenance closure includes updated schedules and targeted verification.

Appendix AE establishes a controlled record for components and controls that age differently, with failure indicators, preventive action, approved spares and post-maintenance evidence. The operative record in Appendix AE captures component, ageing mechanism, failure indicator, preventive action, approved spare, maintenance state, post-work check and trend. The responsible reviewer for Appendix AE verifies reliability allocation across physical and active controls. Where an Appendix AE field cannot be completed, the reason, consequence and next action are stated directly in

the record. The release condition for Appendix AE is that maintenance preserves or deliberately re-establishes the accepted system state.¹²⁷

Digital or paper implementation of Appendix AE is acceptable provided stable identifiers link it to the relevant room, asset, path, test or decision.

Automation applied to Appendix AE must preserve the visibility of unknowns and reviewer actions. The governing objective for Appendix AE remains that maintenance preserves or deliberately re-establishes the accepted system state.

Table AE-1. System reliability and maintenance logic

Asset	Failure indicator	Preventive action	Post-maintenance evidence
Acoustic door	Gap drift, contact loss, force change, torn seal or incomplete latch	Clean, adjust, replace approved parts and control pressure	Gap map, operation, contact and targeted check
Glazing	Gasket shrinkage, seal cracks, frame movement, condensation or damage	Repair approved perimeter and address moisture or structure	Visual, local scan and updated schedule
Silencer	Pressure rise, contamination, access leak, casing damage or altered branch	Clean or replace within approved configuration	Airflow, pressure, background, attenuation and path record
Resilient support	Bottoming, corrosion, restraint contact, load change or degraded response	Correct load, clearance or approved support	Survey and vibration verification
Masking system	Quiet pocket, failed emitter, spectral drift or credential change	Repair, recalibrate and secure controls	Spatial map, spectra, alarms and configuration record
Firestop	Damage, cable change, missing label, movement or incompatible repair	Restore approved system with qualified work	Inspection, photographs and register update
AV system	Gain change, firmware, mute anomaly, replacement or new cable	Approved configuration and functional review	Source-state test and software baseline

¹²⁷ [MB-0919](#). ISO 10005:2018, ISO 10006:2017.

Asset	Failure indicator	Preventive action	Post-maintenance evidence
Record system	Missing files, broken links, failed hash or inaccessible format	Restore, migrate, audit and control permissions	Verified manifest, hashes and access record

Worked example AE-1. Trend data distinguish drift from a one-time anomaly

Quarterly records show gradual increase in door opening force and intermittent contact loss at the latch jamb. Individual observations remain within the broad maintenance tolerance, but the trend coincides with pressure rebalancing and rising user complaints. The owner does not wait for complete failure. Pressure, closer, hinges, latch and seal condition are reviewed together. Adjustment restores force and contact, and a targeted acoustic check confirms the expected local change. The maintenance log updates the baseline and shortens the next interval. The example shows why repeated small changes can be material even when no single observation crosses an automatic failure threshold.

Application and quality-control protocol

Appendix AE is the controlled record for reliability-centred maintenance of the accepted system. It records asset, function, failure mode, condition measure, trend, interval, task, spare, competence, common cause, post-maintenance test and residual risk. The facility reliability and security custodian controls identifiers, revision, markings, attachments, supersession and access. Closure requires evidence that maintenance preserves the accepted function without creating an undocumented state or new transmission bridge. Each field is completed, marked not applicable with a reason, or assigned as an open item with an owner and review date. Jurisdictional terms and protected references may be added as controlled overlays, while the neutral engineering fields remain visible for technical and authority review.

APPENDIX AF. MASTER GLOSSARY AND CONTROLLED TERMINOLOGY

Appendix AF consolidates canonical terms used across secure construction, acoustic security, sound transmission class, speech privacy and sound engineering. The table does not replace definitions in controlling standards or governmental programmes. It prevents the unified book from assigning one word several incompatible meanings and records the domain in which each definition is used. Jurisdiction-specific labels remain dated and attributed in the relevant chapters, while the neutral terms below provide the common technical vocabulary for cross-disciplinary design, testing and lifecycle records.

Term	Controlled definition	Primary domain
Acceptance	A documented engineering or contractual disposition for a stated object and configuration. It is distinct from governmental accreditation or authority to operate.	Governance
Accreditation	A formal act by a competent authority authorising a facility or system for a defined mission, information category and operating condition.	Authority
Adverse state	A credible operating or access condition expected to challenge performance beyond the ordinary nominal state.	System modelling
Airborne path	Transmission in which acoustic energy propagates principally through air before exciting or passing through a boundary.	Acoustics
Apparent transmission loss	A field quantity that includes direct and flanking transmission under the applicable method and tested geometry.	Measurement

Term	Controlled definition	Primary domain
As-built state	The documented physical configuration after construction, including accepted deviations and concealed-work evidence.	Configuration
As-operated state	The actual configuration and operating condition during use, including software, controls, doors, services and masking.	Configuration
As-tested state	The exact physical and operational state represented by a measurement result.	Metrology
Authority boundary	The limit beyond which engineering evidence cannot substitute for an institutional approval or protected criterion.	Governance
Background correction	A logarithmic correction used where receiving sound includes both transmitted signal and background energy, subject to method limits.	Measurement
Band result	A frequency-resolved value retained before any single-number classification is calculated.	Acoustics
Boundary continuity	The three-dimensional persistence of the intended separating function across fields, edges, openings, services and movement joints.	Construction
Bridge	An unintended rigid or high-transmission connection across an otherwise separated assembly.	Construction
Change state	A configuration after repair, alteration, maintenance, software revision or operational change that requires impact review.	Lifecycle
Claim-to-source record	A mapping between a precise proposition and the source, edition, locator, use and limitation supporting it.	Scholarship
Commissioning	A planned process that verifies readiness, functional state, measurement evidence, deficiencies and accepted baseline.	Lifecycle

Term	Controlled definition	Primary domain
Composite boundary	A separating surface or network containing elements with different areas and transmission coefficients.	Acoustics
Configuration baseline	The controlled set of physical, digital and operational records defining the accepted state.	Configuration
Controlled intervention	A deliberate, recorded and preferably reversible change used to distinguish competing transmission hypotheses.	Forensics
Critical frequency	The frequency region in which bending-wave coincidence can reduce the sound insulation of a plate-like element.	Structural acoustics
Decision rule	The documented rule connecting a measured result and its uncertainty to pass, fail, conditional or further-evidence action.	Metrology
Diagnostic measurement	A measurement selected to locate or explain a mechanism, not automatically to provide a standard acceptance quantity.	Forensics
Dominant-path migration	The change in controlling transmission route after another route has been reduced.	Acoustics
Evidence chain	The trace from requirement and source through design, installation, test, decision and later change.	Governance
Field performance	Performance of the installed relationship under the stated geometry, flanking and operating conditions.	Measurement
Flanking path	Transmission that reaches the receiver by a route other than the nominal separating element.	Acoustics
Guard band	A decision margin applied according to a declared rule to manage false acceptance or rejection near a criterion.	Metrology
Hold point	A stage beyond which work may not proceed until specified evidence has been reviewed and dispositioned.	Construction

Term	Controlled definition	Primary domain
Information consequence	The operational effect of audibility, intelligibility, repetition, identity or activity inference for the protected mission.	Security
Installed equivalence	A justified comparison showing that conditions material to a reference specimen or design are present in the field.	Evidence
Laboratory performance	Performance of a defined specimen under a controlled method and mounting condition.	Measurement
Listener access	The location, authority, dwell, repetition and capability available to a potential receiver.	Security
Mass-air-mass resonance	The low-frequency resonance of two leaves coupled through a compliant air cavity.	Structural acoustics
Material change	A change capable of altering source, path, receiver, evidence, safety or authority.	Lifecycle
Measurand	The quantity intended to be measured, defined sufficiently to make the result and uncertainty meaningful.	Metrology
Measurement uncertainty	A non-negative parameter characterising dispersion of values attributed to the measurand.	Metrology
Masking dependence	Reliance on controlled background sound to achieve a privacy or intelligibility result.	Operations
Maximum credible vocal effort	A bounded high speech-source condition selected from mission and operational evidence.	Source state
Non-equivalence doctrine	The rule that similar terminology, physics or intent across jurisdictions does not establish identical criteria or authority.	Comparative doctrine
Nonconformance	A departure from a controlled requirement, accepted submittal, procedure or baseline.	Quality
Operating state	The declared combination of door, HVAC, electronics, masking, occupancy and environmental conditions.	System modelling

Term	Controlled definition	Primary domain
Path budget	A frequency and state-specific account of direct, flanking, service and structural contributions.	Acoustics
Penetration register	The controlled lifecycle record for every service crossing of the protected boundary.	Construction
Proposition matrix	A table separating laboratory, field, speech-security and authority claims and their evidence.	Evidence
Public-source boundary	The point at which public evidence stops and controlled or project-specific direction must be supplied by the competent authority.	Scholarship
Receiver state	The declared background, access, geometry, dwell and instrumentation condition at the receiving location.	System modelling
Recommissioning	Controlled verification after change, repair, degradation or incident to establish a restored or new baseline.	Lifecycle
Residual risk	Risk remaining after controls and evidence, stated with assumptions, uncertainty and authority disposition.	Security
Reverberation time	The time required for a specified decay of sound level in a room, estimated or measured under a stated method.	Room acoustics
Room data sheet	A controlled record of mission, sources, receivers, construction, services, criteria, states and authority for one room.	Design
Single-number rating	A classification derived from frequency-resolved data under a defined method and scope.	Measurement
Sound transmission class	A single-number laboratory classification calculated from transmission-loss data under the applicable standard.	Measurement
Source state	The location, orientation, level, spectrum, duration and processing of a human or electronic source.	System modelling

Term	Controlled definition	Primary domain
Speech intelligibility	The degree to which spoken information can be understood under stated source, path, receiver and listener conditions.	Speech security
Speech privacy	A bounded condition concerning audibility or intelligibility for a defined listener and environment.	Speech security
State vector	A structured representation of variables defining the system configuration and operation at a particular time.	System modelling
Structure-borne path	Transmission carried principally by mechanical vibration through structural or service elements.	Structural acoustics
Supported inference	An explanation better supported than identified alternatives by convergent evidence without claiming certainty beyond the record.	Forensics
System boundary	The physical, operational and authority limit within which the assurance claim is evaluated.	System modelling
Technical closure	Completion of the defined evidence, correction, retest and residual-risk record for an issue.	Governance
Temporary bridge	A construction aid or contact intended to be removed but capable of becoming a permanent transmission path.	Construction
Traceability	The property by which a result, object or decision can be related to identified references through a documented chain.	Metrology
Uncertainty budget	A structured account of contributions, distributions, sensitivity and covariance used to calculate combined uncertainty.	Metrology
Vulnerability	A condition capable of permitting an adverse consequence under a defined threat and access state, without proving exploitation.	Security

Term	Controlled definition	Primary domain
Weakest path	The route or combination of routes that controls the relevant receiving consequence in a stated band and state.	Acoustics

APPENDIX AG. CONSOLIDATED FORMULA AND VALIDITY REGISTER

The formula register provides a navigation and checking layer for the equations distributed through the book. It records purpose, principal location and the limitation most likely to be lost when an expression is copied into a spreadsheet or design note. The governing equation remains the fully defined version in the cited chapter or Appendix B. Before release, the register is compared with every native equation object and every worked example so that orphan equations, undefined variables and conflicting conventions are corrected rather than concealed by typography.

Relation	Engineering use	Principal locations	Critical limitation
Energetic level addition	Combines incoherent sound-level contributions in a common band and reference.	Chapters 4, 23, 36; Appendix B	Do not use for deterministic phase-coherent summation without justification.
Energetic background subtraction	Estimates signal level from total and background levels.	Chapters 9, 35, 36; Appendix B	Becomes unstable when total and background are too close under the governing method.
Power transmission coefficient	Converts between transmitted-power ratio and transmission loss.	Chapters 5, 8, 23	Requires common reference and frequency definition.
Composite transmission coefficient	Area-weights parallel surface elements in a first-order composite model.	Chapters 20, 21, 23; Appendix B	Does not capture every junction, indirect or coherent effect.
Ideal mass-law screen	Provides a first-order trend for a limp homogeneous single leaf.	Chapters 5, 11, 15	Not a field prediction and not valid near resonance, coincidence or leakage.
Mass-air-mass resonance	Screens the low-frequency resonance of separated leaves.	Chapters 5, 12, 13; Appendix B	Input masses, cavity depth and boundary conditions must represent the assembly.

Relation	Engineering use	Principal locations	Critical limitation
Plate critical frequency	Screens bending-wave coincidence for plate-like elements.	Chapters 5, 11, 17; Appendix B	Material anisotropy, damping and boundary conditions affect the observed region.
Sabine reverberation relation	Relates room volume and equivalent absorption to decay time.	Chapters 7, 27; Appendix B	Assumes sufficiently diffuse conditions and moderate absorption.
Eyring reverberation relation	Provides a decay screen where mean absorption is not small.	Chapter 7	Still depends on diffuse-field and surface assumptions.
Schroeder-frequency screen	Estimates the transition between sparse modal and statistically diffuse behaviour.	Chapters 7, 27	It is a screen, not a sharp physical boundary.
Single-degree natural frequency	Relates mass and stiffness for a simplified mode.	Chapters 6, 13, 17, 18	Distributed structures and frequency-dependent stiffness may require modal or mobility analysis.
Isolation transmissibility	Screens force or motion transmission through an isolator.	Chapters 6, 13, 18; Appendix B	Damping and forcing assumptions must be stated.
Mechanical mobility	Relates velocity response to applied force in the frequency domain.	Chapters 6, 18, 36	Measurement position, direction and boundary state are part of the quantity.
Combined standard uncertainty	Combines sensitivity-weighted contributions including covariance where material.	Chapters 10, 35; Appendix F	Input distributions and correlation must be justified.
Expanded uncertainty	Scales combined standard uncertainty by a stated coverage factor.	Chapters 10, 35; Appendix F	The coverage factor and interpretation must be declared.
Guard-band decision relation	Connects result, uncertainty and criterion to a decision rule.	Chapters 10, 35	The rule must be selected before seeing the result.
Binomial detection probability	Screens the chance that sampling detects one or more defects.	Chapters 14, 17, 34, 36; Appendix B	Assumes a defined population and sampling model.
Path contribution fraction	Expresses one path energy relative to the combined receiving energy.	Chapters 23, 36	Correlated paths and model uncertainty must be considered.

Relation	Engineering use	Principal locations	Critical limitation
Drift significance screen	Compares change from baseline with combined variability or uncertainty.	Chapters 10, 18, 27, 36	A statistical signal does not identify the physical cause.
Availability relation	Relates uptime and downtime for a credited operational control.	Chapters 27, 38; Appendix AE	Common-cause and hidden failures may invalidate a simple independent model.

APPENDIX AH. MASTER OBJECT AND WORKED-EXAMPLE REGISTER

The following registers identify the principal reader-facing objects in this edition. Captions remain the controlling local descriptions, while this apparatus provides the cumulative ownership and navigation record used to verify every figure, table, form, and worked example against the final tome proofs.

AH.1 Figure register

Identifier	Caption	Verified volume and page
Figure 1	1. Source-path-receiver representation of a protected conversation. The security judgement depends on a defined source, a complete path inventory, a receiving condition, and an authority.	V112, p. 27
Figure 1	2. Representative parallel paths from a protected discussion room. The effective boundary is governed by the path that delivers the greatest useful speech information to an accessible receiver.	V112, p. 30
Figure 3	1. Four propositions in the evidentiary chain. Evidence may flow from left to right, but no earlier proposition automatically proves a later one.	V112, p. 95
Figure 4-1	Source, path, and receiver evidence chain. Author's original diagram.	V112, p. 163
Figure 5-1	Idealised transmission-loss regions showing a resonance weakness, a mass-controlled trend, and a coincidence depression. Values are conceptual rather than product predictions. Author's original plot.	V112, p. 198
Figure 5-2	Ideal mass-air-mass resonance as a function of cavity depth for leaves of 15 and 25 kg/m ² . Author's original calculation.	V112, p. 200
Figure 6-1	Force transmissibility of an ideal damped isolator for three damping ratios. Author's original calculation.	V112, p. 312
Figure 6-2	Ideal point-mobility magnitude for the worked single-degree model. Author's original calculation.	V112, p. 313
Figure 7-2	Illustrative talker directivity showing increased forward radiation. Author's original conceptual plot.	V112, p. 369
Figure 7-1	Approximate Schroeder frequency as a function of room volume and decay time. Author's original calculation.	V112, p. 375

Identifier	Caption	Verified volume and page
Figure 8-2	Rating evidence chain. Author's original diagram. A classification begins with frequency-band evidence, passes through a defined weighting method, and acquires contractual or security meaning only when the decision context is stated.	V112, p. 428
Figure 8-1	Frequency curves and single-number concealment. Author's original plot using illustrative data. Similar mid-band classification can conceal markedly different low-frequency transmission.	V112, p. 438
Figure 8-3	Composite weak-element effect. Author's original calculation. A 2 m ² door in a 22 m ² boundary can govern the composite result even when the surrounding wall is improved substantially.	V112, p. 441
Figure 9-1	Metric hierarchy. Author's original diagram. Physical observations are transformed into field quantities, speech consequences, and finally a bounded decision. Each transformation adds assumptions.	V112, p. 500
Figure 9-3	Speech-recovery chain. Author's original diagram. The utterance is transformed by the source room, boundary, flanking paths, receiving condition, and listener before information is recovered.	V112, p. 505
Figure 9-2	Illustrative intelligibility probability. Author's original plot. The curves are explanatory only and are not standard acceptance thresholds.	V112, p. 508
Figure 10-2	Illustrative guard-band decision. Author's original diagram. The acceptance threshold can be separated from the nominal requirement to control decision risk.	V112, p. 572
Figure 10-4	Conformity probability and uncertainty. Author's original plot using normal-distribution illustrations. The same best estimate supports different confidence when uncertainty changes.	V112, p. 574
Figure 10-1	Illustrative uncertainty budget. Author's original plot. The bars are explanatory rather than universal values and show why dominant contributors should be identified.	V112, p. 575
Figure 10-3	Monte Carlo output distribution. Author's original simulation. Vertical lines indicate the illustrative 2.5th percentile, median, and 97.5th percentile.	V112, p. 578
Figure 11-1	Composite anatomy of a paper-faced gypsum panel. Author's original diagram. The exposed facings and formulated core act together as a composite plate. Thickness and surface density are specimen properties. They are not sound-insulation classifications.	V113, p. 11
Figure 11-2	Idealised single-leaf response regions. Author's original diagram. The curve is explanatory rather than a product prediction. Actual response depends upon surface density, orthotropic stiffness, damping, finite dimensions, support and leakage.	V113, p. 37

Identifier	Caption	Verified volume and page
Figure 11-3	Joint, perimeter and fastening controls for a gypsum-board leaf. Author's original diagram. The drawing is conceptual. Project details must follow the applicable tested or evaluated construction.	V113, p. 39
Figure 11-4	Panel and aperture as parallel transmission paths. Author's original diagram. The small opening can govern the energy sum even when the panel field has high transmission loss.	V113, p. 43
Figure 11-5	Board-level evidence chain from product identity to authority decision. Author's original diagram. Each link requires a distinct record, and no link proves the next proposition automatically.	V113, p. 69
Figure 12-1	Comparative framing topologies. Author's original diagram. The board faces are shown at the outer edges. Single shared studs, staggered studs, independent double rows and chase walls create different structural paths even where total thickness and board mass are similar.	V113, p. 76
Figure 12-2	Parallel-path model for a framed wall. Author's original diagram. Energy crosses through the cavity and through structural connections. The total result is limited by the strongest remaining path.	V113, p. 79
Figure 12-3	Ideal mass-air-mass resonance for selected leaf masses. Author's original calculation. The curves are first estimates for uniform air cavities without structural connections.	V113, p. 83
Figure 12-4	Stud spacing and effective compliance. Author's original diagram. Each stud line has a frequency-dependent connection compliance, while the spacing also sets panel-bay dimensions.	V113, p. 87
Figure 12-6	Tall-wall head conditions. Author's original diagram. A movement detail must accommodate structural displacement while preserving the intended acoustic topology and continuous seal.	V113, p. 103
Figure 12-5	Cavity absorber installation states. Author's original diagram. Product identity alone does not establish thickness, continuity, compression or clearance.	V113, p. 107
Figure 13-1	Intended resilient-channel attachment and a rigid screw short circuit. Author's original schematic. The compliant path exists only while the board screw engages the channel without reaching the primary framing.	V113, p. 150
Figure 13-2	Isolation clip and hat-channel load path. Author's original diagram. The supported leaf applies static and dynamic force through the secondary channel to discrete resilient clips and then into the primary frame.	V113, p. 156
Figure 13-3	Idealised spring-mass representation of a resiliently supported finish leaf. Author's original analytical model. A real assembly contains distributed panel modes, cavity stiffness and parallel paths.	V113, p. 158

Identifier	Caption	Verified volume and page
Figure 13-4	Idealised force transmissibility for three damping ratios. Author's original plot. Damping suppresses resonance but modifies the high-frequency asymptote.	V113, p. 159
Figure 13-5	Perimeter isolation at a resiliently supported lining. Author's original schematic. The finish leaf remains clear of the bounding surface while a compatible flexible joint closes the air path and accommodates movement.	V113, p. 187
Figure 13-6	Independent lining in front of a massive wall. Author's original diagram. The clear gap must remain free of ties, adhesive contact, service brackets and debris unless those elements are specifically engineered and included in evidence.	V113, p. 189
Figure 13-7	Constrained-layer damping in a two-board leaf. Author's original schematic. Relative shear in the viscoelastic interlayer dissipates energy when the composite bends.	V113, p. 191
Figure 14-1	Complete boundary network for a lightweight secure-room enclosure. Author's original schematic. The field panel, junctions, openings and services form one acoustic and evidentiary system.	V113, p. 236
Figure 14-2	Head-of-wall detail showing structural movement, stud clearance, membrane termination and layered joint controls. Author's original schematic. The acoustic closure must not lock the intended slip mechanism.	V113, p. 242
Figure 14-3	Membrane penetrations and cavity coupling. Author's original schematic. Box offset, cavity path, conduit continuity and opposite-leaf integrity govern the result.	V113, p. 251
Figure 14-4	Through-penetration showing supporting construction, penetrant, annulus, backing, firestop and acoustic closure. Author's original schematic. Each layer has a distinct function and evidence boundary.	V113, p. 259
Figure 14-5	Joint movement states. Author's original schematic. Installed width, maximum opening, maximum closing and cyclic history must be distinguished.	V113, p. 268
Figure 14-6	Forensic opening and restoration sequence. Author's original schematic. The intervention moves from authority and baseline documentation through exposure, examination, controlled repair and repeat measurement.	V113, p. 288
Figure 14-7	Leakage diagnostic map combining room-level measurement, local pressure, surface vibration and controlled temporary sealing. Author's original schematic.	V113, p. 300
Figure 14-8	Configuration evidence states from design through construction, forensic exposure, repair and retest. Author's original schematic. Each transition requires its own record and cannot be inferred from the final finish alone.	V113, p. 310

Identifier	Caption	Verified volume and page
Figure 15-1	Hollow, partially grouted and fully grouted concrete masonry configurations. Author's original schematic. The visible wall can conceal materially different distributions of air, grout, reinforcement, mass and stiffness.	V114, p. 20
Figure 15-2	Parallel acoustic and structural paths through a hollow masonry unit wall. Author's original schematic. Face-shell bending, web force transmission, cell pressure and mortar-joint leakage contribute in different proportions by frequency.	V114, p. 26
Figure 15-3	Periodic grout, reinforcement and bond-beam network in partially grouted masonry. Author's original schematic. The structural pattern also creates a spatially varying vibration path.	V114, p. 31
Figure 15-4	Grout lift, consolidation and concealed void mechanisms. Author's original schematic. Material test results do not independently prove complete filling throughout every cell.	V114, p. 34
Figure 15-5	Unsealed and continuously purged masonry leakage networks. Author's original schematic. A coating improves only the surface it covers and retains.	V114, p. 50
Figure 15-6	Brick cavity wall with ties, mortar debris, lintel and floor-edge paths. Author's original schematic. Nominal cavity separation is not equivalent to mechanical independence.	V114, p. 53
Figure 15-7	Historic structural clay tile with irregular cells, local fractures and uncertain infill. Author's original schematic. Existing-condition uncertainty should be made explicit before drilling, loading or assigning an acoustic model.	V114, p. 57
Figure 15-8	Forensic inspection grid with escalating verification methods. Author's original schematic. Inspection density should follow consequence, heterogeneity and likely defect clustering.	V114, p. 67
Figure 16-1	Movement-compatible masonry joint with backer rod, controlled bond line and discontinuous finish returns. Author's original schematic. The acoustic closure must remain airtight throughout the specified movement without becoming a rigid bridge.	V114, p. 100
Figure 16-2	Independent lining against masonry with a clear cavity, absorber, isolated perimeter and services retained on the room side. Author's original schematic. Local stabilisation points must be designed as bounded mechanical bridges.	V114, p. 110
Figure 16-4	Crack-diagnostic sequence from mapping and classification through reversible sealing, spectral retest and causal analysis. Author's original diagram. A visible crack, an active acoustic path and a structural cause are separate propositions.	V114, p. 116
Figure 16-3	Direct and flanking network for a masonry separating wall. Author's original diagram. Slab, façade, intersecting partition, ceiling plenum and services can each become dominant after the direct wall is improved.	V114, p. 119

Identifier	Caption	Verified volume and page
Figure 17-1	Cast-in-place concrete wall showing reinforcement, construction joint, form-tie locations, sleeve and slab junction. Author's original schematic. The uniform barrier is interrupted by deliberate and accidental paths that require separate evidence.	V114, p. 172
Figure 17-2	Precast panel joint showing structural connection, bearing, interior acoustic seal, exterior weather seal and cavity. Author's original schematic. Structural continuity and air closure are separate functions.	V114, p. 180
Figure 17-3	Tilt-up sequence from casting through lifting, bracing, joint sealing and interior secondary boundary. Author's original schematic. Acoustic evidence must follow the construction sequence.	V114, p. 183
Figure 17-4	Room-within-room construction inside a concrete shell with isolated floor, independent walls, isolated ceiling and controlled service transitions. Author's original schematic.	V114, p. 186
Figure 17-R1	Precast joint topology showing separate air-seal and structural-connection paths. Author's original schematic.	V114, p. 201
Figure 18-1	Structural continuity from protected room through slab, beam, column and adjacent radiator. Author's original schematic. Energy can bypass a high-isolation wall without crossing its central field.	V114, p. 255
Figure 18-2	Hollow-core slab with longitudinal voids, plank joint, topping and wall intersection. Author's original schematic. A penetration can enter a cavity extending beyond the room boundary.	V114, p. 258
Figure 18-4	Post-tensioned slab with tendon profile, anchor zone, protected drilling corridor and secure-room penetration. Author's original schematic. Acoustic work must remain subordinate to tendon safety.	V114, p. 259
Figure 18-3	Floating floor with resilient layer, isolated perimeter, door transition and service bridge. Author's original schematic. The weakest rigid connection can control the system.	V114, p. 262
Figure 18-R1	Coupled slab, column and room path network. Author's original schematic.	V114, p. 272
Figure 19-1	Historic rubble wall with irregular wythes, voided core, timber pocket, mortar loss and later service chase. Author's original schematic. The acoustic path cannot be inferred from visible thickness alone.	V114, p. 331
Figure 19-2	Ashlar wall with concealed flue, timber floor pocket, later infill and room-side closure. Author's original schematic. A surface patch can leave a connected vertical acoustic path.	V114, p. 335
Figure 19-3	Reversible independent lining inside historic stone construction with inspection cavity, secondary glazing and isolated service zone. Author's original schematic.	V114, p. 338

Identifier	Caption	Verified volume and page
Figure 19-4	Historic evidence map combining archival hypothesis, surface survey, controlled openings, material samples and acoustic observations. Author's original diagram.	V114, p. 340
Figure 19-R1	Connected void route through a heterogeneous rubble wall. Author's original schematic.	V114, p. 348
Figure 20-1	Complete acoustic door assembly comprising leaf, frame, hinges, latch, compression seals, automatic bottom, threshold, perimeter closure and wall interface. Author's original schematic.	V115, p. 14
Figure 20-2	Compression-seal geometry showing correct contact, under-compression, over-compression and corner discontinuity. Author's original schematic.	V115, p. 19
Figure 20-3	Two-door sound lock with absorbent vestibule, offset sight line, separate frames and controlled door sequence. Author's original plan.	V115, p. 25
Figure 20-4	Door commissioning sequence from documents and geometry through operational adjustment, local leakage mapping, field measurement and lifecycle baseline. Author's original flow diagram.	V115, p. 27
Figure 20-R1	Door perimeter contact map with a weak bottom and corner leak. Author's original schematic.	V115, p. 38
Figure 21-1	Glazing is a coupled material, frame, perimeter and façade system. Author's original diagram.	V115, p. 83
Figure 21-2	Idealised finite-pane trend and coincidence depression. Author's original diagram.	V115, p. 88
Figure 21-3	Laminated glass gains damping through interlayer shear, not through the word laminated. Author's original diagram.	V115, p. 91
Figure 21-4	Narrow IGU cavities and deep secondary-glazing cavities require different resonance and frame models. Author's original diagram.	V115, p. 95
Figure 21-5	Curtain-wall framing can flank partitions horizontally and vertically. Author's original diagram.	V115, p. 102
Figure 21-6	A vision panel alters leaf mass, local stiffness, seals and fire or security listings. Author's original diagram.	V115, p. 109
Figure 21-7	Laboratory and field glazing tests answer different questions because specimen boundaries, source geometry, room absorption and flanking differ. Author's original diagram.	V115, p. 118
Figure 21-8	Lifecycle control links accepted configuration, inspection, incident triage, reversible diagnosis, repair and verified recommissioning. Author's original diagram.	V115, p. 138
Figure 22-1	Floor-ceiling and roof systems form a network of direct airborne, impact, plenum, service and junction paths. Author's original diagram.	V115, p. 155
Figure 22-2	Laboratory and field impact measurements require a defined source, specimen, receiving room, microphone distribution and reportable metric. Author's original diagram.	V115, p. 160

Identifier	Caption	Verified volume and page
Figure 22-3	A floating floor is a distributed mass-spring-damper system whose useful isolation depends on dynamic stiffness, surface mass, damping and complete edge isolation. Author's original diagram.	V115, p. 169
Figure 22-4	Raised access floors combine removable plate radiation, pedestal coupling, perimeter gaps and service-plenum continuity. Author's original diagram.	V115, p. 175
Figure 22-5	A ceiling with a shared plenum is an interroom path rather than merely an absorptive finish. Author's original diagram.	V115, p. 179
Figure 22-6	Ideal hanger transmissibility improves above resonance, but perimeter contacts, services and restraints can bypass the model. Author's original calculation plot.	V115, p. 183
Figure 22-7	Roof assemblies couple exterior loading, rooftop plant, deck flanking and wall-head movement. Author's original diagram.	V115, p. 187
Figure 22-8	Forensic diagnosis proceeds from state definition through discriminating intervention to verified remediation and a new lifecycle baseline. Author's original diagram.	V115, p. 203
Figure 23-1	Source, path and receiver graph for complete-envelope acoustic-security analysis. Author's original diagram. Each edge represents a defined transfer quantity rather than an assumed verbal relation.	V115, p. 240
Figure 23-2	Frequency-dependent path dominance for a mixed envelope. Author's original diagram. The governing path changes with frequency, so one remedial priority cannot be assumed for the whole spectrum.	V115, p. 247
Figure 23-3	Four-element junction geometry used to organise direct and flanking transmission. Author's original diagram. Each directional route requires defined connected elements, junction geometry and reference quantity.	V115, p. 254
Figure 23-4	A controlled path matrix relates source elements, junctions and receiving elements while preserving direction, method, evidence and uncertainty. Author's original diagram.	V115, p. 264
Figure 23-5	Multiroom graph models should distinguish protected, controlled, uncontrolled and service-access nodes, together with state-dependent edges. Author's original diagram.	V115, p. 267
Figure 23-6	Hybrid models assign deterministic, statistical, empirical and measured treatments according to frequency, path type and evidence quality. Author's original diagram.	V115, p. 276
Figure 23-7	Diagnostic intervention turns path identification into a controlled causal test while preserving collateral-state controls. Author's original diagram.	V115, p. 293
Figure 23-8	Remediation selection exposes acoustic, cost and maintenance trade-offs rather than hiding them in one score. Author's original diagram.	V115, p. 325
Figure 24-1	HVAC acoustic security is a coupled source-path-receiver network. Author's original diagram.	V116, p. 12

Identifier	Caption	Verified volume and page
Figure 24-4	Rectangular-duct modal behaviour changes above transverse cut-on. Author's original diagram.	V116, p. 20
Figure 24-2	Cross-talk is governed by the complete branch, terminal and room route. Author's original diagram.	V116, p. 24
Figure 24-3	Silencer selection balances attenuation, regenerated noise and pressure loss. Author's original diagram.	V116, p. 28
Figure 24-5	Duct and plenum casings transmit by panel radiation, seams, doors and supports. Author's original diagram.	V116, p. 36
Figure 24-6	Airborne attenuation does not control vibration bypasses through mounts, connectors and supports. Author's original diagram.	V116, p. 53
Figure 24-7	Cross-talk and breakout diagnosis requires simultaneous source, duct, casing and receiving-room evidence. Author's original diagram.	V116, p. 57
Figure 24-8	Commissioning must sample credible HVAC operating states rather than one favourable setting. Author's original diagram.	V116, p. 77
Figure 25-1	A service crossing is a coupled path through the medium, supports, sleeve, treatment and receiving structure. Author's original diagram.	V116, p. 89
Figure 25-2	The matrix shows where evidence must exist. A filled cell does not imply that the evidence passes its technical review. Author's original diagram.	V116, p. 102
Figure 26-1	Electronic systems change source level, pickup, routing, structural excitation and the operating state of the room. Author's original diagram.	V116, p. 204
Figure 26-2	Every electronic asset requires linked physical, functional, software and authority evidence. Author's original diagram.	V116, p. 216
Figure 26-3	The system boundary joins capture, processing, transport, reproduction, control and assurance evidence. Author original diagram.	V116, p. 226
Figure 26-4	Networked audiovisual systems couple media, clock, control, power and evidence planes. Author original diagram.	V116, p. 246
Figure 26-5	Lifecycle assurance returns every material change to a controlled comparison and recommissioning decision. Author original diagram.	V116, p. 269
Figure 27-1	Occupied speech protection depends on source effort, room response, boundary transfer, receiving background and listener access. Author's original diagram.	V116, p. 276
Figure 27-2	Acceptance must reproduce the credible states that can control detectability, not merely the convenient normal state. Author's original diagram.	V116, p. 287
Figure 27-3	The occupied acoustic claim joins source, room, boundary, receiving state, listener access and controlled evidence. Author original diagram.	V116, p. 297

Identifier	Caption	Verified volume and page
Figure 27-4	Masking commissioning maps zones, emitters and critical listener positions at doors, grilles and quiet locations. Author original diagram.	V116, p. 320
Figure 27-5	Human response, room excitation, audibility, behaviour and lifecycle change form a feedback loop around the controlled baseline. Author original diagram.	V116, p. 355
Figure 28-1	Diplomatic-room assurance links authorised function to controlled criteria, project evidence and a competent-authority decision. Author's original diagram.	V117, p. 18
Figure 28-2	The matrix preserves the distinction among disclosed policy, protected criteria, technical evidence and final governmental disposition. Author's original diagram.	V117, p. 27
Figure 28-3	Treated and modular treated conference-room concepts depend on host-structure, HVAC, power, data, fire, egress, accessibility, configuration, assembly, testing and lifecycle interfaces. Author original diagram.	V117, p. 38
Figure 28-4	Construction-security evidence moves through material identity, secure custody, first-of-type work, inspection, measurement, nonconformance, as-built records and controlled release; missed evidence triggers stop-work and recovery. Author original diagram.	V117, p. 64
Figure 28-5	Diplomatic secure-room assurance operates as a lifecycle loop linking threat and mission review, operations, monitoring, change, incident response, repair, evidence updates, inspection, targeted recommissioning and competent-authority decision. Author original diagram.	V117, p. 92
Figure 29-1	A SCIF is an authorised lifecycle system supported by policy, controlled criteria, project evidence and an accreditation decision. Author's original diagram.	V117, p. 99
Figure 29-2	The evidence chain remains open until technical findings and authority decisions agree with the current configuration. Author's original diagram.	V117, p. 108
Figure 29-3	Public doctrine flows from policy through standards and technical specifications into project-controlled criteria, evidence and a competent-authority decision; protected criteria remain outside the public reconstruction. Author original diagram.	V117, p. 121
Figure 29-4	Construction evidence moves through source control, material identity, surveillance, hold-point release, commissioning and deficiency closure before it can support accreditation. Author original diagram.	V117, p. 145
Figure 29-5	Whole-of-government secure-facility assurance is a lifecycle loop linking mission, authority, design, construction, testing, operations, change, incident response and renewed decision. Author original diagram.	V117, p. 172

Identifier	Caption	Verified volume and page
Figure 30-1	United Kingdom secure-speech assurance aligns protective concept, national technical authority, evidence and continuing control. Author's original diagram.	V117, p. 177
Figure 30-2	The crosswalk records function and evidence without turning distinct institutional terms into synonyms. Author's original diagram.	V117, p. 185
Figure 30-3	United Kingdom public authority and source hierarchy, showing distinct policy, protective-security, cyber and technical-security functions. Author original diagram.	V117, p. 196
Figure 30-4	Construction-to-authorisation evidence chain for a secure-speech environment. Author original diagram.	V117, p. 225
Figure 30-5	Lifecycle assurance loop for a United Kingdom secure-speech environment. Author original diagram.	V117, p. 254
Figure 31-1	Canadian secure-facility assurance links policy, departmental governance, technical authority, evidence, operations and authorised use. Author's original diagram.	V117, p. 260
Figure 31-2	Government of Canada five-zone hierarchy with an acoustic listener-access overlay. Author's original diagram.	V117, p. 272
Figure 31-3	Acoustic, physical, COMSEC, EMSEC, cyber and operational assurance converge upon the authorised room state. Author's original diagram.	V117, p. 309
Figure 31-4	Construction evidence chain from approved detail to as-built record. Author's original diagram.	V117, p. 321
Figure 31-5	Lifecycle assurance loop for Canadian secure facilities. Author's original diagram.	V117, p. 334
Figure 32-1	Four-jurisdiction comparative architecture linked by a neutral engineering core. Author's original diagram.	V117, p. 352
Figure 32-2	Crosswalk method from source through function, evidence and decision. Author's original diagram.	V117, p. 356
Figure 32-3	Neutral engineering core with four jurisdictional overlays. Author's original diagram.	V117, p. 375
Figure 32-4	Construction-security evidence chain. Author's original diagram.	V117, p. 410
Figure 32-5	Evidence ladder and maximum defensible inference. Author's original diagram.	V117, p. 423
Figure 32-6	Lifecycle and material-change review loop. Author's original diagram.	V117, p. 430
Figure 33-1	Requirement traceability converts protected function into verifiable project evidence. Author's original diagram.	V117, p. 459
Figure 33-2	A secure-room data sheet records functional and evidentiary conditions, not merely finishes. Author's original diagram.	V117, p. 465
Figure 33-3	Secure construction usually requires both performance and prescriptive controls. Author's original diagram.	V117, p. 468
Figure 33-4	Submittal evidence becomes progressively more project-specific. Author's original diagram.	V117, p. 475

Identifier	Caption	Verified volume and page
Figure 33-6	A first-of-type mock-up is a construction-release gate. Author's original diagram.	V117, p. 478
Figure 33-5	Equal headline ratings do not establish substitution equivalence. Author's original diagram.	V117, p. 480
Figure 33-7	The acceptance matrix links every requirement to evidence and disposition. Author's original diagram.	V117, p. 485
Figure 33-8	Design change control preserves the evidentiary chain. Author's original diagram.	V117, p. 489
Figure 34-1	The construction evidence chain links requirement, approved proposal, observation, disposition, baseline and authority decision. Author's original diagram.	V117, p. 546
Figure 34-2	Risk-ranked coverage combines consequence, concealment, novelty and repetition to select surveillance intensity. Author's original diagram.	V117, p. 554
Figure 34-3	The first-of-type release loop proves design, sequence, workmanship, inspection and evidence before repetition. Author's original diagram.	V117, p. 562
Figure 34-4	A concealed-work evidence packet accumulates layer-specific observations before each irreversible closure. Author's original diagram.	V117, p. 569
Figure 34-5	The penetration-register data model links physical opening, service, approved system, inspections, images, nonconformances and lifecycle changes. Author's original diagram.	V117, p. 597
Figure 34-6	The nonconformance disposition tree separates containment, consequence analysis, authorised disposition, corrective execution, verification and closure. Author's original diagram.	V117, p. 603
Figure 34-7	The configuration-state ladder preserves distinctions among as-designed, as-submitted, as-installed, as-tested and as-authorised evidence. Author's original diagram.	V117, p. 614
Figure 34-8	Lifecycle change control links proposed work, boundary-impact screening, authorised execution, evidence update, retesting and baseline revision. Author's original diagram.	V117, p. 623
Figure 35-1	A defensible commissioning measurement links the authorised question to a defined measurand, controlled state, traceable instrument chain, uncertainty and final disposition. Author's original diagram.	V117, p. 634
Figure 35-2	The matrix requires each evidence class to retain its own method, state and inference limit while contributing to one controlled commissioning record. Author's original diagram.	V117, p. 657
Figure 36-1	Forensic acoustic investigation moves from an authorised question through preservation, baseline reconstruction, discriminating tests, remedy, retest, and controlled closure. Author's original diagram.	V117, p. 729
Figure 36-2	Preservation must bind physical, digital, measurement, witness, and authority records into one traceable state.	V117, p. 737

Identifier	Caption	Verified volume and page
Figure 36-3	A symptom should be expanded into competing path families before the team selects a localising method.	V117, p. 758
Figure 36-4	State-dependent investigation requires explicit control of source, boundary, plant, background, and listener-access variables.	V117, p. 777
Figure 36-5	A local response map identifies regions for further testing; it does not by itself prove a causal defect.	V117, p. 782
Figure 36-6	A controlled intervention gains causal value only when its prediction, collateral variables, negative evidence, and alternative explanations are recorded.	V117, p. 800
Figure 36-7	After a successful local repair, another path may become the system limit and must be measured rather than assumed.	V117, p. 812
Figure 36-8	Technical closure must produce a recoverable dossier, a new baseline, lifecycle triggers, and an authority disposition.	V117, p. 826
Figure 37-1	Integrated secure-room design proceeds from authorised use and source state through path modelling, coordinated construction, measurement, uncertainty, authority disposition and lifecycle control. Author's original diagram.	V118, p. 13
Figure 37-2	The legal-suite wall uses independent stud rows, staggered board layers, controlled head movement, isolated services and continuous perimeter closure. Author's original diagram.	V118, p. 23
Figure 37-3	The CMU executive room coordinates grouted cells, parging, independent lining, frame closure, movement, services and structural junctions. Author's original diagram.	V118, p. 29
Figure 37-4	The historic-stone retrofit uses a reversible inner lining, inspectable cavity, controlled discrete supports, secondary opening treatments and moisture-compatible details. Author's original diagram.	V118, p. 35
Figure 37-5	Door and sound-lock design integrates two maintained doorsets, vestibule absorption, sequencing, pressure, egress, access control and overhead paths. Author's original diagram.	V118, p. 38
Figure 37-6	The HVAC and service-path network separates supply and return routes, controls cross-talk, limits casing breakout, coordinates supports and dampers, and preserves inspection access. Author's original diagram.	V118, p. 44
Figure 37-7	The room-within-room system uses a floating floor, independent walls and ceiling, isolated services, controlled restraints and inspected clearances. Author's original diagram.	V118, p. 52
Figure 37-8	Integrated commissioning links construction, functional systems, path diagnostics, whole-room performance, authority disposition and lifecycle recommissioning. Author's original diagram.	V118, p. 66

Identifier	Caption	Verified volume and page
Figure 38-1	Failure analysis proceeds from reported symptom through baseline preservation, competing hypotheses, discriminating tests, supported mechanism, correction, retest and authority disposition. Author's original diagram.	V118, p. 93
Figure 38-2	Door-system failure can arise at the head, jambs, threshold, hinges, latch, hardware preparations and surrounding frame. Author's original diagram.	V118, p. 99
Figure 38-3	HVAC transmission may follow supply branches, returns, shared plenums, casing breakout, structural supports and operating-state changes. Author's original diagram.	V118, p. 103
Figure 38-4	Massive walls can contain incomplete joints, ungrouted cells, service chases, cracks, embedded elements and structural continuity that bypass surface mass. Author's original diagram.	V118, p. 108
Figure 38-5	Fasteners, backing, pipework and restraints can create rigid force paths across an otherwise resilient system. Author's original diagram.	V118, p. 116
Figure 38-6	Unreviewed changes can move a room from accepted configuration through undocumented work to latent weakness, complaint, investigation and controlled recommissioning. Author's original diagram.	V118, p. 121
Figure 38-7	A narrow campaign can sample only favourable combinations while leaving doors, voids, structural junctions, quiet states and amplified sources untested. Author's original diagram.	V118, p. 139
Figure 38-8	Institutional learning turns an observation into investigation, correction, verified closeout, programme change and renewed assurance rather than allowing the same process to recur. Author's original diagram.	V118, p. 163
Figure XII-1	The secure-room result is produced by a coupled source, transfer-network, receiver, evidence and authority system. Author's original diagram.	V118, p. 170
Figure XII-2	Laboratory, field, occupied speech-security and authority are separate propositions. Author's original diagram.	V118, p. 175
Figure XII-3	The complete boundary is a network of parallel and state-dependent paths. Author's original diagram.	V118, p. 179
Figure XII-4	Design, submittal, construction, testing, operation and change form a controlled configuration loop. Author's original diagram.	V118, p. 191
Figure XII-5	Source authority and technical evidence occupy different layers. Author's original diagram.	V118, p. 194
Figure XII-6	Commissioning connects requirements, observed construction, calibrated evidence, limitations and authority. Author's original diagram.	V118, p. 229

Identifier	Caption	Verified volume and page
Figure XII-7	Full-volume validation proceeds through architecture, technical content, equations, sources, objects, editorial quality, apparatus, document integrity, rendering and package verification. Author's original diagram.	V118, p. 267
Figure XII-8	A checksum-sealed publication chain connects frozen text, rendered pagination, validated apparatus, manifest, member hashes and a release identifier. Author's original diagram.	V118, p. 267

AH.2 Table register

Identifier	Caption	Verified volume and page
Table 1	1. Threat classes, representative receiving conditions, primary evidence, and limitations.	V112, p. 37
Table 2	1. Evidence hierarchy for acoustic-security claims.	V112, p. 61
Table 3	1. Four propositions, their evidence, confounders, and permissible conclusions.	V112, p. 120
Table 3	2. Principal laboratory, field, speech, and authority quantities and their limits.	V112, p. 121
Table 8-1	Principal rating families and bounded propositions	V112, p. 437
Table 8-2	Evidence needed when comparing nominally equal-rated products	V112, p. 480
Table 9-1	Example occupied-condition state matrix	V112, p. 528
Table 10-1	Illustrative decision schedule for minimum field performance	V112, p. 601
Table 11-1	Product, application and acoustic evidence. The table distinguishes product identity and installation requirements from laboratory acoustic evidence, installed field performance, occupied speech-security performance and formal authority disposition.	V113, p. 19
Table 11-2	Board-substitution evidence matrix. The basis-of-design and proposed records are compared at specimen level before a substitution is accepted.	V113, p. 52
Table 11-3	Board-level inspection hold points. Each hold point identifies the record, a representative reject condition and the corrective action required before the work is released.	V113, p. 55
Table 11-4	Forensic observation matrix for gypsum-board boundaries. The table separates an observed condition from competing mechanisms, the observation capable of discriminating among them and the limit on attribution.	V113, p. 64
Table 12-1	Framing topology, principal path and evidentiary caution. The table distinguishes the mechanical relation between leaves from broad product labels.	V113, p. 76

Identifier	Caption	Verified volume and page
Table 12-2	Structural and acoustic variables requiring coordinated submittal review. The same framing choice can affect strength, serviceability, acoustic coupling, fire evidence and construction records.	V113, p. 101
Table 12-3	Cavity absorber condition, mechanism and inspection evidence. The table separates intended porous damping from compression, voids, rigid substitutions and split-cavity conditions.	V113, p. 107
Table 12-4	Concealed-work hold points for framed acoustic boundaries. The table connects each inspection stage to a reproducible record and release criterion.	V113, p. 128
Table 13-1	Resilient support systems and the connection they actually create. The comparison separates product names from mechanical paths and evidentiary limits.	V113, p. 150
Table 13-2	Variables that must be fixed before a resilient assembly can be compared with test evidence. The table converts broad product descriptions into reviewable configuration data.	V113, p. 154
Table 13-3	Concealed-work hold points for resilient channels, clips and independent linings. The release criteria are tied to assembly evidence rather than surface appearance.	V113, p. 212
Table 13-4	Common failure mechanisms, expected symptoms and discriminating inspection. The table distinguishes a candidate mechanism from the observation and test needed to support it.	V113, p. 216
Table 13-5	Remediation choices must target the verified path rather than the visible symptom. Each intervention preserves evidence and specifies post-repair confirmation.	V113, p. 221
Table 14-1	Junction taxonomy, dominant failure mechanisms and required evidence. Each junction must be evaluated as a physical and documentary condition.	V113, p. 236
Table 14-2	Penetration classes, dominant paths and evidence burden. Product category alone does not establish a complete boundary solution.	V113, p. 252
Table 14-3	Distinct evidence for acoustic, fire, movement, structural and security functions. One visible bead or patch cannot be presumed to satisfy every proposition.	V113, p. 271
Table 14-4	Concealed-work hold points and minimum evidence. Inspection is linked to the last stage at which the relevant condition remains observable.	V113, p. 275
Table 14-5	Repair and forensic-opening decision matrix. Repair scope is determined by the affected functions, evidence and ability to reproduce assembly identity.	V113, p. 295
Table 15-1	Product standards and the bounded propositions they establish. Product compliance does not establish completed wall acoustic performance.	V114, p. 21

Identifier	Caption	Verified volume and page
Table 15-2	Hollow, partially grouted and fully grouted CMU configurations, dominant uncertainties and minimum evidence.	V114, p. 36
Table 15-3	Mortar, grout, parging and plaster perform different wall functions, exhibit different failure modes and demand different inspection evidence.	V114, p. 42
Table 15-4	Concrete brick, fired-clay brick, hollow brick and structural clay tile distinctions. Similar external shape does not establish equivalent material or acoustic behaviour.	V114, p. 55
Table 15-5	Construction-surveillance hold points for masonry work.	V114, p. 64
Table 15-R1	Masonry mechanism, discriminating evidence, bounded conclusion and primary corrective route.	V114, p. 95
Table 16-R1	Joint and lining failure modes, diagnostic controls and repair constraints.	V114, p. 164
Table 16-1	Joint type, required movement and acoustic consequence	V114, p. 165
Table 16-2	Independent-lining design variables and failure mechanisms	V114, p. 166
Table 16-3	Crack observation, discriminating test and bounded conclusion	V114, p. 167
Table 16-4	Remediation selection matrix	V114, p. 168
Table 17-R1	Concrete construction state, hidden defect, verification method and acoustic implication.	V114, p. 247
Table 17-1	Concrete system, dominant discontinuity and acoustic evidence	V114, p. 248
Table 17-2	Concrete defect and investigation method	V114, p. 249
Table 17-3	Construction-surveillance hold points for concrete boundaries	V114, p. 250
Table 17-4	Repair method and proof boundary	V114, p. 251
Table 18-R1	Slab-path source, governing diagnostic quantity and preferred control level.	V114, p. 323
Table 18-1	Slab system and flanking characteristics	V114, p. 324
Table 18-2	Vibration measurand and inferential limit	V114, p. 325
Table 18-3	Floating-floor failure modes	V114, p. 326
Table 18-4	Lifecycle triggers for slab retesting	V114, p. 327
Table 19-R1	Historic feature, conservation risk, acoustic path and reversible intervention.	V114, p. 408

Identifier	Caption	Verified volume and page
Table 19-1	Stone family, property uncertainty and acoustic implication	V114, p. 409
Table 19-2	Historic-wall evidence classes	V114, p. 410
Table 19-3	Conservation-compatible intervention hierarchy	V114, p. 411
Table 19-4	Historic-room hold points	V114, p. 412
Table 20-R1	Door subsystem, failure signature, commissioning control and lifecycle trigger.	V115, p. 72
Table 20-1	Door component and failure signature	V115, p. 72
Table 20-2	Performance evidence and its boundary	V115, p. 74
Table 20-3	Commissioning sequence and acceptance record	V115, p. 75
Table 20-4	Sound-lock design variables	V115, p. 78
Table 21-1	Evidence classes and the bounded propositions they support	V115, p. 84
Table 21-2	Glazing configurations, dominant mechanisms and minimum evidence	V115, p. 114
Table 21-3	Glazing commissioning state matrix	V115, p. 128
Table 21-4	Frame and façade components, principal failure signatures and evidence	V115, p. 149
Table 21-5	Measurement and classification methods used in glazing assessment	V115, p. 150
Table 22-1	Evidence classes for horizontal boundaries and the propositions they establish.	V115, p. 156
Table 22-2	Principal floor and roof systems, dominant mechanisms and recurrent field limits.	V115, p. 164
Table 22-3	Floating-floor failure modes, expected signatures and discriminating evidence.	V115, p. 172
Table 22-4	Ceiling and plenum configurations, useful evidence and principal limitations.	V115, p. 182
Table 22-5	Design, concealed-work and commissioning hold points for horizontal boundaries.	V115, p. 200
Table 23-1	Evidence classes and the bounded propositions they can establish	V115, p. 241
Table 23-2	Complete-envelope path taxonomy and minimum diagnostic evidence	V115, p. 249
Table 23-3	Model families, input burden and bounded use in complete-envelope analysis	V115, p. 276
Table 23-4	Diagnostic interventions and discriminating interpretations	V115, p. 304

Identifier	Caption	Verified volume and page
Table 23-5	Complete-envelope acceptance and lifecycle schedule	V115, p. 330
Table 24-1	Standards and the bounded propositions they establish.	V116, p. 14
Table 24-2	Duct components, dominant mechanisms and characteristic failure modes.	V116, p. 31
Table 24-3	Silencer selection and evidence requirements.	V116, p. 70
Table 24-4	Commissioning state matrix.	V116, p. 84
Table 24-5	Lifecycle inspection, maintenance and forensic controls.	V116, p. 85
Table 25-1	System, principal mechanism and required evidence.	V116, p. 100
Table 25-2	Release gate.	V116, p. 110
Table 25-3	Minimum service-path graph fields	V116, p. 114
Table 25-4	Firestop and acoustic-control non-equivalence matrix	V116, p. 131
Table 25-5	Multi-attribute penetration proposition register	V116, p. 153
Table 25-6	Recommended penetration hold-point sequence	V116, p. 156
Table 25-7	Local diagnostic measurement uncertainty budget template	V116, p. 163
Table 25-8	Penetration-register minimum data schema	V116, p. 171
Table 25-9	Chapter 25 integrated release matrix	V116, p. 176
Table 25-10	Chapter 25 lifecycle trigger register	V116, p. 188
Table 25-11	Penetration-substitution equivalence checklist	V116, p. 190
Table 26-1	System, principal mechanism and required evidence.	V116, p. 214
Table 26-2	Electronic boundary node and edge register.	V116, p. 226
Table 26-3	Mute and privacy-state verification matrix.	V116, p. 234
Table 26-4	Conferencing performance and security-relevant states.	V116, p. 243
Table 26-5	Interface capability and control register.	V116, p. 250
Table 26-6	Sensor technology and secure-room implications.	V116, p. 257

Identifier	Caption	Verified volume and page
Table 26-7	Configuration baseline minimum record.	V116, p. 264
Table 26-8	Commissioning matrix for principal electronic states.	V116, p. 267
Table 26-9	Event-driven retest selection.	V116, p. 269
Table 26-10	Chapter 26 release gate.	V116, p. 271
Table 27-1	System, principal mechanism and required evidence.	V116, p. 285
Table 27-2	Occupied-state hierarchy and evidence boundary.	V116, p. 297
Table 27-3	Absorber and finish substitution control.	V116, p. 303
Table 27-4	Vocal-effort source-state register.	V116, p. 310
Table 27-5	Receiving-background state register.	V116, p. 315
Table 27-6	Masking architecture comparison.	V116, p. 317
Table 27-7	Spatial masking and listener-position matrix.	V116, p. 320
Table 27-8	Speech metric applicability and exclusions.	V116, p. 326
Table 27-9	Meeting-cycle transition matrix.	V116, p. 337
Table 27-10	Chapter 27 commissioning measurement plan.	V116, p. 346
Table 27-11	Chapter 27 release gate.	V116, p. 358
Table 28-1	System, principal mechanism and required evidence.	V117, p. 25
Table 28-2	Public authority and project-evidence chain.	V117, p. 35
Table 28-3	Diplomatic facility and use-state taxonomy.	V117, p. 43
Table 28-4	Specialised room terminology and configuration controls.	V117, p. 46
Table 28-5	Host-building due-diligence register.	V117, p. 56
Table 28-6	Secure logistics and material-identity controls.	V117, p. 62
Table 28-7	Concealed-work hold-point and evidence matrix.	V117, p. 67
Table 28-8	Diplomatic-room commissioning and functional-test matrix.	V117, p. 77

Identifier	Caption	Verified volume and page
Table 28-9	Disposition terminology and authority boundaries.	V117, p. 83
Table 28-10	Lifecycle change and recommissioning triggers.	V117, p. 87
Table 29-1	System, principal mechanism and required evidence.	V117, p. 106
Table 29-2	Release gate.	V117, p. 116
Table 29-3	Authority, role, evidence, and decision boundary.	V117, p. 118
Table 29-4	Public source hierarchy and configuration-control fields.	V117, p. 120
Table 29-5	Facility and use-state taxonomy.	V117, p. 124
Table 29-6	Building-system interface register.	V117, p. 130
Table 29-7	Construction-security and concealed-work hold points.	V117, p. 145
Table 29-8	Commissioning and functional-test matrix.	V117, p. 150
Table 29-9	Accreditation and reciprocity evidence matrix.	V117, p. 154
Table 29-10	Agency and programme crosswalk.	V117, p. 159
Table 29-11	Lifecycle change and recommissioning triggers.	V117, p. 167
Table 30-1	System, principal mechanism and required evidence.	V117, p. 184
Table 30-2	Release gate.	V117, p. 191
Table 30-3	United Kingdom authority, role, evidence, and decision boundary.	V117, p. 193
Table 30-4	Operational Requirement chain for a secure-speech project.	V117, p. 197
Table 30-5	Public concept distinctions.	V117, p. 199
Table 30-6	Adjacency and access-zone register.	V117, p. 203
Table 30-7	Glazing and optical-technical-security interface.	V117, p. 210
Table 30-8	Discipline boundary matrix.	V117, p. 221
Table 30-9	Construction-security control and evidence schedule.	V117, p. 224
Table 30-10	First-of-type and nonconformance decision matrix.	V117, p. 230

Identifier	Caption	Verified volume and page
Table 30-11	Commissioning and authorisation matrix.	V117, p. 237
Table 30-12	Change trigger and proportionate recommissioning matrix.	V117, p. 244
Table 31-1	Canadian secure-facility authority and evidence responsibilities	V117, p. 261
Table 31-2	Physical-security zones and acoustic listener-access implications	V117, p. 271
Table 31-3	Organisation screening and site-capability distinctions	V117, p. 280
Table 31-4	Publicly described specialised-facility process	V117, p. 284
Table 31-5	Acoustic quantities and defensible inferences	V117, p. 293
Table 31-6	Distinct security domains at the secure-room interface	V117, p. 310
Table 31-7	Information categories and facility-control implications	V117, p. 312
Table 31-8	Representative concealed-work hold points	V117, p. 321
Table 31-9	Environmental and seasonal states for Canadian facilities	V117, p. 323
Table 31-10	Complete-envelope commissioning state matrix	V117, p. 327
Table 31-11	Illustrative measurement-uncertainty budget	V117, p. 329
Table 32-1	Jurisdictional comparison rule	V117, p. 353
Table 32-2	Authority and decision ownership crosswalk	V117, p. 357
Table 32-3	Protected-room terminology register	V117, p. 362
Table 32-4	Information categories and release controls	V117, p. 364
Table 32-5	Decision-type separation	V117, p. 368
Table 32-6	Source hierarchy and status fields	V117, p. 371
Table 32-7	Controlled-document handling states	V117, p. 373
Table 32-8	Threat and risk assumption register	V117, p. 379
Table 32-9	Metric and method crosswalk	V117, p. 389
Table 32-10	Technical-security domain boundaries	V117, p. 407

Identifier	Caption	Verified volume and page
Table 32-11	Procurement and supply-chain evidence	V117, p. 411
Table 32-12	Information-model and annex architecture	V117, p. 413
Table 32-13	Uncertainty and decision-rule record	V117, p. 420
Table 32-14	Approval and authority matrix	V117, p. 426
Table 32-15	Multinational release register	V117, p. 440
Table 32-16	Crosswalk gap-state taxonomy	V117, p. 443
Table 33-1	Requirement-traceability fields	V117, p. 462
Table 33-2	Contractual hierarchy conflict record	V117, p. 498
Table 33-3	Quantitative performance schedule fields	V117, p. 500
Table 33-4	Interface matrix minimum fields	V117, p. 503
Table 33-5	Maintainability and obsolescence review	V117, p. 522
Table 33-6	Review and witness responsibility matrix	V117, p. 525
Table 33-7	Record classes and handling controls	V117, p. 531
Table 33-8	Publication-ready specification checklist	V117, p. 540
Table 33-9	Submittal disposition categories	V117, p. 540
Table 33-10	Substitution comparison fields	V117, p. 541
Table 33-11	Acceptance dossier structure	V117, p. 541
Table 34-1	Minimum construction-surveillance-plan fields	V117, p. 551
Table 34-2	Risk-ranked surveillance matrix	V117, p. 554
Table 34-3	Hold-point schedule fields	V117, p. 566
Table 34-4	Material-identity and provenance record	V117, p. 571
Table 34-5	Photographic evidence fields	V117, p. 592
Table 34-6	Penetration-register minimum schema	V117, p. 597

Identifier	Caption	Verified volume and page
Table 34-7	Door and seal schedule fields	V117, p. 599
Table 34-8	Nonconformance classification and response	V117, p. 603
Table 34-9	Corrective-action closure dossier	V117, p. 609
Table 34-10	Secure construction handover dossier	V117, p. 619
Table 35-1	System, principal mechanism and required evidence	V117, p. 655
Table 35-2	Extended measurement and commissioning controls	V117, p. 700
Table 35-3	Evidence-family reconciliation	V117, p. 709
Table 35-4	Deficiency and retest governance	V117, p. 717
Table 35-5	Release gate	V117, p. 726
Table 36-1	Complaint symptom, candidate path, and immediate discriminating action	V117, p. 733
Table 36-2	Preservation and authority controls for the examination	V117, p. 736
Table 36-3	Baseline record hierarchy and comparability questions	V117, p. 744
Table 36-4	Localisation methods and their inferential limits	V117, p. 755
Table 36-5	Sound-intensity and vibration localisation quality controls	V117, p. 781
Table 36-6	Controlled-opening and physical-sampling plan	V117, p. 788
Table 36-7	Instrument, calibration, and field-check matrix	V117, p. 793
Table 36-8	Uncertainty and discrepancy components in a forensic conclusion	V117, p. 804
Table 36-9	Remedial-design selection and collateral obligations	V117, p. 809
Table 36-10	Configuration-change triggers and required response	V117, p. 818
Table 36-11	Recommissioning dossier and authority-closure fields	V117, p. 826
Table 36-12	Expert-report architecture for a forensic acoustic matter	V117, p. 831
Table 36-13	Programme-level common-cause investigation fields	V117, p. 838
Table 36-14	Source and public-access limitations register	V117, p. 851

Identifier	Caption	Verified volume and page
Table 37-1	Integrated design-basis and evidence matrix	V118, p. 16
Table 37-2	Comparative assembly and project-condition study	V118, p. 59
Table 37-3	Openings and service-path controls	V118, p. 63
Table 37-4	Integrated commissioning schedule	V118, p. 66
Table 37-5	Case-study acceptance and lifecycle register	V118, p. 69
Table 38-1	Evidence status and permissible conclusion	V118, p. 94
Table 38-2	Institutional classification of an adverse observation	V118, p. 146
Table 38-3	Example path-migration ledger	V118, p. 150
Table 38-4	Lifecycle change-trigger matrix	V118, p. 153
Table 38-5	Chapter 38 release gate for a failure investigation	V118, p. 165
Table XII	1-G. Integration gate for The system-level thesis	V118, p. 172
Table XII	2-G. Integration gate for The four-proposition doctrine	V118, p. 176
Table XII	3-G. Integration gate for The weakest-path doctrine	V118, p. 180
Table XII	4-G. Integration gate for Source states and information consequence	V118, p. 184
Table XII	5-G. Integration gate for Receiver access and operating states	V118, p. 188
Table XII	6-G. Integration gate for Configuration lifecycle and evidence chain	V118, p. 192
Table XII	7-G. Integration gate for Evidence hierarchy and public-source boundaries	V118, p. 196
Table XII	8-G. Integration gate for Design principles for lightweight construction	V118, p. 200
Table XII	9-G. Integration gate for Masonry, concrete, stone and massive construction	V118, p. 204
Table XII	10-G. Integration gate for Doors, glazing and movable boundaries	V118, p. 208
Table XII	11-G. Integration gate for Building services and the acoustic boundary	V118, p. 212
Table XII	12-G. Integration gate for Room acoustics, masking and operational control	V118, p. 216
Table XII	13-G. Integration gate for Measurement architecture and metrology	V118, p. 220

Identifier	Caption	Verified volume and page
Table XII	14-G. Integration gate for Uncertainty and decision rules	V118, p. 224
Table XII	15-G. Integration gate for Construction surveillance and concealment	V118, p. 227
Table XII	16-G. Integration gate for Commissioning and acceptance	V118, p. 231
Table XII	17-G. Integration gate for Forensic diagnosis and remediation	V118, p. 235
Table XII	18-G. Integration gate for Lifecycle governance and change control	V118, p. 239
Table XII	19-G. Integration gate for Governmental comparison and authority boundaries	V118, p. 243
Table XII	20-G. Integration gate for Programme assurance and institutional learning	V118, p. 247
Table XII	21-G. Integration gate for Final synthesis	V118, p. 257
Table XII	22-G. Integration gate for Publication and authority boundary	V118, p. 261
Table XII	23-G. Integration gate for Closing design and evidentiary propositions	V118, p. 264
Table XII	24-G. Integration gate for Final research and professional agenda	V118, p. 268
Table XII	25-G. Integration gate for Unified-book architecture: secure construction, acoustic security, STC, and sound engineering	V118, p. 271
Table XII	26-G. Integration gate for Continuous revision, source freeze, and immutable release practice	V118, p. 273
Table A-1	Notation, symbols, units and conventions	V118, p. 276
Table B-1	Principal equations, validity conditions and interpretation	V118, p. 280
Table C-1	Canonical calculation record	V118, p. 298
Table D-1	Source-state matrix	V118, p. 301
Table E-1	Test-planning form	V118, p. 305
Table F-1	Uncertainty-budget template	V118, p. 309
Table G-1	Penetration register	V118, p. 313
Table H-1	Door, frame, hardware and seal schedule	V118, p. 317
Table I-1	Glazing and frame schedule	V118, p. 321
Table J-1	HVAC and air-path register	V118, p. 325

Identifier	Caption	Verified volume and page
Table K-1	Inspection hold-point schedule	V118, p. 329
Table L-1	Commissioning checklist and evidence dossier	V118, p. 333
Table M-1	Construction-surveillance checklist	V118, p. 337
Table N-1	Forensic examination form	V118, p. 340
Table O-1	Remediation register	V118, p. 343
Table P-1	Change-control form	V118, p. 347
Table Q-1	Governmental crosswalk methodology	V118, p. 351
Table R-1	Source-status and citation methodology	V118, p. 354
Table S-1	Model specification language	V118, p. 357
Table T-1	Expert-report outline	V118, p. 360
Table U-1	Lifecycle inspection and recommissioning schedule	V118, p. 363
Table V-1	Validation gates and publication-evidence chain	V118, p. 366
Table W-1	Owner's project requirements and room-data-sheet template	V118, p. 370
Table X-1	Acceptance, conditional use and authority-disposition form	V118, p. 374
Table Y-1	Programme metrics, audit and corrective-action effectiveness	V118, p. 378
Table Z-1	Data integrity, file control and checksum practice	V118, p. 382
Table AA-1	Multidisciplinary design-review checklist	V118, p. 386
Table AB-1	Failure-mode, effects and criticality method	V118, p. 389
Table AC-1	Competence, training and responsibility matrix	V118, p. 393
Table AD-1	Information-consequence and speech-exposure assessment	V118, p. 396
Table AE-1	System reliability and maintenance logic	V118, p. 401

AH.3 Worked-example register

Identifier	Subject	Verified volume and page
Worked example 4	1. Combining and subtracting levels	V112, p. 135
Worked example 4	2. Surface-power estimate	V112, p. 137
Worked example 4	3. Resistive surface	V112, p. 139
Worked example 4	4. Digital record	V112, p. 141
Worked example 4	5. Energetic spatial average	V112, p. 145
Worked example 4	6. Sensitivity correction	V112, p. 151
Worked example 5	1. Ideal normal-incidence mass-law estimate	V112, p. 195
Worked example 5	2. Sensitivity of critical frequency to thickness	V112, p. 198
Worked example 5	3. Double-leaf resonance	V112, p. 200
Worked example 5	4. Wall with a weak door	V112, p. 205
Worked example 6	1. Point mobility at resonance	V112, p. 266
Worked example 6	2. Damping from decay	V112, p. 269
Worked example 6	3. Isolator selection	V112, p. 273
Worked example 6	4. Panel radiation estimate	V112, p. 281
Worked example 7	1. Effect of vocal-effort uncertainty	V112, p. 346
Worked example 7	2. Lowest axial modes	V112, p. 350
Worked example 7	3. Required absorption area	V112, p. 352
Worked example 7	4. Bandwise masking margin	V112, p. 355
Worked example 7	5. Weighted audibility score	V112, p. 360
Worked example 8	1. From transmission coefficient to band loss	V112, p. 430
Worked example 8	2. Simplified reference-contour fitting	V112, p. 432
Worked example 8	3. A high-rated wall with a modest door	V112, p. 440

Identifier	Subject	Verified volume and page
Worked example 9	1. Energetic averaging	V112, p. 502
Worked example 9	2. Standardising a field difference	V112, p. 503
Worked example 9	3. Band speech-to-background margin	V112, p. 510
Worked example 9	4. Background-limited receiving band	V112, p. 518
Worked example 9	5. Zero observed recoveries	V112, p. 523
Worked example 10	1. Combined uncertainty in a standardised difference	V112, p. 569
Worked example 10	2. Nonlinear background subtraction	V112, p. 578
Worked example 10	3. Shared-risk rule	V112, p. 581
Worked example 10	4. Guarded rule	V112, p. 581
Worked example 10	5. Clear failure	V112, p. 582
Worked example 10	6. Lower-bound result	V112, p. 582
Worked example 11	1. Thickness and idealised bending stiffness	V113, p. 15
Worked example 11	2. Converting customary surface mass	V113, p. 17
Worked example 11	3. Idealised mass-law sensitivity to surface mass	V113, p. 24
Worked example 11	4. Mass and stiffness of two-layer alternatives	V113, p. 32
Worked example 11	5. Idealised critical-frequency comparison	V113, p. 36
Worked example 11	6. A small unsealed opening	V113, p. 42
Worked example 11	7. Surface-density uncertainty	V113, p. 51
Worked example 12	1. A structural path limiting an improved cavity path	V113, p. 79
Worked example 12	2. Cavity depth and equal leaves	V113, p. 81
Worked example 12	3. Unequal leaves	V113, p. 82
Worked example 12	4. Bay-mode sensitivity to stud spacing	V113, p. 84
Worked example 12	5. Connection-line density	V113, p. 88

Identifier	Subject	Verified volume and page
Worked example 12	6. Double-row cavity depth and path control	V113, p. 95
Worked example 12	7. Area-weighted cavity-depth variation	V113, p. 110
Worked example 12	8. Batt compression	V113, p. 112
Worked example 12	9. Pair estimates for a split cavity	V113, p. 114
Worked example 12	10. Ideal lateral deflection of a tall partition stud	V113, p. 121
Worked example 12	11. Height sensitivity under unchanged pressure	V113, p. 123
Worked Example 12	10 calculated 17.6 mm ideal deflection for a 4.27 m wall. Suppose the clear height increases to 4.88 m [16 ft] with the same member, spacing and pressure. Because,	V113, p. 123
Worked example 12	12. Stud substitution mechanism review	V113, p. 133
Worked example 13	1. Ideal support resonance from clip stiffness	V113, p. 156
Worked example 13	2. Frequency ratio at a speech-relevant band	V113, p. 159
Worked example 13	3. Screw-length margin	V113, p. 161
Worked example 13	4. Change in area stiffness from channel spacing	V113, p. 162
Worked example 13	5. Tolerance stack for avoiding a stud bridge	V113, p. 166
Worked example 13	6. Ceiling clip load	V113, p. 169
Worked example 13	7. Resonance range from preload-dependent clip stiffness	V113, p. 172
Worked example 13	8. Clip count and sensitivity to spacing	V113, p. 176
Worked example 13	9. Independent lining resonance	V113, p. 190
Worked example 13	10. Bounded resonance reduction	V113, p. 193
Worked example 13	11. Eccentric display load on an isolated leaf	V113, p. 199
Worked example 13	12. Ceiling clip load with service allowance	V113, p. 203
Worked example 13	13. Bounded sensitivity of damping peak to temperature shift	V113, p. 207
Worked example 13	14. Local vibration-transfer change with uncertainty	V113, p. 214

Identifier	Subject	Verified volume and page
Worked example 13	15. Probability of missing a dispersed defect	V113, p. 217
Worked example 14	1. Composite transmission through a small open leak	V113, p. 237
Worked example 14	2. Parallel path control after successive repairs	V113, p. 239
Worked example 14	3. Head-joint movement demand	V113, p. 243
Worked example 14	4. Rotation-induced differential opening	V113, p. 245
Worked example 14	5. Equivalent open area of a perimeter slit	V113, p. 248
Worked example 14	6. Debris bridge as a stiffness path	V113, p. 250
Worked example 14	7. Area ratio of an outlet opening	V113, p. 253
Worked example 14	8. Cavity-path area comparison for two box types	V113, p. 255
Worked example 14	9. Equipment support as a parallel stiffness path	V113, p. 257
Worked example 14	10. Annular area and sealant volume	V113, p. 260
Worked example 14	11. Joint-width tolerance and movement percentage	V113, p. 269
Worked example 14	12. Sealant volume for a rectangular joint	V113, p. 272
Worked example 14	13. Probability of detecting distributed workmanship defects	V113, p. 276
Worked example 14	14. Before-and-after closure of a dominant opening	V113, p. 284
Worked example 14	15. Repair-area ratio and its evidentiary meaning	V113, p. 296
Worked example 14	16. Screw-length control in a repaired resilient lining	V113, p. 298
Worked example 14	17. Uncertainty in a local level-difference diagnostic	V113, p. 300
Worked example 14	18. Receiving-level change after dominant leak closure	V113, p. 301
Worked example 14	19. Trend threshold for repeat field testing	V113, p. 309
Worked example 14	20. Simple risk ranking	V113, p. 311
Worked example 15	1. Percentage solid and the limits of a unit calculation	V114, p. 21
Worked example 15	2. Estimating unit-derived surface mass	V114, p. 24

Identifier	Subject	Verified volume and page
Worked example 15	3. Surface mass including mortar and reinforcement	V114, p. 27
Worked example 15	4. Ideal mass-law comparison as a bounded screen	V114, p. 29
Worked example 15	5. Area-weighted screening model for partial grouting	V114, p. 32
Worked example 15	6. Bond-beam contribution to average surface mass	V114, p. 32
Worked example 15	7. Grout volume for a controlled lift	V114, p. 36
Worked example 15	8. Void fraction from a bounded mass balance	V114, p. 36
Worked example 15	9. Density-class substitution and surface mass	V114, p. 39
Worked example 15	10. Mortar-joint area fraction	V114, p. 42
Worked example 15	11. Incomplete head-joint leakage	V114, p. 43
Worked example 15	12. Grout-density and fill-fraction estimate	V114, p. 45
Worked example 15	13. Sampling probability for missed grouted cells	V114, p. 46
Worked example 15	14. Vertical reinforcement line-mass contribution	V114, p. 48
Worked example 15	15. Added surface mass from parging	V114, p. 51
Worked example 15	16. Distributed porosity and surface sealing	V114, p. 51
Worked example 15	17. Mass-air-mass screening for a masonry cavity wall	V114, p. 55
Worked example 15	18. Screening the surface mass of a hollow clay-tile wall	V114, p. 58
Worked example 15	19. Moisture-related change in screened mass law	V114, p. 60
Worked example 15	20. Through-crack screening	V114, p. 60
Worked example 15	21. Composite effect of an access panel	V114, p. 62
Worked example 15	22. Laboratory-to-field residual	V114, p. 64
Worked example 15	23. Probability of missing a clustered defect zone	V114, p. 65
Worked example 15	24. Borescope grid spacing	V114, p. 67

Identifier	Subject	Verified volume and page
Integrated worked example 15	25. Screening a local face-shell resonance	V114, p. 72
Integrated worked example 15	26. Comparing regular and clustered partial grouting	V114, p. 75
Integrated worked example 15	27. Pressure-test evidence without acoustic overclaim	V114, p. 77
Integrated worked example 15	28. Probability of detecting a systematic defect by stratified sampling	V114, p. 89
Integrated worked example 15	29. Lot-density contribution to wall-mass uncertainty	V114, p. 91
Integrated worked example 15	30. Lintel deflection and perimeter seal strain	V114, p. 94
Worked example 16	1. Required movement capacity of an interior masonry joint	V114, p. 100
Worked example 16	2. Differential vertical shortening at a masonry-to-frame interface	V114, p. 102
Worked example 16	3. Area-weighted influence of a sealed movement joint	V114, p. 104
Worked example 16	4. Sealant cross-sectional area and extension strain	V114, p. 105
Worked example 16	5. Deck-flute bypass area	V114, p. 107
Worked example 16	6. Lintel-deflection crack opening	V114, p. 108
Worked example 16	7. Ideal resonance of a masonry-plus-lining system	V114, p. 110
Worked example 16	8. Line stiffness introduced by stabilisation brackets	V114, p. 111
Worked example 16	9. Flanking fin screening	V114, p. 113
Worked example 16	10. Annular opening around a conduit	V114, p. 114
Worked example 16	11. Crack activity rate	V114, p. 116
Worked example 16	12. Before-and-after diagnostic significance	V114, p. 117
Worked example 16	13. Combining three path contributions	V114, p. 119
Worked example 16	14. Vibration attenuation along a slab edge	V114, p. 120

Identifier	Subject	Verified volume and page
Worked example 16	15. Background correction threshold	V114, p. 121
Worked example 16	16. Selecting among three remedial paths	V114, p. 123
Worked example 16	17. Stratified inspection allocation	V114, p. 124
Worked example 16	18. Risk-prioritised inspection interval	V114, p. 126
Worked example 16	19. Temperature-dependent stiffness screen	V114, p. 127
Worked example 16	20. Annular firestop volume	V114, p. 129
Worked example 16	21. Joint-width seasonal range	V114, p. 130
Worked example 16	22. Cover-plate bridge stiffness	V114, p. 131
Worked example 16	23. Remote-level attenuation	V114, p. 131
Worked example 16	24. Cluster-sensitive expansion rule	V114, p. 132
Worked example 16	25. Trihedral void volume	V114, p. 133
Integrated worked example 16	26. Movement demand and sealant strain reserve	V114, p. 135
Integrated worked example 16	27. Longitudinal flute path	V114, p. 137
Integrated worked example 16	28. Stiffness of a bracket array	V114, p. 138
Integrated worked example 16	29. Cable-bundle change and annular reopening	V114, p. 140
Integrated worked example 16	30. Path ranking at a column intersection	V114, p. 143
Integrated worked example 16	31. Pressure force on a flexible joint cover	V114, p. 147
Integrated worked example 16	32. Required sealant movement capacity	V114, p. 154
Integrated worked example 16	33. Accumulated movement screening	V114, p. 159

Identifier	Subject	Verified volume and page
Integrated worked example 16	34. Detection probability for clustered joint defects	V114, p. 161
Worked example 17	1. Surface mass of a concrete wall	V114, p. 172
Worked example 17	2. Concrete volume and mass reconciliation	V114, p. 173
Worked example 17	3. Repeated form-tie area fraction	V114, p. 175
Worked example 17	4. Ideal mass-law comparison for two densities	V114, p. 176
Worked example 17	5. Reinforcement surface-mass fraction	V114, p. 177
Worked example 17	6. Open-crack parallel-path screen	V114, p. 178
Worked example 17	7. Precast-joint area effect	V114, p. 180
Worked example 17	8. Discrete connection transmissibility screen	V114, p. 181
Worked example 17	9. Brace-hole closure count	V114, p. 183
Worked example 17	10. Added topping mass	V114, p. 184
Worked example 17	11. Annular area around a pipe sleeve	V114, p. 185
Worked example 17	12. Floating inner-room resonance	V114, p. 186
Worked example 17	13. Cavity resonance with direct furring	V114, p. 187
Worked example 17	14. Pulse-velocity screen	V114, p. 188
Worked example 17	15. Dynamic-range lower bound	V114, p. 189
Worked example 17	16. Inspection coverage of form ties	V114, p. 191
Worked example 17	17. Restrained shrinkage strain	V114, p. 192
Worked example 17	18. Thermal extension	V114, p. 193
Worked example 17	19. Sandwich-panel surface mass	V114, p. 193
Worked example 17	20. Distributed conduit displacement	V114, p. 194
Worked example 17	21. Modal-frequency sensitivity to modulus	V114, p. 195

Identifier	Subject	Verified volume and page
Worked example 17	22. Repair-area mass effect	V114, p. 195
Integrated worked example 17	23. Sensitivity of a wall mode to modulus and thickness	V114, p. 197
Integrated worked example 17	24. Repeated tie-hole contribution	V114, p. 200
Integrated worked example 17	25. Connection-path screening in a precast wall	V114, p. 203
Integrated worked example 17	26. Effective stiffness of a partially composite layered panel	V114, p. 205
Integrated worked example 17	27. Detection probability for clustered honeycombing	V114, p. 208
Integrated worked example 17	28. Thickness tolerance and flexural rigidity	V114, p. 212
Integrated worked example 17	29. Heavyweight substitution as a bounded mass screen	V114, p. 215
Integrated worked example 17	30. Joint-width tolerance and sealant demand	V114, p. 223
Integrated worked example 17	31. Ranking a concrete corner flank	V114, p. 232
Integrated worked example 17	32. Through-crack area screen	V114, p. 237
Integrated worked example 17	33. Bridge stiffness relative to resilient support	V114, p. 240
Integrated worked example 17	34. Modal-frequency sensitivity to modulus uncertainty	V114, p. 242
Integrated worked example 17	35. Aggregate effect of repeated tie holes	V114, p. 243
Worked example 18	1. Slab surface mass	V114, p. 255
Worked example 18	2. Flexural rigidity comparison	V114, p. 256
Worked example 18	3. Rigid bridge across an isolation joint	V114, p. 257

Identifier	Subject	Verified volume and page
Worked example 18	4. Void-volume screening	V114, p. 258
Worked example 18	5. Tendon exclusion margin	V114, p. 259
Worked example 18	6. Combining impact and airborne background	V114, p. 260
Worked example 18	7. Floating-floor resonance	V114, p. 262
Worked example 18	8. Shared-plenum opening area	V114, p. 263
Worked example 18	9. Ideal force transmissibility	V114, p. 264
Worked example 18	10. Point mobility	V114, p. 264
Worked example 18	11. Bridge stiffness from floor finish	V114, p. 265
Worked example 18	12. Uncertainty in a level difference	V114, p. 266
Worked example 18	13. Ideal critical-frequency screen	V114, p. 268
Worked example 18	14. Loss factor from half-power bandwidth	V114, p. 268
Worked example 18	15. Stair-path level combination	V114, p. 269
Worked example 18	16. Underfloor opening	V114, p. 270
Worked example 18	17. Geometric attenuation screen	V114, p. 270
Worked example 18	18. Clock-drift error	V114, p. 271
Integrated worked example 18	19. Bending wavelength screen for a concrete slab	V114, p. 273
Integrated worked example 18	20. Tendon-location uncertainty and exclusion margin	V114, p. 276
Integrated worked example 18	21. Variable-speed fan crossing a slab resonance	V114, p. 279
Integrated worked example 18	22. Small bridge across a floating slab perimeter	V114, p. 282
Integrated worked example 18	23. Floor-box composite path	V114, p. 287

Identifier	Subject	Verified volume and page
Integrated worked example 18	24. Floating screed resonance	V114, p. 291
Integrated worked example 18	25. Thickness sensitivity of slab rigidity	V114, p. 295
Integrated worked example 18	26. Core opening as a parallel path	V114, p. 297
Integrated worked example 18	27. Isolation efficiency at an operating speed	V114, p. 300
Integrated worked example 18	28. Mobility and injected vibrational power	V114, p. 305
Integrated worked example 18	29. Mount count and static load	V114, p. 308
Integrated worked example 18	30. Rigid-body resonance screen	V114, p. 310
Integrated worked example 18	31. Uncertainty in a transfer-level difference	V114, p. 314
Integrated worked example 18	32. Frequency shift from added fit-out mass	V114, p. 317
Integrated worked example 18	33. Timing error and phase	V114, p. 319
Integrated worked example 18	34. Air-spring stiffness screen	V114, p. 322
Worked example 19	1. Gross mass estimate and uncertainty	V114, p. 331
Worked example 19	2. Moisture uptake from absorption data	V114, p. 332
Worked example 19	3. Connected-void Helmholtz screen	V114, p. 333
Worked example 19	4. Mortar-joint volume	V114, p. 334
Worked example 19	5. Flue cross-section and attenuation need	V114, p. 335
Worked example 19	6. Thin granite panel mass	V114, p. 336
Worked example 19	7. Two-layer composite surface mass	V114, p. 337

Identifier	Subject	Verified volume and page
Worked example 19	8. Independent lining resonance	V114, p. 338
Worked example 19	9. Secondary-glazing cavity	V114, p. 339
Worked example 19	10. Survey coverage	V114, p. 340
Worked example 19	11. Lower-bound reporting	V114, p. 341
Worked example 19	12. Joint-loss area	V114, p. 342
Worked example 19	13. Bow-induced joint change	V114, p. 343
Worked example 19	14. Slate surface mass	V114, p. 343
Worked example 19	15. Delaminated surface-plate resonance screen	V114, p. 344
Worked example 19	16. Anchor density	V114, p. 345
Worked example 19	17. Weighted option comparison	V114, p. 345
Worked example 19	18. Humidity-cycle comparison	V114, p. 346
Integrated worked example 19	19. Directional wave-speed uncertainty	V114, p. 347
Integrated worked example 19	20. Connected-void path versus total porosity	V114, p. 349
Integrated worked example 19	21. Former flue as a parallel path	V114, p. 351
Integrated worked example 19	22. Effect of a thin local zone	V114, p. 368
Integrated worked example 19	23. Two-stage flue closure	V114, p. 371
Integrated worked example 19	24. Uncertainty in stone-derived surface mass	V114, p. 376
Integrated worked example 19	25. Horizontal boundary governs a massive room	V114, p. 379
Integrated worked example 19	26. Combining thickness observations	V114, p. 385

Identifier	Subject	Verified volume and page
Integrated worked example 19	27. Thin panel surface mass	V114, p. 389
Integrated worked example 19	28. Focusing and source-position sensitivity	V114, p. 392
Integrated worked example 19	29. Diminishing value of additional heavy-wall mass	V114, p. 399
Integrated worked example 19	30. Dynamic-range limited wall result	V114, p. 406
Worked example 20	1. Door area controls a strong wall	V115, p. 14
Worked example 20	2. Scaling the leaf mass	V115, p. 15
Worked example 20	3. Ideal mass-law difference	V115, p. 16
Worked example 20	4. Frame twist and seal compression	V115, p. 16
Worked example 20	5. Sag angle	V115, p. 17
Worked example 20	6. Latch moment	V115, p. 18
Worked example 20	7. Seal compression ratio	V115, p. 19
Worked example 20	8. Threshold flatness tolerance	V115, p. 20
Worked example 20	9. Ramp length for a bevelled transition	V115, p. 20
Worked example 20	10. Undercut effect	V115, p. 21
Worked example 20	11. Vision-panel composite	V115, p. 21
Worked example 20	12. Lock-pocket area	V115, p. 22
Worked example 20	13. Pressure force on a door	V115, p. 23
Worked example 20	14. Competing seal forces	V115, p. 23
Worked example 20	15. Meeting-stile gap	V115, p. 24
Worked example 20	16. Ideal series-door screen	V115, p. 25
Worked example 20	17. Normalised insertion loss concept	V115, p. 26

Identifier	Subject	Verified volume and page
Worked example 20	18. Clearance survey statistics	V115, p. 27
Worked example 20	19. Cycle accumulation	V115, p. 28
Worked example 20	20. Relief-air velocity	V115, p. 29
Worked example 20	21. Leaf kinetic energy during closing	V115, p. 30
Worked example 20	22. Operator closing margin	V115, p. 30
Worked example 20	23. Compression-set loss	V115, p. 31
Worked example 20	24. Pair-perimeter growth	V115, p. 31
Worked example 20	25. Threshold rocking	V115, p. 32
Worked example 20	26. Modal damping	V115, p. 32
Worked example 20	27. Perimeter contribution ranking	V115, p. 33
Worked example 20	28. Vestibule reverberation	V115, p. 34
Worked example 20	29. Decision guard band	V115, p. 34
Integrated worked example 20	30. Leaf-mode shift after adding a surface plate	V115, p. 36
Integrated worked example 20	31. Seal-force balance	V115, p. 39
Integrated worked example 20	32. Vestibule absorption and inter-door level	V115, p. 43
Integrated worked example 20	33. Pressure force on an oversize leaf	V115, p. 57
Integrated worked example 20	34. Bottom-seal contact tolerance	V115, p. 60
Integrated worked example 20	35. Two-door system with a vestibule flank	V115, p. 62
Integrated worked example 20	36. Simultaneous-opening exposure fraction	V115, p. 67

Identifier	Subject	Verified volume and page
Integrated worked example 20	37. Area-weighted effect of a threshold gap	V115, p. 69
Worked example 21	1. Surface mass of a monolithic pane	V115, p. 85
Worked example 21	2. Flexural-rigidity ratio	V115, p. 86
Worked example 21	3. Critical-frequency scaling with thickness	V115, p. 88
Worked example 21	4. Ideal mass-law difference	V115, p. 89
Worked example 21	5. Laminate surface mass	V115, p. 91
Worked example 21	6. Sensitivity of a damping-controlled band	V115, p. 92
Worked example 21	7. Separation of critical-frequency estimates	V115, p. 93
Worked example 21	8. Ideal mass-air-mass resonance of an IGU	V115, p. 94
Worked example 21	9. Resonance shift with cavity depth	V115, p. 96
Worked example 21	10. First depth mode of a secondary-glazing cavity	V115, p. 97
Worked example 21	11. Frequency scaling with span	V115, p. 97
Worked example 21	12. Setting-block bearing stress	V115, p. 98
Worked example 21	13. Gasket compression	V115, p. 99
Worked example 21	14. Small perimeter opening in a strong façade	V115, p. 100
Worked example 21	15. Line-path dominance	V115, p. 103
Worked example 21	16. Sealant shear-strain screen	V115, p. 104
Worked example 21	17. Anchor-path sensitivity	V115, p. 105
Worked example 21	18. Composite façade transmission	V115, p. 106
Worked example 21	19. Weep-opening area screen	V115, p. 107
Worked example 21	20. Latch-compression imbalance	V115, p. 108
Worked example 21	21. Area-weighted vision-panel penalty	V115, p. 109

Identifier	Subject	Verified volume and page
Worked example 21	22. Added security-laminate mass	V115, p. 111
Worked example 21	23. Dew-point margin	V115, p. 112
Worked example 21	24. Cavity-depth sensitivity	V115, p. 113
Worked example 21	25. Background-limited receiving level	V115, p. 115
Worked example 21	26. Latching force and repeatable seal contact	V115, p. 116
Worked example 21	27. Oblique source distance correction	V115, p. 118
Worked example 21	28. Reverberation-normalised receiving correction	V115, p. 119
Worked example 21	29. Equal ratings, unequal residual speech bands	V115, p. 120
Worked example 21	30. Directivity-sensitive incident level	V115, p. 122
Worked example 21	31. Local intervention and path attribution	V115, p. 123
Worked example 21	32. Power-law air leakage and pressure-state sensitivity	V115, p. 124
Worked example 21	33. Nominally equal replacement mass	V115, p. 126
Worked example 21	34. Risk-based mock-up coverage	V115, p. 127
Worked example 21	35. Guarded acceptance near a threshold	V115, p. 129
Worked example 21	36. Geometric transfer screen for a larger pane	V115, p. 133
Worked example 21	37. Quiet-hour change in speech-to-background ratio	V115, p. 134
Worked example 21	38. Repeated-access probability screen	V115, p. 135
Worked example 21	39. Combined measurement and transfer uncertainty	V115, p. 136
Worked example 21	40. Inspection interval from a simple hazard rate	V115, p. 138
Worked example 21	41. Differential movement demand at a façade return	V115, p. 139
Worked example 21	42. Before-and-after cycling comparison	V115, p. 141
Worked example 21	43. Applied-film mass significance	V115, p. 142
Worked example 21	44. Submittal completeness score as an administrative screen	V115, p. 143

Identifier	Subject	Verified volume and page
Worked example 21	45. Addition of two correlated corner paths	V115, p. 144
Worked example 21	46. Sequential remediation and residual dominance	V115, p. 145
Worked example 21	47. Temporary access-state consequence	V115, p. 147
Worked example 21	48. Record reconciliation across three sources	V115, p. 149
Worked example 22	1. Surface mass of a reinforced concrete slab	V115, p. 158
Worked example 22	2. Ideal mass-law screening	V115, p. 158
Worked example 22	3. Absorption-normalised impact level	V115, p. 160
Worked example 22	4. Stride frequency and structural harmonics	V115, p. 162
Worked example 22	5. Directional bending-stiffness screen	V115, p. 165
Worked example 22	6. Approximate modal frequency of a simply supported joist	V115, p. 167
Worked example 22	7. Floating-floor natural frequency	V115, p. 169
Worked example 22	8. Ideal force transmissibility above resonance	V115, p. 170
Worked example 22	9. Composite effect of a rigid bridge	V115, p. 171
Worked example 22	10. Applying a difference spectrum cautiously	V115, p. 173
Worked example 22	11. Cable-grommet opening fraction	V115, p. 175
Worked example 22	12. Pedestal load and resilient-pad pressure	V115, p. 176
Worked example 22	13. Reverberation effect of added ceiling absorption	V115, p. 179
Worked example 22	14. Combining direct wall and plenum paths	V115, p. 180
Worked example 22	15. Hanger natural frequency	V115, p. 183
Worked example 22	16. Isolation efficiency of a rooftop spring mount	V115, p. 187
Worked example 22	17. Open-area effect of a movement gap	V115, p. 189
Worked example 22	18. Panel-latch compression variation	V115, p. 191
Worked example 22	19. Spatial variation and arithmetic averaging	V115, p. 194

Identifier	Subject	Verified volume and page
Worked example 22	20. Plenum-barrier insertion screen	V115, p. 195
Worked example 22	21. Combining three flanking paths	V115, p. 196
Worked example 22	22. Defect-detection probability in repeated ceiling bays	V115, p. 198
Worked example 22	23. Guarded acceptance of an impact result	V115, p. 199
Worked example 22	24. Before-and-after improvement with uncertainty	V115, p. 204
Worked example 22	25. Drift in a lifecycle indicator	V115, p. 208
Worked example 22	26. Added ceiling mass and hanger load	V115, p. 209
Worked example 22	27. Resonance shift from resilient-layer stiffening	V115, p. 211
Worked example 22	28. Modal mass and acceleration screen	V115, p. 213
Worked example 22	29. Orifice-flow screening through a floor opening	V115, p. 215
Worked example 22	30. Absorption added by suspended clouds	V115, p. 219
Worked example 22	31. Drop energy and average impact force screen	V115, p. 221
Worked example 22	32. Mesh-size screen for a plate model	V115, p. 223
Worked example 22	33. Combining a direct path with a junction flank	V115, p. 227
Worked example 22	34. Local preload and resonance shift beneath equipment	V115, p. 229
Worked example 22	35. Consequence-weighted horizontal-boundary decision	V115, p. 233
Worked example 23	1. Wall, door and glazing composite	V115, p. 243
Worked example 23	2. Equivalent open area of distributed cracks	V115, p. 245
Worked example 23	3. Path contribution at one band	V115, p. 247
Worked example 23	4. Screening vibration level difference	V115, p. 251
Worked example 23	5. Equal ratings, unequal residual spectra	V115, p. 255
Worked example 23	6. Combining two impact paths	V115, p. 256
Worked example 23	7. Parallel duct and wall contributions	V115, p. 258

Identifier	Subject	Verified volume and page
Worked example 23	8. Effect of reference area on an apparent path estimate	V115, p. 259
Worked example 23	9. Directional source correction in path ranking	V115, p. 261
Worked example 23	10. Receiving absorption and pressure-level change	V115, p. 263
Worked example 23	11. Minimum-cut interpretation of a three-route boundary	V115, p. 265
Worked example 23	12. Two-stage transmission through an intermediate room	V115, p. 267
Worked example 23	13. Distributed plenum with three outlet rooms	V115, p. 269
Worked example 23	14. Door and wall in one boundary	V115, p. 270
Worked example 23	15. Two-subsystem SEA screening balance	V115, p. 272
Worked example 23	16. Modal overlap screening	V115, p. 273
Worked example 23	17. Mesh-resolution screening for a structural wave	V115, p. 275
Worked example 23	18. Single-parameter calibration and non-uniqueness	V115, p. 278
Worked example 23	19. Separating measurement and configuration uncertainty	V115, p. 281
Worked example 23	20. Effect of positive covariance	V115, p. 283
Worked example 23	21. Monte Carlo class probability	V115, p. 285
Worked example 23	22. Sensitivity of a composite level to one path	V115, p. 287
Worked example 23	23. Interaction revealed by a two-factor model	V115, p. 289
Worked example 23	24. Updating odds after a temporary-seal test	V115, p. 291
Worked example 23	25. Significance of a diagnostic intervention	V115, p. 293
Worked example 23	26. Expected value of a diagnostic test	V115, p. 295
Worked example 23	27. Selecting a two-intervention package	V115, p. 297
Worked example 23	28. Weighted residual exposure	V115, p. 299
Worked example 23	29. Duty-cycle averaging and peak-state limitation	V115, p. 301
Worked example 23	30. Guard-band comparison	V115, p. 306

Identifier	Subject	Verified volume and page
Worked example 23	31. Sequential path closure in the legal suite	V115, p. 307
Worked example 23	32. Correlated façade paths	V115, p. 310
Worked example 23	33. Three retrofit defects	V115, p. 311
Worked example 23	34. Bridge stiffness and force transmission screening	V115, p. 313
Worked example 23	35. Two-stage and direct service paths	V115, p. 315
Worked example 23	36. Detecting unit inconsistency in a path model	V115, p. 317
Worked example 23	37. Closure-ratio diagnosis	V115, p. 319
Worked example 23	38. Held-out prediction error	V115, p. 320
Worked example 23	39. Propagating a censored high-isolation path	V115, p. 323
Worked example 23	40. Pareto screening of three remedial packages	V115, p. 326
Worked example 23	41. Robust ranking under workmanship uncertainty	V115, p. 327
Worked example 23	42. Significance of a longitudinal change	V115, p. 329
Worked example 24	1. Adding fan and terminal sound power	V116, p. 15
Worked example 24	2. Subtracting a known background source	V116, p. 16
Worked example 24	3. Blade-passing frequency	V116, p. 17
Worked example 24	4. Screening a variable-speed reduction	V116, p. 18
Worked example 24	5. Filter loading and fan speed	V116, p. 18
Worked example 24	6. First transverse cut-on	V116, p. 19
Worked example 24	7. Lined-run attenuation screen	V116, p. 21
Worked example 24	8. Unequal branch division	V116, p. 22
Worked example 24	9. Series attenuation and terminal radiation	V116, p. 24
Worked example 24	10. Regenerated-noise crossover	V116, p. 27
Worked example 24	11. Air-power cost of silencer pressure loss	V116, p. 29

Identifier	Subject	Verified volume and page
Worked example 24	12. Splitter passage velocity	V116, p. 29
Worked example 24	13. Effect of reinforcement spacing	V116, p. 32
Worked example 24	14. Velocity scaling of a damper tone	V116, p. 33
Worked example 24	15. Added mass and ideal mass-law screen	V116, p. 34
Worked example 24	16. Access-door control of casing transmission	V116, p. 35
Worked example 24	17. Plenum reverberant build-up screen	V116, p. 37
Worked example 24	18. Probe-hole leakage	V116, p. 38
Worked example 24	19. Damper operating-point comparison	V116, p. 39
Worked example 24	20. Sleeve bridge screening	V116, p. 41
Worked example 24	21. Terminal sound power to local level	V116, p. 43
Worked example 24	22. Free-area velocity at a return grille	V116, p. 45
Worked example 24	23. Combining discharge and radiated paths	V116, p. 46
Worked example 24	24. Control-hunting duty cycle	V116, p. 47
Worked example 24	25. Linear-power interpolation between mapped points	V116, p. 49
Worked example 24	26. Quiet-hour loss of masking	V116, p. 50
Worked example 24	27. Equal overall levels with different masking spectra	V116, p. 51
Worked example 24	28. Fan isolator transmissibility	V116, p. 52
Worked example 24	29. Support line-force screen	V116, p. 54
Worked example 24	30. Pressure force on a door	V116, p. 54
Worked example 24	31. Laboratory dynamic-range bound	V116, p. 56
Worked example 24	32. Upstream/downstream level difference with area correction	V116, p. 57
Worked example 24	33. Temporary terminal block as a diagnostic intervention	V116, p. 59
Worked example 24	34. Casing radiation efficiency screen	V116, p. 60

Identifier	Subject	Verified volume and page
Worked example 24	35. Phase drift between recorders	V116, p. 61
Worked example 24	36. Guarded acceptance of a cross-talk result	V116, p. 62
Worked example 24	37. Monte Carlo-style percentile screen	V116, p. 63
Worked example 24	38. Compensating model errors	V116, p. 64
Worked example 24	39. Comparing three design interventions	V116, p. 65
Worked example 24	40. Path-schedule arithmetic with a generated source	V116, p. 67
Worked example 24	41. Local sensitivity of parallel paths	V116, p. 68
Worked example 24	42. State-envelope maximum	V116, p. 68
Worked example 24	43A. Detecting an incomplete silencer submittal	V116, p. 72
Worked example 24	45A. Source-stability uncertainty	V116, p. 74
Worked example 24	46A. Post-alteration path update	V116, p. 75
Worked example 24	43. Risk-based inspection allocation	V116, p. 76
Worked example 24	44. Commissioning-state coverage	V116, p. 77
Worked example 24	45. Detecting lifecycle drift	V116, p. 78
Worked example 24	46. Selecting the next diagnostic test	V116, p. 80
Worked example 24	47. Integrated return-path budget	V116, p. 82
Worked example 24	48. Free-area correction in the failure case	V116, p. 83
Worked example 25	1. Small opening dominates a high-isolation boundary	V116, p. 91
Worked example 25	2. Support natural frequency and operating ratio	V116, p. 93
Worked example 25	4. Annular area available for a sprinkler crossing	V116, p. 96
Worked example 25	6. Cable-fill screening for a modular sleeve	V116, p. 99
Worked example 25	5. Parallel-path allocation across a shared sleeve	V116, p. 113
Worked example 25	6. Reflection at a water-pipe diameter change	V116, p. 117

Identifier	Subject	Verified volume and page
Worked example 25	7. Joukowsky pressure screen and anchor force	V116, p. 120
Worked example 25	8. Event sound exposure from repeated drainage discharges	V116, p. 122
Worked example 25	9. Isolation transmissibility screen	V116, p. 125
Worked example 25	10. Static-load shift between dry and water-filled branch line	V116, p. 127
Worked example 25	11. Eccentric pipe within a sleeve	V116, p. 133
Worked example 25	12. Differential thermal movement	V116, p. 135
Worked example 25	13. Quarter-wave resonance screen for an open-closed conduit	V116, p. 138
Worked example 25	14. Cable-fill ratio and remaining geometric capacity	V116, p. 140
Worked example 25	15. Transformer force-isolation screen	V116, p. 145
Worked example 25	16. Unequal hanger loading caused by a concentrated valve mass	V116, p. 147
Worked example 25	17. Frame bridge added to a double-leaf wall	V116, p. 149
Worked example 25	18. Coherence-supported transfer estimate	V116, p. 159
Worked example 25	19. Local treatment insertion loss with uncertainty	V116, p. 160
Worked example 25	20. Background correction near the validity limit	V116, p. 162
Worked example 25	21. Guard-banded acceptance of penetration leakage	V116, p. 163
Worked example 25	22. Condensation screen at a cold pipe sleeve	V116, p. 166
Worked example 25	23. Access-panel seal compression tolerance	V116, p. 168
Worked example 25	24. Risk-priority number for inspection scheduling	V116, p. 171
Worked example 25	25. Combined leakage improvement after two remediations	V116, p. 175
Worked example 25	26. Evidence-completeness index for handover	V116, p. 176
Worked example 25	27. Gas-line characteristic impedance comparison	V116, p. 179
Worked example 25	28. Level change produced by shaft-area divergence	V116, p. 181
Worked example 25	29. Sequential repair and diminishing return	V116, p. 185

Identifier	Subject	Verified volume and page
Worked example 25	30. Inspection-interval adjustment from observed defect rate	V116, p. 187
Worked example 25	31. Capability indices for backing depth	V116, p. 193
Worked example 26	1. Electronic source-level increase	V116, p. 206
Worked example 26	3. Bracket force from harmonic acceleration	V116, p. 209
Worked example 26	8. Quiet-state background change	V116, p. 219
Worked example 26	13. Parallel capture-path completeness	V116, p. 226
Worked example 26	14. Digital headroom and acoustic consequence	V116, p. 228
Worked example 26	15. Microphone output and chain signal-to-noise ratio	V116, p. 229
Worked example 26	16. Distance-related level difference	V116, p. 231
Worked example 26	17. Spatial-alias screening frequency	V116, p. 232
Worked example 26	18. Residual attenuation in a mute path	V116, p. 234
Worked example 26	19. Sensitivity, power and distance estimate	V116, p. 236
Worked example 26	20. Directivity-index consequence	V116, p. 237
Worked example 26	21. Articulating-arm moment	V116, p. 238
Worked example 26	22. Fan blade-passing frequency	V116, p. 240
Worked example 26	23. Residual echo after ERLE	V116, p. 241
Worked example 26	24. End-to-end conversational latency	V116, p. 242
Worked example 26	26. Sample-clock drift	V116, p. 245
Worked example 26	27. PoE loop loss	V116, p. 247
Worked example 26	29. Common-mode rejection screening	V116, p. 249
Worked example 26	31. Receiver planning from seating count	V116, p. 252
Worked example 26	32. Emergency-source margin	V116, p. 253
Worked example 26	33. Horizontal field width	V116, p. 254

Identifier	Subject	Verified volume and page
Worked example 26	34. Ultrasonic wavelength	V116, p. 256
Worked example 26	35. Storage-volume screening	V116, p. 257
Worked example 26	36. Masking-state exposure interval	V116, p. 259
Worked example 26	38. Clock-offset effect on event ordering	V116, p. 261
Worked example 26	40. Hash comparison decision	V116, p. 263
Worked example 26	43. State-space screening	V116, p. 267
Worked example 26	44. Drift significance against uncertainty	V116, p. 269
Worked example 27	1. Sabine screening of reverberation time	V116, p. 278
Worked example 27	3. Axial room-mode screen	V116, p. 281
Worked example 27	5. Masking benefit reduced by vocal response	V116, p. 284
Worked example 27	8. Repetition sensitivity screen	V116, p. 290
Worked example 27	13. State-combination completeness	V116, p. 296
Worked example 27	14. Required equivalent absorption	V116, p. 299
Worked example 27	15. Sabine and Eyring comparison	V116, p. 300
Worked example 27	16. Area-weighted absorption after substitution	V116, p. 302
Worked example 27	17. Reflection-path delay	V116, p. 304
Worked example 27	18. Summation of independent electronic sources	V116, p. 306
Worked example 27	19. Critical-distance screening	V116, p. 308
Worked example 27	20. Percentile source selection	V116, p. 309
Worked example 27	21. Masking benefit with bounded Lombard response	V116, p. 312
Worked example 27	22. Time-weighted equivalent level	V116, p. 313
Worked example 27	23. Quiet-state privacy margin	V116, p. 314
Worked example 27	24. Masking-service availability	V116, p. 317

Identifier	Subject	Verified volume and page
Worked example 27	25. Spectral adjustment without broadband inflation	V116, p. 319
Worked example 27	26. Spatial variation screen	V116, p. 320
Worked example 27	27. Combined latent-failure screen	V116, p. 323
Worked example 27	28. Mount-isolation screening	V116, p. 324
Worked example 27	29. Band speech-to-background ratio	V116, p. 326
Worked example 27	30. Isolation-background combined screen	V116, p. 328
Worked example 27	31. Token-recognition confidence interval screen	V116, p. 331
Worked example 27	32. Cumulative recognition probability	V116, p. 332
Worked example 27	33. Receiver self-noise and available margin	V116, p. 334
Worked example 27	34. Exposure-opportunity screen	V116, p. 336
Worked example 27	35. Door-open duty cycle	V116, p. 337
Worked example 27	36. Source-level reduction at the receiving point	V116, p. 339
Worked example 27	37. Abnormal-state expected exposure screen	V116, p. 340
Worked example 27	38. Receiver inventory sufficiency	V116, p. 342
Worked example 27	39. Alarm-response performance	V116, p. 345
Worked example 27	40. Spatial sample count	V116, p. 346
Worked example 27	41. Combined uncertainty and guarded acceptance	V116, p. 349
Worked example 27	42. Three-sigma screening limits	V116, p. 350
Worked example 27	43. Controlled-intervention effect	V116, p. 352
Worked example 27	44. Risk-ranked retest score	V116, p. 354
Worked example 27	45. Residual-risk ranking across states	V116, p. 357
Worked example 28	1. Terminology control score	V117, p. 19
Worked example 28	2. Authority-traceability coverage	V117, p. 35

Identifier	Subject	Verified volume and page
Worked example 28	3. Weighted responsibility coverage	V117, p. 37
Worked example 28	4. Mitigation verification fraction	V117, p. 39
Worked example 28	5. Public-source sufficiency screen	V117, p. 41
Worked example 28	6. Credible state-combination count	V117, p. 42
Worked example 28	7. Geometric open-area screening	V117, p. 45
Worked example 28	8. Terminology reconciliation rate	V117, p. 46
Worked example 28	9. Weakest-domain screen	V117, p. 48
Worked example 28	10. Logarithmic combination of two source states	V117, p. 50
Worked example 28	11. Receiving-zone coverage	V117, p. 51
Worked example 28	12. Design-review closure rate	V117, p. 52
Worked example 28	13. End-to-end traceability	V117, p. 54
Worked example 28	14. Weighted due-diligence exposure	V117, p. 56
Worked example 28	15. Free-field distance screening	V117, p. 58
Worked example 28	16. Multi-authority conflict closure	V117, p. 59
Worked example 28	17. Thermal movement screening	V117, p. 60
Worked example 28	18. Chain-of-custody completeness	V117, p. 62
Worked example 28	19. Certification schedule reserve	V117, p. 64
Worked example 28	20. Escort staffing demand	V117, p. 65
Worked example 28	21. Hold-point release coverage	V117, p. 67
Worked example 28	22. Least-access screening	V117, p. 69
Worked example 28	23. End-to-end latency budget	V117, p. 70
Worked example 28	24. Ventilation opening screen	V117, p. 72
Worked example 28	25. Module floor-load screen	V117, p. 74

Identifier	Subject	Verified volume and page
Worked example 28	26. Shipping shock force screen	V117, p. 75
Worked example 28	27. Weighted commissioning completion	V117, p. 76
Worked example 28	28. Expanded uncertainty and guard band	V117, p. 79
Worked example 28	29. Decision-record completeness	V117, p. 81
Worked example 28	30. Residual-risk screen	V117, p. 82
Worked example 28	31. Punch-list burn-down	V117, p. 84
Worked example 28	32. Critical-spares availability	V117, p. 86
Worked example 28	33. Recommissioning trigger score	V117, p. 87
Worked example 28	34. Evidence-preservation completeness	V117, p. 89
Worked example 28	35. Verified lesson implementation	V117, p. 90
Worked example 28	36. Integrated evidence coverage	V117, p. 92
Worked example 29	1. Completion percentage versus controlling gate	V117, p. 100
Worked example 29	2. Guarded field decision	V117, p. 112
Worked example 29	3. Responsibility-link coverage	V117, p. 118
Worked example 29	4. Source-configuration integrity	V117, p. 121
Worked example 29	5. Planning-risk reserve	V117, p. 123
Worked example 29	6. Credible state-combination count	V117, p. 125
Worked example 29	7. Accessible-zone exposure	V117, p. 127
Worked example 29	8. Hidden-path sampling coverage	V117, p. 129
Worked example 29	9. Isolation natural-frequency screen	V117, p. 131
Worked example 29	10. Composite transmission screen	V117, p. 132
Worked example 29	11. Duct attenuation budget	V117, p. 134
Worked example 29	12. UPS autonomy screen	V117, p. 135

Identifier	Subject	Verified volume and page
Worked example 29	13. Critical-path availability	V117, p. 137
Worked example 29	14. Door-cycle demand	V117, p. 139
Worked example 29	15. Weakest-domain index	V117, p. 140
Worked example 29	16. Surveillance staffing demand	V117, p. 142
Worked example 29	17. Chain-of-custody completeness	V117, p. 143
Worked example 29	18. Hold-point release coverage	V117, p. 145
Worked example 29	19. Zero-failure sampling screen	V117, p. 147
Worked example 29	20. Least-access screening	V117, p. 148
Worked example 29	21. Weighted commissioning completion	V117, p. 150
Worked example 29	22. Guarded field result	V117, p. 152
Worked example 29	23. Root-sum-square uncertainty	V117, p. 153
Worked example 29	24. Weighted open-item closure	V117, p. 154
Worked example 29	25. Reciprocity-equivalence score	V117, p. 156
Worked example 29	26. Layered residual screen	V117, p. 157
Worked example 29	27. Self-inspection closure rate	V117, p. 159
Worked example 29	28. Crosswalk coverage	V117, p. 160
Worked example 29	29. Countermeasure implementation rate	V117, p. 162
Worked example 29	30. Inspection-frequency demand	V117, p. 163
Worked example 29	31. Maintenance-backlog exposure	V117, p. 165
Worked example 29	32. Configuration-drift index	V117, p. 166
Worked example 29	33. Recommissioning-trigger score	V117, p. 168
Worked example 29	34. Evidence-preservation completeness	V117, p. 170
Worked example 29	35. Closure-inventory reconciliation	V117, p. 171

Identifier	Subject	Verified volume and page
Worked example 29	36. Integrated evidence coverage	V117, p. 172
Worked example 30	1. Functional cross-reference count	V117, p. 178
Worked example 30	2. Authority-chain coverage	V117, p. 194
Worked example 30	3. Source-register integrity	V117, p. 196
Worked example 30	4. Requirement-to-risk traceability	V117, p. 198
Worked example 30	5. Terminology correction rate	V117, p. 200
Worked example 30	6. Credible operating-state count	V117, p. 202
Worked example 30	7. Access-weighted exposure index	V117, p. 204
Worked example 30	8. Survey confidence allocation	V117, p. 205
Worked example 30	9. Parallel-path sound reduction	V117, p. 207
Worked example 30	10. Door-open exposure time	V117, p. 209
Worked example 30	11. Line-of-sight exposure fraction	V117, p. 211
Worked example 30	12. Duct attenuation budget	V117, p. 212
Worked example 30	13. Geometric opening fraction	V117, p. 214
Worked example 30	14. Directional vibration level difference	V117, p. 216
Worked example 30	15. Equivalent absorption and reverberation estimate	V117, p. 217
Worked example 30	16. System-state combination count	V117, p. 219
Worked example 30	17. Interface-review coverage	V117, p. 221
Worked example 30	18. Inspection anomaly rate	V117, p. 223
Worked example 30	19. Concealed-work observation coverage	V117, p. 225
Worked example 30	20. Supply-chain traceability coverage	V117, p. 227
Worked example 30	21. Aggregation sensitivity score	V117, p. 229
Worked example 30	22. First-of-type defect reduction	V117, p. 231

Identifier	Subject	Verified volume and page
Worked example 30	23. Calibration drift correction	V117, p. 232
Worked example 30	24. Band speech-to-background margin	V117, p. 234
Worked example 30	25. Combined standard uncertainty and guard band	V117, p. 235
Worked example 30	26. Commissioning-state closure	V117, p. 237
Worked example 30	27. Monitoring coverage fraction	V117, p. 239
Worked example 30	28. Configuration-drift rate	V117, p. 240
Worked example 30	29. Incident-timeline completeness	V117, p. 242
Worked example 30	30. Recommissioning trigger score	V117, p. 244
Worked example 30	31. Behavioural-control compliance	V117, p. 246
Worked example 30	32. Door-force operating margin	V117, p. 247
Worked example 30	33. Claim-precision rate	V117, p. 249
Worked example 30	34. Contract-security obligation coverage	V117, p. 251
Worked example 30	35. Crosswalk classification completeness	V117, p. 252
Worked example 30	36. Lifecycle assurance closure ratio	V117, p. 254
Worked example 31	1. Governance closure ratio	V117, p. 261
Worked example 31	2. Source-status verification coverage	V117, p. 263
Worked example 31	3. Authority ambiguity index	V117, p. 265
Worked example 31	4. Risk screening score	V117, p. 266
Worked example 31	5. High-consequence fragment fraction	V117, p. 268
Worked example 31	6. Screening and need-to-know coverage	V117, p. 270
Worked example 31	7. Zone-transition control density	V117, p. 272
Worked example 31	8. Time-weighted listener exposure	V117, p. 274
Worked example 31	9. Third-party interface closure	V117, p. 276

Identifier	Subject	Verified volume and page
Worked example 31	10. Temporary-state availability	V117, p. 277
Worked example 31	11. Approved work-site coverage	V117, p. 279
Worked example 31	12. Capability alignment fraction	V117, p. 281
Worked example 31	13. Inspection workload estimate	V117, p. 283
Worked example 31	14. Specialised-facility readiness index	V117, p. 285
Worked example 31	15. Authority-to-operate evidence closure	V117, p. 286
Worked example 31	16. Communication attenuation margin	V117, p. 288
Worked example 31	17. Approved audio-state coverage	V117, p. 290
Worked example 31	18. Energetic combination of source states	V117, p. 291
Worked example 31	19. Area-weighted composite transmission	V117, p. 293
Worked example 31	20. Background-correction eligibility	V117, p. 295
Worked example 31	21. Receiver sampling density	V117, p. 296
Worked example 31	22. Door-gap open area	V117, p. 298
Worked example 31	23. Parallel flanking-path sum	V117, p. 299
Worked example 31	24. Duct-route attenuation balance	V117, p. 301
Worked example 31	25. Penetration open-area fraction	V117, p. 302
Worked example 31	26. Band speech-to-background margin after masking	V117, p. 304
Worked example 31	27. Audiovisual state-space count	V117, p. 305
Worked example 31	28. Secure communications availability	V117, p. 307
Worked example 31	29. Protected-source boundary coverage	V117, p. 309
Worked example 31	30. Facility-evaluation closure ratio	V117, p. 311
Worked example 31	31. Physical and cyber control coverage	V117, p. 313
Worked example 31	32. Supply-chain screening score	V117, p. 315

Identifier	Subject	Verified volume and page
Worked example 31	33. Access anomaly rate	V117, p. 316
Worked example 31	34. Sensitive-information exposure index	V117, p. 318
Worked example 31	35. Custody-chain completion	V117, p. 319
Worked example 31	36. Hold-point detection probability	V117, p. 321
Worked example 31	37. Seasonal joint movement	V117, p. 324
Worked example 31	38. Coordinated requirement closure	V117, p. 325
Worked example 31	39. Commissioning state coverage	V117, p. 327
Worked example 31	40. Combined standard uncertainty	V117, p. 329
Worked example 31	41. Guard-band acceptance decision	V117, p. 331
Worked example 31	42. Competence coverage	V117, p. 332
Worked example 31	43. Mean time between configuration-affecting events	V117, p. 334
Worked example 31	44. Foreign-interface approval closure	V117, p. 335
Worked example 31	45. Public-source releaseability fraction	V117, p. 337
Worked example 31	46. Collaboration-access reduction	V117, p. 339
Worked example 31	47. Alternate-site suitability score	V117, p. 340
Worked example 31	48. Sanitisation evidence completeness	V117, p. 342
Worked example 31	49. Dominant-path contribution in a multi-tenant case	V117, p. 344
Worked example 32	1. Crosswalk source coverage	V117, p. 354
Worked example 32	2. False-equivalence rate	V117, p. 356
Worked example 32	3. Authority closure ratio	V117, p. 358
Worked example 32	4. Delegation ambiguity index	V117, p. 360
Worked example 32	5. Terminology collision fraction	V117, p. 362
Worked example 32	6. Classification mapping confidence	V117, p. 365

Identifier	Subject	Verified volume and page
Worked example 32	7. Effective personnel access	V117, p. 366
Worked example 32	8. Decision-chain latency	V117, p. 369
Worked example 32	9. Source age indicator	V117, p. 371
Worked example 32	10. Controlled-document minimisation	V117, p. 373
Worked example 32	11. Neutral-core reuse	V117, p. 375
Worked example 32	12. Requirement completeness	V117, p. 377
Worked example 32	13. Risk screening score	V117, p. 379
Worked example 32	14. Source-state coverage	V117, p. 381
Worked example 32	15. Time-weighted listener exposure	V117, p. 382
Worked example 32	16. Laboratory similarity score	V117, p. 384
Worked example 32	17. Field dynamic-range margin	V117, p. 386
Worked example 32	18. Speech-to-background margin	V117, p. 388
Worked example 32	19. Metric-name collision	V117, p. 390
Worked example 32	20. Masking-state availability	V117, p. 391
Worked example 32	21. Door-gap area	V117, p. 393
Worked example 32	22. Glazing composite loss	V117, p. 395
Worked example 32	23. Duct attenuation balance	V117, p. 397
Worked example 32	24. Parallel flanking paths	V117, p. 398
Worked example 32	25. Penetration open fraction	V117, p. 400
Worked example 32	26. Electronic-state coverage	V117, p. 402
Worked example 32	27. Cyber-physical control overlap	V117, p. 404
Worked example 32	28. TSCM finding closure	V117, p. 405
Worked example 32	29. EMSEC installation evidence	V117, p. 408

Identifier	Subject	Verified volume and page
Worked example 32	30. Construction hold-point coverage	V117, p. 410
Worked example 32	31. Supply-chain identity coverage	V117, p. 412
Worked example 32	32. Controlled-model access reduction	V117, p. 414
Worked example 32	33. Inspection sampling fraction	V117, p. 416
Worked example 32	34. Mock-up defect reduction	V117, p. 417
Worked example 32	35. Instrument calibration drift	V117, p. 419
Worked example 32	36. Combined standard uncertainty	V117, p. 421
Worked example 32	37. Evidence-chain completeness	V117, p. 423
Worked example 32	38. Deviation residual score	V117, p. 424
Worked example 32	39. Approval-condition closure	V117, p. 426
Worked example 32	40. Reciprocity change delta	V117, p. 428
Worked example 32	41. Material-change screening	V117, p. 430
Worked example 32	42. Maintenance completion	V117, p. 431
Worked example 32	43. Incident evidence recovery	V117, p. 433
Worked example 32	44. Third-party obligation closure	V117, p. 435
Worked example 32	45. Temporary-facility verified availability	V117, p. 436
Worked example 32	46. Conflict-resolution closure	V117, p. 438
Worked example 32	47. Multinational release minimisation	V117, p. 440
Worked example 32	48. Translation ambiguity rate	V117, p. 442
Worked example 32	49. Crosswalk update latency	V117, p. 444
Worked example 33	1. Converting an adjective into a requirement	V117, p. 459
Worked example 33	2. Assumption maturity index	V117, p. 460
Worked example 33	3. Source-state envelope	V117, p. 461

Identifier	Subject	Verified volume and page
Worked example 33	4. Traceability closure	V117, p. 463
Worked example 33	5. Path budget in the basis of design	V117, p. 464
Worked example 33	6. Data-sheet completeness	V117, p. 465
Worked example 33	7. Frequency-range omission	V117, p. 466
Worked example 33	8. Necessary prescription	V117, p. 468
Worked example 33	9. Interface count	V117, p. 469
Worked example 33	10. Detail coverage ratio	V117, p. 470
Worked example 33	11. Revision collision	V117, p. 471
Worked example 33	12. Procurement risk allocation	V117, p. 472
Worked example 33	13. Qualification scoring	V117, p. 472
Worked example 33	14. Bid normalisation	V117, p. 473
Worked example 33	15. Review-cycle duration	V117, p. 474
Worked example 33	16. Report completeness	V117, p. 475
Worked example 33	17. Tolerance stack	V117, p. 476
Worked example 33	18. Mock-up defect multiplication	V117, p. 478
Worked example 33	19. Delegated-design load case	V117, p. 479
Worked example 33	20. Multi-attribute equivalence	V117, p. 480
Worked example 33	21. RFI trend threshold	V117, p. 481
Worked example 33	22. Recurrence probability screen	V117, p. 482
Worked example 33	23. Hold-point capacity	V117, p. 483
Worked example 33	24. Sample allocation	V117, p. 483
Worked example 33	25. Guarded field result	V117, p. 484
Worked example 33	26. Critical open cell	V117, p. 485

Identifier	Subject	Verified volume and page
Worked example 33	27. Mode coverage	V117, p. 486
Worked example 33	28. Handover manifest reconciliation	V117, p. 487
Worked example 33	29. Seal replacement interval	V117, p. 488
Worked example 33	30. Change-impact score	V117, p. 489
Worked example 33	31. Lifecycle value comparison	V117, p. 490
Worked example 33	32. Critical-path effect	V117, p. 490
Worked example 33	33. Stratified sample	V117, p. 491
Worked example 33	34. Distribution reduction	V117, p. 492
Worked example 33	35. Laboratory dynamic range	V117, p. 493
Worked example 33	36. Comment closure quality	V117, p. 493
Worked example 33	37. Access clearance	V117, p. 494
Worked example 33	38. Rework cost multiplier	V117, p. 495
Worked example 33	39. Avoided defect count	V117, p. 495
Worked example 33	40. Conflicting cavity dimensions	V117, p. 497
Worked example 33	41. Rating preserved while a controlling band degrades	V117, p. 500
Worked example 33	42. Cable tray crossing owned by no trade	V117, p. 502
Worked example 33	43. Missing appendix changes the conclusion	V117, p. 505
Worked example 33	44. Silencer data without system responsibility	V117, p. 507
Worked example 33	45. Low bid omits the evidence chain	V117, p. 509
Worked example 33	46. First article passes but production drifts	V117, p. 510
Worked example 33	47. Correct drawing, wrong issue status	V117, p. 512
Worked example 33	48. Failed test and premature attribution	V117, p. 514
Worked example 33	49. Common design, different acceptance routes	V117, p. 516

Identifier	Subject	Verified volume and page
Worked example 33	50. Whole-room effect of two procurement changes	V117, p. 518
Worked example 33	51. Spare-parts decision under lead-time risk	V117, p. 521
Worked example 33	52. Review depth selected by consequence	V117, p. 525
Worked example 33	53. Affected-population search	V117, p. 528
Worked example 33	54. Failed field test under preservation protocol	V117, p. 530
Worked example 33	55. Conditional acceptance with expiry	V117, p. 533
Worked example 33	56. Door option with interacting obligations	V117, p. 536
Worked example 33	57. Deferred full-load HVAC test	V117, p. 539
Worked example 34	1. Local evidence and room-wide inference	V117, p. 547
Worked example 34	2. Conflicting release signatures	V117, p. 549
Worked example 34	3. Surveillance-plan readiness	V117, p. 552
Worked example 34	4. Stratified coverage	V117, p. 556
Worked example 34	5. Competence matrix	V117, p. 558
Worked example 34	6. Superseded detail at the workplace	V117, p. 560
Worked example 34	7. Mock-up that omits the controlling path	V117, p. 563
Worked example 34	8. Sealant benchmark	V117, p. 564
Worked example 34	9. Notice-window failure	V117, p. 567
Worked example 34	10. Layered wall release	V117, p. 570
Worked example 34	11. Identical packaging, different product	V117, p. 573
Worked example 34	12. Batch containment	V117, p. 574
Worked example 34	13. Hidden screw bridge	V117, p. 576
Worked example 34	14. Staggering failure at a hidden layer	V117, p. 578
Worked example 34	15. Deflection joint bridged by finish	V117, p. 579

Identifier	Subject	Verified volume and page
Worked example 34	16. Door passes open inspection and fails closed inspection	V117, p. 582
Worked example 34	17. Decorative trim bridge	V117, p. 583
Worked example 34	18. Oversized sleeve	V117, p. 585
Worked example 34	19. Firestop accepted, acoustic path remains	V117, p. 587
Worked example 34	20. Silencer bypass	V117, p. 588
Worked example 34	21. Plenum route concealed by complete walls	V117, p. 590
Worked example 34	22. Display bracket as a structural bridge	V117, p. 591
Worked example 34	23. Photograph without location	V117, p. 594
Worked example 34	24. Cloud-synchronised camera roll	V117, p. 595
Worked example 34	25. Register reconciliation	V117, p. 598
Worked example 34	26. Seal replacement without identity	V117, p. 599
Worked example 34	27. Rising defect trend	V117, p. 601
Worked example 34	28. Misclassified repeated defect	V117, p. 604
Worked example 34	29. The wrong corrective action	V117, p. 606
Worked example 34	30. Use-as-is rejected	V117, p. 607
Worked example 34	31. Repair complete, issue still open	V117, p. 611
Worked example 34	32. Retrospective declaration rejected	V117, p. 612
Worked example 34	33. As-built drawing conflicts with evidence	V117, p. 615
Worked example 34	34. Hash mismatch during handover	V117, p. 617
Worked example 34	35. Handover volume without navigation	V117, p. 620
Worked example 34	36. Access control creates inspection risk	V117, p. 622
Worked example 34	37. Technology refresh creates drift	V117, p. 624
Worked example 34	38. Rework exposure	V117, p. 625

Identifier	Subject	Verified volume and page
Worked example 34	39. Avoided defect propagation	V117, p. 627
Worked example 35	1. Metric selection for one room pair	V117, p. 636
Worked example 35	2. Source drift during a measurement series	V117, p. 638
Worked example 35	3. Composite laboratory boundary dominated by a door	V117, p. 640
Worked example 35	4. Standardised level difference	V117, p. 642
Worked example 35	5. Energetic effect of one perimeter segment	V117, p. 644
Worked example 35	6. Parallel plenum and wall paths	V117, p. 646
Worked example 35	7. Microphone voltage from acoustic sensitivity	V117, p. 648
Worked example 35	8. Field calibration drift	V117, p. 650
Worked example 35	9. Energetic average of source-room levels	V117, p. 652
Worked example 35	10. Effective sample size under correlation	V117, p. 654
Worked example 35	11. Energetic background correction	V117, p. 659
Worked example 35	12. Sabine absorption estimate	V117, p. 661
Worked example 35	13. Acceleration converted to sinusoidal velocity	V117, p. 663
Worked example 35	14. Sound power from uniform normal intensity	V117, p. 665
Worked example 35	15. Free-field distance change screen	V117, p. 666
Worked example 35	16. Net benefit after Lombard response	V117, p. 669
Worked example 35	17. Combined uncertainty with positive covariance	V117, p. 671
Worked example 35	18. Guarded higher-is-better acceptance	V117, p. 673
Worked example 35	19. Sample count and record duration	V117, p. 675
Worked example 35	20. Timing error converted to phase error	V117, p. 677
Worked example 35	21. Coherence and transfer-magnitude screen	V117, p. 679
Worked example 35	22. Short event hidden by equivalent level	V117, p. 682

Identifier	Subject	Verified volume and page
Worked example 35	23. Combined low-frequency floor	V117, p. 684
Worked example 35	24. Repair comparison under a pressure-flow model	V117, p. 686
Worked example 35	25. Triangulated auxiliary diagnosis	V117, p. 688
Worked example 35	26. Rounding changes a guard-band decision	V117, p. 690
Worked example 35	27. Between-team variance	V117, p. 692
Worked example 35	28. Persistent drift below a single-test threshold	V117, p. 694
Worked example 35	29. Source exposure control	V117, p. 696
Worked example 35	30. Opinion narrowed by missing configuration evidence	V117, p. 698
Worked example 35	31. Before-and-after difference with correlated uncertainty	V117, p. 699
Worked example 35	32. Crest factor and hidden overload risk	V117, p. 702
Worked example 35	33. Effective independent position count	V117, p. 704
Worked example 35	34. Nonlinear propagation through an energetic sum	V117, p. 706
Worked example 35	35. Evidence convergence and remaining alternative	V117, p. 708
Worked example 35	36. Source drift and energetic bias	V117, p. 711
Worked example 35	37. Pressure-dependent door contribution	V117, p. 713
Worked example 35	38. Silencer benefit limited by casing breakout	V117, p. 715
Worked example 35	39. Retest matrix after three linked repairs	V117, p. 717
Worked example 35	40. Out-of-tolerance impact screen	V117, p. 720
Worked example 35	41. Clustered defect expands a campaign	V117, p. 722
Worked example 35	42. Independent recalculation reveals a unit mismatch	V117, p. 723
Worked example 35	43. Weighted commissioning-evidence screen	V117, p. 725
Worked example 36	1. Defect-opportunity sample size	V117, p. 731
Worked example 36	2. Uncertainty of a bounded comparison	V117, p. 731

Identifier	Subject	Verified volume and page
Worked example 36	3. Energetic background subtraction	V117, p. 734
Worked example 36	4. Temporary-control residual exposure	V117, p. 734
Worked example 36	5. Evidence-manifest completeness	V117, p. 737
Worked example 36	6. Controller-clock drift	V117, p. 737
Worked example 36	7. Authority-and-record coverage	V117, p. 739
Worked example 36	8. Pressure force during a controlled opening	V117, p. 740
Worked example 36	9. Drawing-reconciliation matrix	V117, p. 742
Worked example 36	10. Revision-set usability	V117, p. 742
Worked example 36	11. Like-for-like commissioning comparison	V117, p. 745
Worked example 36	12. Comparability grade	V117, p. 746
Worked example 36	13. Uncontrolled-change rate	V117, p. 748
Worked example 36	14. Chronology lag	V117, p. 748
Worked example 36	15. Expected value of a discriminating test	V117, p. 750
Worked example 36	16. Search-priority index	V117, p. 751
Worked example 36	17. Normalised field level difference	V117, p. 753
Worked example 36	18. Source-stability check	V117, p. 753
Worked example 36	19. Reconnaissance-grid size	V117, p. 756
Worked example 36	20. Hot-region repeatability	V117, p. 756
Worked example 36	21. Weighted spectral centroid	V117, p. 758
Worked example 36	22. Coherence-screen uncertainty	V117, p. 759
Worked example 36	23. Ideal mass-law screen	V117, p. 761
Worked example 36	24. Mass-air-mass resonance screen	V117, p. 761
Worked example 36	25. Composite effect of a small open-equivalent gap	V117, p. 763

Identifier	Subject	Verified volume and page
Worked example 36	26. Seal-contact coverage	V117, p. 763
Worked example 36	27. Pressure-assisted doorset load	V117, p. 765
Worked example 36	28. Frame-twist effect on seal compression	V117, p. 766
Worked example 36	29. Glazing cavity-resonance screen	V117, p. 767
Worked example 36	30. Parallel interstitial paths	V117, p. 769
Worked example 36	31. Duct path with regenerated noise	V117, p. 771
Worked example 36	32. Service-support transmissibility	V117, p. 773
Worked example 36	33. Event-log alignment	V117, p. 775
Worked example 36	34. Band speech-to-background margin	V117, p. 777
Worked example 36	35. Vibration velocity level	V117, p. 779
Worked example 36	36. Integrated sound power from intensity	V117, p. 782
Worked example 36	37. Pressure-flow extrapolation	V117, p. 784
Worked example 36	38. Thermal-contrast significance screen	V117, p. 786
Worked example 36	39. Destructive-sampling screen	V117, p. 789
Worked example 36	40. Custody-transfer completeness	V117, p. 791
Worked example 36	41. Acoustic field-check correction	V117, p. 794
Worked example 36	42. Effective sample size under spatial correlation	V117, p. 796
Worked example 36	43. Censored receiving-band bound	V117, p. 798
Worked example 36	44. Likelihood ratio for a discriminating observation	V117, p. 800
Worked example 36	45. Bounded Bayesian update	V117, p. 802
Worked example 36	46. Combined measurement uncertainty	V117, p. 805
Worked example 36	47. Residual-risk priority	V117, p. 807
Worked example 36	48. Expected remedial value	V117, p. 810

Identifier	Subject	Verified volume and page
Worked example 36	49. Dominant-path migration	V117, p. 812
Worked example 36	50. Temporary-control availability	V117, p. 814
Worked example 36	51. Hold-point detection screen	V117, p. 816
Worked example 36	52. Configuration-change consequence index	V117, p. 819
Worked example 36	53. EWMA trend indicator	V117, p. 821
Worked example 36	54. Guard-band decision	V117, p. 823
Worked example 36	55. Recommissioning-dossier completeness	V117, p. 826
Worked example 36	56. Technical contribution allocation	V117, p. 829
Worked example 36	57. Opinion sensitivity to disputed assumptions	V117, p. 831
Worked example 36	58. Interlaboratory compatibility screen	V117, p. 834
Worked example 36	59. Threat-neutral incident severity screen	V117, p. 836
Worked example 36	60. Common-cause population detection	V117, p. 838
Worked example 36	61. Corrective-action effectiveness	V117, p. 840
Worked example 36	62. Redaction residual-identification screen	V117, p. 842
Worked example 36	63. Open-issue priority	V117, p. 844
Worked example 36	64. Risk-adjusted recommissioning interval	V117, p. 846
Worked example 37	1. Converting a headline rating into a requirement set	V118, p. 14
Worked example 37	2. Source-state matrix for ordinary and amplified discussion	V118, p. 16
Worked example 37	3. Parallel paths and dominant-path migration	V118, p. 18
Worked example 37	4. Equal STC, unequal speech-band weakness	V118, p. 19
Worked example 37	5. Guarded acceptance with unresolved configuration uncertainty	V118, p. 21
Worked example 37	6. Ideal mass-air-mass resonance screen	V118, p. 23
Worked example 37	7. Composite wall, door and glazing contribution	V118, p. 25

Identifier	Subject	Verified volume and page
Worked example 37	8. Reverberation and vocal-effort consequence	V118, p. 26
Worked example 37	9. Retrofit path ranking	V118, p. 27
Worked example 37	10. Grout quantity reconciliation	V118, p. 29
Worked example 37	11. Parging mass versus air closure	V118, p. 30
Worked example 37	12. Structural path versus airborne path	V118, p. 32
Worked example 37	13. Sound-lock energetic screen	V118, p. 33
Worked example 37	14. Large-cavity resonance screen	V118, p. 35
Worked example 37	15. Decision under hidden-condition uncertainty	V118, p. 36
Worked example 37	16. Expected open-state exposure	V118, p. 38
Worked example 37	17. Vision-panel composite penalty	V118, p. 39
Worked example 37	18. Floating-floor transmissibility screen	V118, p. 40
Worked example 37	19. Competing overhead and underfloor paths	V118, p. 42
Worked example 37	20. Silencer insertion loss and regenerated noise	V118, p. 44
Worked example 37	21. Door contact across pressure range	V118, p. 46
Worked example 37	22. Pipe-support bridge	V118, p. 47
Worked example 37	23. Risk-ranked penetration inspection	V118, p. 48
Worked example 37	24. Amplified source and receiving margin	V118, p. 49
Worked example 37	25. Masking benefit with Lombard response	V118, p. 51
Worked example 37	26. Isolator load and natural-frequency check	V118, p. 52
Worked example 37	27. One rigid bridge across an isolated floor	V118, p. 54
Worked example 37	28. Diplomatic-room acceptance ladder	V118, p. 55
Worked example 37	29. Landlord alteration and path-budget consequence	V118, p. 56
Worked example 37	30. Accessible door trade-off	V118, p. 58

Identifier	Subject	Verified volume and page
Worked example 37	31. Weighted assembly selection	V118, p. 60
Worked example 37	32. Plant isolation and residual structural flank	V118, p. 62
Worked example 37	33. Expected lifecycle cost	V118, p. 64
Worked example 37	34. Uncertainty of an improvement	V118, p. 68
Worked example 37	35. Option ranking after a missing path is discovered	V118, p. 85
Worked example 38	1. A temporary seal as discriminating evidence	V118, p. 95
Worked example 38	2. Parallel-path reduction after a local intervention	V118, p. 97
Worked example 38	3. Area of a narrow perimeter discontinuity	V118, p. 99
Worked example 38	4. Time exposure from intermittent closure failure	V118, p. 101
Worked example 38	5. Wall and duct contributions	V118, p. 103
Worked example 38	6. Day and night speech margin	V118, p. 105
Worked example 38	7. Bypass limits insertion-loss benefit	V118, p. 106
Worked example 38	8. Continuous open-joint screen	V118, p. 108
Worked example 38	9. Local mass deficit and resonance screen	V118, p. 110
Worked example 38	10. Two structural flanking paths	V118, p. 112
Worked example 38	11. Glazing-frame penalty	V118, p. 114
Worked example 38	12. Bridge stiffness and isolation-loss screen	V118, p. 117
Worked example 38	13. Local resilient-pad pressure	V118, p. 119
Worked example 38	14. Open annular-area screen	V118, p. 121
Worked example 38	15. Rigid and resilient force paths in parallel	V118, p. 123
Worked example 38	16. Combined effect of three maintenance openings	V118, p. 125
Worked example 38	17. Net masking benefit after vocal response	V118, p. 127
Worked example 38	18. Amplified source and residual margin	V118, p. 128

Identifier	Subject	Verified volume and page
Worked example 38	19. Composite wall and door	V118, p. 130
Worked example 38	20. Source-on and background correction limit	V118, p. 132
Worked example 38	20A. Repeatability does not cure position bias	V118, p. 134
Worked example 38	20B. Conditional operation during an unresolved plenum concern	V118, p. 136
Worked example 38	20C. Sound-lock exposure from ordinary traffic	V118, p. 137
Worked example 38	21. Position-to-position variability	V118, p. 139
Worked example 38	22. Intermittent bottom-seal failure over repeated meetings	V118, p. 141
Worked example 38	23. Dynamic-stiffness sensitivity after clip substitution	V118, p. 143
Worked example 38	24. Local bridge and residual duct path	V118, p. 145
Worked example 38	25. Bounded classification	V118, p. 146
Worked example 38	26. Hash verification of raw measurement files	V118, p. 148
Worked example 38	27. Correlated uncertainty of an improvement	V118, p. 149
Worked example 38	28. Maximum possible benefit from one path	V118, p. 151
Worked example 38	29. Pareto screen of failure causes	V118, p. 152
Worked example 38	30. Risk-ranked retest decision	V118, p. 154
Worked example 38	30A. Trend threshold with measurement variability	V118, p. 155
Worked example 38	30B. Common-cause screen by installation cohort	V118, p. 157
Worked example 38	30C. Responsibility gap in a duct penetration	V118, p. 159
Worked example 38	30D. Apparent saving after excluded assurance work	V118, p. 160
Worked example 38	30E. Abstraction without losing the mechanism	V118, p. 162
Worked example 38	31. Verification of a corrective programme	V118, p. 164
Worked example B-1	Composite opening	V118, p. 290
Worked example B-2	Double-leaf resonance	V118, p. 291

Identifier	Subject	Verified volume and page
Worked example B-3	Equivalent absorption	V118, p. 292
Worked example B-4	Isolation support	V118, p. 293
Worked example B-5	Sampling probability	V118, p. 294
Worked example B-6	Covariant uncertainty	V118, p. 295
Worked example D-1	Selecting a controlling source state	V118, p. 302
Worked example E-1	A test plan prevents retrospective method selection	V118, p. 306
Worked example F-1	Combined uncertainty with covariance	V118, p. 310
Worked example G-1	Cable growth changes an accepted penetration	V118, p. 314
Worked example H-1	Door direction and pressure reveal an incomplete seal	V118, p. 318
Worked example I-1	Pane replacement does not cure a mullion route	V118, p. 322
Worked example J-1	Silencer data and installed network performance diverge	V118, p. 326
Worked example K-1	A missed hold point cannot be closed by signature	V118, p. 330
Worked example L-1	Premature commissioning creates a false baseline	V118, p. 334
Worked example O-1	Local repair and whole-room benefit answer different questions	V118, p. 344
Worked example P-1	A nominally like-for-like display is material	V118, p. 348
Worked example W-1	Selecting the controlling listener position	V118, p. 371
Worked example X-1	Conditional use after a low-frequency residual	V118, p. 375
Worked example Z-1	Detecting silent substitution	V118, p. 383
Worked example AB-1	Criticality ranking without false precision	V118, p. 390
Worked example AD-1	Repetition changes practical consequence	V118, p. 398
Worked example AE-1	Trend data distinguish drift from a one-time anomaly	V118, p. 403

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MB-0001. A. Arjunan, A. Baroutaji, and J. Robinson, " Perforated Steel Stud to Improve the Acoustic Insulation of Drywall Partitions, " *Acoustics* 3, no. 4 (2021): 679-694, <https://doi.org/10.3390/acoustics3040043>.

MB-0002. A. C. C. Warnock and J. D. Quirt, " Control of Sound Transmission through Gypsum Board Walls, " *National Research Council Canada technical literature*; R. E. Halliwell, T. R. T. Nightingale, A. C. C. Warnock and J. A. Birta, *Gypsum Board Walls: Transmission Loss Data, IRC Internal Report IR-761* (Ottawa: National Research Council Canada, 1998).

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MB-0004. A. C. C. Warnock, Sound transmission through concrete blocks with attached drywall (*Journal of the Acoustical Society of America* 90 (1991)), Laboratory evidence for CMU with attached linings; specimen-specific., <https://doi.org/10.1121/1.401661>; A. C. C. Warnock, Sound transmission through two kinds of porous concrete blocks with attached drywall (*Journal of the Acoustical Society of America* 91 (1992)), Porosity and attached lining effects; specimen-specific., <https://doi.org/10.1121/1.402421>; J. A. Díaz-Cereceda et al., Sound transmission loss analysis through a multilayer lightweight concrete hollow brick wall by FEM and experimental validation (*Building and Environment* 45 (2010), 2373-2386), Periodic hollow masonry, gypsum linings and vibro-acoustic modelling., <https://doi.org/10.1016/j.buildenv.2010.04.013>; M. Villot et al., A homogenised vibratory model for predicting the acoustic properties of hollow brick walls (*Journal of Sound and Vibration* 330 (2011), 3400-3409), Anisotropic homogenisation and Lamb-wave behaviour of hollow brick walls., <https://doi.org/10.1016/j.jsv.2011.02.015>; Carl Hopkins, *Sound Insulation* (2007), Frequency-resolved wall, junction and field sound-insulation theory., ISBN 9780750665261.

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- MB-0008. Internal cross-reference. Chapters 15 through 27 of this edition contain the controlling construction and building-services treatments. The precise external source and edition supporting each proposition are recorded in the chapter that owns the relevant construction system.
- MB-0009. Internal cross-reference. Chapters 28 through 32 of this edition contain the jurisdictional public-source registers and comparative crosswalks. Similar terms may carry different legal and institutional meanings, and controlled criteria are neither inferred nor reproduced.
- MB-0010. Acoustical Society of America, ANSI/ASA S3.5-1997 (R2024), Methods for Calculation of the Speech Intelligibility Index, calculation clauses. [Cited 9 times in this edition.]
- MB-0011. AHRI Standard 260-2024, ducted-equipment sound-power rating across operating ranges; ISO 13347-1:2025, general fan acoustic-performance principles.
- MB-0012. AHRI Standard 260-2024, Sound Rating of Ducted Air Moving and Conditioning Equipment, mapped inlet, outlet and casing components; ASHRAE, HVAC Applications, Chapter 49.
- MB-0013. AHRI Standard 880-2017 (R2023) and 881-2017 (R2023), Performance Rating of Air Terminals; ANSI/ASHRAE Standard 130-2025, Laboratory Methods of Testing Air Terminal Units.
- MB-0014. Alessandro Schiavi, Andrea Pavoni Belli and Francesco Russo, Estimation of Acoustical Performance of Floating Floors from Dynamic Stiffness of Resilient Layers (Building Acoustics 12(2), 2005), DOI 10.1260/1351010054037938. Scope note: Empirical relation between apparent dynamic stiffness and impact reduction; ageing and damping limit transfer; Marco Caniato, C. Schmid and Andrea Gasparella, A comprehensive analysis of time influence on floating floors: Effects on acoustic performance and occupants comfort (Applied Acoustics 166, 2020, 107339), DOI 10.1016/j.apacoust.2020.107339. Scope note: Five-year material study of load and

dynamic-stiffness change; application bounded to tested materials. [Cited 2 times in this edition.]

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- MB-0016. American Concrete Institute and Post-Tensioning Institute, ACI/PTI CODE-320-25, Post-Tensioned Structural Concrete - Code Requirements and Commentary (2025), Post-tensioned materials, design, detailing, anchorages, inspection and testing; not an acoustic standard., [https://www.concrete.org/publications/typesofpublications/standards\(codesandspecs\)/suiteofcodes.aspx](https://www.concrete.org/publications/typesofpublications/standards(codesandspecs)/suiteofcodes.aspx); International Code Council, 2024 International Building Code (2024), Structural, fire, penetration and acoustical provisions subject to local adoption., <https://codes.iccsafe.org/content/IBC2024P1>.
- MB-0017. American Concrete Institute and Post-Tensioning Institute, ACI/PTI CODE-320-25, Post-Tensioned Structural Concrete, Code Requirements and Commentary (2025). [Cited 3 times in this edition.]
- MB-0018. American Concrete Institute and Precast/Prestressed Concrete Institute, ACI/PCI CODE-319-25, Structural Precast Concrete - Code Requirements and Commentary (2025), Structural precast concrete design and construction; does not establish acoustic performance., <https://www.concrete.org/store/productdetail.aspx?ItemID=31925>; Precast/Prestressed Concrete Institute, PCI Design Handbook, 9th edition (2025-2026 release), Precast and prestressed concrete design, connections, tolerances and construction guidance., https://www.pci.org/PCI/PCI/Design_Resources/Design_Handbook.aspx; International Organization for Standardization, ISO 10848-4:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 4: Junctions with at least one Type A element (2017; confirmed 2023), Heavyweight junction characterisation in laboratory or field., <https://www.iso.org/standard/67229.html>.

- MB-0019. American Concrete Institute and Precast/Prestressed Concrete Institute, ACI/PCI CODE-319-25, Structural Precast Concrete, Code Requirements and Commentary (2025).
- MB-0020. American Concrete Institute and The Masonry Society guidance on assessment and repair, used within structural scope. Non-destructive evaluation requires qualified interpretation and does not automatically establish acoustic consequence.
- MB-0021. American Concrete Institute, ACI CODE-318-25 and ACI CODE-562-25; ISO 20816 family; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition. Structural, vibration and acoustic propositions remain distinct.
- MB-0022. American Concrete Institute, ACI CODE-318-25, Building Code for Structural Concrete, Code Requirements and Commentary (2025), Parts 1 through 5 and construction provisions. [Cited 3 times in this edition.]
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- MB-0024. American Concrete Institute, ACI CODE-318-25, Building Code Requirements for Structural Concrete and Commentary (2025), Structural concrete design and detailing., <https://www.concrete.org/store/productdetail.aspx?ItemID=31825>; American Concrete Institute and Post-Tensioning Institute, ACI/PTI CODE-320-25, Post-Tensioned Structural Concrete - Code Requirements and Commentary (2025), Post-tensioned materials, design, detailing, anchorages, inspection and testing; not an acoustic standard., [https://www.concrete.org/publications/typesofpublications/standards\(codesandspecs\)/suiteofcodes.aspx](https://www.concrete.org/publications/typesofpublications/standards(codesandspecs)/suiteofcodes.aspx).
- MB-0025. American Concrete Institute, ACI CODE-318-25, Building Code Requirements for Structural Concrete and Commentary (2025), Structural concrete design and detailing., <https://www.concrete.org/store/productdetail.aspx?ItemID=31825>; American Concrete Institute and Post-Tensioning Institute, ACI/PTI CODE-320-25, Post-Tensioned Structural Concrete - Code Requirements and Commentary (2025), Post-tensioned materials, design, detailing, anchorages, inspection and testing; not an acoustic standard., [https://www.concrete.org/publications/typesofpublications/standards\(codesandspecs\)/suiteofcodes.aspx](https://www.concrete.org/publications/typesofpublications/standards(codesandspecs)/suiteofcodes.aspx); Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Structural mobility, force transmission, power flow and wave propagation., ISBN 9780123736338.
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prestressed concrete structural systems.,

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MB-0027. American Concrete Institute, ACI CODE-318-25, Building Code Requirements for Structural Concrete and Commentary (2025), Structural concrete design and detailing., <https://www.concrete.org/store/productdetail.aspx?ItemID=31825>; International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (2017; confirmed 2023), Prediction of direct and flanking airborne sound., <https://www.iso.org/standard/70242.html>; International Organization for Standardization, ISO 10848-4:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 4: Junctions with at least one Type A element (2017; confirmed 2023), Heavyweight junction characterisation., <https://www.iso.org/standard/67229.html>; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Structural mobility, force transmission, power flow and wave propagation., ISBN 9780123736338.

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Field (2025), Field specimens and curing; does not directly measure in-place wall acoustic properties., https://store.astm.org/c0031_c0031m-25.html.

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MB-0039. American Society of Heating, Refrigerating and Air-Conditioning Engineers and recognised mechanical-system guidance, used for commissioning and operational-mode coordination. [Cited 3 times in this edition.]

MB-0040. American Society of Heating, Refrigerating and Air-Conditioning Engineers, ASHRAE Handbook, HVAC Applications, Noise and Vibration Control, 2023 edition. Status at the 14 August 2026 source freeze: Published. Public locator: <https://www.ashrae.org/technical-resources/ashrae-handbook>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 8 times in this edition.]

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MB-0042. American Society of Plumbing Engineers, Plumbing Engineering Design Handbook (current published handbook set). Public locator: <https://www.aspe.org/education-credentialing/plumbing-engineering-design-handbook/>. ASHRAE, 2023 ASHRAE Handbook. HVAC Applications, Chapter 49, Noise and Vibration Control (2023). Public locator: <https://www.ashrae.org/technical-resources/ashrae-handbook>. The sources support the treatment of drainage, venting, material, flow regime, and building-services noise as state-dependent rather than stationary. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.

MB-0043. Andrea Saltelli, Paola Annoni, Ivano Azzini, Francesca Campolongo, Marco Ratto and Stefano Tarantola, Variance based sensitivity analysis of model output. Design and estimator for the total sensitivity index (Computer Physics Communications 181(2), 2010, 259-270), DOI 10.1016/j.cpc.2009.09.018, peer-reviewed sensitivity analysis, limitation: general variance-based method; computational cost and input-dependence assumptions must be stated; Max D. Morris, Factorial Sampling Plans for Preliminary Computational Experiments (Technometrics 33(2), 1991, 161-174), DOI 10.1080/00401706.1991.10484804, peer-reviewed screening design, limitation: screening method identifies influential inputs but does not by itself quantify complete output uncertainty.

- MB-0044. Andreas Mayr and T. R. T. Nightingale, "On Transmission of Structure-Borne Power from Wood Studs to Gypsum Board Mounted on Resilient Metal Channels, Part 1: Force and Moment Transmission," *Canadian Acoustics* 32, no. 3 (2004): 164-165.
- MB-0045. ANSI/AMCA Standard 300-24; ANSI/AMCA Standard 320-23; ISO 13347-1:2025 through ISO 13347-4:2025/2026; ISO 5136:2003.
- MB-0046. ANSI/ASHRAE Standard 70-2023, Method of Testing the Performance of Air Outlets and Air Inlets, laboratory aerodynamic and sound-generation methods.
- MB-0047. ANSI/ASHRAE/IES Standard 202-2024, ASHRAE Guideline 0-2019 and ISO 10012:2003 support commissioning and measurement-management structure. [Cited 3 times in this edition.]
- MB-0048. ANSI/BHMA A156.21-2025, American National Standard for Thresholds (2025).
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- MB-0050. Arjunan, Baroutaji, and Robinson, "Perforated Steel Stud," 679-694.
- MB-0051. Arjunan, "Computationally-Efficient Numerical Model," 1414-1431; Arjunan, Baroutaji, and Robinson, "Perforated Steel Stud," 679-694; Min, Wang, and Qu, "Airborne Sound Insulation Performance," 30584.
- MB-0052. ASHRAE, 2023 ASHRAE Handbook - HVAC Applications, chapter 49, "Noise and Vibration Control," especially the source-path-receiver discussion.
- MB-0053. ASHRAE, 2023 ASHRAE Handbook, HVAC Applications, Chapter 49, fan operating point and sound; Bies, Hansen and Howard, *Engineering Noise Control*, fan laws and aerodynamic sound.
- MB-0054. ASHRAE, 2023 ASHRAE Handbook, HVAC Applications, Chapter 49, "Noise and Vibration Control", source-path-receiver framework and HVAC transmission paths; David A. Bies, Colin H. Hansen and Carl Q. Howard, *Engineering Noise Control*, 5th ed. (CRC Press, 2017), chapters on fans, ducts and silencers.
- MB-0055. ASHRAE, 2023 ASHRAE Handbook. HVAC Applications, Chapter 49, Noise and Vibration Control (2023). Public locator: <https://www.ashrae.org/technical-resources/ashrae-handbook>. David A. Bies, Colin H. Hansen and Carl Q. Howard, *Engineering Noise Control, Theory and Practice* (5th ed., 2017). Public locator: <https://www.routledge.com/Engineering-Noise-Control-Theory-and-Practice/Bies-Hansen-Howard/p/book/9781138186392>. The references address fluid-borne and structure-borne transmission through piping, fittings, supports, and connected structures. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.
- MB-0056. ASHRAE, 2023 ASHRAE Handbook. HVAC Applications, Chapter 49, Noise and Vibration Control (2023). Public locator: <https://www.ashrae.org/technical-resources/ashrae-handbook>. David A. Bies, Colin H.

Hansen and Carl Q. Howard, *Engineering Noise Control, Theory and Practice* (5th ed., 2017). Public locator: <https://www.routledge.com/Engineering-Noise-Control-Theory-and-Practice/Bies-Hansen-Howard/p/book/9781138186392>. These sources support source-path-receiver modelling and distributed mechanical or airborne transmission. The graph formulation in this section is the author's engineering synthesis. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.

MB-0057. ASHRAE, 2023 ASHRAE Handbook. HVAC Applications, Chapter 49, Noise and Vibration Control (2023). Public locator: <https://www.ashrae.org/technical-resources/ashrae-handbook>. International Organization for Standardization, ISO 16283-1:2014/Amd 1:2017, Field measurement of sound insulation in buildings and of building elements. Part 1: Airborne sound insulation (2014; Amendment 1:2017). Public locator: <https://www.iso.org/standard/55997.html>. Shafts, risers, and common chases can operate as distributed receivers and mixed airborne or structure-borne paths. Measurement planning should include accessible remote emergence points. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.

MB-0058. ASHRAE, 2023 ASHRAE Handbook. HVAC Applications, Chapter 49, Noise and Vibration Control (2023). Public locator: <https://www.ashrae.org/technical-resources/ashrae-handbook>. U.S. Department of Defense, UFC 3-401-01, Mechanical Engineering (28 July 2025; Change 2, 14 May 2026). Public locator: <https://www.wbdg.org/dod/ufc/ufc-3-401-01>. Vibration isolation must be analysed as an installed load path including stiffness, damping, restraint, support mobility, flexible connections, clearances, and operating frequency. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.

MB-0059. ASHRAE, 2025 ASHRAE Handbook, Fundamentals, Chapter 8, "Sound and Vibration", sound power and pressure; Leo L. Beranek and István L. Vér, eds., *Noise and Vibration Control Engineering*, 2nd ed. (Wiley, 2006).

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- MB-0061. ASHRAE, ASHRAE Handbook - HVAC Applications, chapter on sound and vibration control (2023), Mechanical equipment vibration, isolation and building-service noise., <https://www.ashrae.org/technical-resources/ashrae-handbook>; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Structural mobility, force transmission, power flow and wave propagation., ISBN 9780123736338; International Code Council, 2024 International Building Code (2024), Structural, fire, penetration and acoustical provisions subject to local adoption., <https://codes.iccsafe.org/content/IBC2024P1>.
- MB-0062. ASHRAE, ASHRAE Handbook, HVAC Applications (2023), chapter on sound and vibration control.
- MB-0063. ASHRAE, Handbook. HVAC Applications, current public issuer information and recognised noise-and-vibration-control practice. Mechanical operation, access, airflow, breakout, regeneration and vibration must be coordinated with the project acoustic basis.
- MB-0064. ASHRAE, HVAC Applications, Chapter 49, cross-talk paths; ASTM E1414/E1414M-21a, Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum; Carl Hopkins, Sound Insulation (Elsevier, 2007), building-service transmission.
- MB-0065. Association of the Wall and Ceiling Industry, "Recommendations for Assessing and Repairing Gypsum Boards and Panels," 2015, <https://www.awci.org/media/products/recommendations-for-assessing-repairing-gypsum-boards-and-panels/>; the guidance emphasises restoration of the original rated or sound-control system rather than cosmetic replacement alone.
- MB-0066. ASTM C754-20, ASTM C840-23 and GA-600-2024; Chapter 33 submittal-equivalence doctrine. Equal catalogue properties do not establish assembly equivalence.
- MB-0067. ASTM C754-20, installation of steel framing members to receive screw-attached gypsum panel products; ASTM C840-23, application and finishing of gypsum board; Gypsum Association, GA-600-2024.
- MB-0068. ASTM C840-25, Standard Specification for Application and Finishing of Gypsum Board; ASTM C754-20, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; Gypsum Association, GA-600-2024. Exact tested or listed assembly configurations remain controlling where more specific. [Cited 3 times in this edition.]
- MB-0069. ASTM C919-24, Standard Practice for Use of Sealants in Acoustical Applications. Joint geometry, backing, adhesion, movement and substrate conditions remain project-specific. [Cited 3 times in this edition.]

- MB-0070. ASTM E1186-22, Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems. Diagnostic methods can assist leakage localisation but do not substitute automatically for the project acoustic test method.
- MB-0071. ASTM E1414/E1414M-21a; ASTM E336-25a; ISO 10848 series; ISO 12354-1:2017. Field plenums and flanking networks require complete path representation.
- MB-0072. ASTM E1414/E1414M-21a; ASTM E336-25a; public commissioning and closeout guidance. Ceiling systems, barriers, services and maintenance access must be represented in the field state.
- MB-0073. ASTM E2174-24, ASTM E2393-24 and ASTM E3038-22a, covering inspection of installed penetration firestops, fire-resistive joint systems and perimeter fire barriers. Listed-system requirements and the authority having jurisdiction remain controlling. [Cited 4 times in this edition.]
- MB-0074. ASTM E2638-24, closed-room speech-privacy measurement; IEC 60268-16:2020 with Corrigendum 1:2025, Speech Transmission Index; ANSI/ASA S3.5-1997 (R2022), Speech Intelligibility Index.
- MB-0075. ASTM E2638-24, IEC 60268-16:2020 and ANSI/ASA S3.5-1997 (R2022) support bounded speech-performance analysis. [Cited 3 times in this edition.]
- MB-0076. ASTM E2638-24, Objective Measurement of the Speech Privacy Provided by a Closed Room; ASHRAE, HVAC Applications, Chapter 49; Chapter 9 of this volume provides the governing speech-consequence framework.
- MB-0077. ASTM E2638-24, secs. 1 and 5. [Cited 5 times in this edition.]
- MB-0078. ASTM E2638-24; IEC 60268-16:2020; Chapter 9 of this work. Listener position, source state and receiving background bound speech conclusions.
- MB-0079. ASTM E2713-25 and ASTM E3176-24, disciplined investigation and reporting; organisational incident-classification terms remain authority specific.
- MB-0080. ASTM E2713-25 and ASTM E3176-24, preservation, investigation and reporting principles; Chapter 36 of this work concerning complaint triage and baseline reconstruction.
- MB-0081. ASTM E2713-25, ASTM E3176-24 and NIST SP 800-86 support investigation, reporting and evidence discipline within their scopes. [Cited 3 times in this edition.]
- MB-0082. ASTM E2713-25; Carl Hopkins, Sound Insulation (Elsevier, 2007), chapters on direct and flanking transmission; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd ed. (Academic Press, 2007).
- MB-0083. ASTM E2964-26 and ASTM C919-24 support door and seal measurement or practice within defined configurations; they do not establish complete-room approval. [Cited 4 times in this edition.]

- MB-0084. ASTM E2964-26; door-manufacturer maintenance instructions for the installed model; applicable fire-door, accessibility and egress requirements. Maintenance must preserve every controlling obligation.
- MB-0085. ASTM E3157-25 and ASTM E3456-25, current public ASTM installation and inspection sources identified in the Chapter 34 source register. Apply only within their published scopes and verify project adoption.
- MB-0086. ASTM E3176-24; applicable evidence law, professional rules and discovery obligations determined by jurisdiction and instruction. This chapter does not provide legal advice.
- MB-0087. ASTM E336-25a and ISO 16283-1:2014 with published amendments define field airborne sound-insulation methods within their scopes. [Cited 4 times in this edition.]
- MB-0088. ASTM E336-25a and ISO 16283-1:2014+A1:2017, spatial sampling and field method provisions. Standardised averages and targeted diagnostics answer different questions.
- MB-0089. ASTM E336-25a, ASTM E2638-24, ASTM E2964-26 and ASTM E477-26. These methods address defined field room, speech-privacy, door and duct-silencer measurements. Each result remains limited by method, configuration, background and dynamic range. [Cited 4 times in this edition.]
- MB-0090. ASTM E336-25a, secs. 1 and 5. [Cited 14 times in this edition.]
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- MB-0092. ASTM E413-22 and ISO 717-1:2020, single-number classifications; ASTM E2638-24, IEC 60268-16:2020 and ANSI/ASA S3.5-1997 (R2022), bounded speech metrics. Single numbers do not replace frequency-band evidence or authority decisions.
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- MB-0097. ASTM E477-26; ASHRAE Handbook, HVAC Applications, sound and vibration control; ASHRAE Guideline 0-2019 and ANSI/ASHRAE/IES Standard 202-2024. Laboratory silencer data do not establish installed whole-system performance.

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- MB-0099. ASTM E477-26; ISO 7235:2003; ISO 11691:2020; Munjal, Acoustics of Ducts and Mufflers, absorptive and reactive silencer theory.
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- MB-0101. ASTM E492-25, laboratory impact-sound transmission through floor-ceiling assemblies; ASTM E1007-25, field impact-sound measurement. Impact metrics do not establish airborne speech isolation.
- MB-0102. ASTM E814 and ASTM E2174-24; NFPA 13 and applicable fire-protection requirements; ASTM C919-24 and ASTM C1193-25. Fire, movement and acoustic closure are parallel obligations.
- MB-0103. ASTM E90-23 and ISO 10140 laboratory sound-insulation framework. Glazing evidence applies to the tested specimen, dimensions, supports and boundary conditions.
- MB-0104. ASTM E90-23, ISO 10140-2:2021, ASTM E413-22 and ISO 717-1:2020 illustrate the distinction among specimen testing, frequency data and classification. [Cited 3 times in this edition.]
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- MB-0242. ASTM International, ASTM E283/E283M-26, Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; ASTM International, ASTM E783-02(2018), Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors. These steady-airflow methods are diagnostic complements, not acoustic test methods.
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status is scholarly rather than normative; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Academic Press, technical monograph, limitation: structural vibration, power flow and radiation theory.

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Pearl, Causality: Models, Reasoning, and Inference, 2nd edition (2009), Cambridge University Press, ISBN 978-0-521-89560-6, causal inference reference, limitation: general causal framework; building-acoustic interventions require physical and metrological validation.

- MB-0266. ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025), DOI 10.1520/E0336-25A, field room-pair measurement, limitation: actual room-pair performance including direct and flanking paths; temporary modifications must be disclosed; International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70242.html>, prediction standard, limitation: detailed band model and simplified rating model require valid element and junction data; International Organization for Standardization, ISO 10848-1:2017, Acoustics - Laboratory and field measurement of flanking transmission for airborne, impact and building service equipment sound between adjoining rooms - Part 1: Frame document (Edition 2, 2017; confirmed 2026), <https://www.iso.org/standard/67226.html>, flanking measurement framework, limitation: quantity and supporting part depend on element and junction type; International Organization for Standardization, ISO 10848-4:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 4: Application to junctions with at least one Type A element (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67229.html>, junction measurement, limitation: field results are specific to the installed structure and can contain unwanted flanking.
- MB-0267. ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025), DOI 10.1520/E0336-25A, field room-pair measurement, limitation: actual room-pair performance including direct and flanking paths; temporary modifications must be disclosed; International Organization for Standardization, ISO 12354-3:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 3: Airborne sound insulation against outdoor sound (Edition 1, 2017; confirmed 2023), <https://www.iso.org/standard/70244.html>, façade prediction standard, limitation: includes direct and flanking paths for external surfaces; approximate correspondence to field results; International Organization for Standardization, ISO 16283-1:2014 with Amendment 1:2017, Acoustics - Field measurement of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 1, 2014 plus Amd 1:2017; confirmed), <https://www.iso.org/standard/55997.html>, field airborne measurement, limitation: room volumes and frequency range bounded by method; measured quantity remains configuration-specific; International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, 2020; confirmed 2025), <https://www.iso.org/standard/73930.html>, uncertainty

standard, limitation: measurement uncertainty does not automatically include model-form or mission uncertainty; Carl Hopkins, Sound Insulation (2007), Elsevier, ISBN 978-0-7506-6526-1, technical monograph, limitation: prediction and measurement theory; source status is scholarly rather than normative; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Academic Press, technical monograph, limitation: structural vibration, power flow and radiation theory; Marshall Long, Architectural Acoustics, 2nd edition (2014), Academic Press, technical monograph, limitation: architectural acoustics synthesis; not a standards document; J. D. Quirt, Sound transmission through windows (1982), Journal of the Acoustical Society of America, research article, limitation: illustrates frequency-dependent glazing and frame effects; current product data and standards still required.

MB-0268. ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025), DOI 10.1520/E0336-25A, field room-pair measurement, limitation: actual room-pair performance including direct and flanking paths; temporary modifications must be disclosed; International Organization for Standardization, ISO 16283-1:2014 with Amendment 1:2017, Acoustics - Field measurement of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 1, 2014 plus Amd 1:2017; confirmed), <https://www.iso.org/standard/55997.html>, field airborne measurement, limitation: room volumes and frequency range bounded by method; measured quantity remains configuration-specific; International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, 2020; confirmed 2025), <https://www.iso.org/standard/73930.html>, uncertainty standard, limitation: measurement uncertainty does not automatically include model-form or mission uncertainty; Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of measurement data - Guide to the expression of uncertainty in measurement (2008 with minor corrections), <https://www.bipm.org/en/committees/jc/jcgm/publications>, uncertainty framework, limitation: linearised propagation requires suitable model and distributions; International Organization for Standardization and International Electrotechnical Commission, ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories (Edition 3, 2017; corrected 2018; confirmed 2023), <https://www.iso.org/standard/66912.html>, laboratory competence, limitation: competence and traceability requirements do not validate an incorrect measurement model; BIPM, IEC, IFCC, ILAC, ISO, IUPAC, IUPAP and OIML, JCGM 200:2012, International Vocabulary of Metrology, 3rd edition (2012 with corrections), <https://www.bipm.org/en/committees/jc/jcgm/publications>, terminology, limitation: definitions require context and do not supply a room-specific model.

MB-0269. ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025), DOI 10.1520/E0336-25A. Scope note: Field room-pair metrics include direct and flanking paths and apply to

the tested configuration; International Organization for Standardization, ISO 16283-1:2014, Acoustics - Field measurement of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 1, 2014; confirmed 2020), <https://www.iso.org/standard/55997.html>. Scope note: Field airborne measurements under defined procedures; revision activity does not supersede until publication.

MB-0270. ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025), scope and reported field quantities.

MB-0271. ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation Between Rooms in Buildings (2025), sections 5–12; ISO 16283-1:2014/Amd 1:2017, Field Measurement of Sound Insulation in Buildings and of Building Elements, Part 1: Airborne Sound Insulation, measurement clauses. [Cited 5 times in this edition.]

MB-0272. ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025). [Cited 5 times in this edition.]

MB-0273. ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025a), Composite room-to-room performance; individual door ATL is not isolated by the ordinary method., <https://store.astm.org/e0336-25a.html>; ASTM International, ASTM E2964-26, Standard Test Method for Measurement of the Normalized Insertion Loss of Doors (2026), Field NDIL and DTC for hinged personnel doors under stated limits; flanking reduced but not eliminated., <https://store.astm.org/e2964-26.html>; ASTM International, RR:E33-1015, E2964 Reproducibility and Repeatability Research Report (2019), Precision study for fixed-microphone and scanning E2964 methods., <https://store.astm.org/rr-e33-1015.html>; ASTM International, RR:E33-1014, E2964 Intralaboratory Precision Research Report (2014), Intralaboratory precision evidence for E2964; not a general field acceptance criterion., <https://store.astm.org/rr-e33-1014.html>. [Cited 3 times in this edition.]

MB-0274. ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation Between Rooms in Buildings (ASTM E336-25a (2025a); issuer status verified 10 August 2026), scope, field procedure, background correction, spatial sampling, and reporting provisions; International Organization for Standardization, ISO 16283-1:2014 with Amendment 1:2017, Acoustics, Field Measurement of Sound Insulation in Buildings and of Building Elements, Part 1: Airborne Sound Insulation (ISO 16283-1:2014 with Amendment 1:2017; issuer metadata verified 10 August 2026), field airborne-insulation measurement and reporting provisions; David A. Bies, Colin H. Hansen, and Carl H. Howard, Engineering Noise Control: Theory and Practice (6th ed., CRC Press, 2024), chapters on

measurement, source characterisation, vibration control, and building elements. [Cited 10 times in this edition.]

MB-0275. ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (West Conshohocken, PA: ASTM International, 2025).

MB-0276. ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (West Conshohocken, PA: ASTM International, 2025); ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (West Conshohocken, PA: ASTM International, 2022); International Organization for Standardization, ISO 16283-1:2025, Acoustics - Field Measurement of Sound Insulation in Buildings and of Building Elements - Part 1: Airborne Sound Insulation (Geneva: ISO, 2025); International Organization for Standardization, ISO 717-1:2026, Acoustics - Rating of Sound Insulation in Buildings and of Building Elements - Part 1: Airborne Sound Insulation (Geneva: ISO, 2026).

MB-0277. ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (West Conshohocken, PA: ASTM International, 2025); International Organization for Standardization, ISO 16283-1:2014, Acoustics - Field Measurement of Sound Insulation in Buildings and of Building Elements - Part 1: Airborne Sound Insulation (Geneva: ISO, 2014), confirmed 2025.

MB-0278. ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings, 2025a. Status at the 14 August 2026 source freeze: Active at source freeze. Public locator: <https://store.astm.org/standards/e336>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 8 times in this edition.]

MB-0279. ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings, especially sections 1.1-1.4 and 5.1-5.4, DOI 10.1520/E0336-25A.

MB-0280. ASTM International, ASTM E336-25a; ASTM E2638-24; ASTM E2964-26, Field sound isolation, closed-room speech privacy and low-frequency field measurement standards (2024 to 2026 editions); Joint Committee for Guides in Metrology / International Organization for Standardization, JCGM 100:2008; JCGM 106:2012; ISO 12999-1:2020, Measurement uncertainty, conformity assessment and uncertainty in building acoustics (2008 to 2020 editions); Office of the Director of National Intelligence, ICS 705-02, Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information Facilities (22 December 2016). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-0281. ASTM International, ASTM E3456-25, Practice for On-Site Identification of Firestop Systems and Judgments (2025). Public locator: <https://store.astm.org/e3456-25.html>. UL Solutions, Inspection Based Service Offerings, public firestop special-inspection programme information (available at 16 August 2026 source freeze). Public locator: <https://www.ul.com/services/inspection-based-service-offerings>. Installed-system identification and special inspection can strengthen provenance, but they do not convert firestop evidence into acoustic proof. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.

MB-0282. ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (2022), DOI 10.1520/E0413-22, single-number classification, limitation: ratings are method-dependent and unsuitable for markedly different source spectra without band analysis; International Organization for Standardization, ISO 16283-2:2020, Acoustics - Field measurement of sound insulation in buildings and of building elements - Part 2: Impact sound insulation (Edition 3, 2020; confirmed), <https://www.iso.org/standard/77436.html>, field impact measurement, limitation: standardised source and defined rooms; operational impacts may differ; International Organization for Standardization, ISO 717-1:2020, Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 4, 2020; confirmed 2026), <https://www.iso.org/standard/77435.html>, rating standard, limitation: single numbers simplify requirements but remain derived from band data; International Organization for Standardization, ISO 717-2:2020, Acoustics - Rating of sound insulation in buildings and of building elements - Part 2: Impact sound insulation (Edition 4, 2020; confirmed 2026), <https://www.iso.org/standard/69867.html>, rating standard, limitation: single-number impact ratings remain source- and method-specific.

MB-0283. ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (2022), sections 4–9; ISO 717-1:2020, Rating of Sound Insulation in Buildings and of Building Elements, Part 1: Airborne Sound Insulation, rating clauses. [Cited 6 times in this edition.]

MB-0284. ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (2022). [Cited 4 times in this edition.]

MB-0285. ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (ASTM E413-22 (2022); issuer status verified 10 August 2026), classification and reference-contour provisions; International Organization for Standardization, ISO 717-1:2020, Acoustics, Rating of Sound Insulation in Buildings and of Building Elements, Part 1: Airborne Sound Insulation (ISO 717-1:2020; issuer metadata verified 6 March 2026), airborne sound-insulation rating provisions; Carl Hopkins, Sound Insulation (Elsevier, 2007), chapters on single and multiple elements, flanking, and building prediction. [Cited 4 times in this edition.]

- MB-0286. ASTM International, ASTM E413-22, Classification for Rating Sound Insulation, 2022. Status at the 14 August 2026 source freeze: Active at source freeze. Public locator: <https://store.astm.org/e0413-22.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 3 times in this edition.]
- MB-0287. ASTM International, ASTM E413-22, Classification for Rating Sound Insulation; ASTM International, ASTM E1332-22, Standard Classification for Rating Outdoor-Indoor Sound Attenuation; International Organization for Standardization, ISO 717-1:2020, Acoustics, Rating of Sound Insulation in Buildings and of Building Elements, Part 1: Airborne Sound Insulation, confirmed current in 2026.
- MB-0288. ASTM International, ASTM E413-22, Classification for Rating Sound Insulation, especially sections 4.1-4.2 and 1.1-1.4, DOI 10.1520/E0413-22.
- MB-0289. ASTM International, ASTM E477, Standard Test Method for Laboratory Measurements of Acoustical and Airflow Performance of Duct Liner Materials and Prefabricated Silencers, current edition recorded in project source register. Status at the 14 August 2026 source freeze: Active at source freeze. Public locator: <https://store.astm.org/standards/e477>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 2 times in this edition.]
- MB-0290. ASTM International, ASTM E477-26, laboratory acoustic and airflow testing of duct liner materials and prefabricated silencers.
- MB-0291. ASTM International, ASTM E477-26, laboratory measurements of acoustical and airflow performance of duct liner materials and prefabricated silencers. Laboratory insertion loss does not establish installed breakout, branch geometry or regenerated noise. [Cited 2 times in this edition.]
- MB-0292. ASTM International, ASTM E477-26, Standard Test Method for Laboratory Measurements of Acoustical and Airflow Performance of Duct Liner Materials and Prefabricated Silencers (2026), scope, insertion-loss, generated-noise and pressure-loss provisions; ISO 7235:2003, Acoustics, Laboratory Measurement Procedures for Ducted Silencers and Air-terminal Units; ISO 11691:2020, no-flow insertion-loss survey method.
- MB-0293. ASTM International, ASTM E488/E488M-22, Standard Test Methods for Strength of Anchors in Concrete Elements (2022), used with project-specific masonry qualification where applicable.
- MB-0294. ASTM International, ASTM E492-22, Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine (2022).
- MB-0295. ASTM International, ASTM E492-25, Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using

the Tapping Machine (2025), DOI 10.1520/E0492-25, laboratory impact measurement, limitation: standard source and exact specimen; not every human impact source; ASTM International, ASTM E1007-25, Standard Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures (2025), DOI 10.1520/E1007-25, field impact measurement, limitation: includes field flanking and applies to tested rooms and supports; International Organization for Standardization, ISO 12354-2:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 2: Impact sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70243.html>, prediction standard, limitation: impact prediction bounded by element and flanking data and stated frequency range; International Organization for Standardization, ISO 10848-1:2017, Acoustics - Laboratory and field measurement of flanking transmission for airborne, impact and building service equipment sound between adjoining rooms - Part 1: Frame document (Edition 2, 2017; confirmed 2026), <https://www.iso.org/standard/67226.html>, flanking measurement framework, limitation: quantity and supporting part depend on element and junction type.

MB-0296. ASTM International, ASTM E492-25, Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine (2025), DOI 10.1520/E0492-25. Scope note: Laboratory tapping-machine impact measurements for the exact specimen; assumes a controlled receiving room and suppression of flanking; ASTM International, ASTM E1007-25, Standard Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures (2025), DOI 10.1520/E1007-25. Scope note: Field impact metrics include flanking and apply only to tested rooms and configuration; ASTM International, ASTM E2235-04(2020), Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods (2004 reapproved 2020), DOI 10.1520/E2235-04R20. Scope note: Decay-rate determination for sound-insulation methods; not a complete room-isolation method.

MB-0297. ASTM International, ASTM E492-25, Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine (2025), DOI 10.1520/E0492-25. Scope note: Laboratory tapping-machine impact measurements for the exact specimen; assumes a controlled receiving room and suppression of flanking; ASTM International, ASTM E1007-25, Standard Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures (2025), DOI 10.1520/E1007-25. Scope note: Field impact metrics include flanking and apply only to tested rooms and configuration; ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), DOI 10.1520/E0090-23. Scope note: Laboratory airborne transmission loss of exact specimen; excludes installed flanking and room

operation; ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025), DOI 10.1520/E0336-25A. Scope note: Field room-pair metrics include direct and flanking paths and apply to the tested configuration; ASTM International, ASTM E1414/E1414M-21a, Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum (2021), DOI 10.1520/E1414_E1414M-21A. Scope note: Laboratory ceiling-plenum attenuation under prescribed conditions; field performance may differ materially.

MB-0298. ASTM International, ASTM E492-25, Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine (2025), DOI 10.1520/E0492-25. Scope note: Laboratory tapping-machine impact measurements for the exact specimen; assumes a controlled receiving room and suppression of flanking; ASTM International, ASTM E1007-25, Standard Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures (2025), DOI 10.1520/E1007-25. Scope note: Field impact metrics include flanking and apply only to tested rooms and configuration; International Organization for Standardization, ISO 10140-3:2021, Acoustics - Laboratory measurement of sound insulation of building elements - Part 3: Measurement of impact sound insulation (Edition 3, 2021), <https://www.iso.org/standard/73912.html>. Scope note: Laboratory impact measurement under controlled specimen and receiving-room conditions; International Organization for Standardization, ISO 16283-2:2020, Acoustics - Field measurement of sound insulation in buildings and of building elements - Part 2: Impact sound insulation (Edition 3, 2020; confirmed 2025), <https://www.iso.org/standard/77436.html>. Scope note: Field procedures for rooms 10 to 250 cubic metres and 50 Hz to 5 kHz under stated conditions.

MB-0299. ASTM International, ASTM E492-25, Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine (2025), DOI 10.1520/E0492-25. Scope note: Laboratory tapping-machine impact measurements for the exact specimen; assumes a controlled receiving room and suppression of flanking; ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), DOI 10.1520/E0090-23. Scope note: Laboratory airborne transmission loss of exact specimen; excludes installed flanking and room operation; International Organization for Standardization, ISO 10140-1:2021, Acoustics - Laboratory measurement of sound insulation of building elements - Part 1: Application rules for specific products (Edition 3, 2021; systematic review 2026), <https://www.iso.org/standard/73910.html>. Scope note: Product-specific preparation, mounting and operating conditions; current until replaced.

- MB-0300. ASTM International, ASTM E492-25, Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine (2025), Laboratory tapping-machine impact transmission; not intended to simulate all human impacts or field flanking., <https://store.astm.org/standards/e492>; ASTM International, ASTM E1007-25, Standard Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures (2025), Field impact measurement of actual composite floor-ceiling and support structure; one measurement does not predict nominally similar assemblies., <https://store.astm.org/standards/e1007>; ASTM International, ASTM E2179-25, Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors (2025), Laboratory floor-covering reduction on a standard concrete floor; not direct field performance., <https://store.astm.org/e2179-25.html>; ASHRAE, ASHRAE Handbook - HVAC Applications, chapter on sound and vibration control (2023), Mechanical equipment vibration, isolation and building-service noise., <https://www.ashrae.org/technical-resources/ashrae-handbook>; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Structural mobility, force transmission, power flow and wave propagation., ISBN 9780123736338.
- MB-0301. ASTM International, ASTM E492-25, Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine (2025), Laboratory tapping-machine impact transmission; not intended to simulate all human impacts or field flanking., <https://store.astm.org/standards/e492>; ASTM International, ASTM E1007-25, Standard Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures (2025), Field impact measurement of actual composite floor-ceiling and support structure; one measurement does not predict nominally similar assemblies., <https://store.astm.org/standards/e1007>; ASTM International, ASTM E989-21, Standard Classification for Determination of Single-Number Metrics for Impact Noise (2021), IIC and field impact metrics from one-third-octave tapping-machine data; not a low-frequency footfall or speech-security metric., <https://store.astm.org/e0989-21.html>; ASTM International, ASTM E2179-25, Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors (2025), Laboratory floor-covering reduction on a standard concrete floor; not direct field performance., <https://store.astm.org/e2179-25.html>.
- MB-0302. ASTM International, ASTM E557-12(2026), Standard Guide for Architectural Design and Installation Practices for Sound Isolation between Spaces Separated by Operable Partitions (2012, reapproved 2026), Operable-partition design and installation; field performance can be lower because of flanking and seals.,

<https://store.astm.org/standards/e557>; National Fire Protection Association, NFPA 80, Standard for Fire Doors and Other Opening Protectives (2022), Fire-door installation, inspection, testing and maintenance; not an acoustic rating standard., <https://link.nfpa.org/all-publications/80/2022>; Steel Door Institute, ANSI/SDI A250.8-2023, Specifications for Standard Steel Doors and Frames (2023), Steel-door and frame classifications, construction, anchors, hardware preparation and installation; not an acoustic rating standard., <https://steeldoors.org/ansi-250-8/>.

MB-0303. ASTM International, ASTM E580/E580M-24a, Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions (2024), DOI 10.1520/E0580_E0580M-24A. Scope note: Prescriptive seismic installation subject to authority determination; acoustic consequences require separate analysis.

MB-0304. ASTM International, ASTM E580/E580M-24a, Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions (2024), DOI 10.1520/E0580_E0580M-24A. Scope note: Prescriptive seismic installation subject to authority determination; acoustic consequences require separate analysis; American Society of Civil Engineers, ASCE/SEI 7-22, Minimum Design Loads and Associated Criteria for Buildings and Other Structures (2022 with published supplements and errata), ASCE 7-22. Scope note: Structural and nonstructural seismic design; does not determine acoustic isolation.

MB-0305. ASTM International, ASTM E580/E580M-24a, Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions (2024), DOI 10.1520/E0580_E0580M-24A. Scope note: Prescriptive seismic installation subject to authority determination; acoustic consequences require separate analysis; American Society of Civil Engineers, ASCE/SEI 7-22, Minimum Design Loads and Associated Criteria for Buildings and Other Structures (2022 with published supplements and errata), ASCE 7-22. Scope note: Structural and nonstructural seismic design; does not determine acoustic isolation; ASTM International, ASTM E119-25a, Standard Test Methods for Fire Tests of Building Construction and Materials (2025), DOI 10.1520/E0119-25A. Scope note: Fire resistance of exact assembly under prescribed exposure; acoustic substitutions require separate evidence.

MB-0306. ASTM International, ASTM E580/E580M-24a, Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions (2024), DOI 10.1520/E0580_E0580M-24A. Scope note: Prescriptive seismic installation subject to authority determination; acoustic consequences require separate analysis; American Society of Civil Engineers, ASCE/SEI 7-22, Minimum Design Loads and Associated Criteria for Buildings and Other Structures (2022 with published supplements and errata), ASCE 7-22. Scope note: Structural and nonstructural seismic design; does not determine acoustic isolation;

Frank Fahy and Paolo Gardonio, Sound and Structural Vibration: Radiation, Transmission and Response (Second edition 2007), Academic Press. Scope note: Structural vibration and radiation theory; idealisations require stated boundary conditions.

MB-0307. ASTM International, ASTM E756-05(2023), Standard Test Method for Measuring Vibration-Damping Properties of Materials (West Conshohocken, PA: ASTM International, 2023), scope and significance and use.

MB-0308. ASTM International, ASTM E779-19, Standard Test Method for Determining Air Leakage Rate by Fan Pressurization. Status at the 14 August 2026 source freeze: Active. Public locator: <https://store.astm.org/e0779-19.html>. Air-leakage rate is not acoustic transmission loss.

MB-0309. ASTM International, ASTM E814, fire tests of penetration fire-stop systems, current edition at source freeze, current ASTM edition. Status at the 14 August 2026 source freeze: Active. Public locator: <https://www.astm.org/>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 4 times in this edition.]

MB-0310. ASTM International, ASTM E814, fire tests of penetration firestop systems; ASTM E2174-24, on-site inspection of installed firestop systems. Firestop conformity and acoustic closure require separate, coordinated evidence.

MB-0311. ASTM International, ASTM E814-24, Standard Test Method for Fire Tests of Penetration Firestop Systems (2024; accessed edition used for this release). Public locator: <https://store.astm.org/standards/e814>. ASTM International, WK97942, Revision of E814-24 work item (initiated 30 January 2026). Public locator: <https://store.astm.org/products-services/standards-and-publications/standards/workitem-wk97942>. ASTM International, ASTM E3456-25, Practice for On-Site Identification of Firestop Systems and Judgments (2025). Public locator: <https://store.astm.org/e3456-25.html>. ASTM International, WK95859, Revision of E3456-25 work item (initiated 28 July 2025). Public locator: <https://store.astm.org/workitem-wk95859>. ASTM International, ASTM E3037-20, Standard Test Method for Measuring Relative Movement Capabilities of Through-Penetration Firestop Systems (2020). Public locator: <https://store.astm.org/standards/e3037>. ASTM International, WK97854, Revision of E3037-20 work item (initiated 22 January 2026). Public locator: <https://store.astm.org/products-services/standards-and-publications/standards/workitem-wk97854>. The register distinguishes an accessed published edition, an ongoing revision work item, separate active movement and identification standards, and their development work items. Direct catalogue verification remains necessary before project use. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.

- MB-0312. ASTM International, ASTM E814-24, Standard Test Method for Fire Tests of Penetration Firestop Systems (2024; accessed edition used for this release). Public locator: <https://store.astm.org/standards/e814>. U.S. Department of Defense, UFGS 07 84 00, Firestopping (1 May 2010; active in May 2026 UFGS master). Public locator: <https://www.wbdg.org/dod/ufgs/ufgs-07-84-00>. ASTM International, WK97942, Revision of E814-24 work item (initiated 30 January 2026). Public locator: <https://store.astm.org/products-services/standards-and-publications/standards/workitem-wk97942>. ASTM E814-24 is the accessed edition analysed in this release. ASTM indexed catalogue pages returned inconsistent active-version signals at the source freeze, so the controlling edition must be verified directly before project use. WK97942 is a committee work item and is not itself a published standard. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.
- MB-0313. ASTM International, ASTM E814-24, Standard Test Method for Fire Tests of Penetration Firestop Systems (West Conshohocken, PA: ASTM International, 2024), scope and system-configuration provisions; UL Solutions, UL 1479, Fire Tests of Penetration Firestops, current certification programme.
- MB-0314. ASTM International, ASTM E90-23, scope, apparatus, specimen and calculation provisions.
- MB-0315. ASTM International, ASTM E90-23, laboratory airborne sound transmission-loss method and reporting provisions. [Cited 2 times in this edition.]
- MB-0316. ASTM International, ASTM E90-23, laboratory airborne sound transmission; ASTM E336-25a, field room-to-room airborne sound attenuation; ASTM E2638-24, objective speech privacy for a closed room. These methods support distinct laboratory, field and speech propositions within their stated scopes.
- MB-0317. ASTM International, ASTM E90-23, laboratory measurement of airborne sound transmission loss of building partitions and elements; ASTM E336-25a, field measurement of airborne sound attenuation between rooms; ASTM E2638-24, objective measurement of speech privacy provided by a closed room. The methods support distinct propositions within their scopes.
- MB-0318. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), DOI 10.1520/E0090-23, laboratory element measurement, limitation: exact laboratory specimen only; installed flanking and operational state excluded; ASTM International, ASTM E2964-26, Standard Test Method for Measurement of the Normalized Insertion Loss of Doors (2026), DOI 10.1520/E2964-26, field door insertion measurement, limitation: primarily hinged personnel doors under 6 square metres; surrounding flanking reduced but not eliminated; International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2,

2020; confirmed 2025), <https://www.iso.org/standard/73930.html>, uncertainty standard, limitation: measurement uncertainty does not automatically include model-form or mission uncertainty.

MB-0319. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), DOI 10.1520/E0090-23, laboratory element measurement, limitation: exact laboratory specimen only; installed flanking and operational state excluded; International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70242.html>, prediction standard, limitation: detailed band model and simplified rating model require valid element and junction data; Carl Hopkins, Sound Insulation (2007), Elsevier, ISBN 978-0-7506-6526-1, technical monograph, limitation: prediction and measurement theory; source status is scholarly rather than normative; Lothar Cremer, Manfred Heckl and Björn A. T. Petersson, Structure-Borne Sound, 3rd edition (2005), Springer, technical monograph, limitation: structure-borne wave, mobility and junction theory.

MB-0320. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), DOI 10.1520/E0090-23. Scope note: Laboratory airborne transmission loss of exact specimen; excludes installed flanking and room operation; ASTM International, ASTM E119-25a, Standard Test Methods for Fire Tests of Building Construction and Materials (2025), DOI 10.1520/E0119-25A. Scope note: Fire resistance of exact assembly under prescribed exposure; acoustic substitutions require separate evidence.

MB-0321. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), DOI 10.1520/E0090-23. Scope note: Laboratory airborne transmission loss of exact specimen; excludes installed flanking and room operation; ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025), DOI 10.1520/E0336-25A. Scope note: Field room-pair metrics include direct and flanking paths and apply to the tested configuration.

MB-0322. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), DOI 10.1520/E0090-23. Scope note: Laboratory airborne transmission loss of exact specimen; excludes installed flanking and room operation; ASTM International, ASTM E492-25, Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine (2025), DOI 10.1520/E0492-25. Scope note: Laboratory tapping-machine

impact measurements for the exact specimen; assumes a controlled receiving room and suppression of flanking; Carl Hopkins, Sound Insulation (2007), Elsevier. Scope note: Theory, measurement and prediction; technical synthesis rather than controlling standard; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration: Radiation, Transmission and Response (Second edition 2007), Academic Press. Scope note: Structural vibration and radiation theory; idealisations require stated boundary conditions.

MB-0323. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), DOI 10.1520/E0090-23. Scope note: Laboratory airborne transmission loss of exact specimen; excludes installed flanking and room operation; ASTM International, ASTM E492-25, Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine (2025), DOI 10.1520/E0492-25. Scope note: Laboratory tapping-machine impact measurements for the exact specimen; assumes a controlled receiving room and suppression of flanking; International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70242.html>. Scope note: Band and simplified prediction models depend on measured element and junction data; current edition remains controlling until replaced; Carl Hopkins, Sound Insulation (2007), Elsevier. Scope note: Theory, measurement and prediction; technical synthesis rather than controlling standard.

MB-0324. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), DOI 10.1520/E0090-23. Scope note: Laboratory airborne transmission loss of exact specimen; excludes installed flanking and room operation; International Organization for Standardization, ISO 10140-2:2021, Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation (Edition 3, 2021), <https://www.iso.org/standard/73911.html>. Scope note: Laboratory airborne sound insulation of exact specimen; Carl Hopkins, Sound Insulation (2007), Elsevier. Scope note: Theory, measurement and prediction; technical synthesis rather than controlling standard; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration: Radiation, Transmission and Response (Second edition 2007), Academic Press. Scope note: Structural vibration and radiation theory; idealisations require stated boundary conditions; L. Cremer, M. Heckl and B. A. T. Petersson, Structure-Borne Sound: Structural Vibrations and Sound Radiation at Audio Frequencies (Third edition 2005), Springer. Scope note: Structure-borne theory and junction behaviour; practical application depends on material and geometry.

- MB-0325. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), Laboratory specimen transmission loss., <https://store.astm.org/standards/e90>; ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025a), Field measurement of room-to-room airborne attenuation., <https://store.astm.org/standards/e336>; International Organization for Standardization, ISO 16283-1:2025, Acoustics, Field measurement of sound insulation in buildings and of building elements, Part 1: Airborne sound insulation (2025), Field measurement framework., <https://www.iso.org/standard/77480.html>; ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), Laboratory transmission loss of defined specimens., <https://store.astm.org/e0090-23.html>; ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025a), Field room-to-room attenuation including configured direct and flanking paths., <https://store.astm.org/e0336-25a.html>; ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), Laboratory transmission loss of defined specimens., <https://store.astm.org/e0090-23.html>; ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025a), Field room performance including flanking., <https://store.astm.org/e0336-25a.html>.
- MB-0326. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), Laboratory specimen transmission loss., <https://store.astm.org/standards/e90>; ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (2022), Single-number classification from frequency data; does not replace the curve., <https://store.astm.org/standards/e413>; ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025a), Field measurement of room-to-room airborne attenuation., <https://store.astm.org/standards/e336>; International Organization for Standardization, ISO 16283-1:2025, Acoustics, Field measurement of sound insulation in buildings and of building elements, Part 1: Airborne sound insulation (2025), Field measurement framework., <https://www.iso.org/standard/77480.html>; International Organization for Standardization, ISO 717-1:2026, Acoustics, Rating of sound insulation in buildings and of building elements, Part 1: Airborne sound insulation (2026), Rating framework for airborne sound insulation., <https://www.iso.org/standard/86261.html>; ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), Laboratory transmission loss of defined specimens., [https://store.astm.org/e0090-](https://store.astm.org/e0090-23.html)

23.html; ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025a), Field room-to-room attenuation including configured direct and flanking paths., <https://store.astm.org/e0336-25a.html>; ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (2022), Single-number ratings from frequency-band data; not a speech-security or accreditation test., <https://store.astm.org/e0413-22.html>; ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), Laboratory transmission loss of defined specimens., <https://store.astm.org/e0090-23.html>; ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025a), Field room performance including flanking., <https://store.astm.org/e0336-25a.html>.

MB-0327. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), Laboratory transmission loss of complete tested door and surrounding specimen., <https://store.astm.org/e0090-23.html>; ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (2022), STC derived from one-third-octave transmission loss; not field or speech-security performance., <https://store.astm.org/e0413-22.html>; ASTM International, ASTM E557-12(2026), Standard Guide for Architectural Design and Installation Practices for Sound Isolation between Spaces Separated by Operable Partitions (2012, reapproved 2026), Operable-partition design and installation; field performance can be lower because of flanking and seals., <https://store.astm.org/standards/e557>; Window & Door Manufacturers Association, ANSI/WDMA I.S.1A-21, Industry Standard for Interior Architectural Wood Flush Doors (2021; errata through July 2022), Wood flush-door construction, grades and duty levels; not an acoustic rating standard., <https://www.wdma.com/architectural-door-standards>; Steel Door Institute, ANSI/SDI A250.8-2023, Specifications for Standard Steel Doors and Frames (2023), Steel-door and frame classifications, construction, anchors, hardware preparation and installation; not an acoustic rating standard., <https://steeldoor.org/ansi-250-8/>.

MB-0328. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), Laboratory transmission loss of complete tested door and surrounding specimen., <https://store.astm.org/e0090-23.html>; ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (2022), STC derived from one-third-octave transmission loss; not field or speech-security performance., <https://store.astm.org/e0413-22.html>; Carl Hopkins, Sound Insulation (2007), Composite elements, doors, leaks and field sound isolation., ISBN 9780750665261; Marshall Long, Architectural Acoustics, 2nd edition (2014), Door transmission, seals, vestibules and room acoustics., ISBN 9780123982582; Window & Door Manufacturers

Association, ANSI/WDMA I.S.1A-21, Industry Standard for Interior Architectural Wood Flush Doors (2021; errata through July 2022), Wood flush-door construction, grades and duty levels; not an acoustic rating standard., <https://www.wdma.com/architectural-door-standards>; Steel Door Institute, ANSI/SDI A250.8-2023, Specifications for Standard Steel Doors and Frames (2023), Steel-door and frame classifications, construction, anchors, hardware preparation and installation; not an acoustic rating standard., <https://steeldoor.org/ansi-250-8/>; Window & Door Manufacturers Association, ANSI/WDMA I.S.6A-21, Industry Standard for Interior Architectural Wood Stile and Rail Doors (2021; errata through July 2022), Stile-and-rail wood-door construction and duty levels; acoustic performance requires complete tested opening., <https://www.wdma.com/architectural-door-standards>.

MB-0329. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), Laboratory transmission loss of complete tested door and surrounding specimen., <https://store.astm.org/e0090-23.html>; ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (2022), STC derived from one-third-octave transmission loss; not field or speech-security performance., <https://store.astm.org/e0413-22.html>; Window & Door Manufacturers Association, ANSI/WDMA I.S.1A-21, Industry Standard for Interior Architectural Wood Flush Doors (2021; errata through July 2022), Wood flush-door construction, grades and duty levels; not an acoustic rating standard., <https://www.wdma.com/architectural-door-standards>; Steel Door Institute, ANSI/SDI A250.8-2023, Specifications for Standard Steel Doors and Frames (2023), Steel-door and frame classifications, construction, anchors, hardware preparation and installation; not an acoustic rating standard., <https://steeldoor.org/ansi-250-8/>; Window & Door Manufacturers Association, ANSI/WDMA I.S.6A-21, Industry Standard for Interior Architectural Wood Stile and Rail Doors (2021; errata through July 2022), Stile-and-rail wood-door construction and duty levels; acoustic performance requires complete tested opening., <https://www.wdma.com/architectural-door-standards>.

MB-0330. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), Laboratory transmission loss of defined specimens., <https://store.astm.org/e0090-23.html>; ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025a), Field room performance including flanking., <https://store.astm.org/e0336-25a.html>.

MB-0331. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), Laboratory transmission loss of defined specimens., <https://store.astm.org/e0090-23.html>; ASTM International, ASTM E336-25a, Standard

Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025a), Field room performance including flanking., <https://store.astm.org/e0336-25a.html>; International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (2017; confirmed 2023), Direct and flanking prediction where input data exist., <https://www.iso.org/standard/70242.html>; Carl Hopkins, Sound Insulation (2007), Heavyweight construction, junctions and field evidence., ISBN 9780750665261; Marshall Long, Architectural Acoustics, 2nd edition (2014), Massive walls, cavities, openings and room acoustics., ISBN 9780123982582.

MB-0332. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), Laboratory transmission loss of defined specimens; not field or occupied speech performance., <https://store.astm.org/e0090-23.html>; ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025a), Field room-to-room attenuation including configured direct and flanking paths., <https://store.astm.org/e0336-25a.html>; International Organization for Standardization, ISO 16283-1:2025, Acoustics - Field measurement of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (2025), Field airborne sound-insulation measurement; diagnosis of individual paths requires additional methods., <https://www.iso.org/standard/79444.html>; Carl Hopkins, Sound Insulation (2007), Direct and flanking transmission, junctions, field quantities and prediction., ISBN 9780750665261; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Structural mobility, power flow and junction coupling., ISBN 9780123736338.

MB-0333. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), sections 5–13; ISO 10140-2:2021, Laboratory Measurement of Sound Insulation of Building Elements, Part 2: Measurement of Airborne Sound Insulation, measurement clauses. [Cited 7 times in this edition.]

MB-0334. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), significance and use, secs. 5.1-5.3.

MB-0335. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023). [Cited 4 times in this edition.]

MB-0336. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (ASTM E90-23 (2023); issuer status verified 10 August 2026), scope,

apparatus, specimen-mounting, measurement, and calculation provisions; International Organization for Standardization, ISO 10140-2:2021, Acoustics, Laboratory Measurement of Sound Insulation of Building Elements, Part 2: Measurement of Airborne Sound Insulation (ISO 10140-2:2021; issuer metadata verified 10 August 2026), laboratory airborne-insulation measurement provisions; Carl Hopkins, Sound Insulation (Elsevier, 2007), chapters on single and multiple elements, flanking, and building prediction. [Cited 10 times in this edition.]

MB-0337. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (West Conshohocken, PA: ASTM International, 2023), scope and specimen requirements.

MB-0338. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements, 2023. Status at the 14 August 2026 source freeze: Active at source freeze. Public locator: <https://store.astm.org/e0090-23.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 3 times in this edition.]

MB-0339. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; International Organization for Standardization, ISO 10140-1:2021, Acoustics, Laboratory Measurement of Sound Insulation of Building Elements, Part 1: Application Rules for Specific Products; ISO 10140-2:2021, Part 2: Measurement of Airborne Sound Insulation; ISO 10140-5:2021, Part 5: Requirements for Test Facilities and Equipment.

MB-0340. ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements, especially sections 5.1-5.3 and 1.1-1.3, DOI 10.1520/E0090-23.

MB-0341. ASTM International, ASTM E966-18, Standard Guide for Field Measurements of Airborne Sound Attenuation of Building Facades and Facade Elements; International Organization for Standardization, ISO 16283-3:2016, Acoustics, Field Measurement of Sound Insulation in Buildings and of Building Elements, Part 3: Facade Sound Insulation. ISO lists a second edition under development, so the 2016 publication is used with status disclosed.

MB-0342. ASTM International, ASTM E966-18a, Standard Guide for Field Measurements of Airborne Sound Attenuation of Building Facades and Facade Elements, 2018a. Status at the 14 August 2026 source freeze: Active at source freeze. Public locator: <https://store.astm.org/e0966-18a.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 4 times in this edition.]

- MB-0343. ASTM International, ASTM E989-21, Standard Classification for Determination of Impact Insulation Class (2021).
- MB-0344. ASTM International, ASTM E989-21, Standard Classification for Determination of Single-Number Metrics for Impact Noise (2021), DOI 10.1520/E0989-21. Scope note: Tapping-machine ratings do not address low-frequency footfall boom, squeak, crunch or rattle; ASTM International, ASTM E3207-21, Standard Classification for Determination of Low-Frequency Impact Noise Ratings (2021), DOI 10.1520/E3207-21. Scope note: Low-frequency ratings supplement rather than replace E989 ratings; interlaboratory reproducibility remains bounded.
- MB-0345. ASTM International, ASTM F1642/F1642M-25, Standard Test Method for Glazing and Glazing Systems Subject to Airblast Loadings; ASTM International, ASTM F1233-21, Standard Test Method for Security Glazing Materials and Systems. These are public test methods and do not disclose project-specific threat criteria or establish acoustic performance.
- MB-0346. ASTM International, Field sound isolation, closed-room speech privacy and low-frequency field measurement standards. Identifier: ASTM E336-25a; ASTM E2638-24; ASTM E2964-26. Status at the 16 August 2026 source freeze: Active editions at source freeze. Public locator: <https://www.astm.org/>. Technical role in this crosswalk: Consensus standards. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed. [Cited 2 times in this edition.]
- MB-0347. ASTM International, Field sound isolation, closed-room speech privacy and low-frequency field measurement standards. Identifier: ASTM E336-25a; ASTM E2638-24; ASTM E2964-26. Status at the 16 August 2026 source freeze: Active editions at source freeze. Public locator: <https://www.astm.org/>. Technical role in this crosswalk: Consensus standards. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; International Electrotechnical Commission, Objective Rating of Speech Intelligibility by Speech Transmission Index. Identifier: IEC 60268-16:2020 with Corrigendum 1:2025. Status at the 16 August 2026 source freeze: Published, Edition 5.0, stability date 2028. Public locator: <https://webstore.iec.ch/en/publication/26771>. Technical role in this crosswalk: Consensus standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; FCDO Services, Secure Speech Environments. Identifier: Secure Speech Environments. Status at the 16 August 2026 source freeze: Current official public description. Public locator:

<https://www.fcdoservices.gov.uk/what-we-offer/secure-speech-environments/>.

Technical role in this crosswalk: Primary governmental service description. Limitation:

Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; ASTM International, Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room. Identifier: ASTM E2638-24. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator: <https://www.astm.org/e2638-24.html>.

Technical role in this crosswalk: Closed-room speech-privacy measurement framework. Limitation: Not a universal governmental accreditation threshold and not a substitute for competent-authority criteria.

MB-0348. ASTM International, Field sound isolation, closed-room speech privacy and low-frequency field measurement standards. Identifier: ASTM E336-25a; ASTM E2638-24; ASTM E2964-26. Status at the 16 August 2026 source freeze: Active editions at source freeze. Public locator: <https://www.astm.org/>. Technical role in this crosswalk: Consensus standards. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; International Organization for Standardization, Field Measurement of Airborne Sound Insulation. Identifier: ISO 16283-1:2014 with Amendment 1:2017. Status at the 16 August 2026 source freeze: Published and current at source freeze. Public locator: <https://www.iso.org/standard/55997.html>. Technical role in this crosswalk: Consensus standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; International Electrotechnical Commission, Objective Rating of Speech Intelligibility by Speech Transmission Index. Identifier: IEC 60268-16:2020 with Corrigendum 1:2025. Status at the 16 August 2026 source freeze: Published, Edition 5.0, stability date 2028. Public locator: <https://webstore.iec.ch/en/publication/26771>. Technical role in this crosswalk: Consensus standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; International Organization for Standardization and International Electrotechnical Commission, General requirements for the competence of testing and calibration laboratories. Identifier: ISO/IEC 17025:2017. Status at the 16 August 2026 source freeze: Confirmed current at source freeze. Public locator: <https://www.iso.org/standard/66912.html>. Technical role in this crosswalk: Laboratory

competence, impartiality and consistent operation. Limitation: Accreditation scope must cover the actual method and does not confer governmental facility authority.

MB-0349. ASTM International, Field sound isolation, closed-room speech privacy and low-frequency field measurement standards. Identifier: ASTM E336-25a; ASTM E2638-24; ASTM E2964-26. Status at the 16 August 2026 source freeze: Active editions at source freeze. Public locator: <https://www.astm.org/>. Technical role in this crosswalk: Consensus standards. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; International Organization for Standardization, Field Measurement of Airborne Sound Insulation. Identifier: ISO 16283-1:2014 with Amendment 1:2017. Status at the 16 August 2026 source freeze: Published and current at source freeze. Public locator: <https://www.iso.org/standard/55997.html>. Technical role in this crosswalk: Consensus standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; International Electrotechnical Commission, Objective Rating of Speech Intelligibility by Speech Transmission Index. Identifier: IEC 60268-16:2020 with Corrigendum 1:2025. Status at the 16 August 2026 source freeze: Published, Edition 5.0, stability date 2028. Public locator: <https://webstore.iec.ch/en/publication/26771>. Technical role in this crosswalk: Consensus standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; International Organization for Standardization, Measurement Uncertainty in Building Acoustics, Part 1: Sound Insulation. Identifier: ISO 12999-1:2020. Status at the 16 August 2026 source freeze: Published and current at source freeze. Public locator: <https://www.iso.org/standard/73930.html>. Technical role in this crosswalk: Consensus standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0350. ASTM International, Field sound isolation, closed-room speech privacy and low-frequency field measurement standards. Identifier: ASTM E336-25a; ASTM E2638-24; ASTM E2964-26. Status at the 16 August 2026 source freeze: Active editions at source freeze. Public locator: <https://www.astm.org/>. Technical role in this crosswalk: Consensus standards. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information

and protected approval thresholds are not reconstructed.; International Organization for Standardization, Field Measurement of Airborne Sound Insulation. Identifier: ISO 16283-1:2014 with Amendment 1:2017. Status at the 16 August 2026 source freeze: Published and current at source freeze. Public locator: <https://www.iso.org/standard/55997.html>. Technical role in this crosswalk: Consensus standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; International Organization for Standardization and International Electrotechnical Commission, General requirements for the competence of testing and calibration laboratories. Identifier: ISO/IEC 17025:2017. Status at the 16 August 2026 source freeze: Confirmed current at source freeze. Public locator: <https://www.iso.org/standard/66912.html>. Technical role in this crosswalk: Laboratory competence, impartiality and consistent operation. Limitation: Accreditation scope must cover the actual method and does not confer governmental facility authority.; International Organization for Standardization, Measurement Uncertainty in Building Acoustics, Part 1: Sound Insulation. Identifier: ISO 12999-1:2020. Status at the 16 August 2026 source freeze: Published and current at source freeze. Public locator: <https://www.iso.org/standard/73930.html>. Technical role in this crosswalk: Consensus standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0351. ASTM International, Field sound isolation, closed-room speech privacy and low-frequency field measurement standards. Identifier: ASTM E336-25a; ASTM E2638-24; ASTM E2964-26. Status at the 16 August 2026 source freeze: Active editions at source freeze. Public locator: <https://www.astm.org/>. Technical role in this crosswalk: Consensus standards. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; International Organization for Standardization, Field Measurement of Airborne Sound Insulation. Identifier: ISO 16283-1:2014 with Amendment 1:2017. Status at the 16 August 2026 source freeze: Published and current at source freeze. Public locator: <https://www.iso.org/standard/55997.html>. Technical role in this crosswalk: Consensus standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; International Organization for Standardization, Measurement Uncertainty in Building Acoustics, Part

1: Sound Insulation. Identifier: ISO 12999-1:2020. Status at the 16 August 2026 source freeze: Published and current at source freeze. Public locator:

<https://www.iso.org/standard/73930.html>. Technical role in this crosswalk: Consensus standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; ASTM

International, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings. Identifier: ASTM E336-25a. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator:

<https://www.astm.org/e0336-25a.html>. Technical role in this crosswalk: Field room-to-room airborne sound measurement. Limitation: Proprietary standard. Results depend on configuration and do not alone establish speech-security approval.

MB-0352. ASTM International, Field sound isolation, closed-room speech privacy and low-frequency field measurement standards. Identifier: ASTM E336-25a; ASTM E2638-24; ASTM E2964-26. Status at the 16 August 2026 source freeze: Active editions at source freeze. Public locator: <https://www.astm.org/>. Technical role in this crosswalk:

Consensus standards. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; International Organization for Standardization, Field Measurement of Airborne Sound Insulation. Identifier: ISO 16283-1:2014 with Amendment 1:2017. Status at the 16 August 2026 source freeze: Published and current at source freeze. Public locator:

<https://www.iso.org/standard/55997.html>. Technical role in this crosswalk: Consensus standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; International

Organization for Standardization, Measurement Uncertainty in Building Acoustics, Part 1: Sound Insulation. Identifier: ISO 12999-1:2020. Status at the 16 August 2026 source freeze: Published and current at source freeze. Public locator:

<https://www.iso.org/standard/73930.html>. Technical role in this crosswalk: Consensus standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Joint

Committee for Guides in Metrology, Evaluation of measurement data, Guide to the expression of uncertainty in measurement. Identifier: JCGM 100:2008. Status at the 16 August 2026 source freeze: Current public metrology guide at source freeze. Public locator: <https://www.bipm.org/en/committees/jc/jcgm/publications>. Technical role in

this crosswalk: Measurement models, uncertainty components, covariance and reporting. Limitation: General metrology guidance. It does not provide acoustic acceptance values.

MB-0353. ASTM International, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings. Identifier: ASTM E336-25a. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator: <https://www.astm.org/e0336-25a.html>. Technical role: Field room-to-room airborne sound measurement. Limitation: Proprietary standard. Results depend on configuration and do not alone establish speech-security approval. [Cited 2 times in this edition.]

MB-0354. ASTM International, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings. Identifier: ASTM E336-25a. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator: <https://www.astm.org/e0336-25a.html>. Technical role: Field room-to-room airborne sound measurement. Limitation: Proprietary standard. Results depend on configuration and do not alone establish speech-security approval. ASTM International, Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room. Identifier: ASTM E2638-24. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator: <https://www.astm.org/e2638-24.html>. Technical role: Closed-room speech-privacy measurement framework. Limitation: Not a universal governmental accreditation threshold and not a substitute for competent-authority criteria. International Organization for Standardization, Acoustics, Measurement of room acoustic parameters, Part 2: Reverberation time in ordinary rooms. Identifier: ISO 3382-2:2008. Status at the 16 August 2026 source freeze: Confirmed current at source freeze. Public locator: <https://www.iso.org/standard/36201.html>. Technical role: Room-decay and reverberation-time measurement. Limitation: Does not determine security classification, facility approval or speech consequence by itself.

MB-0355. ASTM International, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings. Identifier: ASTM E336-25a. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator: <https://www.astm.org/e0336-25a.html>. Technical role: Field room-to-room airborne sound measurement. Limitation: Proprietary standard. Results depend on configuration and do not alone establish speech-security approval. ASTM International, Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room. Identifier: ASTM E2638-24. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator: <https://www.astm.org/e2638-24.html>. Technical role: Closed-room speech-privacy measurement framework. Limitation: Not a universal governmental accreditation threshold and not a substitute for competent-authority criteria. International

Organization for Standardization, Field measurement of sound insulation in buildings and of building elements, Part 1: Airborne sound insulation. Identifier: ISO 16283-1:2014 with Amendment 1:2017. Status at the 16 August 2026 source freeze: Confirmed current at source freeze. Public locator: <https://www.iso.org/standard/55997.html>. Technical role: International field airborne-insulation quantities and methods. Limitation: Proprietary standard. Project applicability and acceptance criteria require explicit adoption. [Cited 2 times in this edition.]

MB-0356. ASTM International, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings. Identifier: ASTM E336-25a. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator: <https://www.astm.org/e0336-25a.html>. Technical role: Field room-to-room airborne sound measurement. Limitation: Proprietary standard. Results depend on configuration and do not alone establish speech-security approval. International Organization for Standardization, Field measurement of sound insulation in buildings and of building elements, Part 1: Airborne sound insulation. Identifier: ISO 16283-1:2014 with Amendment 1:2017. Status at the 16 August 2026 source freeze: Confirmed current at source freeze. Public locator: <https://www.iso.org/standard/55997.html>. Technical role: International field airborne-insulation quantities and methods. Limitation: Proprietary standard. Project applicability and acceptance criteria require explicit adoption. International Organization for Standardization and International Electrotechnical Commission, General requirements for the competence of testing and calibration laboratories. Identifier: ISO/IEC 17025:2017. Status at the 16 August 2026 source freeze: Confirmed current at source freeze. Public locator: <https://www.iso.org/standard/66912.html>. Technical role: Laboratory competence, impartiality and consistent operation. Limitation: Accreditation scope must cover the actual method and does not confer governmental facility authority.

MB-0357. ASTM International, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings. Identifier: ASTM E336-25a. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator: <https://www.astm.org/e0336-25a.html>. Technical role: Field room-to-room airborne sound measurement. Limitation: Proprietary standard. Results depend on configuration and do not alone establish speech-security approval. International Organization for Standardization, Field measurement of sound insulation in buildings and of building elements, Part 1: Airborne sound insulation. Identifier: ISO 16283-1:2014 with Amendment 1:2017. Status at the 16 August 2026 source freeze: Confirmed current at source freeze. Public locator: <https://www.iso.org/standard/55997.html>. Technical role: International field airborne-insulation quantities and methods. Limitation: Proprietary standard. Project applicability and acceptance criteria require explicit adoption. Internal cross-reference: the relevant chapters of this edition provide

the governing integration of acoustic physics, construction, measurement, uncertainty, and lifecycle doctrine. This navigation statement is not an external authority and does not enlarge the scope of the cited primary sources.

MB-0358. ASTM International, Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room. Identifier: ASTM E2638-24. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator: <https://www.astm.org/e2638-24.html>. Technical role: Closed-room speech-privacy measurement framework. Limitation: Not a universal governmental accreditation threshold and not a substitute for competent-authority criteria.

MB-0359. ASTM International, Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room. Identifier: ASTM E2638-24. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator: <https://www.astm.org/e2638-24.html>. Technical role: Closed-room speech-privacy measurement framework. Limitation: Not a universal governmental accreditation threshold and not a substitute for competent-authority criteria.

International Organization for Standardization, Acoustics, Measurement of room acoustic parameters, Part 2: Reverberation time in ordinary rooms. Identifier: ISO 3382-2:2008. Status at the 16 August 2026 source freeze: Confirmed current at source freeze. Public locator: <https://www.iso.org/standard/36201.html>. Technical role: Room-decay and reverberation-time measurement. Limitation: Does not determine security classification, facility approval or speech consequence by itself.

International Electrotechnical Commission, Sound system equipment, Part 16: Objective rating of speech intelligibility by speech transmission index. Identifier: IEC 60268-16:2020. Status at the 16 August 2026 source freeze: Current edition with published corrections identified at source freeze. Public locator: <https://webstore.iec.ch/en/publication/62713>. Technical role: Speech Transmission Index method and limitations. Limitation: Proprietary method. STI is listener and condition dependent and is not a universal secure-room criterion.

MB-0360. Barry N. Taylor and Chris E. Kuyatt, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results, NIST Technical Note 1297, 1994 edition, DOI 10.6028/NIST.tn.1297.

MB-0361. Bravo et al., "Influence of Air Layers and Damping Layers Between Gypsum Boards on Sound Transmission," 1051-1059.

MB-0362. Brick Industry Association, Technical Note 18, Volume Changes - Analysis and Effects of Movement.

MB-0363. Cross-reference to MB-0362. The complete authority record is consolidated under the earlier identifier.

MB-0364. Brick Industry Association, Technical Note 18A, Accommodating Expansion of Brickwork.

- MB-0365. Brick Industry Association, Technical Note 18B, Accommodating Building Deflections.
- MB-0366. Brick Industry Association, Technical Note 41, Hollow Brick Masonry.
- MB-0367. Brick Industry Association, Technical Note 5A, Sound Insulation - Clay Masonry Walls.
- MB-0368. Brick Industry Association, Technical Note 7B, Water Penetration Resistance - Construction and Workmanship.
- MB-0369. British Gypsum, " Gyproc SoundBloc Infinae 100 12.5 mm, " product information updated 12 August 2025, accessed 11 August 2026.
- MB-0370. British Gypsum, " GypWall Single Frame, " system-performance page, accessed 11 August 2026; British Gypsum, " GypWall Twin Frame Independent, " system-performance page, accessed 11 August 2026. The published values are system values for stated build-ups, not intrinsic board ratings.
- MB-0371. Builders Hardware Manufacturers Association, ANSI/BHMA A156.21-2025, Thresholds (2025), Threshold performance, installation and durability; acoustic compatibility must be evaluated in the complete opening., <https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/A15621-2025-Thresholds>; International Code Council, 2024 International Building Code (2024), Egress, accessibility, fire-resistance and door requirements subject to local adoption., <https://codes.iccsafe.org/content/IBC2024P1>; International Code Council, ICC A117.1-2017, Accessible and Usable Buildings and Facilities (2017), Clearances, thresholds, opening force and manoeuvring; adopted edition varies., <https://codes.iccsafe.org/content/ICC%20A117.1-2017>.
- MB-0372. Builders Hardware Manufacturers Association, ANSI/BHMA A156.22-2026, Gasketing (2026), Door gasketing performance and durability; actual acoustic result depends on installation and complete opening., <https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/artmid/495/articleid/46>; Dušan Dlhý and Katarína Minarovičová, Door Bottom Joint Design and its Influence on Sound Transmission of the Door (2014), Experimental treatment of bottom-joint sealing; specific test specimens and configurations., <https://doi.org/10.4028/www.scientific.net/AMR.899.487>; Takafumi Shimizu, Daiji Takahashi and Yasuhito Kawai, Numerical Analyses and Experimental Evaluation of Reduction Technique for Sound Transmission through Gaps (2015), Gap transmission and local absorption concepts; not a complete door-system accreditation method., <https://doi.org/10.1016/j.apacoust.2015.06.008>; Weimin Thor and J. Stuart Bolton, A Desktop Procedure for Measuring the Transmission Loss of Automotive Door Seals (2017), Seal samples under controlled compression; automotive geometry requires cautious transfer to building doors., <https://doi.org/10.4271/2017-01-1760>; Li Shengming, Wang Pengjun, Huang Chengwei and Xie Xiaodong, Study on Sound

Insulation Improvement of the Sealing Strip at the Bottom of Residential Door (2021), Residential door-bottom seal tests; reported improvements are specimen-specific., <https://doi.org/10.16300/j.cnki.1000-3630.2021.03.016>; Orçun Saf, Haluk Erol and Ali Erkin Kutlu, Design Optimization of Door Sealing for the Sound Transmission Performance (2023), Vehicle sealing optimisation; supports compression and geometry principles rather than building-door ratings., <https://doi.org/10.1177/09544070221118414>.

MB-0373. Builders Hardware Manufacturers Association, ANSI/BHMA A156.22-2026, Gasketing (2026), Door gasketing performance and durability; actual acoustic result depends on installation and complete opening., <https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/artmid/495/articleid/46>; Takafumi Shimizu, Daiji Takahashi and Yasuhito Kawai, Numerical Analyses and Experimental Evaluation of Reduction Technique for Sound Transmission through Gaps (2015), Gap transmission and local absorption concepts; not a complete door-system accreditation method., <https://doi.org/10.1016/j.apacoust.2015.06.008>; Weimin Thor and J. Stuart Bolton, A Desktop Procedure for Measuring the Transmission Loss of Automotive Door Seals (2017), Seal samples under controlled compression; automotive geometry requires cautious transfer to building doors., <https://doi.org/10.4271/2017-01-1760>; Li Shengming, Wang Pengjun, Huang Chengwei and Xie Xiaodong, Study on Sound Insulation Improvement of the Sealing Strip at the Bottom of Residential Door (2021), Residential door-bottom seal tests; reported improvements are specimen-specific., <https://doi.org/10.16300/j.cnki.1000-3630.2021.03.016>; Orçun Saf, Haluk Erol and Ali Erkin Kutlu, Design Optimization of Door Sealing for the Sound Transmission Performance (2023), Vehicle sealing optimisation; supports compression and geometry principles rather than building-door ratings., <https://doi.org/10.1177/09544070221118414>.

MB-0374. Builders Hardware Manufacturers Association, ANSI/BHMA A156.25-2023, Electrified Locking Devices (2023), Electrified locking devices; cable routes and strikes must not compromise acoustic or fire performance., <https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/artmid/495/articleid/46>; Builders Hardware Manufacturers Association, ANSI/BHMA A156.31-2024, Electric Strikes and Frame Mounted Actuators (2024), Frame-mounted electrified hardware; frame cuts and wiring require acoustic coordination., <https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/artmid/495/articleid/46>. [Cited 2 times in this edition.]

MB-0375. Builders Hardware Manufacturers Association, ANSI/BHMA A156.4-2024, Door Closers and Pivots (2024), Closer cycles, operation and force; field performance affected by pressure, installation and maintenance., <https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/A1564-2024-Door-Closers-and-Pivots>; Builders Hardware Manufacturers Association,

ANSI/BHMA A156.17-2025, Self Closing Hinges and Pivots (2025), Self-closing hinges and pivots; use in acoustic openings requires complete system review.,
<https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/artmid/495/articleid/46>; Builders Hardware Manufacturers Association, ANSI/BHMA A156.26-2025, Continuous Hinges (2025), Continuous hinge requirements; leaf alignment and seal compression remain installation variables., <https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/artmid/495/articleid/46>.

MB-0376. Builders Hardware Manufacturers Association, ANSI/BHMA A156.4-2024, Door Closers and Pivots (2024), Closer cycles, operation and force; field performance affected by pressure, installation and maintenance.,
<https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/A1564-2024-Door-Closers-and-Pivots>; Builders Hardware Manufacturers Association, ANSI/BHMA A156.17-2025, Self Closing Hinges and Pivots (2025), Self-closing hinges and pivots; use in acoustic openings requires complete system review.,
<https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/artmid/495/articleid/46>; Builders Hardware Manufacturers Association, ANSI/BHMA A156.26-2025, Continuous Hinges (2025), Continuous hinge requirements; leaf alignment and seal compression remain installation variables., <https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/artmid/495/articleid/46>; Builders Hardware Manufacturers Association, ANSI/BHMA A156.25-2023, Electrified Locking Devices (2023), Electrified locking devices; cable routes and strikes must not compromise acoustic or fire performance.,
<https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/artmid/495/articleid/46>; Builders Hardware Manufacturers Association, ANSI/BHMA A156.31-2024, Electric Strikes and Frame Mounted Actuators (2024), Frame-mounted electrified hardware; frame cuts and wiring require acoustic coordination.,
<https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/artmid/495/articleid/46>.

MB-0377. Builders Hardware Manufacturers Association, ANSI/BHMA A156.4-2024, Door Closers and Pivots (2024), Closer cycles, operation and force; field performance affected by pressure, installation and maintenance.,
<https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/A1564-2024-Door-Closers-and-Pivots>; Builders Hardware Manufacturers Association, ANSI/BHMA A156.25-2023, Electrified Locking Devices (2023), Electrified locking devices; cable routes and strikes must not compromise acoustic or fire performance.,
<https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/artmid/495/articleid/46>; Builders Hardware Manufacturers Association, ANSI/BHMA A156.31-2024, Electric Strikes and Frame Mounted Actuators (2024), Frame-mounted electrified hardware; frame cuts and wiring require acoustic coordination.,
<https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/artmid/495/articleid/46>; International Code Council, 2024 International Building Code (2024),

Egress, accessibility, fire-resistance and door requirements subject to local adoption., <https://codes.iccsafe.org/content/IBC2024P1>; International Code Council, ICC A117.1-2017, Accessible and Usable Buildings and Facilities (2017), Clearances, thresholds, opening force and manoeuvring; adopted edition varies., <https://codes.iccsafe.org/content/ICC%20A117.1-2017>.

MB-0378. C. Díaz and A. Pedrero, " On the Sound Insulation of Masonry Wall Façades, " Building and Environment 43 (2008): 523-529.

MB-0379. Cabinet Office, Government Security Classifications Policy, Government Security Classifications Policy (2024 public edition); Cabinet Office, PPN 012, Security Classifications Policy (17 February 2025); National Protective Security Authority, Security-Minded Approach to Information Management, Security-Minded Approach to Information Management (Current public web guidance accessed 16 August 2026). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0380. Cabinet Office, Government Security Classifications Policy. Identifier: Government Security Classifications Policy. Status at the 16 August 2026 source freeze: Current public classification policy at source freeze. Public locator: <https://www.gov.uk/government/publications/government-security-classifications/government-security-classifications-policy-html>. Technical role in this crosswalk: Primary governmental policy. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed. [Cited 2 times in this edition.]

MB-0381. Cabinet Office, Government Security Classifications Policy. Identifier: Government Security Classifications Policy. Status at the 16 August 2026 source freeze: Current public classification policy at source freeze. Public locator: <https://www.gov.uk/government/publications/government-security-classifications/government-security-classifications-policy-html>. Technical role in this crosswalk: Primary governmental policy. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Treasury Board of Canada Secretariat, Policy on Government Security. Identifier: Policy instrument 16578. Status at the 16 August 2026 source freeze: Current; amended effective 6 January 2025. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=16578>. Technical role in this crosswalk: Government-wide security

governance, accountability and lifecycle protection. Limitation: High-level policy. It does not disclose project-specific acoustic, EMSEC or specialised-facility criteria.; International Organization for Standardization, Organization and Digitization of Information about Buildings and Civil Engineering Works, Security-Minded Approach to Information Management. Identifier: ISO 19650-5:2020. Status at the 16 August 2026 source freeze: Consensus standard metadata at source freeze. Public locator: <https://www.iso.org/standard/74206.html>. Technical role in this crosswalk: Consensus standard metadata. Limitation: Proprietary standard. Used only for public security-minded information-management principles.; U.S. Department of State, Scope and Authority, including Definitions of Diplomatic Security Terms. Identifier: 12 FAM 010. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0010.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Defines public terminology and authority. It does not disclose controlled room criteria or approve a project.

MB-0382. Cabinet Office, Government Security Classifications Policy. Identifier: Government Security Classifications Policy. Status at the 16 August 2026 source freeze: Current public classification policy at source freeze. Public locator: <https://www.gov.uk/government/publications/government-security-classifications/government-security-classifications-policy.html>. Technical role in this crosswalk: Primary governmental policy. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; U.S. Department of Defense, DoD Information Security Program and Protection of Sensitive Compartmented Information. Identifier: DoDI 5200.01, Change 2. Status at the 16 August 2026 source freeze: Current public issuance listed at source freeze. Public locator: <https://www.esd.whs.mil/Directives/issuances/dodi/dodm/>. Technical role in this crosswalk: Primary governmental instruction. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; Treasury Board of Canada Secretariat, Policy on Government Security. Identifier: Policy instrument 16578. Status at the 16 August 2026 source freeze: Current; amended effective 6 January 2025. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=16578>. Technical role in this crosswalk: Government-wide security governance, accountability and lifecycle protection. Limitation: High-level policy. It does not disclose project-specific acoustic, EMSEC or specialised-facility criteria.; U.S. Department of State, Scope and Authority, including Definitions of Diplomatic Security Terms. Identifier: 12 FAM 010. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0010.html>. Technical role in this crosswalk:

Primary governmental authority. Limitation: Defines public terminology and authority. It does not disclose controlled room criteria or approve a project.

MB-0383. Cabinet Office, GovS 007, Version 2.0, Government Functional Standard: Security (13 September 2021); Cabinet Office, Government Security Classifications Policy, Government Security Classifications Policy (2024 public edition); Government Security Group, Government Security Standards portal, Standards across government security disciplines (Updated 9 December 2025); National Protective Security Authority, Secure Working Areas, Secure Working Areas (Current public web guidance accessed 16 August 2026). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0384. Cabinet Office, GovS 007, Version 2.0, Government Functional Standard: Security (13 September 2021); Cabinet Office, Security Policy Framework, Protecting Government Assets (2 December 2022); FCDO Services, UK National Authority for Counter-Eavesdropping, UK NACE, The UK National Authority for Counter-Eavesdropping (Current public web description accessed 16 August 2026); National Cyber Security Centre, TEMPEST and Electromagnetic Security, TEMPEST and Electromagnetic Security (Published 1 August 2016; current public page at source freeze). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0385. Cabinet Office, GovS 007, Version 2.0, Government Functional Standard: Security (13 September 2021); FCDO Services, UK NACE, Monitoring, Technical Monitoring for Secure Environments (Current public service description accessed 16 August 2026); National Protective Security Authority, Secure Working Areas, Secure Working Areas (Current public web guidance accessed 16 August 2026). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0386. Cabinet Office, GovS 007, Version 2.0, Government Functional Standard: Security (13 September 2021); National Protective Security Authority, Secure Working Areas, Secure Working Areas (Current public web guidance accessed 16 August 2026); FCDO Services, UK National Authority for Counter-Eavesdropping, UK NACE, The UK National Authority for Counter-Eavesdropping (Current public web description accessed 16 August 2026); National Cyber Security Centre, TEMPEST and Electromagnetic Security,

TEMPEST and Electromagnetic Security (Published 1 August 2016; current public page at source freeze). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0387. Cabinet Office, GovS 007, Version 2.0, Government Functional Standard: Security (13 September 2021); National Protective Security Authority, Secure Working Areas, Secure Working Areas (Current public web guidance accessed 16 August 2026); FCDO Services, UK National Authority for Counter-Eavesdropping, UK NACE, The UK National Authority for Counter-Eavesdropping (Current public web description accessed 16 August 2026); National Cyber Security Centre, TEMPEST and Electromagnetic Security, TEMPEST and Electromagnetic Security (Published 1 August 2016; current public page at source freeze); Cabinet Office, Security Policy Framework, Protecting Government Assets (2 December 2022). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0388. Cabinet Office, Protecting the UK National Security Through Public Procurement. Identifier: PPN 025. Status at the 16 August 2026 source freeze: Current procurement guidance at source freeze. Public locator: <https://www.gov.uk/government/publications/ppn-025-protecting-the-uks-national-security-through-public-procurement>. Technical role in this crosswalk: Primary governmental procurement guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Office of the Director of National Intelligence, Supply Chain Threat Revisions. Identifier: ICS 731-02. Status at the 16 August 2026 source freeze: Public standard listed by ODNI at source freeze. Public locator: <https://www.dni.gov/index.php/features/203-about/organization/national-counterintelligence-and-security-center?start=78>. Technical role in this crosswalk: Primary governmental standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; U.S. Department of State, Construction Security Standards, Procurement, and Transit Security of Construction Materials. Identifier: 12 FAM 350. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/12fam/12fam0350.html>. Technical role in this crosswalk:

Primary governmental authority. Limitation: Describes roles and public processes. It does not reproduce the controlled technical standards referenced in 12 FAH-6.; Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role in this crosswalk: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public.

MB-0389. Cabinet Office, Security Policy Framework, Protecting Government Assets (2 December 2022); National Protective Security Authority, Security-Minded Approach to Information Management, Security-Minded Approach to Information Management (Current public web guidance accessed 16 August 2026); FCDO Services, UK NACE, Monitoring, Technical Monitoring for Secure Environments (Current public service description accessed 16 August 2026). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0390. Canadian Centre for Cyber Security, Canadian Industrial TEMPEST Program. Identifier: CITP. Status at the 16 August 2026 source freeze: Current public programme description at source freeze. Public locator: <https://www.cyber.gc.ca/en/tools-services/canadian-industrial-tempest-program-citp>. Technical role: TEMPEST equipment certification and support for EMSEC facility evaluations. Limitation: Public programme information does not disclose controlled test methods or facility thresholds.

MB-0391. Canadian Centre for Cyber Security, Canadian Industrial TEMPEST Program. Identifier: CITP. Status at the 16 August 2026 source freeze: Current public programme description at source freeze. Public locator: <https://www.cyber.gc.ca/en/tools-services/canadian-industrial-tempest-program-citp>. Technical role: TEMPEST equipment certification and support for EMSEC facility evaluations. Limitation: Public programme information does not disclose controlled test methods or facility thresholds. Canadian Centre for Cyber Security, Emission Security Guidance. Identifier: ITSG-11A. Status at the 16 August 2026 source freeze: Protected publication; superseded ITSG-11 in March 2025. Public locator: <https://www.cyber.gc.ca/en/guidance/emission-security-emsec-guidance-itsg-11a>. Technical role: Authoritative protected EMSEC guidance under the Chief, CSE.

Limitation: Only the public existence, status and access route are used. Protected criteria are not reconstructed.

MB-0392. Canadian Centre for Cyber Security, Communications security public information. Status at the 16 August 2026 source freeze: Current public information at source freeze. Public locator: <https://www.cyber.gc.ca/en/comsec>. Technical role: COMSEC governance, secure communications and authorised custody concepts. Limitation: Operational COMSEC procedures, keying material and controlled criteria are excluded.

MB-0393. Canadian Centre for Cyber Security, Communications security public information. Status at the 16 August 2026 source freeze: Current public information at source freeze. Public locator: <https://www.cyber.gc.ca/en/comsec>. Technical role: COMSEC governance, secure communications and authorised custody concepts. Limitation: Operational COMSEC procedures, keying material and controlled criteria are excluded. Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public.

MB-0394. Canadian Centre for Cyber Security, Direction on the use of voice and audio technology in public-facing services. Status at the 16 August 2026 source freeze: Current public direction at source freeze. Public locator: <https://www.cyber.gc.ca/en/guidance/direction-use-voice-audio-technology-public-facing-services>. Technical role: Public-facing voice and audio technology for unclassified and protected information within scope. Limitation: Scope-limited direction. It does not authorise classified discussion or specialised-facility use. Canadian Centre for Cyber Security, Security and privacy controls and assurance activities catalogue. Identifier: ITSP.10.033. Status at the 16 August 2026 source freeze: Current; effective 31 March 2026. Public locator: <https://www.cyber.gc.ca/en/guidance/cyber-security-privacy-risk-management/itsp10033/foreword-overview-introduction>. Technical role: Current Canadian control and assurance catalogue superseding ITSG-33 Annex 3A. Limitation: Controls require selection, tailoring, allocation and assessment. Catalogue inclusion is not automatic project applicability.

MB-0395. Canadian Centre for Cyber Security, Emission Security Guidance. Identifier: ITSG-11A. Status at the 16 August 2026 source freeze: Protected publication; superseded ITSG-11 in March 2025. Public locator: <https://www.cyber.gc.ca/en/guidance/emission-security-emsec-guidance-itsg-11a>. Technical role: Authoritative protected EMSEC guidance under the Chief, CSE.

Limitation: Only the public existence, status and access route are used. Protected criteria are not reconstructed. Canadian Centre for Cyber Security, Canadian Industrial TEMPEST Program. Identifier: CITP. Status at the 16 August 2026 source freeze: Current public programme description at source freeze. Public locator: <https://www.cyber.gc.ca/en/tools-services/canadian-industrial-tempest-program-citp>. Technical role: TEMPEST equipment certification and support for EMSEC facility evaluations. Limitation: Public programme information does not disclose controlled test methods or facility thresholds. Canadian Centre for Cyber Security, Communications security public information. Status at the 16 August 2026 source freeze: Current public information at source freeze. Public locator: <https://www.cyber.gc.ca/en/comsec>. Technical role: COMSEC governance, secure communications and authorised custody concepts. Limitation: Operational COMSEC procedures, keying material and controlled criteria are excluded.

MB-0396. Canadian Centre for Cyber Security, Emission Security Guidance. Identifier: ITSG-11A. Status at the 16 August 2026 source freeze: Protected publication; superseded ITSG-11 in March 2025. Public locator: <https://www.cyber.gc.ca/en/guidance/emission-security-emsec-guidance-itsg-11a>. Technical role: Authoritative protected EMSEC guidance under the Chief, CSE. Limitation: Only the public existence, status and access route are used. Protected criteria are not reconstructed. Canadian Centre for Cyber Security, Fundamentals of Emission Security. Identifier: Learning course description. Status at the 16 August 2026 source freeze: Current public course description; 2026 schedule published. Public locator: <https://www.cyber.gc.ca/en/education-community/learning-hub/courses/fundamentals-emission-security-emsec>. Technical role: Public description of EMSEC vulnerabilities, countermeasures and facility-evaluation concepts. Limitation: A course description cannot substitute for ITSG-11A or competent EMSEC evaluation.

MB-0397. Canadian Centre for Cyber Security, ITSG-11A public metadata. [Cited 3 times in this edition.]

MB-0398. Canadian Centre for Cyber Security, PE-19, "Information Leakage."

MB-0399. Canadian Centre for Cyber Security, Protecting specified information in non-Government of Canada systems and organizations. Identifier: ITSP.10.171. Status at the 16 August 2026 source freeze: Current; second release 28 October 2025. Public locator: <https://www.cyber.gc.ca/en/guidance/protecting-specified-information-non-government-canada-systems-and-organizations-itsp10171>. Technical role: Security requirements for specified information in non-GC systems. Limitation: Applies to specified information within stated scope, not classified facility accreditation. Canadian Centre for Cyber Security, Assessing security requirements for specified information. Identifier: ITSP.10.171-01. Status at the 16 August 2026 source freeze: Current; effective 20 April 2026. Public locator: <https://www.cyber.gc.ca/en/guidance/assessing-security-requirements-specified-information-itsp10171-01>. Technical role: Assessment

procedures and evidence methods for specified-information controls. Limitation: Assessment under this publication does not establish specialised acoustic, COMSEC or EMSEC approval. Canadian Centre for Cyber Security, Security and privacy controls and assurance activities catalogue. Identifier: ITSP.10.033. Status at the 16 August 2026 source freeze: Current; effective 31 March 2026. Public locator: <https://www.cyber.gc.ca/en/guidance/cyber-security-privacy-risk-management/itsp10033/foreword-overview-introduction>. Technical role: Current Canadian control and assurance catalogue superseding ITSG-33 Annex 3A. Limitation: Controls require selection, tailoring, allocation and assessment. Catalogue inclusion is not automatic project applicability.

MB-0400. Canadian Centre for Cyber Security, "Canadian Industrial TEMPEST Program," accessed 10 August 2026, <https://www.cyber.gc.ca/en/tools-services/canadian-industrial-tempest-program-citp>.

MB-0401. Canadian Centre for Cyber Security, "Emission Security Guidance ITSG-11A," public metadata identifying a March 2025 update and Protected A distribution, accessed 10 August 2026.

MB-0402. Canadian Centre for Cyber Security, "Physical and Environmental Protection," PE-19, Information Leakage, accessed 10 August 2026, <https://www.cyber.gc.ca/en/guidance/cyber-security-privacy-risk-management/itsp10033/physical-environmental-protection>.

MB-0403. Carl Hopkins, Sound Insulation (2007), Direct and flanking transmission, junctions, field quantities and prediction., ISBN 9780750665261; Marshall Long, Architectural Acoustics, 2nd edition (2014), Transmission, room acoustics, openings and field diagnosis., ISBN 9780123982582; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Structural mobility, power flow and junction coupling., ISBN 9780123736338; National Park Service, Preservation Brief 2: Repointing Mortar Joints in Historic Masonry Buildings (public preservation guidance), Compatible mortar analysis and repointing; not an acoustic standard., <https://www.nps.gov/orgs/1739/upload/preservation-brief-02-repointing.pdf>.

MB-0404. Carl Hopkins, Sound Insulation (2007), Elsevier, ISBN 978-0-7506-6526-1, technical monograph, limitation: prediction and measurement theory; source status is scholarly rather than normative; Lothar Cremer, Manfred Heckl and Björn A. T. Petersson, Structure-Borne Sound, 3rd edition (2005), Springer, technical monograph, limitation: structure-borne wave, mobility and junction theory; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Academic Press, technical monograph, limitation: structural vibration, power flow and radiation theory.

MB-0405. Carl Hopkins, Sound Insulation (2007), Elsevier, ISBN 978-0-7506-6526-1, technical monograph, limitation: prediction and measurement theory; source status is scholarly rather than normative; Lothar Cremer, Manfred Heckl and Björn A. T. Petersson, Structure-Borne Sound, 3rd edition (2005), Springer, technical monograph, limitation:

structure-borne wave, mobility and junction theory; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Academic Press, technical monograph, limitation: structural vibration, power flow and radiation theory; M. Granger Morgan and Max Henrion, Uncertainty: A Guide to Dealing with Uncertainty in Quantitative Risk and Policy Analysis (1990), Cambridge University Press, ISBN 978-0-521-42744-9, uncertainty and decision analysis reference, limitation: general uncertainty and decision-analysis framework; secure-room consequences and authority decisions remain project-specific; International Organization for Standardization, ISO 31000:2018, Risk management - Guidelines (Edition 2, 2018; confirmed 2023), <https://www.iso.org/standard/65694.html>, risk-management guidance, limitation: generic risk-management framework; does not establish acoustic-security performance or accreditation criteria. [Cited 2 times in this edition.]

MB-0406. Carl Hopkins, Sound Insulation (2007), Elsevier. Scope note: Theory, measurement and prediction; technical synthesis rather than controlling standard; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration: Radiation, Transmission and Response (Second edition 2007), Academic Press. Scope note: Structural vibration and radiation theory; idealisations require stated boundary conditions; L. Cremer, M. Heckl and B. A. T. Petersson, Structure-Borne Sound: Structural Vibrations and Sound Radiation at Audio Frequencies (Third edition 2005), Springer. Scope note: Structure-borne theory and junction behaviour; practical application depends on material and geometry.

MB-0407. Carl Hopkins, Sound Insulation (2007), Frequency-resolved wall, junction and field sound-insulation theory., ISBN 9780750665261; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Mobility, force transmission and structural coupling., ISBN 9780123736338; Carl Hopkins, Sound Insulation (2007), Heavyweight walls, junctions, flanking and field prediction., ISBN 9780750665261; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Structural wave propagation, mobility and power flow., ISBN 9780123736338; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Structural mobility, force transmission, power flow and wave propagation., ISBN 9780123736338; Carl Hopkins, Sound Insulation (2007), Heavyweight construction, junctions and field evidence., ISBN 9780750665261; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Structural wave propagation, interfaces and damping., ISBN 9780123736338.

MB-0408. Carl Hopkins, Sound Insulation (2007), Frequency-resolved wall, junction and field sound-insulation theory., ISBN 9780750665261; Marshall Long, Architectural Acoustics, 2nd edition (2014), Transmission loss, composite partitions, flanking and room acoustics., ISBN 9780123982582; Carl Hopkins, Sound Insulation (2007), Heavyweight walls, junctions, flanking and field prediction., ISBN 9780750665261; Carl Hopkins, Sound Insulation (2007), Flanking, floors, junctions and building prediction., ISBN 9780750665261; Carl Hopkins, Sound Insulation (2007), Heavyweight construction,

junctions and field evidence., ISBN 9780750665261; Marshall Long, Architectural Acoustics, 2nd edition (2014), Massive walls, cavities, openings and room acoustics., ISBN 9780123982582.

MB-0409. Carl Hopkins, Sound Insulation (2007), Heavyweight construction, junctions and field evidence., ISBN 9780750665261; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Structural wave propagation, interfaces and damping., ISBN 9780123736338; Marshall Long, Architectural Acoustics, 2nd edition (2014), Massive walls, cavities, openings and room acoustics., ISBN 9780123982582.

MB-0410. Carl Hopkins, Sound Insulation (Elsevier, 2007), chapters 2–7; Tor Erik Vigran, Building Acoustics (Taylor & Francis, 2008), chapters 3–6. [Cited 6 times in this edition.]

MB-0411. Carl Hopkins, Sound Insulation (Elsevier, 2007), chapters on single and multiple elements, flanking, and building prediction; International Organization for Standardization, ISO 10848-1:2017, Acoustics, Laboratory and field measurement of flanking transmission for airborne, impact and building service equipment sound between adjoining rooms, Part 1: Frame document (ISO 10848-1:2017; issuer metadata verified 2 July 2026), definitions, framework, and measurement principles for flanking transmission; International Organization for Standardization, ISO 12354-1:2017, Building acoustics, Estimation of acoustic performance of buildings from the performance of elements, Part 1: Airborne sound insulation between rooms (ISO 12354-1:2017; issuer metadata verified 10 August 2026), calculation framework for direct and flanking airborne paths. [Cited 4 times in this edition.]

MB-0412. Carl Hopkins, Sound Insulation (Elsevier, 2007), chapters on single and multiple elements, flanking, and building prediction; Tor Erik Vigran, Building Acoustics (Taylor & Francis, 2008), chapters on plate transmission, double constructions, and building acoustics; Marshall Long, Architectural Acoustics (2nd ed., Academic Press, 2014), chapters on room acoustics, sound isolation, and architectural systems. [Cited 12 times in this edition.]

MB-0413. Carl Hopkins, Sound Insulation (Elsevier, 2007), chapters on single elements, multiple elements, openings and flanking; Tor Erik Vigran, Building Acoustics (Taylor & Francis, 2008), chapters on plate transmission and double constructions; Marshall Long, Architectural Acoustics, 2nd ed. (Academic Press, 2014), building-envelope and sound-isolation chapters.

MB-0414. Carl Hopkins, Sound Insulation (Oxford: Butterworth-Heinemann, 2007), chapters on building elements and flanking transmission. [Cited 2 times in this edition.]

MB-0415. Carl Hopkins, Sound Insulation (Oxford: Butterworth-Heinemann, 2007). [Cited 4 times in this edition.]

MB-0416. Chapter 33 procurement and responsibility doctrine, Chapter 34 construction surveillance, and Chapter 35 commissioning. Internal cross-references do not replace independent external authority for technical propositions.

- MB-0417. Chapters 26 and 37 of this work, controlled treatments of audiovisual equipment, source-state matrices, software baselines and amplified-source examples.
- MB-0418. Cold-Formed Steel Engineers Institute, "FAQ of the Month," May 2025 guidance recommending mil thickness rather than gauge terminology; Steel Framing Industry Association, Technical Guide for Cold-Formed Steel Framing Products (February 2026), publication listing.
- MB-0419. Concrete Masonry & Hardscapes Association, TEK 03-02A, Grouting Concrete Masonry Walls.
- MB-0420. Concrete Masonry & Hardscapes Association, TEK 09-04A, Grout for Concrete Masonry.
- MB-0421. Concrete Masonry & Hardscapes Association, TEK 10-02D, Control Joints for Concrete Masonry Walls, public technical guidance.
- MB-0422. Concrete Masonry & Hardscapes Association, TEK 13-01D, Sound Transmission Class Ratings for Concrete Masonry Walls.
- MB-0423. Concrete Masonry & Hardscapes Association, TEK 13-02A, Noise Control With Concrete Masonry. [Cited 3 times in this edition.]
- MB-0424. Concrete Masonry & Hardscapes Association, TEK 18-08B, Grout Quality Assurance.
- MB-0425. Construction Specifications Institute specification practice, public UFGS quality-control and commissioning sections, and Chapter 34 of this work concerning temporary works, hold points and concealed-work evidence.
- MB-0426. Construction Specifications Institute, MasterFormat, current issuer information. MasterFormat organises work results but does not define secure-room performance or integration.
- MB-0427. Cybersecurity and Infrastructure Security Agency, Interagency Security Committee, Federal facility security risk-management policies and standards. Identifier: Risk Management Process for Federal Facilities. Status at the 16 August 2026 source freeze: Official public policy framework. Public locator: <https://www.cisa.gov/about-interagency-security-committee>. Technical role in this crosswalk: Primary governmental policy framework. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; National Institute of Standards and Technology, Risk Management Framework and security and privacy controls. Identifier: NIST SP 800-37 Rev. 2 and SP 800-53 Rev. 5. Status at the 16 August 2026 source freeze: Official public technical guidance. Public locator: <https://csrc.nist.gov/publications>. Technical role in this crosswalk: Primary governmental technical guidance. Limitation: Use is confined to the public source

scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; Cabinet Office, Protecting Government Assets. Identifier: Security Policy Framework. Status at the 16 August 2026 source freeze: Current public policy framework at source freeze. Public locator: <https://www.gov.uk/government/publications/security-policy-framework/hmg-security-policy-framework>. Technical role in this crosswalk: Primary governmental policy. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Treasury Board of Canada Secretariat, Policy on Government Security. Identifier: Policy instrument 16578. Status at the 16 August 2026 source freeze: Current; amended effective 6 January 2025. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=16578>. Technical role in this crosswalk: Government-wide security governance, accountability and lifecycle protection. Limitation: High-level policy. It does not disclose project-specific acoustic, EMSEC or specialised-facility criteria.

MB-0428. David A. Bies, Colin H. Hansen and Carl H. Howard, Engineering Noise Control: Theory and Practice, 6th edition, 2024. Status at the 14 August 2026 source freeze: Published. Public locator: Publisher record. Secondary authority. Project-specific criteria and current standards remain controlling. [Cited 4 times in this edition.]

MB-0429. David A. Bies, Colin H. Hansen and Carl Q. Howard, Engineering Noise Control, Theory and Practice (5th ed., 2017). Public locator: <https://www.routledge.com/Engineering-Noise-Control-Theory-and-Practice/Bies-Hansen-Howard/p/book/9781138186392>. Small conduits and connected boxes may act as acoustic waveguides and structural paths. Mode and attenuation estimates require actual dimensions, wall losses, bends, fill, and termination conditions. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.

MB-0430. David A. Bies, Colin H. Hansen, and Carl H. Howard, Engineering Noise Control: Theory and Practice, 6th ed. (CRC Press, 2024), measurement and instrumentation chapters; Marshall Long, Architectural Acoustics, 2nd ed. (Academic Press, 2014), chapters 2–4. [Cited 5 times in this edition.]

MB-0431. Davy et al., “Empirical Corrections,” abstract and resonance formulation.

MB-0432. Davy, Guigou-Carter, and Villot, “Equivalent Translational Compliance,” 4615-4624.

MB-0433. Davy, Phillips, and Pearse, “The Damping of Gypsum Plaster Board Wooden Stud Cavity Walls,” 52-56.

MB-0434. Davy, "Improvement of a Simple Theoretical Model," 841-849; Davy, "Sound Transmission of Cavity Walls," 814-821; Davy, Guigou-Carter, and Villot, "Equivalent Translational Compliance," 4615-4624.

MB-0435. Davy, "Predicting the Sound Insulation of Single Leaf Walls"; International Organization for Standardization, ISO 12354-1:2017, Building Acoustics, Estimation of Acoustic Performance of Buildings from the Performance of Elements, Part 1: Airborne Sound Insulation Between Rooms, element and junction modelling provisions.

MB-0436. Davy, "Sound Transmission of Cavity Walls"; Steel Deck Institute, ANSI/SDI AISI S917-17(R2024) and S918-17(R2024).

MB-0437. Davy, "Sound Transmission of Cavity Walls," 814-821.

MB-0438. Defense Counterintelligence and Security Agency / eCFR, 32 CFR Part 117, National Industrial Security Program Operating Manual Rule (Effective 24 February 2021; current electronic rule at source freeze); Defense Counterintelligence and Security Agency, NISP Oversight and Security Review Process, National Industrial Security Program oversight, review and rating resources (Current public web resources at source freeze). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-0439. Defense Counterintelligence and Security Agency / eCFR, National Industrial Security Program Operating Manual Rule. Identifier: 32 CFR Part 117. Status at the 16 August 2026 source freeze: Current federal rule and DCSA implementation guidance. Public locator: <https://www.dcsa.mil/Industrial-Security/National-Industrial-Security-Program-Oversight/32-CFR-Part-117-NISPOM-Rule/ddd/>. Technical role in this crosswalk: Primary federal regulation and official implementation guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; Cabinet Office, Government Functional Standard: Security. Identifier: GovS 007, Version 2.0. Status at the 16 August 2026 source freeze: Current public functional standard at source freeze. Public locator: <https://www.gov.uk/government/publications/government-functional-standard-govs-007-security>. Technical role in this crosswalk: Primary governmental standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Treasury Board of Canada Secretariat, Directive on Security Screening. Identifier: Policy instrument 32805. Status at the 16 August 2026 source freeze: Current; effective 6 January 2025. Public locator:

<https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32805>. Technical role in this crosswalk: Security-screening model, lifecycle assurance, temporary access and need-related access governance. Limitation: Screening does not itself confer need-to-know, facility approval or authority to discuss sensitive information.; U.S. Department of State, Physical Security of Facilities Abroad. Identifier: 12 FAM 310. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0310.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Public policy and responsibility framework. Detailed OSPB and handbook criteria may be controlled or nonpublic.

MB-0440. Defense Counterintelligence and Security Agency / eCFR, National Industrial Security Program Operating Manual Rule. Identifier: 32 CFR Part 117. Status at the 16 August 2026 source freeze: Current federal rule and DCSA implementation guidance. Public locator: <https://www.dcsa.mil/Industrial-Security/National-Industrial-Security-Program-Oversight/32-CFR-Part-117-NISPOM-Rule/ddd/>. Technical role in this crosswalk: Primary federal regulation and official implementation guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; Cabinet Office, Government Security Classifications Policy. Identifier: Government Security Classifications Policy. Status at the 16 August 2026 source freeze: Current public classification policy at source freeze. Public locator: <https://www.gov.uk/government/publications/government-security-classifications/government-security-classifications-policy.html>. Technical role in this crosswalk: Primary governmental policy. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role in this crosswalk: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public.; U.S. Department of State, Construction Security Standards, Procurement, and Transit Security of Construction Materials. Identifier: 12 FAM 350. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/12fam/12fam0350.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Describes roles and public

processes. It does not reproduce the controlled technical standards referenced in 12 FAH-6.

MB-0441. Defense Counterintelligence and Security Agency, NISP Oversight and Security Review Process, National Industrial Security Program oversight, review and rating resources (Current public web resources at source freeze); U.S. Department of Energy, Office of Security Policy and Office of Enterprise Assessments, Public safeguards and security policy resources, Security Policy and National Security Assessments (Current public web resources at source freeze); Office of the Director of National Intelligence, ICS 705-02, Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information Facilities (22 December 2016). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-0442. Department of Defense, Whole Building Design Guide, "About the UFC Program," explaining the role and applicability of UFC, UFS, and component-specific facilities criteria, accessed 10 August 2026.

MB-0443. Fahy and Gardonio, Sound and Structural Vibration; David A. Bies, Colin H. Hansen and Carl H. Howard, Engineering Noise Control, 6th ed. (2024), source-path-receiver and vibration-control treatments.

MB-0444. FCDO Services and the UK National Authority for Counter-Eavesdropping, "Secure Speech Environments," public service description, accessed 10 August 2026; National Research Council Canada, "Sound in Rooms" (2006). [Cited 10 times in this edition.]

MB-0445. FCDO Services and UK National Authority for Counter-Eavesdropping, Secure Speech Environments, public service description current at source freeze. Status at the 14 August 2026 source freeze: Current public source. Public locator: <https://www.fcdoservices.gov.uk/services/secure-speech/>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 5 times in this edition.]

MB-0446. FCDO Services, Secure Speech Environments, Secure Speech Environments (Current public service description accessed 16 August 2026); FCDO Services, UK National Authority for Counter-Eavesdropping, UK NACE, The UK National Authority for Counter-Eavesdropping (Current public web description accessed 16 August 2026); Cabinet Office, GovS 007, Version 2.0, Government Functional Standard: Security (13 September 2021); International Organization for Standardization, ISO 12999-1:2020, Measurement Uncertainty in Building Acoustics, Part 1: Sound Insulation (2020; confirmed current in 2025). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room,

system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0447. FCDO Services, Secure Speech Environments, Secure Speech Environments (Current public service description accessed 16 August 2026); International Organization for Standardization, ISO 3382-2:2008 with Corrigendum 1:2009, Measurement of Reverberation Time in Ordinary Rooms (2008; confirmed current in 2022); International Electrotechnical Commission, IEC 60268-16:2020 with Corrigendum 1:2025, Objective Rating of Speech Intelligibility by Speech Transmission Index (2020; corrigendum 7 July 2025). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0448. FCDO Services, Secure Speech Environments. Identifier: Secure Speech Environments. Status at the 16 August 2026 source freeze: Current official public description. Public locator: <https://www.fcdoservices.gov.uk/what-we-offer/secure-speech-environments/>. Technical role in this crosswalk: Primary governmental service description. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0449. FCDO Services, Secure Speech Environments. Identifier: Secure Speech Environments. Status at the 16 August 2026 source freeze: Current official public description. Public locator: <https://www.fcdoservices.gov.uk/what-we-offer/secure-speech-environments/>. Technical role in this crosswalk: Primary governmental service description. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; International Electrotechnical Commission, Objective Rating of Speech Intelligibility by Speech Transmission Index. Identifier: IEC 60268-16:2020 with Corrigendum 1:2025. Status at the 16 August 2026 source freeze: Published, Edition 5.0, stability date 2028. Public locator: <https://webstore.iec.ch/en/publication/26771>. Technical role in this crosswalk: Consensus standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; ASTM International, Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room. Identifier: ASTM E2638-24. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator:

<https://www.astm.org/e2638-24.html>. Technical role in this crosswalk: Closed-room speech-privacy measurement framework. Limitation: Not a universal governmental accreditation threshold and not a substitute for competent-authority criteria.; U.S. Department of State, Scope and Authority, including Definitions of Diplomatic Security Terms. Identifier: 12 FAM 010. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0010.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Defines public terminology and authority. It does not disclose controlled room criteria or approve a project.

MB-0450. FCDO Services, UK NACE, Construction Security, Construction Security (Current public service description accessed 16 August 2026); Cabinet Office, PPN 025, Protecting the UK National Security Through Public Procurement (Published 19 June 2026; updated 3 July 2026); Ministry of Defence, Industry Security Notices, including ISN 2026/04 and ISN 2025/08, Industry Security Notices (Register updated 18 June 2026); National Protective Security Authority, Security-Minded Approach to Information Management, Security-Minded Approach to Information Management (Current public web guidance accessed 16 August 2026). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0451. FCDO Services, UK NACE, Construction Security, Construction Security (Current public service description accessed 16 August 2026); FCDO Services, UK National Authority for Counter-Eavesdropping, UK NACE, The UK National Authority for Counter-Eavesdropping (Current public web description accessed 16 August 2026); National Protective Security Authority, Build it Secure, Security risk management, Operational Requirement and project-lifecycle guidance (Current public web guidance accessed 16 August 2026); National Protective Security Authority, Security-Minded Approach to Information Management, Security-Minded Approach to Information Management (Current public web guidance accessed 16 August 2026). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0452. FCDO Services, UK NACE, Construction Security, Construction Security (Current public service description accessed 16 August 2026); National Protective Security Authority, Build it Secure, Security risk management, Operational Requirement and project-lifecycle guidance (Current public web guidance accessed 16 August 2026); National Protective Security Authority, Introduction to ISO 23234:2021, Major infrastructure projects, security considerations for clients (Current public web guidance

accessed 16 August 2026). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0453. FCDO Services, UK NACE, Listening with Lasers, Public technical-security note on laser eavesdropping (5 June 2024); FCDO Services, UK National Authority for Counter-Eavesdropping, UK NACE, The UK National Authority for Counter-Eavesdropping (Current public web description accessed 16 August 2026); International Organization for Standardization, ISO 16283-1:2014 with Amendment 1:2017, Field Measurement of Airborne Sound Insulation (2014; confirmed current in 2025); National Protective Security Authority, Secure Working Areas, Secure Working Areas (Current public web guidance accessed 16 August 2026). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0454. FCDO Services, UK NACE, Monitoring, Technical Monitoring for Secure Environments (Current public service description accessed 16 August 2026); FCDO Services, UK National Authority for Counter-Eavesdropping, UK NACE, The UK National Authority for Counter-Eavesdropping (Current public web description accessed 16 August 2026); National Cyber Security Centre, Secure RF Communications in Operational Technology, Principles for secure radio frequency communications in operational technology (Published 14 April 2026). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0455. FCDO Services, UK NACE, Public technical-security note on laser eavesdropping. Identifier: Listening with Lasers. Status at the 16 August 2026 source freeze: Current public awareness article at source freeze. Public locator: <https://www.fcdo.gov.uk/listening-with-lasers/>. Technical role in this crosswalk: Primary governmental technical-security awareness guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0456. FCDO Services, UK NACE, Public technical-security note on laser eavesdropping. Identifier: Listening with Lasers. Status at the 16 August 2026 source freeze: Current public awareness article at source freeze. Public locator:

<https://www.fcdo.services.gov.uk/listening-with-lasers/>. Technical role in this crosswalk: Primary governmental technical-security awareness guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; U.S. Department of State, Physical Security of Facilities Abroad. Identifier: 12 FAM 310. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator:

<https://fam.state.gov/FAM/12FAM/12FAM0310.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Public policy and responsibility framework. Detailed OSPB and handbook criteria may be controlled or nonpublic.; National Protective Security Authority, Secure Rooms. Identifier: Secure Rooms. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.npsa.gov.uk/building-protection/building-services-internal-spaces/secure-rooms>. Technical role in this crosswalk: Primary governmental protective-security guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Royal Canadian Mounted Police, Guide to the Application of Physical Security Zones. Identifier: GCPSPG-015 (2024). Status at the 16 August 2026 source freeze: Current public guide; effective 1 July 2024. Public locator: <https://www.rcmp-grc.gc.ca/en/security-information/guide-application-physical-security-zones-gcpspg-015-2024>. Technical role in this crosswalk: Five-zone physical-security architecture and risk-based application. Limitation: Zoning is not an acoustic rating, EMSEC evaluation or specialised-facility accreditation.

MB-0457. FCDO Services, UK NACE, Technical Surveillance Countermeasures, Technical Surveillance Countermeasures (Current public service description accessed 16 August 2026); FCDO Services, UK National Authority for Counter-Eavesdropping, UK NACE, The UK National Authority for Counter-Eavesdropping (Current public web description accessed 16 August 2026); Cabinet Office, GovS 007, Version 2.0, Government Functional Standard: Security (13 September 2021). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0458. FCDO Services, UK NACE, Technical Surveillance Countermeasures, Technical Surveillance Countermeasures (Current public service description accessed 16 August 2026); FCDO Services, UK National Authority for Counter-Eavesdropping, UK NACE, The UK National Authority for Counter-Eavesdropping (Current public web description accessed 16 August 2026); Cabinet Office, Security Policy Framework, Protecting

Government Assets (2 December 2022). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0459. FCDO Services, UK NACE, Technical Surveillance Countermeasures, Technical Surveillance Countermeasures (Current public service description accessed 16 August 2026); FCDO Services, UK National Authority for Counter-Eavesdropping, UK NACE, The UK National Authority for Counter-Eavesdropping (Current public web description accessed 16 August 2026); FCDO Services, UK NACE, Monitoring, Technical Monitoring for Secure Environments (Current public service description accessed 16 August 2026). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0460. FCDO Services, UK NACE, Technical Surveillance Countermeasures, Technical Surveillance Countermeasures (Current public service description accessed 16 August 2026); National Cyber Security Centre, Secure RF Communications in Operational Technology, Principles for secure radio frequency communications in operational technology (Published 14 April 2026); Cabinet Office, GovS 007, Version 2.0, Government Functional Standard: Security (13 September 2021). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0461. FCDO Services, UK NACE, "Listening with Lasers," 5 June 2024, accessed 10 August 2026, <https://www.fcdoservices.gov.uk/listening-with-lasers/>.

MB-0462. FCDO Services, UK NACE, "Technical Surveillance Countermeasures," accessed 10 August 2026, <https://www.fcdoservices.gov.uk/uk-nace/uk-nace-operations/tscm/>.

MB-0463. FCDO Services, UK National Authority for Counter-Eavesdropping, The UK National Authority for Counter-Eavesdropping. Identifier: UK NACE. Status at the 16 August 2026 source freeze: Current official public description. Public locator: <https://www.fcdoservices.gov.uk/uk-nace/>. Technical role in this crosswalk: Primary governmental technical-security authority description. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0464. FCDO Services, UK National Authority for Counter-Eavesdropping, The UK National Authority for Counter-Eavesdropping. Identifier: UK NACE. Status at the 16 August 2026 source freeze: Current official public description. Public locator: <https://www.fcdoservices.gov.uk/uk-nace/>. Technical role in this crosswalk: Primary governmental technical-security authority description. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; FCDO Services, UK NACE, Technical Surveillance Countermeasures. Identifier: Technical Surveillance Countermeasures. Status at the 16 August 2026 source freeze: Current official public description. Public locator: <https://www.fcdoservices.gov.uk/uk-nace/uk-nace-operations/tscm/>. Technical role in this crosswalk: Primary governmental technical-security service description. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; U.S. Department of State, Bureau of Diplomatic Security. Identifier: 1 FAM 260. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/01fam/01fam0260.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Defines organisational roles. It does not authorise a contractor to perform governmental certification or accreditation.; Treasury Board of Canada Secretariat, Directive on Security Management. Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role in this crosswalk: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions.

MB-0465. FCDO Services, UK National Authority for Counter-Eavesdropping, UK NACE, The UK National Authority for Counter-Eavesdropping (Current public web description accessed 16 August 2026); FCDO Services, UK NACE, Technical Surveillance Countermeasures, Technical Surveillance Countermeasures (Current public service description accessed 16 August 2026); National Cyber Security Centre, TEMPEST and Electromagnetic Security, TEMPEST and Electromagnetic Security (Published 1 August 2016; current public page at source freeze); National Cyber Security Centre, TEMPEST and EMS Policy, TEMPEST and EMS Policy and public document-status page (Published 18 July 2017; reviewed 15 May 2025); National Cyber Security Centre, CFTCS, Formal TEMPEST Certification Scheme (Published 1 August 2016; public page current at source freeze). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve,

accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0466. FCDO Services, "Secure Speech Environments," accessed 10 August 2026, <https://www.fcdoservices.gov.uk/what-we-offer/secure-speech-environments/>.

MB-0467. FCDO Services, "Secure Speech Environments." [Cited 6 times in this edition.]

MB-0468. FCDO Services, "Technical Surveillance Countermeasures."

MB-0469. For the bounded treatment in Section 26.13, see United States Department of Defense, UFGS 27 41 00, Audio-Visual Systems (2026-02-01; Active), <https://www.wbdg.org/dod/ufigs/ufigs-27-41-00>. Scope limitation: Provides guide-specification content that must be edited for the project. It is not a substitute for a complete secure-room basis of design.

MB-0470. For the bounded treatment in Section 26.14, see International Electrotechnical Commission, IEC 60268-21:2018, Sound system equipment - Part 21: Acoustical (output-based) measurements (2018-11-07; Edition 1.0; IEC stability date 2026), <https://webstore.iec.ch/en/publication/28687>. Scope limitation: Provides physical output measurements for active and passive sound systems. It does not assess perceived sound quality or room authorisation.

MB-0471. For the bounded treatment in Section 26.15, see International Electrotechnical Commission, IEC 60268-4:2018, Sound system equipment - Part 4: Microphones (2018-09-12; Edition 6.0; IEC stability date 2027), <https://webstore.iec.ch/en/publication/32039>. Scope limitation: Covers sound-system microphone characteristics and measurements. It does not establish secure-room accreditation or endpoint security.

MB-0472. For the bounded treatment in Section 26.16, see International Electrotechnical Commission, IEC 60268-4:2018, Sound system equipment - Part 4: Microphones (2018-09-12; Edition 6.0; IEC stability date 2027), <https://webstore.iec.ch/en/publication/32039>. Scope limitation: Covers sound-system microphone characteristics and measurements. It does not establish secure-room accreditation or endpoint security.

MB-0473. For the bounded treatment in Section 26.17, see International Electrotechnical Commission, IEC 60268-4:2018, Sound system equipment - Part 4: Microphones (2018-09-12; Edition 6.0; IEC stability date 2027), <https://webstore.iec.ch/en/publication/32039>. Scope limitation: Covers sound-system microphone characteristics and measurements. It does not establish secure-room accreditation or endpoint security.

MB-0474. For the bounded treatment in Section 26.18, see International Telecommunication Union, ITU-T P.340, Transmission characteristics and speech quality parameters of hands-free terminals (Current public recommendation page

accessed 2026-08-16; In force with published amendments and corrigendum), <https://www.itu.int/rec/T-REC-P.340/en>. Scope limitation: Addresses terminal transmission performance, including conversational behaviour. It does not prove confidentiality of a room or service.

MB-0475. For the bounded treatment in Section 26.19, see International Electrotechnical Commission, IEC 60268-21:2018, Sound system equipment - Part 21: Acoustical (output-based) measurements (2018-11-07; Edition 1.0; IEC stability date 2026), <https://webstore.iec.ch/en/publication/28687>. Scope limitation: Provides physical output measurements for active and passive sound systems. It does not assess perceived sound quality or room authorisation.

MB-0476. For the bounded treatment in Section 26.20, see International Electrotechnical Commission, IEC 60268-21:2018, Sound system equipment - Part 21: Acoustical (output-based) measurements (2018-11-07; Edition 1.0; IEC stability date 2026), <https://webstore.iec.ch/en/publication/28687>. Scope limitation: Provides physical output measurements for active and passive sound systems. It does not assess perceived sound quality or room authorisation.

MB-0477. For the bounded treatment in Section 26.21, see International Electrotechnical Commission, IEC 60268-23:2023, Sound system equipment - Part 23: TVs and monitors - Loudspeaker systems (2023; Published international standard), <https://webstore.iec.ch/en/publication/77478>. Scope limitation: Addresses loudspeaker systems associated with televisions and monitors. It does not establish installed structural isolation.

MB-0478. For the bounded treatment in Section 26.22, see International Electrotechnical Commission, IEC 60268-22:2020, Sound system equipment - Part 22: Electrical and mechanical measurements on transducers (2020; Published international standard), <https://webstore.iec.ch/en/publication/66439>. Scope limitation: Supports transducer electrical and mechanical characterisation. Installed mounting and room-path conclusions require separate evidence.

MB-0479. For the bounded treatment in Section 26.23, see International Telecommunication Union, ITU-T P.340, Transmission characteristics and speech quality parameters of hands-free terminals (Current public recommendation page accessed 2026-08-16; In force with published amendments and corrigendum), <https://www.itu.int/rec/T-REC-P.340/en>. Scope limitation: Addresses terminal transmission performance, including conversational behaviour. It does not prove confidentiality of a room or service.

MB-0480. For the bounded treatment in Section 26.24, see International Telecommunication Union, ITU-T P.341, Transmission characteristics for wideband digital hands-free telephony terminals (Current public recommendation page accessed 2026-08-16; In force), <https://www.itu.int/rec/T-REC-P.341/en>. Scope limitation: Provides

wideband terminal characteristics. Network, endpoint and room security remain separate questions.

MB-0481. For the bounded treatment in Section 26.25, see National Institute of Standards and Technology, NIST SP 800-128, Guide for Security-Focused Configuration Management of Information Systems (2011; updates through 2019; Final), <https://csrc.nist.gov/pubs/sp/800/128/upd1/final>. Scope limitation: Provides security-focused configuration-management guidance. It is not an acoustic test method or project-specific authority.

MB-0482. For the bounded treatment in Section 26.26, see Audio Engineering Society, AES67-2023, AES standard for audio applications of networks - High-performance streaming audio-over-IP interoperability (2023; Published), <https://aes2.org/publications/standards-search/>. Scope limitation: Addresses interoperable networked audio transport. It does not define secure network architecture or room acceptance.

MB-0483. For the bounded treatment in Section 26.27, see Institute of Electrical and Electronics Engineers, IEEE Std 802.3-2022, IEEE Standard for Ethernet (2022; Published consolidated revision), <https://standards.ieee.org/ieee/802.3/10422/>. Scope limitation: Defines Ethernet physical and data-link provisions, including incorporated PoE amendments. It does not define secure-room operation or acoustic performance.

MB-0484. For the bounded treatment in Section 26.28, see United States Department of Defense, UFC 3-580-01, Information and Communications Technology Infrastructure Planning and Design (2024-11-21; Active), <https://www.wbdg.org/dod/ufc/ufc-3-580-01>. Scope limitation: Provides ICT space, pathway, cabling and interconnection criteria. It does not address every technology using that infrastructure or prove secure-room accreditation.

MB-0485. For the bounded treatment in Section 26.29, see International Electrotechnical Commission, IEC 60268-22:2020, Sound system equipment - Part 22: Electrical and mechanical measurements on transducers (2020; Published international standard), <https://webstore.iec.ch/en/publication/66439>. Scope limitation: Supports transducer electrical and mechanical characterisation. Installed mounting and room-path conclusions require separate evidence.

MB-0486. For the bounded treatment in Section 26.30, see National Institute of Standards and Technology, NIST SP 800-213 and SP 800-213A, IoT Device Cybersecurity Guidance for the Federal Government and IoT Device Cybersecurity Requirement Catalog (2021; Final), <https://csrc.nist.gov/pubs/sp/800/213/final>. Scope limitation: Supports acquisition and definition of IoT cybersecurity requirements. It does not replace system authorisation or acoustic commissioning.

MB-0487. For the bounded treatment in Section 26.31, see United States Department of Justice, 2010 ADA Standards for Accessible Design, Sections 219 and 706, Assistive

Listening Systems (2010; Federal accessibility standards), <https://www.ada.gov/law-and-regs/design-standards/2010-stds/>. Scope limitation: Defines accessibility obligations and technical provisions. It does not waive security, privacy or electromagnetic-control requirements.

MB-0488. For the bounded treatment in Section 26.32, see National Fire Protection Association, NFPA 72, 2025 edition, National Fire Alarm and Signaling Code (2025; Published edition; adoption varies), <https://www.nfpa.org/codes-and-standards/nfpa-72-standard-development/72>. Scope limitation: Governs fire alarm and emergency communications where adopted. Acoustic-security controls cannot obstruct required notification or inspection.

MB-0489. For the bounded treatment in Section 26.33, see National Institute of Standards and Technology, NISTIR 8259A, IoT Device Cybersecurity Capability Core Baseline (2020; Final), <https://csrc.nist.gov/pubs/ir/8259/a/final>. Scope limitation: Defines a device-capability baseline. It does not prove implementation quality or facility suitability.

MB-0490. For the bounded treatment in Section 26.34, see National Institute of Standards and Technology, NIST SP 800-213 and SP 800-213A, IoT Device Cybersecurity Guidance for the Federal Government and IoT Device Cybersecurity Requirement Catalog (2021; Final), <https://csrc.nist.gov/pubs/sp/800/213/final>. Scope limitation: Supports acquisition and definition of IoT cybersecurity requirements. It does not replace system authorisation or acoustic commissioning.

MB-0491. For the bounded treatment in Section 26.35, see National Institute of Standards and Technology, NISTIR 8259A, IoT Device Cybersecurity Capability Core Baseline (2020; Final), <https://csrc.nist.gov/pubs/ir/8259/a/final>. Scope limitation: Defines a device-capability baseline. It does not prove implementation quality or facility suitability.

MB-0492. For the bounded treatment in Section 26.36, see ASHRAE, ANSI/ASHRAE Standard 135-2024, BACnet - A Data Communication Protocol for Building Automation and Control Networks (2024; Current listed edition; continuous maintenance), <https://www.ashrae.org/technical-resources/standards-and-guidelines/read-only-versions-of-ashrae-standards>. Scope limitation: Defines protocol services and objects. Use of BACnet does not by itself establish secure configuration, acoustical performance or interoperability of every feature.

MB-0493. For the bounded treatment in Section 26.37, see International Electrotechnical Commission, IEC 62443-3-3:2013 with COR1:2014, Industrial communication networks - Network and system security - Part 3-3: System security requirements and security levels (2013; corrigendum 2014; Published; IEC stability date 2027), <https://webstore.iec.ch/en/publication/7033>. Scope limitation: Addresses control-system security requirements. It does not establish an acoustic rating or governmental facility accreditation.

- MB-0494. For the bounded treatment in Section 26.38, see National Institute of Standards and Technology, NIST SP 800-128, Guide for Security-Focused Configuration Management of Information Systems (2011; updates through 2019; Final), <https://csrc.nist.gov/pubs/sp/800/128/upd1/final>. Scope limitation: Provides security-focused configuration-management guidance. It is not an acoustic test method or project-specific authority.
- MB-0495. For the bounded treatment in Section 26.39, see National Institute of Standards and Technology, NIST SP 800-161 Rev. 1, Cybersecurity Supply Chain Risk Management Practices for Systems and Organizations (2022; Final), <https://csrc.nist.gov/pubs/sp/800/161/r1/final>. Scope limitation: Provides supply-chain risk-management guidance. It does not certify a particular audiovisual product or secure facility.
- MB-0496. For the bounded treatment in Section 26.40, see National Institute of Standards and Technology, NIST SP 800-128, Guide for Security-Focused Configuration Management of Information Systems (2011; updates through 2019; Final), <https://csrc.nist.gov/pubs/sp/800/128/upd1/final>. Scope limitation: Provides security-focused configuration-management guidance. It is not an acoustic test method or project-specific authority.
- MB-0497. For the bounded treatment in Section 26.41, see National Institute of Standards and Technology, NIST SP 800-218 Version 1.1, Secure Software Development Framework (2022-02; Final), <https://csrc.nist.gov/pubs/sp/800/218/final>. Scope limitation: Addresses secure software-development practices. It does not establish product approval or acoustic performance.
- MB-0498. For the bounded treatment in Section 26.42, see United States Department of Defense, UFC 4-010-06, Cybersecurity of Facility-Related Control Systems (2023-10-10; Active), <https://www.wbdg.org/dod/ufc/ufc-4-010-06>. Scope limitation: Provides design-stage FRCS cybersecurity requirements and expressly does not itself produce an RMF authorisation to operate.
- MB-0499. For the bounded treatment in Section 26.43, see Audiovisual and Integrated Experience Association, AVIXA 10:2013, Audiovisual Systems Performance Verification (2013; republished 2024; Published and under revision), <https://www.avixa.org/resources/standards/av-systems-performance-verification>. Scope limitation: Provides a framework for defining and reporting AV verification. Project-specific criteria and secure-room authority remain necessary.
- MB-0500. For the bounded treatment in Section 26.44, see National Institute of Standards and Technology, NIST SP 800-128, Guide for Security-Focused Configuration Management of Information Systems (2011; updates through 2019; Final), <https://csrc.nist.gov/pubs/sp/800/128/upd1/final>. Scope limitation: Provides security-focused configuration-management guidance. It is not an acoustic test method or project-specific authority.

- MB-0501. For the bounded treatment in Section 26.45, see National Institute of Standards and Technology, NIST SP 800-128, Guide for Security-Focused Configuration Management of Information Systems (2011; updates through 2019; Final), <https://csrc.nist.gov/pubs/sp/800/128/upd1/final>. Scope limitation: Provides security-focused configuration-management guidance. It is not an acoustic test method or project-specific authority.
- MB-0502. For the bounded treatment in Section 27.13, see ASTM International, ASTM E2638-24, Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room (2024; Active), <https://store.astm.org/e2638-24.html>. Scope limitation: Combines room isolation and receiving-side background for unaided-listener speech privacy. It does not set universal acceptance criteria or determine electronic eavesdropping risk.
- MB-0503. For the bounded treatment in Section 27.14, see International Organization for Standardization, ISO 3382-2:2008 and ISO 3382-2:2008/Cor 1:2009, Acoustics - Measurement of room acoustic parameters - Part 2: Reverberation time in ordinary rooms (2008; corrigendum 2009; confirmed current 2022; Published international standard), <https://www.iso.org/standard/36201.html>. Scope limitation: Defines ordinary-room reverberation-time measurement. It does not establish speech-security acceptance, room accreditation, or masking criteria.
- MB-0504. For the bounded treatment in Section 27.15, see ASTM International, ASTM E2235-04(2020), Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods (2004; reapproved 2020; Active), <https://store.astm.org/e2235-04r20.html>. Scope limitation: Supports decay-rate determination in sound-insulation measurements. It does not by itself define a complete occupied-room privacy test.
- MB-0505. For the bounded treatment in Section 27.16, see International Organization for Standardization, ISO 354:2003, Acoustics - Measurement of sound absorption in a reverberation room (2003; confirmed current 2024; Published international standard), <https://www.iso.org/standard/34545.html>. Scope limitation: Laboratory absorption data describe the tested specimen and mounting. They do not alone predict installed room response or secure-room performance.
- MB-0506. For the bounded treatment in Section 27.17, see International Organization for Standardization, ISO 3382-2:2008 and ISO 3382-2:2008/Cor 1:2009, Acoustics - Measurement of room acoustic parameters - Part 2: Reverberation time in ordinary rooms (2008; corrigendum 2009; confirmed current 2022; Published international standard), <https://www.iso.org/standard/36201.html>. Scope limitation: Defines ordinary-room reverberation-time measurement. It does not establish speech-security acceptance, room accreditation, or masking criteria.
- MB-0507. For the bounded treatment in Section 27.18, see International Electrotechnical Commission, IEC 60268-16:2020 with IEC 60268-16:2020/COR1:2025, Sound system

equipment - Part 16: Objective rating of speech intelligibility by speech transmission index (2020; corrigendum 2025; Edition 5.0; corrected version published 2025-07; stability date 2028), <https://webstore.iec.ch/en/publication/26771>. Scope limitation: Defines STI methods and expressly requires attention to method limitations. STI alone does not establish speech privacy, especially under fluctuating noise or unmodelled listener aids.

MB-0508. For the bounded treatment in Section 27.19, see ASTM International, ASTM E1179-13(2019), Standard Specification for Sound Sources Used for Testing Open Office Components and Systems (2013; reapproved 2019; Active), <https://store.astm.org/e1179-13r19.html>. Scope limitation: Specifies test-source characteristics for the stated application. It does not define actual occupant speech distributions or closed-room security acceptance.

MB-0509. For the bounded treatment in Section 27.20, see International Organization for Standardization, ISO 9921:2003, Ergonomics - Assessment of speech communication (2003; confirmed current 2022; Published international standard), <https://www.iso.org/standard/33589.html>. Scope limitation: Addresses speech communication for warning and information exchange. It is not a confidentiality or governmental accreditation standard.

MB-0510. For the bounded treatment in Section 27.21, see Nature Portfolio / original research authors, Scientific Reports 16, article 49995 (2026), The Lombard effect and speech intelligibility under speech-shaped noise (2026; Peer-reviewed original research), <https://doi.org/10.1038/s41598-026-49995-x>. Scope limitation: Reports one controlled study population and condition. Its mean response is not a universal vocal-effort coefficient or a secure-room design constant.

MB-0511. For the bounded treatment in Section 27.22, see International Electrotechnical Commission, IEC 61672-1:2013, Electroacoustics - Sound level meters - Part 1: Specifications (2013; Edition 2.0; IEC stability date 2029), <https://webstore.iec.ch/en/publication/5708>. Scope limitation: Specifies sound-level-meter performance. Instrument conformity does not prove correct field method, calibration state, sampling, uncertainty, or room acceptance.

MB-0512. For the bounded treatment in Section 27.23, see ASTM International, ASTM E2638-24, Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room (2024; Active), <https://store.astm.org/e2638-24.html>. Scope limitation: Combines room isolation and receiving-side background for unaided-listener speech privacy. It does not set universal acceptance criteria or determine electronic eavesdropping risk.

MB-0513. For the bounded treatment in Section 27.24, see ASTM International, ASTM E2638-24, Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room (2024; Active), <https://store.astm.org/e2638-24.html>. Scope limitation: Combines room isolation and receiving-side background for unaided-

listener speech privacy. It does not set universal acceptance criteria or determine electronic eavesdropping risk.

- MB-0514. For the bounded treatment in Section 27.25, see National Institute for Occupational Safety and Health, NIOSH Recommended Exposure Limit for Occupational Noise, Understand Noise Exposure (Public page current 2026; United States government occupational-health guidance), <https://www.cdc.gov/niosh/noise/about/noise.html>. Scope limitation: The 85 dBA eight-hour REL addresses occupational hearing risk. It is not a masking design target, comfort criterion, or speech-security threshold.
- MB-0515. For the bounded treatment in Section 27.26, see International Electrotechnical Commission, IEC 61260-1:2014, Electroacoustics - Octave-band and fractional-octave-band filters - Part 1: Specifications (2014; Edition 1.0), <https://webstore.iec.ch/en/publication/5063>. Scope limitation: Specifies filter performance. It does not define which bands, spatial samples, source states, or decision limits are appropriate to a particular secure-room claim.
- MB-0516. For the bounded treatment in Section 27.27, see International Electrotechnical Commission, IEC 61672-1:2013, Electroacoustics - Sound level meters - Part 1: Specifications (2013; Edition 2.0; IEC stability date 2029), <https://webstore.iec.ch/en/publication/5708>. Scope limitation: Specifies sound-level-meter performance. Instrument conformity does not prove correct field method, calibration state, sampling, uncertainty, or room acceptance.
- MB-0517. For the bounded treatment in Section 27.28, see ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025a; last updated 3 February 2026; Active), <https://store.astm.org/e0336-25a.html>. Scope limitation: Provides field room-to-room sound-attenuation measurement. It does not alone establish speech intelligibility, operational privacy, or competent-authority approval.
- MB-0518. For the bounded treatment in Section 27.29, see International Electrotechnical Commission, IEC 60268-16:2020 with IEC 60268-16:2020/COR1:2025, Sound system equipment - Part 16: Objective rating of speech intelligibility by speech transmission index (2020; corrigendum 2025; Edition 5.0; corrected version published 2025-07; stability date 2028), <https://webstore.iec.ch/en/publication/26771>. Scope limitation: Defines STI methods and expressly requires attention to method limitations. STI alone does not establish speech privacy, especially under fluctuating noise or unmodelled listener aids.
- MB-0519. For the bounded treatment in Section 27.30, see ASTM International, ASTM E2638-24, Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room (2024; Active), <https://store.astm.org/e2638-24.html>. Scope limitation: Combines room isolation and receiving-side background for unaided-

listener speech privacy. It does not set universal acceptance criteria or determine electronic eavesdropping risk.

MB-0520. For the bounded treatment in Section 27.31, see National Research Council Canada, NRC Canada research report and related peer-reviewed programme, New Framework for Rating the Speech Privacy of Enclosed Rooms (Public research record accessed 16 August 2026; Government research publication), <https://nrc-publications.canada.ca/eng/view/object/?id=f789d555-0334-4c38-90dd-0d42b87f5dac>. Scope limitation: Supports probabilistic treatment of enclosed-room speech privacy. Research findings do not themselves create universal contractual or governmental acceptance criteria.

MB-0521. For the bounded treatment in Section 27.32, see National Research Council Canada, NRC Canada research report and related peer-reviewed programme, New Framework for Rating the Speech Privacy of Enclosed Rooms (Public research record accessed 16 August 2026; Government research publication), <https://nrc-publications.canada.ca/eng/view/object/?id=f789d555-0334-4c38-90dd-0d42b87f5dac>. Scope limitation: Supports probabilistic treatment of enclosed-room speech privacy. Research findings do not themselves create universal contractual or governmental acceptance criteria.

MB-0522. For the bounded treatment in Section 27.33, see ASTM International, ASTM E2638-24, Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room (2024; Active), <https://store.astm.org/e2638-24.html>. Scope limitation: Combines room isolation and receiving-side background for unaided-listener speech privacy. It does not set universal acceptance criteria or determine electronic eavesdropping risk.

MB-0523. For the bounded treatment in Section 27.34, see ASTM International, ASTM E2638-24, Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room (2024; Active), <https://store.astm.org/e2638-24.html>. Scope limitation: Combines room isolation and receiving-side background for unaided-listener speech privacy. It does not set universal acceptance criteria or determine electronic eavesdropping risk.

MB-0524. For the bounded treatment in Section 27.35, see ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025a; last updated 3 February 2026; Active), <https://store.astm.org/e0336-25a.html>. Scope limitation: Provides field room-to-room sound-attenuation measurement. It does not alone establish speech intelligibility, operational privacy, or competent-authority approval.

MB-0525. For the bounded treatment in Section 27.36, see International Organization for Standardization, ISO 9921:2003, Ergonomics - Assessment of speech communication (2003; confirmed current 2022; Published international standard), <https://www.iso.org/standard/33589.html>. Scope limitation: Addresses speech

communication for warning and information exchange. It is not a confidentiality or governmental accreditation standard.

MB-0526. For the bounded treatment in Section 27.37, see International Organization for Standardization, ISO 7731:2003, Ergonomics - Danger signals for public and work areas - Auditory danger signals (2003; Published international standard), <https://www.iso.org/standard/33590.html>. Scope limitation: Addresses audibility and recognition of danger signals. Acoustic-security controls must not defeat required warning performance.

MB-0527. For the bounded treatment in Section 27.38, see United States Department of Justice and United States Access Board, 2010 ADA Standards for Accessible Design, Sections 219 and 706, Assistive Listening Systems (2010; Federal accessibility standards), <https://www.ada.gov/law-and-regs/design-standards/2010-stds/>. Scope limitation: Defines accessibility obligations and technical provisions. It does not waive confidentiality, electromagnetic, cyber, life-safety, or competent-authority requirements.

MB-0528. For the bounded treatment in Section 27.39, see International Organization for Standardization, ISO 9921:2003, Ergonomics - Assessment of speech communication (2003; confirmed current 2022; Published international standard), <https://www.iso.org/standard/33589.html>. Scope limitation: Addresses speech communication for warning and information exchange. It is not a confidentiality or governmental accreditation standard.

MB-0529. For the bounded treatment in Section 27.40, see International Electrotechnical Commission, IEC 60942:2017, Electroacoustics - Sound calibrators (2017; Edition 4.0), <https://webstore.iec.ch/en/publication/30045>. Scope limitation: Specifies sound calibrators. A field level check does not establish full frequency response, phase matching, microphone self-noise, or data-processing validity.

MB-0530. For the bounded treatment in Section 27.41, see National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994 edition, public web guidance current; Government metrology guidance), <https://www.nist.gov/pml/nist-technical-note-1297/nist-tn-1297-5-combined-standard-uncertainty>. Scope limitation: Provides uncertainty principles. It does not select project acceptance thresholds, coverage factors, guard bands, or competent decision authority.

MB-0531. For the bounded treatment in Section 27.42, see International Electrotechnical Commission, IEC 61672-1:2013, Electroacoustics - Sound level meters - Part 1: Specifications (2013; Edition 2.0; IEC stability date 2029), <https://webstore.iec.ch/en/publication/5708>. Scope limitation: Specifies sound-level-meter performance. Instrument conformity does not prove correct field method, calibration state, sampling, uncertainty, or room acceptance.

MB-0532. For the bounded treatment in Section 27.43, see ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025a; last updated 3 February 2026; Active), <https://store.astm.org/e0336-25a.html>. Scope limitation: Provides field room-to-room sound-attenuation measurement. It does not alone establish speech intelligibility, operational privacy, or competent-authority approval.

MB-0533. For the bounded treatment in Section 27.44, see International Organization for Standardization, ISO 3382-2:2008 and ISO 3382-2:2008/Cor 1:2009, Acoustics - Measurement of room acoustic parameters - Part 2: Reverberation time in ordinary rooms (2008; corrigendum 2009; confirmed current 2022; Published international standard), <https://www.iso.org/standard/36201.html>. Scope limitation: Defines ordinary-room reverberation-time measurement. It does not establish speech-security acceptance, room accreditation, or masking criteria.

MB-0534. For the bounded treatment in Section 27.45, see ASTM International, ASTM E2638-24, Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room (2024; Active), <https://store.astm.org/e2638-24.html>. Scope limitation: Combines room isolation and receiving-side background for unaided-listener speech privacy. It does not set universal acceptance criteria or determine electronic eavesdropping risk.

MB-0535. For the bounded treatment in Section 28.11, see Office of the Law Revision Counsel, U.S. House of Representatives, 22 U.S.C. section 4802, Responsibility of Secretary of State (laws in effect 19 July 2026). Status: Current public statutory text at source freeze. Public locator: [https://uscode.house.gov/view.xhtml?req=\(title:22%20section:4802%20edition:prelim\)](https://uscode.house.gov/view.xhtml?req=(title:22%20section:4802%20edition:prelim)). Limitation: Allocates public responsibility and functions. It does not publish project-specific acoustic or technical-security criteria..

MB-0536. For the bounded treatment in Section 28.12, see U.S. Department of State, 1 FAM 260, Bureau of Diplomatic Security (Public organisation text with revisions through 16 April 2025). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/01fam/01fam0260.html>. Limitation: Defines organisational roles. It does not authorise a contractor to perform governmental certification or accreditation..

MB-0537. For the bounded treatment in Section 28.13, see U.S. Department of State, 12 FAM 310, Physical Security of Facilities Abroad (CT:DS-452, 14 November 2025). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0310.html>. Limitation: Public policy and responsibility framework. Detailed OSPB and handbook criteria may be controlled or nonpublic..

MB-0538. For the bounded treatment in Section 28.14, see U.S. Department of State, 12 FAM 310, Physical Security of Facilities Abroad (CT:DS-452, 14 November 2025). Status:

Current public text at source freeze. Public locator:

<https://fam.state.gov/FAM/12FAM/12FAM0310.html>. Limitation: Public policy and responsibility framework. Detailed OSPB and handbook criteria may be controlled or nonpublic..

MB-0539. For the bounded treatment in Section 28.15, see U.S. Department of State, Bureau of Overseas Buildings Operations, OBO public project portfolio, Overseas Buildings Operations Project Portfolio (Accessed 16 August 2026). Status: Current public website at source freeze. Public locator: <https://oboportfolio.state.gov/>. Limitation: Public programme descriptions and project summaries only. No controlled facility details are inferred..

MB-0540. For the bounded treatment in Section 28.16, see U.S. Department of State, 12 FAM 010, Scope and Authority, including Definitions of Diplomatic Security Terms (CT:DS-439, 23 April 2025). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0010.html>. Limitation: Defines public terminology and authority. It does not disclose controlled room criteria or approve a project..

MB-0541. For the bounded treatment in Section 28.17, see U.S. Department of State, 12 FAM 010, Scope and Authority, including Definitions of Diplomatic Security Terms (CT:DS-439, 23 April 2025). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0010.html>. Limitation: Defines public terminology and authority. It does not disclose controlled room criteria or approve a project..

MB-0542. For the bounded treatment in Section 28.18, see U.S. Department of State, 1 FAM 260, Bureau of Diplomatic Security (Public organisation text with revisions through 16 April 2025). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/01fam/01fam0260.html>. Limitation: Defines organisational roles. It does not authorise a contractor to perform governmental certification or accreditation..

MB-0543. For the bounded treatment in Section 28.19, see ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025a, updated 3 February 2026). Status: Active metadata at source freeze. Public locator: <https://store.astm.org/e0336-25a.html>. Limitation: Proprietary standard. This chapter describes public method scope and engineering use without reproducing protected text..

MB-0544. For the bounded treatment in Section 28.20, see U.S. Department of State, 12 FAM 310, Physical Security of Facilities Abroad (CT:DS-452, 14 November 2025). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0310.html>. Limitation: Public policy and responsibility framework. Detailed OSPB and handbook criteria may be controlled or nonpublic..

- MB-0545. For the bounded treatment in Section 28.21, see U.S. Department of State, 15 FAM 1010, Overview, Scope, Authority, and General Policy for Capital Projects (CT:OBO-162, 10 April 2025). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/15fam/15fam1010.html>. Limitation: Public project-management policy. Detailed design standards, budgets and classified project information are outside scope..
- MB-0546. For the bounded treatment in Section 28.22, see U.S. Department of State, 15 FAM 650, Facility Management Support for Major Projects (CT:OBO-168, 24 July 2026). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/15FAM/15FAM0650.html>. Limitation: Integrated design and lifecycle review do not replace project security certification, controlled criteria or technical testing..
- MB-0547. For the bounded treatment in Section 28.23, see U.S. Department of State, 15 FAM 650, Facility Management Support for Major Projects (CT:OBO-168, 24 July 2026). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/15FAM/15FAM0650.html>. Limitation: Integrated design and lifecycle review do not replace project security certification, controlled criteria or technical testing..
- MB-0548. For the bounded treatment in Section 28.24, see U.S. Government Accountability Office, GAO-25-107582, Embassy Construction: State Has Made Progress but Could Improve Project Performance Information (14 November 2024). Status: Official public oversight report. Public locator: <https://www.gao.gov/products/gao-25-107582>. Limitation: Portfolio observations and figures do not establish conditions or controlled criteria at any individual protected room..
- MB-0549. For the bounded treatment in Section 28.25, see U.S. Department of State, 15 FAM 110, General Authorities and Responsibilities for Overseas Real Property Management (CT:OBO-154, 5 June 2024). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/15FAM/15FAM0110.html>. Limitation: Establishes real-property responsibilities, not secure-room technical acceptance values..
- MB-0550. For the bounded treatment in Section 28.26, see U.S. Government Accountability Office, GAO-23-105887, State Department: Additional Steps Are Needed to Improve Overseas Facility Resilience (2023). Status: Official public oversight report. Public locator: <https://www.gao.gov/products/gao-23-105887>. Limitation: Resilience observations inform host-facility risk but do not replace technical-security design or acceptance..
- MB-0551. For the bounded treatment in Section 28.27, see Office of the Law Revision Counsel, U.S. House of Representatives, 22 U.S.C. section 4852, Diplomatic Construction Program (laws in effect 21 July 2026). Status: Current public statutory text at source freeze. Public locator: <https://uscode.house.gov/view.xhtml?>

req=(title:22%20section:4852%20edition:prelim). Limitation: Public construction and procurement provisions do not disclose controlled technical specifications or acceptance thresholds..

MB-0552. For the bounded treatment in Section 28.28, see U.S. Department of State, 12 FAM 360, Construction Security Certification Program (CT:DS-423, 15 April 2024). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/12fam/12fam0360.html>. Limitation: Establishes public certification processes and applicability. Project-specific memoranda, risk findings and controlled criteria remain outside this chapter..

MB-0553. For the bounded treatment in Section 28.29, see U.S. Department of State, 12 FAM 350, Construction Security Standards, Procurement, and Transit Security of Construction Materials (CT:DS-403, 9 May 2023). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/12fam/12fam0350.html>. Limitation: Describes roles and public processes. It does not reproduce the controlled technical standards referenced in 12 FAH-6..

MB-0554. For the bounded treatment in Section 28.30, see U.S. Department of State, 12 FAM 350, Construction Security Standards, Procurement, and Transit Security of Construction Materials (CT:DS-403, 9 May 2023). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/12fam/12fam0350.html>. Limitation: Describes roles and public processes. It does not reproduce the controlled technical standards referenced in 12 FAH-6..

MB-0555. For the bounded treatment in Section 28.31, see International Organization for Standardization, ISO 19650-5:2020, Organization and Digitization of Information about Buildings and Civil Engineering Works, Security-Minded Approach to Information Management (2020). Status: Consensus standard metadata at source freeze. Public locator: <https://www.iso.org/standard/74206.html>. Limitation: Proprietary standard. Used only for public security-minded information-management principles..

MB-0556. For the bounded treatment in Section 28.32, see U.S. Department of State, 1 FAM 260, Bureau of Diplomatic Security (Public organisation text with revisions through 16 April 2025). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/01fam/01fam0260.html>. Limitation: Defines organisational roles. It does not authorise a contractor to perform governmental certification or accreditation..

MB-0557. For the bounded treatment in Section 28.33, see U.S. Department of State, 15 FAM 650, Facility Management Support for Major Projects (CT:OBO-168, 24 July 2026). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/15FAM/15FAM0650.html>. Limitation: Integrated design and lifecycle review do not replace project security certification, controlled criteria or technical testing..

- MB-0558. For the bounded treatment in Section 28.34, see U.S. Department of State, 12 FAM 010, Scope and Authority, including Definitions of Diplomatic Security Terms (CT:DS-439, 23 April 2025). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0010.html>. Limitation: Defines public terminology and authority. It does not disclose controlled room criteria or approve a project..
- MB-0559. For the bounded treatment in Section 28.35, see Office of the Law Revision Counsel, U.S. House of Representatives, 22 U.S.C. section 4852, Diplomatic Construction Program (laws in effect 21 July 2026). Status: Current public statutory text at source freeze. Public locator: [https://uscode.house.gov/view.xhtml?req=\(title:22%20section:4852%20edition:prelim\)](https://uscode.house.gov/view.xhtml?req=(title:22%20section:4852%20edition:prelim)). Limitation: Public construction and procurement provisions do not disclose controlled technical specifications or acceptance thresholds..
- MB-0560. For the bounded treatment in Section 28.36, see U.S. Department of State, Office of Inspector General, AUD-CGI-20-43, Audit of the Bureau of Overseas Buildings Operations Construction Closeout Process (September 2020). Status: Official public oversight report. Public locator: https://www.stateoig.gov/uploads/report/report_pdf_file/aud-cgi-20-43.pdf. Limitation: Programme findings do not disclose or validate controlled room criteria..
- MB-0561. For the bounded treatment in Section 28.37, see Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data, Guide to the Expression of Uncertainty in Measurement (2008 with corrections). Status: Current foundational public metrology guide. Public locator: <https://www.bipm.org/en/committees/jc/jcgm/publications>. Limitation: General uncertainty framework. The measurement model and acceptance risk remain project specific..
- MB-0562. For the bounded treatment in Section 28.38, see U.S. Department of State, 12 FAM 390, Department of State Facility Accreditation Program (public text accessed 16 August 2026). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0390.html>. Limitation: Public governance language does not permit an engineer to grant accreditation or infer controlled criteria..
- MB-0563. For the bounded treatment in Section 28.39, see U.S. Department of State, Office of Inspector General, ISP-I-24-19, Review of the Department of State Physical Security Waivers and Exceptions Process (June 2024). Status: Official public oversight report. Public locator: https://www.stateoig.gov/uploads/report/report_pdf_file/isp-i-24-19.pdf. Limitation: Supports governance analysis without publishing controlled vulnerabilities or authorising a project disposition..
- MB-0564. For the bounded treatment in Section 28.40, see U.S. Department of State, Office of Inspector General, AUD-CGI-20-43, Audit of the Bureau of Overseas Buildings

Operations Construction Closeout Process (September 2020). Status: Official public oversight report. Public locator: https://www.stateoig.gov/uploads/report/report_pdf_file/aud-cgi-20-43.pdf. Limitation: Programme findings do not disclose or validate controlled room criteria..

MB-0565. For the bounded treatment in Section 28.41, see U.S. Department of State, 15 FAH-1, Facilities Maintenance Handbook (handbook updated 6 May 2026; associated policy revised 24 July 2026). Status: Current public maintenance guidance at source freeze. Public locator: <https://fam.state.gov/fam/15fah01/15fah010110.html>. Limitation: General maintenance procedures require room-specific controls where protected configuration or evidence is involved..

MB-0566. For the bounded treatment in Section 28.42, see U.S. Department of State, 15 FAM 680, Facility Operations, Sustainment, Restoration, and Modernization Supplemental Standards (CT:OBO-168, 24 July 2026). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/15fam/15fam0680.html>. Limitation: Public procedural guidance, including CAA-related work. It does not reproduce protected CSP contents or technical criteria..

MB-0567. For the bounded treatment in Section 28.43, see U.S. Department of State, 15 FAM 620, Facility Operations (CT:OBO-168, 24 July 2026). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/15fam/15fam0620.html>. Limitation: General operations policy does not establish technical-security status for a specialised room..

MB-0568. For the bounded treatment in Section 28.44, see U.S. Department of State, Office of Inspector General, AUD-MERO-20-39, Audit of the Bureau of Overseas Buildings Operations Process for Reviewing and Learning From Past Projects (September 2020). Status: Official public oversight report. Public locator: https://www.stateoig.gov/uploads/report/report_pdf_file/aud-mero-20-39.pdf. Limitation: Lessons-process findings support institutional improvement but do not establish room-level technical acceptance criteria..

MB-0569. For the bounded treatment in Section 28.45, see U.S. Department of State, 12 FAM 310, Physical Security of Facilities Abroad (CT:DS-452, 14 November 2025). Status: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0310.html>. Limitation: Public policy and responsibility framework. Detailed OSPB and handbook criteria may be controlled or nonpublic..

MB-0570. For the bounded treatment in Section 36.1, see ASTM International, ASTM E3176-24, Standard Guide for Forensic Engineering Expert Reports (Active; last updated 25 March 2024), <https://store.astm.org/e3176-24.html>. Technical role: Forensic report purpose, content, limitations, and electronic representation. Scope limitation: Informational guide. Report form remains subject to engagement terms, applicable law, and tribunal orders.

- MB-0571. For the bounded treatment in Section 36.1, see Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of measurement data - Guide to the expression of uncertainty in measurement (Public metrology guide at source freeze), <https://www.bipm.org/en/committees/jc/jcgm/publications>. Technical role: Measurement models, standard uncertainty, covariance, and expanded uncertainty. Scope limitation: General metrology guidance. The measurand and decision rule remain application specific.
- MB-0572. For the bounded treatment in Section 36.10, see ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (Active at source freeze), <https://store.astm.org/e0336-25a.html>. Technical role: Field room-to-room airborne sound-attenuation measurement. Scope limitation: A field result is configuration and state specific. It does not alone establish speech-security approval.
- MB-0573. For the bounded treatment in Section 36.10, see National Institute of Standards and Technology, NIST/SEMATECH e-Handbook of Statistical Methods, Engineering statistics reference (Public NIST resource at source freeze), <https://www.itl.nist.gov/div898/handbook/>. Technical role: Experimental design, sampling, estimation, control charts, and statistical diagnostics. Scope limitation: Statistical methods require a physically valid model and representative data.
- MB-0574. For the bounded treatment in Section 36.11, see International Electrotechnical Commission, IEC 61672-1:2013, Electroacoustics - Sound level meters - Part 1: Specifications (Edition cited at source freeze), <https://webstore.iec.ch/en/publication/5708>. Technical role: Performance requirements for sound level meters. Scope limitation: Instrument class does not cure an unsuitable method, geometry, or state definition.
- MB-0575. For the bounded treatment in Section 36.11, see International Organization for Standardization, ISO 7626 series, Mechanical vibration and shock - Experimental determination of mechanical mobility (Series cited at source freeze), <https://www.iso.org/committee/51508/x/catalogue/>. Technical role: Mobility and transfer-function measurement concepts. Scope limitation: Results depend on excitation, support, sensor mounting, linearity, and boundary conditions.
- MB-0576. For the bounded treatment in Section 36.12, see Carl Hopkins, Sound Insulation, 2007, Sound Insulation (Recognised engineering monograph),. Technical role: Building sound-insulation theory, field and laboratory quantities, and flanking. Scope limitation: Textbook analysis must be reconciled with current standards and the actual construction.
- MB-0577. For the bounded treatment in Section 36.12, see International Organization for Standardization, ISO 10140-2:2021, Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation (Published edition at source freeze), <https://www.iso.org/standard/79487.html>.

Technical role: International laboratory airborne sound-insulation measurement. Scope limitation: A laboratory element rating is not a whole-room or authorisation result.

MB-0578. For the bounded treatment in Section 36.13, see ASTM International, ASTM E1186-22, Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems (Active at source freeze), <https://store.astm.org/e1186-22.html>.

Technical role: Qualitative air-leakage site detection methods. Scope limitation: Air leakage and acoustic leakage can correlate, but neither is a universal surrogate for the other.

MB-0579. For the bounded treatment in Section 36.13, see David A. Bies, Colin H. Hansen, and Carl Q. Howard, Engineering Noise Control, 6th ed., 2024, Engineering Noise Control: Theory and Practice (Current recognised engineering monograph at source freeze),. Technical role: Noise-control physics, sources, propagation, measurement, and diagnostic practice. Scope limitation: General engineering treatment does not replace project-specific testing or authority decisions.

MB-0580. For the bounded treatment in Section 36.14, see ASTM International, ASTM C919-24, Standard Practice for Use of Sealants in Acoustical Applications (Active at source freeze), <https://store.astm.org/c0919-24.html>. Technical role: Acoustical sealant application practice. Scope limitation: Sealant practice does not establish fire, movement, durability, or whole-room performance by itself.

MB-0581. For the bounded treatment in Section 36.14, see ASTM International, ASTM E814-24, Standard Test Method for Fire Tests of Penetration Firestop Systems (Active page accessed at source freeze; later work item under development), <https://store.astm.org/e0814-24.html>. Technical role: Fire resistance testing of penetration firestop systems. Scope limitation: Fire-resistance evidence and acoustic closure are separate propositions. Direct catalogue confirmation is required before project application.

MB-0582. For the bounded treatment in Section 36.15, see Carl Hopkins, Sound Insulation, 2007, Sound Insulation (Recognised engineering monograph),. Technical role: Building sound-insulation theory, field and laboratory quantities, and flanking. Scope limitation: Textbook analysis must be reconciled with current standards and the actual construction.

MB-0583. For the bounded treatment in Section 36.15, see International Organization for Standardization, ISO 7626 series, Mechanical vibration and shock - Experimental determination of mechanical mobility (Series cited at source freeze), <https://www.iso.org/committee/51508/x/catalogue/>. Technical role: Mobility and transfer-function measurement concepts. Scope limitation: Results depend on excitation, support, sensor mounting, linearity, and boundary conditions.

MB-0584. For the bounded treatment in Section 36.16, see Carl Hopkins, Sound Insulation, 2007, Sound Insulation (Recognised engineering monograph),. Technical role: Building

sound-insulation theory, field and laboratory quantities, and flanking. Scope limitation: Textbook analysis must be reconciled with current standards and the actual construction.

MB-0585. For the bounded treatment in Section 36.16, see International Organization for Standardization, ISO 10848-1:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 1: Frame document (Published and current at source freeze), <https://www.iso.org/standard/67226.html>. Technical role: Flanking-transmission framework and quantities. Scope limitation: Selection of the supporting part and interpretation depend on element and junction type.

MB-0586. For the bounded treatment in Section 36.17, see ASHRAE, 2023 ASHRAE Handbook - HVAC Applications, Sound and vibration control and related applications chapters (Current handbook volume at source freeze), <https://www.ashrae.org/technical-resources/ashrae-handbook>. Technical role: HVAC sound, vibration, system effects, and engineering practice. Scope limitation: Handbook guidance requires project-specific design, measurement, and authority review.

MB-0587. For the bounded treatment in Section 36.17, see ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (Active at source freeze), <https://store.astm.org/e0336-25a.html>. Technical role: Field room-to-room airborne sound-attenuation measurement. Scope limitation: A field result is configuration and state specific. It does not alone establish speech-security approval.

MB-0588. For the bounded treatment in Section 36.18, see ASTM International, ASTM E2174-24, Standard Practice for On-Site Inspection of Installed Firestop Systems (Edition cited at source freeze), <https://store.astm.org/e2174-24.html>. Technical role: Installed firestop inspection practice. Scope limitation: Inspection to this practice does not establish acoustic performance unless that proposition is separately tested.

MB-0589. For the bounded treatment in Section 36.18, see International Organization for Standardization, ISO 20816-1:2016, Mechanical vibration - Measurement and evaluation of machine vibration - Part 1: General guidelines (Published edition at source freeze), <https://www.iso.org/standard/63180.html>. Technical role: General vibration measurement and evaluation concepts. Scope limitation: Machine-vibration severity guidance is not a building-acoustic causal criterion.

MB-0590. For the bounded treatment in Section 36.19, see International Electrotechnical Commission, IEC 60268-16:2020 with Corrigendum 1:2025, Sound system equipment - Part 16: Objective rating of speech intelligibility by speech transmission index (Edition 5.0; corrected July 2025), <https://webstore.iec.ch/en/publication/26771>. Technical role: Speech Transmission Index methods and limitations. Scope limitation: STI depends on source, noise, processing, language, and listener assumptions. It is not a universal secure-room criterion.

- MB-0591. For the bounded treatment in Section 36.19, see Office of the Director of National Intelligence, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities, Version 1.5.1, Public SCIF technical specifications (Public version at source freeze), <https://www.dni.gov/index.php/ncsc-how-we-work/ncsc-security-executive-agent>. Technical role: Public facility-governance, construction, inspection, and lifecycle context. Scope limitation: Controlled supplements, classified criteria, project-specific vulnerabilities, and authority decisions are excluded.
- MB-0592. For the bounded treatment in Section 36.2, see ASTM International, ASTM E2638-24, Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room (Active at source freeze), <https://store.astm.org/e2638-24.html>. Technical role: Closed-room speech-privacy measurement framework. Scope limitation: The method does not set universal acceptance criteria and does not address electronic interception.
- MB-0593. For the bounded treatment in Section 36.2, see International Organization for Standardization, ISO 31000:2018, Risk management - Guidelines (Published edition at source freeze), <https://www.iso.org/standard/65694.html>. Technical role: Risk framing, analysis, evaluation, treatment, monitoring, and communication. Scope limitation: Does not supply secure-room likelihoods, consequences, or acceptance criteria.
- MB-0594. For the bounded treatment in Section 36.20, see ASHRAE, ASHRAE Standard 230-2022, Commissioning Process for Existing Buildings and Systems (Published standard at source freeze), <https://www.ashrae.org/technical-resources/bookstore/commissioning>. Technical role: Existing-building commissioning and ongoing performance verification. Scope limitation: Existing-building application requires a defined scope, baseline, and authority.
- MB-0595. For the bounded treatment in Section 36.20, see International Electrotechnical Commission, IEC 60268-16:2020 with Corrigendum 1:2025, Sound system equipment - Part 16: Objective rating of speech intelligibility by speech transmission index (Edition 5.0; corrected July 2025), <https://webstore.iec.ch/en/publication/26771>. Technical role: Speech Transmission Index methods and limitations. Scope limitation: STI depends on source, noise, processing, language, and listener assumptions. It is not a universal secure-room criterion.
- MB-0596. For the bounded treatment in Section 36.21, see Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd ed., 2007, Sound and Structural Vibration (Recognised engineering monograph),. Technical role: Structural waves, mobility, power flow, radiation, and vibration measurement. Scope limitation: Idealised models require configuration-specific validation.
- MB-0597. For the bounded treatment in Section 36.21, see International Organization for Standardization, ISO 20816-1:2016, Mechanical vibration - Measurement and

evaluation of machine vibration - Part 1: General guidelines (Published edition at source freeze), <https://www.iso.org/standard/63180.html>. Technical role: General vibration measurement and evaluation concepts. Scope limitation: Machine-vibration severity guidance is not a building-acoustic causal criterion.

MB-0598. For the bounded treatment in Section 36.22, see David A. Bies, Colin H. Hansen, and Carl Q. Howard, Engineering Noise Control, 6th ed., 2024, Engineering Noise Control: Theory and Practice (Current recognised engineering monograph at source freeze). Technical role: Noise-control physics, sources, propagation, measurement, and diagnostic practice. Scope limitation: General engineering treatment does not replace project-specific testing or authority decisions.

MB-0599. For the bounded treatment in Section 36.22, see Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of measurement data - Guide to the expression of uncertainty in measurement (Public metrology guide at source freeze), <https://www.bipm.org/en/committees/jc/jcgm/publications>. Technical role: Measurement models, standard uncertainty, covariance, and expanded uncertainty. Scope limitation: General metrology guidance. The measurand and decision rule remain application specific.

MB-0600. For the bounded treatment in Section 36.23, see ASTM International, ASTM E779-19, Standard Test Method for Determining Air Leakage Rate by Fan Pressurization (Active edition cited; revision work item exists), <https://store.astm.org/e0779-19.html>. Technical role: Whole-building or zone air-leakage rate by pressurisation. Scope limitation: The method does not locate every path and does not directly yield acoustic transmission loss.

MB-0601. For the bounded treatment in Section 36.23, see David A. Bies, Colin H. Hansen, and Carl Q. Howard, Engineering Noise Control, 6th ed., 2024, Engineering Noise Control: Theory and Practice (Current recognised engineering monograph at source freeze). Technical role: Noise-control physics, sources, propagation, measurement, and diagnostic practice. Scope limitation: General engineering treatment does not replace project-specific testing or authority decisions.

MB-0602. For the bounded treatment in Section 36.24, see ASTM International, ASTM E1186-22, Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems (Active at source freeze), <https://store.astm.org/e1186-22.html>. Technical role: Qualitative air-leakage site detection methods. Scope limitation: Air leakage and acoustic leakage can correlate, but neither is a universal surrogate for the other.

MB-0603. For the bounded treatment in Section 36.24, see International Organization for Standardization, ISO 18436-7:2014, Condition monitoring and diagnostics of machines - Requirements for qualification and assessment of personnel - Part 7: Thermography (Confirmed in 2025), <https://www.iso.org/standard/56360.html>. Technical role:

Thermography personnel competence framework. Scope limitation: Personnel qualification does not convert a thermal anomaly into proof of an acoustic mechanism.

MB-0604. For the bounded treatment in Section 36.25, see National Institute of Standards and Technology, NIST/SEMATECH e-Handbook of Statistical Methods, Engineering statistics reference (Public NIST resource at source freeze),

<https://www.itl.nist.gov/div898/handbook/>. Technical role: Experimental design, sampling, estimation, control charts, and statistical diagnostics. Scope limitation: Statistical methods require a physically valid model and representative data.

MB-0605. For the bounded treatment in Section 36.25, see United States Department of Defense, UFGS 01 45 00, Quality Control (Public UFGS edition and changes at source freeze), <https://www.wbdg.org/dod/ufgs/ufgs-01-45-00>. Technical role: Preparatory, initial, follow-up, testing, and documentation controls for construction quality. Scope limitation: Project specifications and secure-room authority requirements remain controlling.

MB-0606. For the bounded treatment in Section 36.26, see National Institute of Standards and Technology, FIPS PUB 180-4, Secure Hash Standard (Current publication with revision announced), <https://csrc.nist.gov/pubs/fips/180-4/upd1/final>. Technical role: Approved secure hash algorithms for integrity manifests. Scope limitation: A matching hash supports bit-level integrity, not truth, completeness, or causal meaning.

MB-0607. For the bounded treatment in Section 36.26, see United States Courts, Federal Rules of Evidence 702, 703, 705, and 901, Expert testimony, bases of opinion, disclosure, and authentication rules (Rule 702 amendment effective 1 December 2023; current rules must be checked for the forum), <https://www.uscourts.gov/rules-policies/current-rules-practice-procedure/federal-rules-evidence>. Technical role: General United States federal evidentiary framework. Scope limitation: Not legal advice. State, foreign, arbitral, administrative, and protective-order requirements may differ.

MB-0608. For the bounded treatment in Section 36.27, see International Electrotechnical Commission, IEC 60942:2017, Electroacoustics - Sound calibrators (Edition 4.0 at source freeze), <https://webstore.iec.ch/en/publication/26234>. Technical role: Performance requirements for acoustic calibrators. Scope limitation: A field check at one frequency does not establish complete frequency response, phase match, or channel linearity.

MB-0609. For the bounded treatment in Section 36.27, see International Electrotechnical Commission, IEC 61672-1:2013, Electroacoustics - Sound level meters - Part 1: Specifications (Edition cited at source freeze), <https://webstore.iec.ch/en/publication/5708>. Technical role: Performance requirements for sound level meters. Scope limitation: Instrument class does not cure an unsuitable method, geometry, or state definition.

- MB-0610. For the bounded treatment in Section 36.28, see ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (Active at source freeze), <https://store.astm.org/e0336-25a.html>. Technical role: Field room-to-room airborne sound-attenuation measurement. Scope limitation: A field result is configuration and state specific. It does not alone establish speech-security approval.
- MB-0611. For the bounded treatment in Section 36.28, see Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of measurement data - Guide to the expression of uncertainty in measurement (Public metrology guide at source freeze), <https://www.bipm.org/en/committees/jc/jcgm/publications>. Technical role: Measurement models, standard uncertainty, covariance, and expanded uncertainty. Scope limitation: General metrology guidance. The measurand and decision rule remain application specific.
- MB-0612. For the bounded treatment in Section 36.29, see International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Confirmed in September 2025), <https://www.iso.org/standard/73930.html>. Technical role: Building-acoustic uncertainty treatment. Scope limitation: Does not supply a universal secure-room decision threshold.
- MB-0613. For the bounded treatment in Section 36.29, see Joint Committee for Guides in Metrology, JCGM 106:2012, Evaluation of measurement data - The role of measurement uncertainty in conformity assessment (Public metrology guide at source freeze), <https://www.bipm.org/en/committees/jc/jcgm/publications>. Technical role: Conformity decisions, acceptance limits, and risks of false acceptance or rejection. Scope limitation: Does not select the underlying acoustic or security requirement.
- MB-0614. For the bounded treatment in Section 36.3, see ASTM International, ASTM E2713-25, Standard Guide to Forensic Engineering (Active; last updated 10 February 2025), <https://store.astm.org/e2713-25.html>. Technical role: Forensic-engineering scope, professional roles, and bounded investigative practice. Scope limitation: Informational guide. It does not prescribe acoustic acceptance criteria or confer professional licensure.
- MB-0615. For the bounded treatment in Section 36.3, see National Institute of Standards and Technology, FIPS PUB 180-4, Secure Hash Standard (Current publication with revision announced), <https://csrc.nist.gov/pubs/fips/180-4/upd1/final>. Technical role: Approved secure hash algorithms for integrity manifests. Scope limitation: A matching hash supports bit-level integrity, not truth, completeness, or causal meaning.
- MB-0616. For the bounded treatment in Section 36.30, see ASTM International, ASTM E3176-24, Standard Guide for Forensic Engineering Expert Reports (Active; last updated 25 March 2024), <https://store.astm.org/e3176-24.html>. Technical role: Forensic report purpose, content, limitations, and electronic representation. Scope limitation:

Informational guide. Report form remains subject to engagement terms, applicable law, and tribunal orders.

MB-0617. For the bounded treatment in Section 36.30, see International Organization for Standardization, ISO 31000:2018, Risk management - Guidelines (Published edition at source freeze), <https://www.iso.org/standard/65694.html>. Technical role: Risk framing, analysis, evaluation, treatment, monitoring, and communication. Scope limitation: Does not supply secure-room likelihoods, consequences, or acceptance criteria.

MB-0618. For the bounded treatment in Section 36.31, see ASTM International, ASTM E2713-25, Standard Guide to Forensic Engineering (Active; last updated 10 February 2025), <https://store.astm.org/e2713-25.html>. Technical role: Forensic-engineering scope, professional roles, and bounded investigative practice. Scope limitation: Informational guide. It does not prescribe acoustic acceptance criteria or confer professional licensure.

MB-0619. For the bounded treatment in Section 36.31, see International Organization for Standardization, ISO 31000:2018, Risk management - Guidelines (Published edition at source freeze), <https://www.iso.org/standard/65694.html>. Technical role: Risk framing, analysis, evaluation, treatment, monitoring, and communication. Scope limitation: Does not supply secure-room likelihoods, consequences, or acceptance criteria.

MB-0620. For the bounded treatment in Section 36.32, see International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Confirmed in September 2025), <https://www.iso.org/standard/73930.html>. Technical role: Building-acoustic uncertainty treatment. Scope limitation: Does not supply a universal secure-room decision threshold.

MB-0621. For the bounded treatment in Section 36.32, see Joint Committee for Guides in Metrology, JCGM 106:2012, Evaluation of measurement data - The role of measurement uncertainty in conformity assessment (Public metrology guide at source freeze), <https://www.bipm.org/en/committees/jc/jcgm/publications>. Technical role: Conformity decisions, acceptance limits, and risks of false acceptance or rejection. Scope limitation: Does not select the underlying acoustic or security requirement.

MB-0622. For the bounded treatment in Section 36.33, see ASHRAE, ASHRAE Standard 230-2022, Commissioning Process for Existing Buildings and Systems (Published standard at source freeze), <https://www.ashrae.org/technical-resources/bookstore/commissioning>. Technical role: Existing-building commissioning and ongoing performance verification. Scope limitation: Existing-building application requires a defined scope, baseline, and authority.

MB-0623. For the bounded treatment in Section 36.33, see Office of the Director of National Intelligence, Technical Specifications for Construction and Management of Sensitive

Compartmented Information Facilities, Version 1.5.1, Public SCIF technical specifications (Public version at source freeze), <https://www.dni.gov/index.php/ncsc-how-we-work/ncsc-security-executive-agent>. Technical role: Public facility-governance, construction, inspection, and lifecycle context. Scope limitation: Controlled supplements, classified criteria, project-specific vulnerabilities, and authority decisions are excluded.

MB-0624. For the bounded treatment in Section 36.34, see David A. Bies, Colin H. Hansen, and Carl Q. Howard, Engineering Noise Control, 6th ed., 2024, Engineering Noise Control: Theory and Practice (Current recognised engineering monograph at source freeze),. Technical role: Noise-control physics, sources, propagation, measurement, and diagnostic practice. Scope limitation: General engineering treatment does not replace project-specific testing or authority decisions.

MB-0625. For the bounded treatment in Section 36.34, see United States Department of Defense, UFGS 01 45 00, Quality Control (Public UFGS edition and changes at source freeze), <https://www.wbdg.org/dod/ufigs/ufigs-01-45-00>. Technical role: Preparatory, initial, follow-up, testing, and documentation controls for construction quality. Scope limitation: Project specifications and secure-room authority requirements remain controlling.

MB-0626. For the bounded treatment in Section 36.35, see ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (Active at source freeze), <https://store.astm.org/e0336-25a.html>. Technical role: Field room-to-room airborne sound-attenuation measurement. Scope limitation: A field result is configuration and state specific. It does not alone establish speech-security approval.

MB-0627. For the bounded treatment in Section 36.35, see Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of measurement data - Guide to the expression of uncertainty in measurement (Public metrology guide at source freeze), <https://www.bipm.org/en/committees/jc/jcgm/publications>. Technical role: Measurement models, standard uncertainty, covariance, and expanded uncertainty. Scope limitation: General metrology guidance. The measurand and decision rule remain application specific.

MB-0628. For the bounded treatment in Section 36.36, see ASHRAE, ASHRAE Standard 230-2022, Commissioning Process for Existing Buildings and Systems (Published standard at source freeze), <https://www.ashrae.org/technical-resources/bookstore/commissioning>. Technical role: Existing-building commissioning and ongoing performance verification. Scope limitation: Existing-building application requires a defined scope, baseline, and authority.

MB-0629. For the bounded treatment in Section 36.36, see International Organization for Standardization, ISO 9001:2015 with Amendment 1:2024, Quality management systems

- Requirements (Published edition and amendment at source freeze), <https://www.iso.org/standard/62085.html>. Technical role: Quality-system control of processes, records, nonconformity, and corrective action. Scope limitation: Certification does not establish technical adequacy of a particular repair or test.

MB-0630. For the bounded treatment in Section 36.37, see ASTM International, ASTM E2174-24, Standard Practice for On-Site Inspection of Installed Firestop Systems (Edition cited at source freeze), <https://store.astm.org/e2174-24.html>. Technical role: Installed firestop inspection practice. Scope limitation: Inspection to this practice does not establish acoustic performance unless that proposition is separately tested.

MB-0631. For the bounded treatment in Section 36.37, see International Organization for Standardization, ISO 10005:2018, Quality management - Guidelines for quality plans (Published edition at source freeze), <https://www.iso.org/standard/70398.html>. Technical role: Project-specific quality planning and responsibilities. Scope limitation: Guidance must be translated into technical hold points and acceptance evidence.

MB-0632. For the bounded treatment in Section 36.38, see International Organization for Standardization, ISO 9001:2015 with Amendment 1:2024, Quality management systems - Requirements (Published edition and amendment at source freeze), <https://www.iso.org/standard/62085.html>. Technical role: Quality-system control of processes, records, nonconformity, and corrective action. Scope limitation: Certification does not establish technical adequacy of a particular repair or test.

MB-0633. For the bounded treatment in Section 36.38, see Office of the Director of National Intelligence, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities, Version 1.5.1, Public SCIF technical specifications (Public version at source freeze), <https://www.dni.gov/index.php/ncsc-how-we-work/ncsc-security-executive-agent>. Technical role: Public facility-governance, construction, inspection, and lifecycle context. Scope limitation: Controlled supplements, classified criteria, project-specific vulnerabilities, and authority decisions are excluded.

MB-0634. For the bounded treatment in Section 36.39, see Joint Committee for Guides in Metrology, JCGM 106:2012, Evaluation of measurement data - The role of measurement uncertainty in conformity assessment (Public metrology guide at source freeze), <https://www.bipm.org/en/committees/jc/jcgm/publications>. Technical role: Conformity decisions, acceptance limits, and risks of false acceptance or rejection. Scope limitation: Does not select the underlying acoustic or security requirement.

MB-0635. For the bounded treatment in Section 36.39, see National Institute of Standards and Technology, NIST/SEMATECH e-Handbook of Statistical Methods, Engineering statistics reference (Public NIST resource at source freeze), <https://www.itl.nist.gov/div898/handbook/>. Technical role: Experimental design, sampling, estimation, control charts, and statistical diagnostics. Scope limitation: Statistical methods require a physically valid model and representative data.

- MB-0636. For the bounded treatment in Section 36.4, see United States Courts, Federal Rules of Civil Procedure 26(a)(2), 34, and 37(e), Expert disclosures, production, and preservation of electronically stored information (Current federal rules must be checked for the forum), <https://www.uscourts.gov/rules-policies/current-rules-practice-procedure/federal-rules-civil-procedure>. Technical role: General federal civil-discovery and expert-disclosure framework. Scope limitation: Not legal advice. Engagement terms, court orders, privilege, work product, and local rules control.
- MB-0637. For the bounded treatment in Section 36.4, see United States Courts, Federal Rules of Evidence 702, 703, 705, and 901, Expert testimony, bases of opinion, disclosure, and authentication rules (Rule 702 amendment effective 1 December 2023; current rules must be checked for the forum), <https://www.uscourts.gov/rules-policies/current-rules-practice-procedure/federal-rules-evidence>. Technical role: General United States federal evidentiary framework. Scope limitation: Not legal advice. State, foreign, arbitral, administrative, and protective-order requirements may differ.
- MB-0638. For the bounded treatment in Section 36.40, see ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (Active at source freeze), <https://store.astm.org/e0336-25a.html>. Technical role: Field room-to-room airborne sound-attenuation measurement. Scope limitation: A field result is configuration and state specific. It does not alone establish speech-security approval.
- MB-0639. For the bounded treatment in Section 36.40, see International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Confirmed in September 2025), <https://www.iso.org/standard/73930.html>. Technical role: Building-acoustic uncertainty treatment. Scope limitation: Does not supply a universal secure-room decision threshold.
- MB-0640. For the bounded treatment in Section 36.41, see National Institute of Standards and Technology, FIPS PUB 180-4, Secure Hash Standard (Current publication with revision announced), <https://csrc.nist.gov/pubs/fips/180-4/upd1/final>. Technical role: Approved secure hash algorithms for integrity manifests. Scope limitation: A matching hash supports bit-level integrity, not truth, completeness, or causal meaning.
- MB-0641. For the bounded treatment in Section 36.41, see Office of the Director of National Intelligence, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities, Version 1.5.1, Public SCIF technical specifications (Public version at source freeze), <https://www.dni.gov/index.php/ncsc-how-we-work/ncsc-security-executive-agent>. Technical role: Public facility-governance, construction, inspection, and lifecycle context. Scope limitation: Controlled supplements, classified criteria, project-specific vulnerabilities, and authority decisions are excluded.

- MB-0642. For the bounded treatment in Section 36.42, see United States Courts, Federal Rules of Civil Procedure 26(a)(2), 34, and 37(e), Expert disclosures, production, and preservation of electronically stored information (Current federal rules must be checked for the forum), <https://www.uscourts.gov/rules-policies/current-rules-practice-procedure/federal-rules-civil-procedure>. Technical role: General federal civil-discovery and expert-disclosure framework. Scope limitation: Not legal advice. Engagement terms, court orders, privilege, work product, and local rules control.
- MB-0643. For the bounded treatment in Section 36.42, see United States Courts, Federal Rules of Evidence 702, 703, 705, and 901, Expert testimony, bases of opinion, disclosure, and authentication rules (Rule 702 amendment effective 1 December 2023; current rules must be checked for the forum), <https://www.uscourts.gov/rules-policies/current-rules-practice-procedure/federal-rules-evidence>. Technical role: General United States federal evidentiary framework. Scope limitation: Not legal advice. State, foreign, arbitral, administrative, and protective-order requirements may differ.
- MB-0644. For the bounded treatment in Section 36.43, see United States Courts, Federal Rules of Civil Procedure 26(a)(2), 34, and 37(e), Expert disclosures, production, and preservation of electronically stored information (Current federal rules must be checked for the forum), <https://www.uscourts.gov/rules-policies/current-rules-practice-procedure/federal-rules-civil-procedure>. Technical role: General federal civil-discovery and expert-disclosure framework. Scope limitation: Not legal advice. Engagement terms, court orders, privilege, work product, and local rules control.
- MB-0645. For the bounded treatment in Section 36.43, see United States Courts, Federal Rules of Evidence 702, 703, 705, and 901, Expert testimony, bases of opinion, disclosure, and authentication rules (Rule 702 amendment effective 1 December 2023; current rules must be checked for the forum), <https://www.uscourts.gov/rules-policies/current-rules-practice-procedure/federal-rules-evidence>. Technical role: General United States federal evidentiary framework. Scope limitation: Not legal advice. State, foreign, arbitral, administrative, and protective-order requirements may differ.
- MB-0646. For the bounded treatment in Section 36.44, see ISO and IEC, ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories (Current at source freeze), <https://www.iso.org/standard/66912.html>. Technical role: Laboratory competence, impartiality, traceability, technical records, and validity of results. Scope limitation: Accreditation scope must include the actual method. Laboratory accreditation does not confer facility authorisation.
- MB-0647. For the bounded treatment in Section 36.44, see United States Courts, Federal Rules of Civil Procedure 26(a)(2), 34, and 37(e), Expert disclosures, production, and preservation of electronically stored information (Current federal rules must be checked for the forum), <https://www.uscourts.gov/rules-policies/current-rules-practice-procedure/federal-rules-civil-procedure>.

procedure/federal-rules-civil-procedure. Technical role: General federal civil-discovery and expert-disclosure framework. Scope limitation: Not legal advice. Engagement terms, court orders, privilege, work product, and local rules control.

MB-0648. For the bounded treatment in Section 36.45, see ASTM International, ASTM E2713-25, Standard Guide to Forensic Engineering (Active; last updated 10 February 2025), <https://store.astm.org/e2713-25.html>. Technical role: Forensic-engineering scope, professional roles, and bounded investigative practice. Scope limitation: Informational guide. It does not prescribe acoustic acceptance criteria or confer professional licensure.

MB-0649. For the bounded treatment in Section 36.45, see International Organization for Standardization, ISO 31000:2018, Risk management - Guidelines (Published edition at source freeze), <https://www.iso.org/standard/65694.html>. Technical role: Risk framing, analysis, evaluation, treatment, monitoring, and communication. Scope limitation: Does not supply secure-room likelihoods, consequences, or acceptance criteria.

MB-0650. For the bounded treatment in Section 36.46, see International Organization for Standardization, ISO 31000:2018, Risk management - Guidelines (Published edition at source freeze), <https://www.iso.org/standard/65694.html>. Technical role: Risk framing, analysis, evaluation, treatment, monitoring, and communication. Scope limitation: Does not supply secure-room likelihoods, consequences, or acceptance criteria.

MB-0651. For the bounded treatment in Section 36.46, see International Organization for Standardization, ISO 9001:2015 with Amendment 1:2024, Quality management systems - Requirements (Published edition and amendment at source freeze), <https://www.iso.org/standard/62085.html>. Technical role: Quality-system control of processes, records, nonconformity, and corrective action. Scope limitation: Certification does not establish technical adequacy of a particular repair or test.

MB-0652. For the bounded treatment in Section 36.47, see ASHRAE, ASHRAE Standard 230-2022, Commissioning Process for Existing Buildings and Systems (Published standard at source freeze), <https://www.ashrae.org/technical-resources/bookstore/commissioning>. Technical role: Existing-building commissioning and ongoing performance verification. Scope limitation: Existing-building application requires a defined scope, baseline, and authority.

MB-0653. For the bounded treatment in Section 36.47, see International Organization for Standardization, ISO 19011:2018, Guidelines for auditing management systems (Published edition at source freeze), <https://www.iso.org/standard/70017.html>. Technical role: Audit principles, evidence, sampling, and competence. Scope limitation: Management-system auditing is not a substitute for physical measurement or destructive verification.

- MB-0654. For the bounded treatment in Section 36.48, see ASTM International, ASTM E3176-24, Standard Guide for Forensic Engineering Expert Reports (Active; last updated 25 March 2024), <https://store.astm.org/e3176-24.html>. Technical role: Forensic report purpose, content, limitations, and electronic representation. Scope limitation: Informational guide. Report form remains subject to engagement terms, applicable law, and tribunal orders.
- MB-0655. For the bounded treatment in Section 36.48, see United States Courts, Federal Rules of Evidence 702, 703, 705, and 901, Expert testimony, bases of opinion, disclosure, and authentication rules (Rule 702 amendment effective 1 December 2023; current rules must be checked for the forum), <https://www.uscourts.gov/rules-policies/current-rules-practice-procedure/federal-rules-evidence>. Technical role: General United States federal evidentiary framework. Scope limitation: Not legal advice. State, foreign, arbitral, administrative, and protective-order requirements may differ.
- MB-0656. For the bounded treatment in Section 36.49, see ASHRAE, ASHRAE Standard 230-2022, Commissioning Process for Existing Buildings and Systems (Published standard at source freeze), <https://www.ashrae.org/technical-resources/bookstore/commissioning>. Technical role: Existing-building commissioning and ongoing performance verification. Scope limitation: Existing-building application requires a defined scope, baseline, and authority.
- MB-0657. For the bounded treatment in Section 36.49, see National Institute of Standards and Technology, NIST SP 800-86, Guide to Integrating Forensic Techniques into Incident Response (Public NIST publication at source freeze), <https://csrc.nist.gov/pubs/sp/800/86/final>. Technical role: Digital evidence acquisition, examination, analysis, and reporting concepts. Scope limitation: Cyber incident-response guidance requires adaptation to building systems, legal process, and information controls.
- MB-0658. For the bounded treatment in Section 36.5, see International Organization for Standardization, ISO 10005:2018, Quality management - Guidelines for quality plans (Published edition at source freeze), <https://www.iso.org/standard/70398.html>. Technical role: Project-specific quality planning and responsibilities. Scope limitation: Guidance must be translated into technical hold points and acceptance evidence.
- MB-0659. For the bounded treatment in Section 36.5, see United States Department of Defense, UFGS 01 45 00, Quality Control (Public UFGS edition and changes at source freeze), <https://www.wbdg.org/dod/ufgs/ufgs-01-45-00>. Technical role: Preparatory, initial, follow-up, testing, and documentation controls for construction quality. Scope limitation: Project specifications and secure-room authority requirements remain controlling.

MB-0660. For the bounded treatment in Section 36.50, see ASHRAE, ASHRAE Standard 230-2022, Commissioning Process for Existing Buildings and Systems (Published standard at source freeze),

<https://www.ashrae.org/technical-resources/bookstore/commissioning>. Technical role: Existing-building commissioning and ongoing performance verification. Scope limitation: Existing-building application requires a defined scope, baseline, and authority.

MB-0661. For the bounded treatment in Section 36.50, see Office of the Director of National Intelligence, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities, Version 1.5.1, Public SCIF technical specifications (Public version at source freeze), <https://www.dni.gov/index.php/ncsc-how-we-work/ncsc-security-executive-agent>. Technical role: Public facility-governance, construction, inspection, and lifecycle context. Scope limitation: Controlled supplements, classified criteria, project-specific vulnerabilities, and authority decisions are excluded. [Cited 2 times in this edition.]

MB-0662. For the bounded treatment in Section 36.50, see United States Courts, Federal Rules of Evidence 702, 703, 705, and 901, Expert testimony, bases of opinion, disclosure, and authentication rules (Rule 702 amendment effective 1 December 2023; current rules must be checked for the forum), <https://www.uscourts.gov/rules-policies/current-rules-practice-procedure/federal-rules-evidence>. Technical role: General United States federal evidentiary framework. Scope limitation: Not legal advice. State, foreign, arbitral, administrative, and protective-order requirements may differ.

MB-0663. For the bounded treatment in Section 36.6, see ASHRAE and IES, ANSI/ASHRAE/IES Standard 202-2024, Commissioning Process Requirements for New Buildings and New Systems (Published standard at source freeze), <https://www.ashrae.org/technical-resources/bookstore/commissioning>. Technical role: Minimum commissioning-process requirements. Scope limitation: Does not provide acoustic security thresholds or replace specialist tests.

MB-0664. For the bounded treatment in Section 36.6, see International Organization for Standardization, ISO 16283-1:2014 with Amendment 1:2017, Acoustics - Field measurement of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Confirmed current in 2025), <https://www.iso.org/standard/55997.html>. Technical role: International field measurement procedures for airborne sound insulation. Scope limitation: Proprietary standard. Applicability, frequency range, room volume, and acceptance criteria require project-specific adoption.

MB-0665. For the bounded treatment in Section 36.7, see International Organization for Standardization, ISO 9001:2015 with Amendment 1:2024, Quality management systems - Requirements (Published edition and amendment at source freeze),

<https://www.iso.org/standard/62085.html>. Technical role: Quality-system control of processes, records, nonconformity, and corrective action. Scope limitation: Certification does not establish technical adequacy of a particular repair or test.

MB-0666. For the bounded treatment in Section 36.7, see United States Department of Defense, UFGS 01 45 00, Quality Control (Public UFGS edition and changes at source freeze), <https://www.wbdg.org/dod/ufigs/ufigs-01-45-00>. Technical role: Preparatory, initial, follow-up, testing, and documentation controls for construction quality. Scope limitation: Project specifications and secure-room authority requirements remain controlling.

MB-0667. For the bounded treatment in Section 36.8, see ASTM International, ASTM E2713-25, Standard Guide to Forensic Engineering (Active; last updated 10 February 2025), <https://store.astm.org/e2713-25.html>. Technical role: Forensic-engineering scope, professional roles, and bounded investigative practice. Scope limitation: Informational guide. It does not prescribe acoustic acceptance criteria or confer professional licensure.

MB-0668. For the bounded treatment in Section 36.8, see National Institute of Standards and Technology, NIST/SEMATECH e-Handbook of Statistical Methods, Engineering statistics reference (Public NIST resource at source freeze), <https://www.itl.nist.gov/div898/handbook/>. Technical role: Experimental design, sampling, estimation, control charts, and statistical diagnostics. Scope limitation: Statistical methods require a physically valid model and representative data.

MB-0669. For the bounded treatment in Section 36.9, see International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Confirmed in September 2025), <https://www.iso.org/standard/73930.html>. Technical role: Building-acoustic uncertainty treatment. Scope limitation: Does not supply a universal secure-room decision threshold.

MB-0670. For the bounded treatment in Section 36.9, see International Organization for Standardization, ISO 16283-1:2014 with Amendment 1:2017, Acoustics - Field measurement of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Confirmed current in 2025), <https://www.iso.org/standard/55997.html>. Technical role: International field measurement procedures for airborne sound insulation. Scope limitation: Proprietary standard. Applicability, frequency range, room volume, and acceptance criteria require project-specific adoption.

MB-0671. For the bounded treatment under “ 10.1 A measurement result is an estimate, not the measurand itself ”, see International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application; International

Organization for Standardization and International Electrotechnical Commission, ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories (Edition 3, November 2017; corrected 2018; confirmed 2023), laboratory competence, traceability, uncertainty and decision-rule requirements; National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994 edition with later web maintenance), Type A, Type B, combined and expanded uncertainty guidance.

MB-0672. For the bounded treatment under “ 10.1 A measurement result is an estimate, not the measurand itself ”, see Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data - Guide to the Expression of Uncertainty in Measurement (2008 with minor corrections), measurement models, standard uncertainty, covariance and reporting; National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994; public web edition), Type A and Type B evaluation, propagation, coverage and reporting; Acoustical Society of America and American National Standards Institute, ASA/ANSI S3.5-1997 (R2024), Methods for Calculation of the Speech Intelligibility Index (1997; reaffirmed 2024), Speech Intelligibility Index method and band-importance provisions.

MB-0673. For the bounded treatment under “ 10.10 Traceability, calibration, and laboratory competence ”, see Joint Committee for Guides in Metrology, JCGM 200:2012, International Vocabulary of Metrology - Basic and General Concepts and Associated Terms (3rd ed., 2012), metrology vocabulary for measurand, traceability, calibration and uncertainty; International Organization for Standardization and International Electrotechnical Commission, ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories (Edition 3, November 2017; corrected 2018; confirmed 2023), laboratory competence, traceability, uncertainty and decision-rule requirements; National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994; public web edition), Type A and Type B evaluation, propagation, coverage and reporting.

MB-0674. For the bounded treatment under “ 10.11 Guard bands in procurement and commissioning ”, see Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of measurement data - Guide to the expression of uncertainty in measurement (2008 edition with minor corrections), measurement-model, covariance, propagation and expanded-uncertainty framework; International Electrotechnical Commission, IEC 60268-16:2020, Sound system equipment - Part 16: Objective rating of speech intelligibility by speech transmission index (Edition 5.0, 2020; corrected July 2025), Speech Transmission Index method and interpretation provisions; International Organization for Standardization and International Electrotechnical Commission,

ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories (Edition 3, November 2017; corrected 2018; confirmed 2023), laboratory competence, traceability, uncertainty and decision-rule requirements.

MB-0675. For the bounded treatment under “ 10.12 Forensic and litigation reporting ”, see International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application; Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data - Guide to the Expression of Uncertainty in Measurement (2008 with minor corrections), measurement models, standard uncertainty, covariance and reporting; National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994; public web edition), Type A and Type B evaluation, propagation, coverage and reporting.

MB-0676. For the bounded treatment under “ 10.14 Classification uncertainty as an integer-valued output ”, see International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application; Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data - Guide to the Expression of Uncertainty in Measurement (2008 with minor corrections), measurement models, standard uncertainty, covariance and reporting; National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994; public web edition), Type A and Type B evaluation, propagation, coverage and reporting.

MB-0677. For the bounded treatment under “ 10.15 Uncertainty of spatial averages ”, see International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application; ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (ASTM E336-25a (2025a); last updated 3 February 2026), field room-to-room measurement, background correction, spatial sampling and reporting provisions; International Organization for Standardization, ISO 16283-1:2014, Acoustics - Field measurement of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 1, 2014, with Amendment 1:2017; confirmed 2025), field airborne-insulation quantities, positions, room range and reporting provisions; Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data - Guide to the Expression of Uncertainty in

Measurement (2008 with minor corrections), measurement models, standard uncertainty, covariance and reporting.

MB-0678. For the bounded treatment under “ 10.16 Source stability and spectral drift ”, see International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application; ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (ASTM E336-25a (2025a); last updated 3 February 2026), field room-to-room measurement, background correction, spatial sampling and reporting provisions; International Organization for Standardization, ISO 16283-1:2014, Acoustics - Field measurement of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 1, 2014, with Amendment 1:2017; confirmed 2025), field airborne-insulation quantities, positions, room range and reporting provisions; Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data - Guide to the Expression of Uncertainty in Measurement (2008 with minor corrections), measurement models, standard uncertainty, covariance and reporting.

MB-0679. For the bounded treatment under “ 10.17 Geometry, area, and volume uncertainty ”, see International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application; Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data - Guide to the Expression of Uncertainty in Measurement (2008 with minor corrections), measurement models, standard uncertainty, covariance and reporting; National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994; public web edition), Type A and Type B evaluation, propagation, coverage and reporting.

MB-0680. For the bounded treatment under “ 10.18 Environmental and operational state uncertainty ”, see International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application; Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data - Guide to the Expression of Uncertainty in Measurement (2008 with minor corrections), measurement models, standard uncertainty, covariance and reporting; National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994; public web edition), Type A and Type B evaluation, propagation, coverage and reporting.

- MB-0681. For the bounded treatment under “ 10.19 Correlation among one-third-octave bands ”, see International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application; Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data - Guide to the Expression of Uncertainty in Measurement (2008 with minor corrections), measurement models, standard uncertainty, covariance and reporting; National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994; public web edition), Type A and Type B evaluation, propagation, coverage and reporting.
- MB-0682. For the bounded treatment under “ 10.2 The measurement model and sensitivity coefficients ”, see Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data - Guide to the Expression of Uncertainty in Measurement (2008 with minor corrections), measurement models, standard uncertainty, covariance and reporting; National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994; public web edition), Type A and Type B evaluation, propagation, coverage and reporting.
- MB-0683. For the bounded treatment under “ 10.20 Decision rules for two-sided and asymmetric requirements ”, see Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of measurement data - Guide to the expression of uncertainty in measurement (2008 edition with minor corrections), measurement-model, covariance, propagation and expanded-uncertainty framework; International Electrotechnical Commission, IEC 60268-16:2020, Sound system equipment - Part 16: Objective rating of speech intelligibility by speech transmission index (Edition 5.0, 2020; corrected July 2025), Speech Transmission Index method and interpretation provisions; International Organization for Standardization and International Electrotechnical Commission, ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories (Edition 3, November 2017; corrected 2018; confirmed 2023), laboratory competence, traceability, uncertainty and decision-rule requirements.
- MB-0684. For the bounded treatment under “ 10.21 Multiple comparisons and room portfolios ”, see International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application; ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (ASTM E336-25a (2025a); last updated 3 February 2026), field room-to-room measurement, background correction, spatial sampling and reporting provisions; International Organization for Standardization, ISO 16283-1:2014,

Acoustics - Field measurement of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 1, 2014, with Amendment 1:2017; confirmed 2025), field airborne-insulation quantities, positions, room range and reporting provisions; Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data - Guide to the Expression of Uncertainty in Measurement (2008 with minor corrections), measurement models, standard uncertainty, covariance and reporting.

MB-0685. For the bounded treatment under “ 10.22 Uncertainty in remediation claims ”, see International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application; Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data - Guide to the Expression of Uncertainty in Measurement (2008 with minor corrections), measurement models, standard uncertainty, covariance and reporting; National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994; public web edition), Type A and Type B evaluation, propagation, coverage and reporting.

MB-0686. For the bounded treatment under “ 10.23 Numerical example. Uncertainty of a before-and-after change ”, see International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application; Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data - Guide to the Expression of Uncertainty in Measurement (2008 with minor corrections), measurement models, standard uncertainty, covariance and reporting; National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994; public web edition), Type A and Type B evaluation, propagation, coverage and reporting.

MB-0687. For the bounded treatment under “ 10.24 Measurement system validation and software assurance ”, see International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application; Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data - Guide to the Expression of Uncertainty in Measurement (2008 with minor corrections), measurement models, standard uncertainty, covariance and reporting; National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994; public web edition), Type A and Type B evaluation, propagation, coverage and reporting.

- MB-0688. For the bounded treatment under “ 10.25 Internal quality control and proficiency evidence ”, see International Organization for Standardization and International Electrotechnical Commission, ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories (Edition 3, November 2017; corrected 2018; confirmed 2023), laboratory competence, traceability, uncertainty and decision-rule requirements; Joint Committee for Guides in Metrology, JCGM 200:2012, International Vocabulary of Metrology - Basic and General Concepts and Associated Terms (3rd ed., 2012), metrology vocabulary for measurand, traceability, calibration and uncertainty; National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994; public web edition), Type A and Type B evaluation, propagation, coverage and reporting.
- MB-0689. For the bounded treatment under “ 10.27 Uncertainty in decay-rate estimation ”, see ASTM International, ASTM E2235-04(2020), Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods (Reapproved 2020), decay-rate measurement and evaluation provisions for sound-insulation tests; International Organization for Standardization, ISO 3382-2:2008, Acoustics - Measurement of room acoustic parameters - Part 2: Reverberation time in ordinary rooms (Edition 1, 2008; confirmed current 2022), ordinary-room decay and reverberation-time measurement provisions; International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application.
- MB-0690. For the bounded treatment under “ 10.28 Asymmetric loss, model discrepancy, and defensible acceptance near a boundary ”, see International Organization for Standardization and International Electrotechnical Commission, ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories (Edition 3, November 2017; corrected 2018; confirmed 2023), laboratory competence, traceability, uncertainty and decision-rule requirements; International Laboratory Accreditation Cooperation, ILAC G8:09/2019, Guidelines on Decision Rules and Statements of Conformity (September 2019), decision rules, guard bands and statements of conformity; Joint Committee for Guides in Metrology, JCGM 106:2012, Evaluation of Measurement Data - The Role of Measurement Uncertainty in Conformity Assessment (2012), role of measurement uncertainty in conformity assessment and decision risk; Joint Committee for Guides in Metrology, JCGM 200:2012, International Vocabulary of Metrology - Basic and General Concepts and Associated Terms (3rd ed., 2012), metrology vocabulary for measurand, traceability, calibration and uncertainty.
- MB-0691. For the bounded treatment under “ 10.28 Asymmetric loss, model discrepancy, and defensible acceptance near a boundary ”, see International Organization for

Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application; Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of measurement data - Guide to the expression of uncertainty in measurement (2008 edition with minor corrections), measurement-model, covariance, propagation and expanded-uncertainty framework; Joint Committee for Guides in Metrology, JCGM 101:2008, Evaluation of Measurement Data - Supplement 1 to the GUM - Propagation of distributions using a Monte Carlo method (2008), Monte Carlo propagation of distributions for nonlinear uncertainty models; Joint Committee for Guides in Metrology, JCGM 106:2012, Evaluation of Measurement Data - The Role of Measurement Uncertainty in Conformity Assessment (2012), role of measurement uncertainty in conformity assessment and decision risk.

MB-0692. For the bounded treatment under “ 10.3 Type A and Type B evaluations ”, see Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data - Guide to the Expression of Uncertainty in Measurement (2008 with minor corrections), measurement models, standard uncertainty, covariance and reporting; National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994; public web edition), Type A and Type B evaluation, propagation, coverage and reporting; National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994 edition with later web maintenance), Type A, Type B, combined and expanded uncertainty guidance.

MB-0693. For the bounded treatment under “ 10.31 Effective degrees of freedom and coverage factors ”, see Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data - Guide to the Expression of Uncertainty in Measurement (2008 with minor corrections), measurement models, standard uncertainty, covariance and reporting; National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994; public web edition), Type A and Type B evaluation, propagation, coverage and reporting; Joint Committee for Guides in Metrology, JCGM 101:2008, Evaluation of Measurement Data - Supplement 1 to the GUM - Propagation of distributions using a Monte Carlo method (2008), Monte Carlo propagation of distributions for nonlinear uncertainty models.

MB-0694. For the bounded treatment under “ 10.4 Expanded uncertainty and coverage ”, see Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data - Guide to the Expression of Uncertainty in Measurement (2008 with minor corrections), measurement models, standard uncertainty, covariance and reporting; National Institute of Standards and Technology, NIST Technical Note 1297,

Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994; public web edition), Type A and Type B evaluation, propagation, coverage and reporting.

- MB-0695. For the bounded treatment under “ 10.5 Decision rules and the separation of measurement from acceptance ”, see International Organization for Standardization and International Electrotechnical Commission, ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories (Edition 3, November 2017; corrected 2018; confirmed 2023), laboratory competence, traceability, uncertainty and decision-rule requirements; International Laboratory Accreditation Cooperation, ILAC G8:09/2019, Guidelines on Decision Rules and Statements of Conformity (September 2019), decision rules, guard bands and statements of conformity; Joint Committee for Guides in Metrology, JCGM 106:2012, Evaluation of Measurement Data - The Role of Measurement Uncertainty in Conformity Assessment (2012), role of measurement uncertainty in conformity assessment and decision risk.
- MB-0696. For the bounded treatment under “ 10.50 Uncertainty in flanking-path prediction ”, see International Organization for Standardization, ISO 10848-1:2017, Acoustics - Laboratory and field measurement of flanking transmission for airborne, impact and building service equipment sound - Part 1: Frame document (Edition 2, 2017), measurement framework for direct and flanking transmission; International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (Edition 2, 2017), calculation framework for direct and flanking airborne paths; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration: Radiation, Transmission and Response (2nd ed., Academic Press, 2007), chapters on structural vibration, mobility, power flow and radiation.
- MB-0697. For the bounded treatment under “ 10.6 Consumer risk, producer risk, and institutional consequence ”, see Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of measurement data - Guide to the expression of uncertainty in measurement (2008 edition with minor corrections), measurement-model, covariance, propagation and expanded-uncertainty framework; International Electrotechnical Commission, IEC 60268-16:2020, Sound system equipment - Part 16: Objective rating of speech intelligibility by speech transmission index (Edition 5.0, 2020; corrected July 2025), Speech Transmission Index method and interpretation provisions; International Organization for Standardization and International Electrotechnical Commission, ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories (Edition 3, November 2017; corrected 2018; confirmed 2023), laboratory competence, traceability, uncertainty and decision-rule requirements.
- MB-0698. For the bounded treatment under “ 10.7 Building-acoustics uncertainty contributors ”, see International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building

acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application; ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (ASTM E336-25a (2025a); last updated 3 February 2026), field room-to-room measurement, background correction, spatial sampling and reporting provisions; International Organization for Standardization, ISO 16283-1:2014, Acoustics - Field measurement of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 1, 2014, with Amendment 1:2017; confirmed 2025), field airborne-insulation quantities, positions, room range and reporting provisions.

MB-0699. For the bounded treatment under "10.8 Uncertainty in STC and R_w classification", see ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (ASTM E413-22 (2022)), classification, reference-contour, deficiency and reporting provisions; International Organization for Standardization, ISO 717-1:2020, Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 4, April 2020; confirmed March 2026), weighted airborne sound-insulation ratings and spectrum-adaptation provisions; International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application.

MB-0700. For the bounded treatment under "10.9 Monte Carlo propagation for nonlinear models", see Joint Committee for Guides in Metrology, JCGM 101:2008, Evaluation of Measurement Data - Supplement 1 to the GUM - Propagation of distributions using a Monte Carlo method (2008), Monte Carlo propagation of distributions for nonlinear uncertainty models; Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data - Guide to the Expression of Uncertainty in Measurement (2008 with minor corrections), measurement models, standard uncertainty, covariance and reporting.

MB-0701. For the bounded treatment under "8.1 The purpose and danger of compression", see ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (ASTM E413-22 (2022)), classification, reference-contour, deficiency and reporting provisions; International Organization for Standardization, ISO 717-1:2020, Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 4, April 2020; confirmed March 2026), weighted airborne sound-insulation ratings and spectrum-adaptation provisions.

MB-0702. For the bounded treatment under "8.1 The purpose and danger of compression", see ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (ASTM E90-23 (2023)), scope, laboratory specimen, chamber, measurement

and reporting provisions; ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (ASTM E336-25a (2025a); last updated 3 February 2026), field room-to-room measurement, background correction, spatial sampling and reporting provisions; International Organization for Standardization, ISO 16283-1:2014, Acoustics - Field measurement of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 1, 2014, with Amendment 1:2017; confirmed 2025), field airborne-insulation quantities, positions, room range and reporting provisions.

MB-0703. For the bounded treatment under “8.10 Rounding, uncertainty, and classification stability”, see International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application; Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data - Guide to the Expression of Uncertainty in Measurement (2008 with minor corrections), measurement models, standard uncertainty, covariance and reporting; National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994; public web edition), Type A and Type B evaluation, propagation, coverage and reporting.

MB-0704. For the bounded treatment under “8.11 Forensic interpretation of ratings”, see ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (ASTM E413-22 (2022)), classification, reference-contour, deficiency and reporting provisions; International Organization for Standardization, ISO 717-1:2020, Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 4, April 2020; confirmed March 2026), weighted airborne sound-insulation ratings and spectrum-adaptation provisions; Carl Hopkins, Sound Insulation (Elsevier, 2007), chapters on building sound insulation, ratings, direct and flanking transmission.

MB-0705. For the bounded treatment under “8.12 Design rules derived from the rating analysis”, see ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (ASTM E413-22 (2022)), classification, reference-contour, deficiency and reporting provisions; International Organization for Standardization, ISO 717-1:2020, Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 4, April 2020; confirmed March 2026), weighted airborne sound-insulation ratings and spectrum-adaptation provisions; Carl Hopkins, Sound Insulation (Elsevier, 2007), chapters on building sound insulation, ratings, direct and flanking transmission.

MB-0706. For the bounded treatment under “8.13 Frequency range, source spectra, and the low-band problem”, see ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings

(ASTM E336-25a (2025a); last updated 3 February 2026), field room-to-room measurement, background correction, spatial sampling and reporting provisions; International Organization for Standardization, ISO 16283-1:2014, Acoustics - Field measurement of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 1, 2014, with Amendment 1:2017; confirmed 2025), field airborne-insulation quantities, positions, room range and reporting provisions; Heinrich Kuttruff, Room Acoustics (6th ed., CRC Press, 2016), chapters on room fields, decay, speech and spatial variation.

MB-0707. For the bounded treatment under “8.14 The reference spectrum hidden inside a rating”, see International Organization for Standardization, ISO 717-1:2020, Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 4, April 2020; confirmed March 2026), weighted airborne sound-insulation ratings and spectrum-adaptation provisions; Tor Erik Vigran, Building Acoustics (Taylor & Francis, 2008), chapters on single and multiple constructions, plate transmission and building acoustics.

MB-0708. For the bounded treatment under “8.15 Curve shape as a diagnostic signature”, see ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (ASTM E413-22 (2022)), classification, reference-contour, deficiency and reporting provisions; International Organization for Standardization, ISO 717-1:2020, Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 4, April 2020; confirmed March 2026), weighted airborne sound-insulation ratings and spectrum-adaptation provisions; Carl Hopkins, Sound Insulation (Elsevier, 2007), chapters on building sound insulation, ratings, direct and flanking transmission.

MB-0709. For the bounded treatment under “8.16 Openings, seals, and the non-linearity of leakage”, see Carl Hopkins, Sound Insulation (Elsevier, 2007), chapters on building sound insulation, ratings, direct and flanking transmission; Marshall Long, Architectural Acoustics (2nd ed., Academic Press, 2014), chapters on architectural sound isolation, rooms, doors, glazing and services; ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (ASTM E90-23 (2023)), scope, laboratory specimen, chamber, measurement and reporting provisions.

MB-0710. For the bounded treatment under “8.17 Classification of variable and operable systems”, see ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (ASTM E413-22 (2022)), classification, reference-contour, deficiency and reporting provisions; International Organization for Standardization, ISO 717-1:2020, Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 4, April 2020; confirmed March 2026), weighted airborne sound-insulation ratings and spectrum-adaptation provisions; Carl Hopkins,

Sound Insulation (Elsevier, 2007), chapters on building sound insulation, ratings, direct and flanking transmission.

- MB-0711. For the bounded treatment under “8.18 Ratings in predictive design models”, see International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (Edition 2, 2017), calculation framework for direct and flanking airborne paths; International Organization for Standardization, ISO 10848-1:2017, Acoustics - Laboratory and field measurement of flanking transmission for airborne, impact and building service equipment sound - Part 1: Frame document (Edition 2, 2017), measurement framework for direct and flanking transmission; Carl Hopkins, Sound Insulation (Elsevier, 2007), chapters on building sound insulation, ratings, direct and flanking transmission.
- MB-0712. For the bounded treatment under “8.19 Rating evidence in submittals and substitutions”, see ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (ASTM E413-22 (2022)), classification, reference-contour, deficiency and reporting provisions; International Organization for Standardization, ISO 717-1:2020, Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 4, April 2020; confirmed March 2026), weighted airborne sound-insulation ratings and spectrum-adaptation provisions; International Organization for Standardization and International Electrotechnical Commission, ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories (Edition 3, November 2017; corrected 2018; confirmed 2023), laboratory competence, traceability, uncertainty and decision-rule requirements.
- MB-0713. For the bounded treatment under “8.2 Frequency-resolved transmission loss as the primary evidence”, see ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (ASTM E90-23 (2023)), scope, laboratory specimen, chamber, measurement and reporting provisions; International Organization for Standardization, ISO 10140-2:2021, Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation (Edition 3, 2021), laboratory airborne sound-insulation measurement provisions; Carl Hopkins, Sound Insulation (Elsevier, 2007), chapters on building sound insulation, ratings, direct and flanking transmission.
- MB-0714. For the bounded treatment under “8.2 Frequency-resolved transmission loss as the primary evidence”, see Carl Hopkins, Sound Insulation (Elsevier, 2007), chapters on building sound insulation, ratings, direct and flanking transmission; Tor Erik Vigran, Building Acoustics (Taylor & Francis, 2008), chapters on single and multiple constructions, plate transmission and building acoustics; Ben H. Sharp, Prediction

Methods for the Sound Transmission of Building Elements (Noise Control Engineering, 1978, and associated technical reports), single-leaf prediction and coincidence analysis.

- MB-0715. For the bounded treatment under “8.20 Worked comparison of equal classifications”, see ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (ASTM E413-22 (2022)), classification, reference-contour, deficiency and reporting provisions; International Organization for Standardization, ISO 717-1:2020, Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 4, April 2020; confirmed March 2026), weighted airborne sound-insulation ratings and spectrum-adaptation provisions; Carl Hopkins, Sound Insulation (Elsevier, 2007), chapters on building sound insulation, ratings, direct and flanking transmission.
- MB-0716. For the bounded treatment under “8.22 Classification stability under band censoring, rounded values, and laboratory limits”, see ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (ASTM E90-23 (2023)), scope, laboratory specimen, chamber, measurement and reporting provisions; ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (ASTM E413-22 (2022)), classification, reference-contour, deficiency and reporting provisions; International Organization for Standardization, ISO 10140-2:2021, Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation (Edition 3, 2021), laboratory airborne sound-insulation measurement provisions; International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application.
- MB-0717. For the bounded treatment under “8.22 Classification stability under band censoring, rounded values, and laboratory limits”, see ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (ASTM E90-23 (2023)), scope, laboratory specimen, chamber, measurement and reporting provisions; International Organization for Standardization, ISO 10140-2:2021, Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation (Edition 3, 2021), laboratory airborne sound-insulation measurement provisions; International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application; Tor Erik Vigran, Building Acoustics (Taylor & Francis, 2008), chapters on single and multiple constructions, plate transmission and building acoustics.

MB-0718. For the bounded treatment under “8.22 Specimen size, mounting opening, and laboratory boundary conditions”, see ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (ASTM E90-23 (2023)), scope, laboratory specimen, chamber, measurement and reporting provisions; International Organization for Standardization, ISO 10140-2:2021, Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation (Edition 3, 2021), laboratory airborne sound-insulation measurement provisions; Tor Erik Vigran, Building Acoustics (Taylor & Francis, 2008), chapters on single and multiple constructions, plate transmission and building acoustics.

MB-0719. For the bounded treatment under “8.23 Interlaboratory reproducibility and the myth of the exact catalogue number”, see International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, April 2020; confirmed 2025), building-acoustics uncertainty determination and application; International Organization for Standardization and International Electrotechnical Commission, ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories (Edition 3, November 2017; corrected 2018; confirmed 2023), laboratory competence, traceability, uncertainty and decision-rule requirements; David A. Bies, Colin H. Hansen, and Carl H. Howard, Engineering Noise Control: Theory and Practice (6th ed., CRC Press, 2024), chapters on measurement, sources, paths, control and building applications.

MB-0720. For the bounded treatment under “8.26 Ceiling, plenum, and impact metrics that are often confused”, see Marshall Long, Architectural Acoustics (2nd ed., Academic Press, 2014), chapters on architectural sound isolation, rooms, doors, glazing and services; David A. Bies, Colin H. Hansen, and Carl H. Howard, Engineering Noise Control: Theory and Practice (6th ed., CRC Press, 2024), chapters on measurement, sources, paths, control and building applications.

MB-0721. For the bounded treatment under “8.3 ASTM STC classification and the reference-contour idea”, see ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (ASTM E413-22 (2022)), classification, reference-contour, deficiency and reporting provisions; ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (ASTM E90-23 (2023)), scope, laboratory specimen, chamber, measurement and reporting provisions.

MB-0722. For the bounded treatment under “8.4 R_w and the ISO 717-1 framework”, see International Organization for Standardization, ISO 717-1:2020, Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 4, April 2020; confirmed March 2026), weighted airborne sound-insulation ratings and spectrum-adaptation provisions; International Organization for

Standardization, ISO 10140-2:2021, Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation (Edition 3, 2021), laboratory airborne sound-insulation measurement provisions; International Organization for Standardization, ISO 16283-1:2014, Acoustics - Field measurement of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 1, 2014, with Amendment 1:2017; confirmed 2025), field airborne-insulation quantities, positions, room range and reporting provisions.

MB-0723. For the bounded treatment under “8.5 Laboratory ratings, field classifications, and the flanking question”, see ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (ASTM E336-25a (2025a); last updated 3 February 2026), field room-to-room measurement, background correction, spatial sampling and reporting provisions; ASTM International, ASTM E2235-04(2020), Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods (Reapproved 2020), decay-rate measurement and evaluation provisions for sound-insulation tests.

MB-0724. For the bounded treatment under “8.5 Laboratory ratings, field classifications, and the flanking question”, see ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (ASTM E90-23 (2023)), scope, laboratory specimen, chamber, measurement and reporting provisions; ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (ASTM E336-25a (2025a); last updated 3 February 2026), field room-to-room measurement, background correction, spatial sampling and reporting provisions; ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (ASTM E413-22 (2022)), classification, reference-contour, deficiency and reporting provisions.

MB-0725. For the bounded treatment under “8.6 Why equal ratings can represent unequal risk”, see ASTM International, ASTM E2638-24, Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room (ASTM E2638-24 (2024)), closed-room speech-privacy method, listener assumptions and probabilistic interpretation; National Research Council Canada, New Framework for Rating the Speech Privacy of Enclosed Rooms (Public NRC Canada research framework), probabilistic speech-privacy framework and source-background treatment; John S. Bradley and colleagues, National Research Council Canada, Research series on closed-room speech privacy and architectural speech security (NRC Canada research reports and peer-reviewed papers, including RR-276), government research on source distributions, closed-room speech privacy and recovery probability.

MB-0726. For the bounded treatment under “8.7 Composite boundaries and the arithmetic of weak elements”, see Carl Hopkins, Sound Insulation (Elsevier, 2007), chapters on building sound insulation, ratings, direct and flanking transmission;

International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (Edition 2, 2017), calculation framework for direct and flanking airborne paths.

MB-0727. For the bounded treatment under “8.8 Component ratings and system ratings”, see ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (ASTM E413-22 (2022)), classification, reference-contour, deficiency and reporting provisions; International Organization for Standardization, ISO 717-1:2020, Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 4, April 2020; confirmed March 2026), weighted airborne sound-insulation ratings and spectrum-adaptation provisions; Carl Hopkins, Sound Insulation (Elsevier, 2007), chapters on building sound insulation, ratings, direct and flanking transmission.

MB-0728. For the bounded treatment under “8.9 The contractual life of a rating”, see ASTM International, ASTM E413-22, Classification for Rating Sound Insulation (ASTM E413-22 (2022)), classification, reference-contour, deficiency and reporting provisions; International Organization for Standardization, ISO 717-1:2020, Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 4, April 2020; confirmed March 2026), weighted airborne sound-insulation ratings and spectrum-adaptation provisions; International Organization for Standardization and International Electrotechnical Commission, ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories (Edition 3, November 2017; corrected 2018; confirmed 2023), laboratory competence, traceability, uncertainty and decision-rule requirements.

MB-0729. For the bounded treatment under “9.1 The field problem begins where the laboratory specimen ends”, see ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (ASTM E336-25a (2025a); last updated 3 February 2026), field room-to-room measurement, background correction, spatial sampling and reporting provisions; International Organization for Standardization, ISO 16283-1:2014, Acoustics - Field measurement of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 1, 2014, with Amendment 1:2017; confirmed 2025), field airborne-insulation quantities, positions, room range and reporting provisions.

MB-0730. For the bounded treatment under “9.10 Source and receiver calibration for speech tests”, see ASTM International, ASTM E2638-24, Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room (ASTM E2638-24 (2024)), closed-room speech-privacy method, listener assumptions and probabilistic interpretation; National Research Council Canada, New Framework for Rating the Speech Privacy of Enclosed Rooms (Public NRC Canada research framework), probabilistic speech-privacy framework and source-background

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- MB-0789. IEC 60268-16:2020; applicable audiovisual system standards and manufacturer evidence for the installed configuration. Acoustic source testing does not establish cybersecurity or freedom from unauthorised collection.
- MB-0790. IEC 60268-16:2020; ISO 19650 series; Chapters 26 and 35 of this work. Audiovisual source states, software configuration and acoustic performance require controlled records, while cybersecurity and electronic security remain separate disciplines.
- MB-0791. International Code Council, 2024 International Building Code (2024), Structural, fire and alteration provisions subject to local adoption., <https://codes.iccsafe.org/content/IBC2024P1>.
- MB-0792. International Code Council, 2024 International Building Code (2024), Structural, fire, penetration and acoustical provisions subject to local adoption., <https://codes.iccsafe.org/content/IBC2024P1>; ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), Laboratory airborne transmission loss., <https://store.astm.org/e0090-23.html>; ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025a), Field room-to-room attenuation including direct and flanking paths., <https://store.astm.org/e0336-25a.html>.
- MB-0793. International Code Council, 2024 International Building Code (Country Club Hills, IL: ICC, 2024), provisions for fire-resistance-rated construction, penetrations, joints and special inspection, subject to local adoption and amendment.
- MB-0794. International Code Council, 2024 International Building Code, subject to local adoption and amendment. [Cited 2 times in this edition.]
- MB-0795. International Code Council, 2024 International Existing Building Code, subject to local adoption and amendment.
- MB-0796. International Electrotechnical Commission, IEC 60268-16:2020 with Corrigendum 1:2025, 2020, corrected 2025. Status at the 14 August 2026 source freeze: Current. Public locator: <https://webstore.iec.ch/en/publication/26771>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 2 times in this edition.]
- MB-0797. International Electrotechnical Commission, IEC 60268-16:2020 with Corrigendum 1:2025, Objective rating of speech intelligibility by speech transmission index, 2020, corrected July 2025. Status at the 14 August 2026 source freeze: Current, stability date 2028. Public locator: <https://webstore.iec.ch/en/publication/26771>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 3 times in this edition.]

- MB-0798. International Electrotechnical Commission, IEC 60268-16:2020 with Corrigendum 1:2025, Sound system equipment, Part 16: Objective rating of speech intelligibility by speech transmission index, Edition 5, 2020; corrected 2025. Status at the 14 August 2026 source freeze: Current at source freeze. Public locator: <https://webstore.iec.ch/en/publication/26771>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 2 times in this edition.]
- MB-0799. International Electrotechnical Commission, IEC 60268-16:2020 with Corrigendum 1:2025, Speech transmission index, 2020, corrected 2025. Status at the 14 August 2026 source freeze: Current. Public locator: <https://webstore.iec.ch/en/publication/26771>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 6 times in this edition.]
- MB-0800. International Electrotechnical Commission, IEC 60268-16:2020, Sound system equipment, Part 16: Objective rating of speech intelligibility by speech transmission index (Edition 5.0, 2020; corrected 2025), method and interpretation provisions for the Speech Transmission Index; Heinrich Kuttruff, Room Acoustics (6th ed., CRC Press, 2016), chapters on modes, statistical room acoustics, decay, and intelligibility. [Cited 17 times in this edition.]
- MB-0801. International Electrotechnical Commission, IEC 60942:2017, Electroacoustics, Sound calibrators, Edition 4, 2017. Status at the 14 August 2026 source freeze: Current at source freeze. Public locator: <https://webstore.iec.ch/en/publication/30045>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 10 times in this edition.]
- MB-0802. International Electrotechnical Commission, IEC 60942:2017, Sound calibrators, 2017, Edition 4.0. Status at the 14 August 2026 source freeze: Current. Public locator: <https://webstore.iec.ch/en/publication/30045>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room.
- MB-0803. International Electrotechnical Commission, IEC 61260 series, Electroacoustics, Octave-band and fractional-octave-band filters, current applicable editions at source freeze. Status at the 14 August 2026 source freeze: Current. Public locator: <https://webstore.iec.ch/>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 5 times in this edition.]
- MB-0804. International Electrotechnical Commission, IEC 61672-1:2013, Electroacoustics, Sound level meters, Part 1: Specifications, Edition 2, 2013. Status at the 14 August 2026 source freeze: Current at source freeze. Public locator: <https://webstore.iec.ch/en/publication/5708>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 5 times in this edition.]

- MB-0805. International Electrotechnical Commission, IEC 61672-1:2013, Sound level meters, Part 1: Specifications, 2013, Edition 2.0. Status at the 14 August 2026 source freeze: Current, stability date 2029. Public locator: <https://webstore.iec.ch/en/publication/5708>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 4 times in this edition.]
- MB-0806. International Electrotechnical Commission, IEC 61672-2:2013 with Amendment 1:2017, Sound level meters, Part 2: Pattern evaluation tests, 2013 and 2017. Status at the 14 August 2026 source freeze: Current at source freeze. Public locator: <https://webstore.iec.ch/en/publication/60360>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 7 times in this edition.]
- MB-0807. International Electrotechnical Commission, IEC 61672-3, Electroacoustics, Sound level meters, Part 3: Periodic tests, applicable current edition at source freeze. Status at the 14 August 2026 source freeze: Current. Public locator: <https://webstore.iec.ch/>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 4 times in this edition.]
- MB-0808. International Electrotechnical Commission, Objective Rating of Speech Intelligibility by Speech Transmission Index. Identifier: IEC 60268-16:2020 with Corrigendum 1:2025. Status at the 16 August 2026 source freeze: Published, Edition 5.0, stability date 2028. Public locator: <https://webstore.iec.ch/en/publication/26771>. Technical role in this crosswalk: Consensus standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.
- MB-0809. International Electrotechnical Commission, Objective Rating of Speech Intelligibility by Speech Transmission Index. Identifier: IEC 60268-16:2020 with Corrigendum 1:2025. Status at the 16 August 2026 source freeze: Published, Edition 5.0, stability date 2028. Public locator: <https://webstore.iec.ch/en/publication/26771>. Technical role in this crosswalk: Consensus standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; ASTM International, Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room. Identifier: ASTM E2638-24. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator: <https://www.astm.org/e2638-24.html>. Technical role in this crosswalk: Closed-room speech-privacy measurement framework. Limitation: Not a universal governmental accreditation threshold and not a substitute for competent-

authority criteria.; FCDO Services, Secure Speech Environments. Identifier: Secure Speech Environments. Status at the 16 August 2026 source freeze: Current official public description. Public locator: <https://www.fcdo.gov.uk/what-we-offer/secure-speech-environments/>. Technical role in this crosswalk: Primary governmental service description. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; U.S. Department of State, Scope and Authority, including Definitions of Diplomatic Security Terms. Identifier: 12 FAM 010. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0010.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Defines public terminology and authority. It does not disclose controlled room criteria or approve a project.

MB-0810. International Organization for Standardization and International Electrotechnical Commission, General requirements for the competence of testing and calibration laboratories. Identifier: ISO/IEC 17025:2017. Status at the 16 August 2026 source freeze: Confirmed current at source freeze. Public locator: <https://www.iso.org/standard/66912.html>. Technical role: Laboratory competence, impartiality and consistent operation. Limitation: Accreditation scope must cover the actual method and does not confer governmental facility authority.

MB-0811. International Organization for Standardization and International Electrotechnical Commission, General requirements for the competence of testing and calibration laboratories. Identifier: ISO/IEC 17025:2017. Status at the 16 August 2026 source freeze: Confirmed current at source freeze. Public locator: <https://www.iso.org/standard/66912.html>. Technical role: Laboratory competence, impartiality and consistent operation. Limitation: Accreditation scope must cover the actual method and does not confer governmental facility authority. Joint Committee for Guides in Metrology, Evaluation of measurement data, Guide to the expression of uncertainty in measurement. Identifier: JCGM 100:2008. Status at the 16 August 2026 source freeze: Current public metrology guide at source freeze. Public locator: <https://www.bipm.org/en/committees/jc/jcgm/publications>. Technical role: Measurement models, uncertainty components, covariance and reporting. Limitation: General metrology guidance. It does not provide acoustic acceptance values. Joint Committee for Guides in Metrology, Evaluation of measurement data, The role of measurement uncertainty in conformity assessment. Identifier: JCGM 106:2012. Status at the 16 August 2026 source freeze: Current public guide at source freeze. Public locator: <https://www.bipm.org/en/committees/jc/jcgm/publications>. Technical role: Decision rules, guard bands and conformity risk. Limitation: Requires an adopted tolerance, decision rule and risk policy.

- MB-0812. International Organization for Standardization and International Electrotechnical Commission, ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories (Edition 3, 2017; corrected 2018; confirmed 2023), <https://www.iso.org/standard/66912.html>, laboratory competence, limitation: competence and traceability requirements do not validate an incorrect measurement model; BIPM, IEC, IFCC, ILAC, ISO, IUPAC, IUPAP and OIML, JCGM 200:2012, International Vocabulary of Metrology, 3rd edition (2012 with corrections), <https://www.bipm.org/en/committees/jc/jcgm/publications>, terminology, limitation: definitions require context and do not supply a room-specific model; Joint Committee for Guides in Metrology, JCGM GUM-6:2020, Guide to the expression of uncertainty in measurement - Part 6: Developing and using measurement models (2020), DOI 10.59161/JCGMGUM-6-2020, metrology guidance, limitation: general measurement-model guidance; application requires a complete acoustic model and stated assumptions; Marc C. Kennedy and Anthony O'Hagan, Bayesian Calibration of Computer Models (Journal of the Royal Statistical Society Series B 63(3), 2001, 425-464), DOI 10.1111/1467-9868.00294, peer-reviewed statistical modelling, limitation: general computer-model calibration framework; identifiability and model discrepancy require problem-specific treatment; M. Granger Morgan and Max Henrion, Uncertainty: A Guide to Dealing with Uncertainty in Quantitative Risk and Policy Analysis (1990), Cambridge University Press, ISBN 978-0-521-42744-9, uncertainty and decision analysis reference, limitation: general uncertainty and decision-analysis framework; secure-room consequences and authority decisions remain project-specific.
- MB-0813. International Organization for Standardization and International Electrotechnical Commission, ISO/IEC 27037:2012, guidance for identification, collection, acquisition and preservation of digital evidence; ASTM E3176-24, expert-report guidance.
- MB-0814. International Organization for Standardization, ISO 10140-1:2021, Laboratory measurement of sound insulation of building elements, Part 1: Application rules for specific products, Edition 3, 2021. Status at the 14 August 2026 source freeze: Published; under systematic review at source freeze. Public locator: <https://www.iso.org/standard/73910.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room.
- MB-0815. International Organization for Standardization, ISO 10140-2:2021, Acoustics - Laboratory Measurement of Sound Insulation of Building Elements - Part 2: Measurement of Airborne Sound Insulation (Geneva: ISO, 2021), clauses 4-6.
- MB-0816. International Organization for Standardization, ISO 10140-2:2021, Laboratory measurement of sound insulation of building elements, Part 2: Measurement of airborne sound insulation, Edition 2, 2021. Status at the 14 August 2026 source freeze: Published; under systematic review at source freeze. Public locator: <https://www.iso.org/standard/79487.html>. Use is confined to the source scope. The

document does not itself approve, accredit or authorise a secure room. [Cited 9 times in this edition.]

MB-0817. International Organization for Standardization, ISO 10140-4:2021, Laboratory measurement of sound insulation of building elements, Part 4: Measurement procedures and requirements, Edition 2, 2021. Status at the 14 August 2026 source freeze: Published; under systematic review at source freeze. Public locator: <https://www.iso.org/standard/73911.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 3 times in this edition.]

MB-0818. International Organization for Standardization, ISO 10140-5:2021, Laboratory measurement of sound insulation of building elements, Part 5: Requirements for test facilities and equipment, Edition 2, 2021. Status at the 14 August 2026 source freeze: Published. Public locator: <https://www.iso.org/standard/79482.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room.

MB-0819. International Organization for Standardization, ISO 10816 and ISO 20816 family, Mechanical vibration evaluation of machine vibration, current applicable parts at source freeze. Status at the 14 August 2026 source freeze: Published family. Public locator: <https://www.iso.org/standards.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 3 times in this edition.]

MB-0820. International Organization for Standardization, ISO 10848-1:2017, Acoustics - Laboratory and field measurement of flanking transmission for airborne, impact and building service equipment sound between adjoining rooms - Part 1: Frame document (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67226.html>. Scope note: Framework for measured flanking transmission; application depends on element type and supporting part; International Organization for Standardization, ISO 10848-2:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 2: Application to Type B elements when the junction has a small influence (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67227.html>. Scope note: Applies to suspended ceilings, access floors, light uninterrupted facades and floating floors; test element and plenum paths may be inseparable; International Organization for Standardization, ISO 10848-4:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 4: Application to junctions having at least one Type A element (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67229.html>. Scope note: Laboratory and field junction measurement for heavyweight and other Type A elements.

MB-0821. International Organization for Standardization, ISO 10848-1:2017, Acoustics - Laboratory and field measurement of flanking transmission for airborne, impact and building service equipment sound between adjoining rooms - Part 1: Frame document

(Edition 2, 2017; confirmed 2026), <https://www.iso.org/standard/67226.html>, flanking measurement framework, limitation: quantity and supporting part depend on element and junction type; International Organization for Standardization, ISO 10848-2:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 2: Application to Type B elements when the junction has a small influence (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67227.html>, flanking measurement, limitation: type B elements such as ceilings and access floors; test element and plenum contributions may be inseparable; International Organization for Standardization, ISO 10848-4:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 4: Application to junctions with at least one Type A element (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67229.html>, junction measurement, limitation: field results are specific to the installed structure and can contain unwanted flanking.

MB-0822. International Organization for Standardization, ISO 10848-1:2017, Acoustics - Laboratory and field measurement of flanking transmission for airborne, impact and building service equipment sound between adjoining rooms - Part 1: Frame document (Edition 2, 2017; confirmed 2026), <https://www.iso.org/standard/67226.html>, flanking measurement framework, limitation: quantity and supporting part depend on element and junction type; International Organization for Standardization, ISO 10848-4:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 4: Application to junctions with at least one Type A element (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67229.html>, junction measurement, limitation: field results are specific to the installed structure and can contain unwanted flanking; Lothar Cremer, Manfred Heckl and Björn A. T. Petersson, Structure-Borne Sound, 3rd edition (2005), Springer, technical monograph, limitation: structure-borne wave, mobility and junction theory; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Academic Press, technical monograph, limitation: structural vibration, power flow and radiation theory.

MB-0823. International Organization for Standardization, ISO 10848-1:2017, Acoustics - Laboratory and field measurement of flanking transmission for airborne, impact and building service equipment sound between adjoining rooms - Part 1: Frame document (Edition 2, 2017; confirmed 2026), <https://www.iso.org/standard/67226.html>, flanking measurement framework, limitation: quantity and supporting part depend on element and junction type; International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, 2020; confirmed 2025), <https://www.iso.org/standard/73930.html>, uncertainty standard, limitation: measurement uncertainty does not automatically include model-form or mission uncertainty; Carl Hopkins, Sound Insulation (2007), Elsevier, ISBN 978-0-7506-6526-1, technical monograph, limitation: prediction and measurement theory; source status is scholarly rather than normative; Lothar Cremer, Manfred Heckl and Björn A. T.

Petersson, Structure-Borne Sound, 3rd edition (2005), Springer, technical monograph, limitation: structure-borne wave, mobility and junction theory; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Academic Press, technical monograph, limitation: structural vibration, power flow and radiation theory; Marc C. Kennedy and Anthony O'Hagan, Bayesian Calibration of Computer Models (Journal of the Royal Statistical Society Series B 63(3), 2001, 425-464), DOI 10.1111/1467-9868.00294, peer-reviewed statistical modelling, limitation: general computer-model calibration framework; identifiability and model discrepancy require problem-specific treatment.

MB-0824. International Organization for Standardization, ISO 10848-1:2017, Acoustics, Laboratory and Field Measurement of Flanking Transmission for Airborne, Impact and Building Service Equipment Sound between Adjoining Rooms, Part 1: Frame Document (2017), confirmed 2023.

MB-0825. International Organization for Standardization, ISO 10848-1:2017, Acoustics, Laboratory and field measurement of flanking transmission for airborne, impact and building service equipment sound between adjoining rooms, Part 1: Frame document (ISO 10848-1:2017; issuer metadata verified 2 July 2026), definitions, framework, and measurement principles for flanking transmission; International Organization for Standardization, ISO 12354-1:2017, Building acoustics, Estimation of acoustic performance of buildings from the performance of elements, Part 1: Airborne sound insulation between rooms (ISO 12354-1:2017; issuer metadata verified 10 August 2026), calculation framework for direct and flanking airborne paths; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration: Radiation, Transmission and Response (2nd ed., Academic Press, 2007), chapters on structural mobility, power flow, radiation, and transmission. [Cited 4 times in this edition.]

MB-0826. International Organization for Standardization, ISO 10848-2:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 2: Application to Type B elements when the junction has a small influence (2017; confirmed 2023), Laboratory measurement of Type B flanking elements; results apply to tested dimensions and do not separate plenum and element transmission., <https://www.iso.org/standard/67227.html>; International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (2017; confirmed 2023; revision under development), Prediction from direct and flanking element data; model validity depends on configuration and input data., <https://www.iso.org/standard/70242.html>; International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (2017; confirmed 2023; revision under development), Frequency-band prediction from direct and flanking data; validity depends on element

and junction inputs., <https://www.iso.org/standard/70242.html>; International Organization for Standardization, ISO 10848-1:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 1: Frame document (2017; replacement work item initiated 2026), Frame method and quantities for laboratory and field flanking measurement., <https://www.iso.org/standard/67226.html>; International Organization for Standardization, ISO 10848-3:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 3: Type B elements when the junction has a substantial influence (2017; confirmed 2023), Applies to structurally connected Type B elements where the junction materially affects transmission., <https://www.iso.org/standard/67228.html>; International Organization for Standardization, ISO 10848-4:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 4: Junctions with at least one Type A element (2017; confirmed 2023), Laboratory and field characterisation of junctions with at least one Type A element., <https://www.iso.org/standard/67229.html>; International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (2017; confirmed 2023), Direct and flanking prediction; model depends on element and junction data., <https://www.iso.org/standard/70242.html>; International Organization for Standardization, ISO 10848-4:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 4: Junctions with at least one Type A element (2017; confirmed 2023), Heavyweight junction characterisation in laboratory or field., <https://www.iso.org/standard/67229.html>; International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (2017; confirmed 2023), Prediction of direct and flanking airborne sound., <https://www.iso.org/standard/70242.html>; International Organization for Standardization, ISO 10848-4:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 4: Junctions with at least one Type A element (2017; confirmed 2023), Heavyweight junction characterisation., <https://www.iso.org/standard/67229.html>; International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (2017; confirmed 2023), Direct and flanking prediction where input data exist., <https://www.iso.org/standard/70242.html>.

MB-0827. International Organization for Standardization, ISO 10848-2:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 2: Application to Type B elements when the junction has a small influence (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67227.html>, flanking measurement, limitation: type B elements such as ceilings and access floors; test element and plenum contributions may be inseparable; ASTM International, ASTM E1414/E1414M-21a,

Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum (2021), DOI 10.1520/E1414_E1414M-21A, ceiling-plenum path measurement, limitation: prescribed laboratory arrangement; actual plenums may differ.

MB-0828. International Organization for Standardization, ISO 10848-2:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 2: Application to Type B elements when the junction has a small influence (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67227.html>. Scope note: Applies to suspended ceilings, access floors, light uninterrupted facades and floating floors; test element and plenum paths may be inseparable.

MB-0829. International Organization for Standardization, ISO 10848-2:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 2: Application to Type B elements when the junction has a small influence (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67227.html>. Scope note: Applies to suspended ceilings, access floors, light uninterrupted facades and floating floors; test element and plenum paths may be inseparable; ASHRAE, ASHRAE Handbook - HVAC Applications (2023 edition), Chapter on sound and vibration control. Scope note: Sound and vibration control for building services; recommendations require project-specific verification.

MB-0830. International Organization for Standardization, ISO 10848-2:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 2: Application to Type B elements when the junction has a small influence (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67227.html>. Scope note: Applies to suspended ceilings, access floors, light uninterrupted facades and floating floors; test element and plenum paths may be inseparable; ASTM International, ASTM C635/C635M-22, Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings (2022), DOI 10.1520/C0635_C0635M-22. Scope note: Grid structural classification does not establish complete ceiling acoustics or continuous-system performance; ASHRAE, ASHRAE Handbook - HVAC Applications (2023 edition), Chapter on sound and vibration control. Scope note: Sound and vibration control for building services; recommendations require project-specific verification.

MB-0831. International Organization for Standardization, ISO 10848-2:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 2: Application to Type B elements when the junction has a small influence (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67227.html>. Scope note: Applies to suspended ceilings, access floors, light uninterrupted facades and floating floors; test element and plenum paths may be inseparable; Carl Hopkins, Sound Insulation (2007), Elsevier. Scope note: Theory, measurement and prediction; technical synthesis rather than controlling standard; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration:

Radiation, Transmission and Response (Second edition 2007), Academic Press. Scope note: Structural vibration and radiation theory; idealisations require stated boundary conditions.

MB-0832. International Organization for Standardization, ISO 10848-2:2017, Acoustics, Laboratory and Field Measurement of Flanking Transmission, Part 2: Application to Type B Elements when the Junction Has a Small Influence (2017), confirmed 2023.

MB-0833. International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (2017; confirmed 2023), Direct and flanking prediction; model depends on element and junction data., <https://www.iso.org/standard/70242.html>; International Organization for Standardization, ISO 10848-4:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 4: Junctions with at least one Type A element (2017; confirmed 2023), Heavyweight junction characterisation in laboratory or field., <https://www.iso.org/standard/67229.html>; Carl Hopkins, Sound Insulation (2007), Heavyweight walls, junctions, flanking and field prediction., ISBN 9780750665261; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Structural wave propagation, mobility and power flow., ISBN 9780123736338.

MB-0834. International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (2017; confirmed 2023), Prediction of direct and flanking airborne sound., <https://www.iso.org/standard/70242.html>; International Organization for Standardization, ISO 10848-4:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 4: Junctions with at least one Type A element (2017; confirmed 2023), Heavyweight junction characterisation., <https://www.iso.org/standard/67229.html>; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Structural mobility, force transmission, power flow and wave propagation., ISBN 9780123736338; Carl Hopkins, Sound Insulation (2007), Flanking, floors, junctions and building prediction., ISBN 9780750665261.

MB-0835. International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (2017; confirmed 2023), Prediction of direct and flanking airborne sound., <https://www.iso.org/standard/70242.html>; International Organization for Standardization, ISO 10848-4:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 4: Junctions with at least one Type A element (2017; confirmed 2023), Heavyweight junction characterisation., <https://www.iso.org/standard/67229.html>; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Structural mobility, force transmission, power

flow and wave propagation., ISBN 9780123736338; Carl Hopkins, Sound Insulation (2007), Flanking, floors, junctions and building prediction., ISBN 9780750665261; Marshall Long, Architectural Acoustics, 2nd edition (2014), Floor-ceiling airborne and impact behaviour., ISBN 9780123982582.

MB-0836. International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70242.html>, prediction standard, limitation: detailed band model and simplified rating model require valid element and junction data.

MB-0837. International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70242.html>, prediction standard, limitation: detailed band model and simplified rating model require valid element and junction data; Carl Hopkins, Sound Insulation (2007), Elsevier, ISBN 978-0-7506-6526-1, technical monograph, limitation: prediction and measurement theory; source status is scholarly rather than normative; Marshall Long, Architectural Acoustics, 2nd edition (2014), Academic Press, technical monograph, limitation: architectural acoustics synthesis; not a standards document.

MB-0838. International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70242.html>, prediction standard, limitation: detailed band model and simplified rating model require valid element and junction data; International Organization for Standardization, ISO 10848-1:2017, Acoustics - Laboratory and field measurement of flanking transmission for airborne, impact and building service equipment sound between adjoining rooms - Part 1: Frame document (Edition 2, 2017; confirmed 2026), <https://www.iso.org/standard/67226.html>, flanking measurement framework, limitation: quantity and supporting part depend on element and junction type; International Organization for Standardization, ISO 10848-2:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 2: Application to Type B elements when the junction has a small influence (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67227.html>, flanking measurement, limitation: type B elements such as ceilings and access floors; test element and plenum contributions may be inseparable; International Organization for Standardization, ISO 10848-4:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 4: Application to junctions with at least one Type A element (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67229.html>, junction measurement,

limitation: field results are specific to the installed structure and can contain unwanted flanking.

- MB-0839. International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70242.html>, prediction standard, limitation: detailed band model and simplified rating model require valid element and junction data; International Organization for Standardization, ISO 12354-2:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 2: Impact sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70243.html>, prediction standard, limitation: impact prediction bounded by element and flanking data and stated frequency range; International Organization for Standardization, ISO 717-1:2020, Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (Edition 4, 2020; confirmed 2026), <https://www.iso.org/standard/77435.html>, rating standard, limitation: single numbers simplify requirements but remain derived from band data; International Organization for Standardization, ISO 717-2:2020, Acoustics - Rating of sound insulation in buildings and of building elements - Part 2: Impact sound insulation (Edition 4, 2020; confirmed 2026), <https://www.iso.org/standard/69867.html>, rating standard, limitation: single-number impact ratings remain source- and method-specific.
- MB-0840. International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70242.html>. Scope note: Band and simplified prediction models depend on measured element and junction data; current edition remains controlling until replaced; International Organization for Standardization, ISO 10848-1:2017, Acoustics - Laboratory and field measurement of flanking transmission for airborne, impact and building service equipment sound between adjoining rooms - Part 1: Frame document (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67226.html>. Scope note: Framework for measured flanking transmission; application depends on element type and supporting part; International Organization for Standardization, ISO 10848-4:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 4: Application to junctions having at least one Type A element (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67229.html>. Scope note: Laboratory and field junction measurement for heavyweight and other Type A elements.
- MB-0841. International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of

elements - Part 1: Airborne sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70242.html>. Scope note: Band and simplified prediction models depend on measured element and junction data; current edition remains controlling until replaced; International Organization for Standardization, ISO 10848-4:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 4: Application to junctions having at least one Type A element (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67229.html>. Scope note: Laboratory and field junction measurement for heavyweight and other Type A elements.

MB-0842. International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70242.html>. Scope note: Band and simplified prediction models depend on measured element and junction data; current edition remains controlling until replaced; International Organization for Standardization, ISO 12354-2:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 2: Impact sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70243.html>. Scope note: Impact prediction models depend on element and flanking data and have defined frequency and uncertainty limits.

MB-0843. International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70242.html>. Scope note: Band and simplified prediction models depend on measured element and junction data; current edition remains controlling until replaced; International Organization for Standardization, ISO 12354-2:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 2: Impact sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70243.html>. Scope note: Impact prediction models depend on element and flanking data and have defined frequency and uncertainty limits; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration: Radiation, Transmission and Response (Second edition 2007), Academic Press. Scope note: Structural vibration and radiation theory; idealisations require stated boundary conditions; L. Cremer, M. Heckl and B. A. T. Petersson, Structure-Borne Sound: Structural Vibrations and Sound Radiation at Audio Frequencies (Third edition 2005), Springer. Scope note: Structure-borne theory and junction behaviour; practical application depends on material and geometry.

- MB-0844. International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70242.html>. Scope note: Band and simplified prediction models depend on measured element and junction data; current edition remains controlling until replaced; International Organization for Standardization, ISO 12354-2:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 2: Impact sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70243.html>. Scope note: Impact prediction models depend on element and flanking data and have defined frequency and uncertainty limits; International Organization for Standardization, ISO 10848-1:2017, Acoustics - Laboratory and field measurement of flanking transmission for airborne, impact and building service equipment sound between adjoining rooms - Part 1: Frame document (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67226.html>. Scope note: Framework for measured flanking transmission; application depends on element type and supporting part; International Organization for Standardization, ISO 10848-4:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 4: Application to junctions having at least one Type A element (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67229.html>. Scope note: Laboratory and field junction measurement for heavyweight and other Type A elements.
- MB-0845. International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70242.html>. Scope note: Band and simplified prediction models depend on measured element and junction data; current edition remains controlling until replaced; International Organization for Standardization, ISO 12354-2:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 2: Impact sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70243.html>. Scope note: Impact prediction models depend on element and flanking data and have defined frequency and uncertainty limits; International Organization for Standardization, ISO 10848-4:2017, Acoustics - Laboratory and field measurement of flanking transmission - Part 4: Application to junctions having at least one Type A element (Edition 2, 2017; confirmed 2023), <https://www.iso.org/standard/67229.html>. Scope note: Laboratory and field junction measurement for heavyweight and other Type A elements; L. Cremer, M. Heckl and B. A. T. Petersson, Structure-Borne Sound: Structural Vibrations and Sound Radiation at Audio Frequencies (Third edition 2005), Springer. Scope note: Structure-borne theory and junction behaviour; practical application depends on material and geometry.

- MB-0846. International Organization for Standardization, ISO 12354-1:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 1: Airborne sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70242.html>. Scope note: Band and simplified prediction models depend on measured element and junction data; current edition remains controlling until replaced; International Organization for Standardization, ISO 12354-2:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 2: Impact sound insulation between rooms (Edition 1, 2017; confirmed 2023; revision initiated 2025), <https://www.iso.org/standard/70243.html>. Scope note: Impact prediction models depend on element and flanking data and have defined frequency and uncertainty limits; Jorgen Olsson and Andreas Linderholt, Low-frequency impact sound of timber floors: A finite element-based study of conceptual designs (Building Acoustics 28(1), 2021), DOI 10.1177/1351010X20917874. Scope note: Conceptual finite-element study highlighting 20-50 Hz behaviour and excitation-position sensitivity; Anders Homb and Simone Conta, Timber hollow-box floors: Sound insulation measurement results and analysis (Building Acoustics, 2022), DOI 10.1177/1351010X221100604. Scope note: Laboratory measurements of specific hollow-box timber assemblies and floating-floor variants; results remain specimen-specific.
- MB-0847. International Organization for Standardization, ISO 12354-1:2017, Building Acoustics, Estimation of Acoustic Performance of Buildings from the Performance of Elements, Part 1: Airborne Sound Insulation between Rooms (2017), confirmed 2023.
- MB-0848. International Organization for Standardization, ISO 12354-3:2017, Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 3: Airborne sound insulation against outdoor sound (Edition 1, 2017; confirmed 2023), <https://www.iso.org/standard/70244.html>, façade prediction standard, limitation: includes direct and flanking paths for external surfaces; approximate correspondence to field results; ASTM International, ASTM E1332-22, Standard Classification for Determination of Outdoor-Indoor Transmission Class (2022), DOI 10.1520/E1332-22, façade classification, limitation: ranking metric for transportation-like spectra; detailed bands preferred for final design.
- MB-0849. International Organization for Standardization, ISO 12543-4:2021, Glass in Building, Laminated Glass and Laminated Safety Glass, Part 4: Test Methods for Durability; ASTM C1172-24e1. Durability compliance and acoustic performance remain separate evidence classes.
- MB-0850. International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, 2020; confirmed 2025), <https://www.iso.org/standard/73930.html>, uncertainty standard, limitation: measurement uncertainty does not automatically include model-form or mission

uncertainty; Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of measurement data - Guide to the expression of uncertainty in measurement (2008 with minor corrections), <https://www.bipm.org/en/committees/jc/jcgm/publications>, uncertainty framework, limitation: linearised propagation requires suitable model and distributions.

MB-0851. International Organization for Standardization, ISO 12999-1:2020, Acoustics - Determination and application of measurement uncertainties in building acoustics - Part 1: Sound insulation (Edition 2, 2020; confirmed 2025), <https://www.iso.org/standard/73930.html>, uncertainty standard, limitation: measurement uncertainty does not automatically include model-form or mission uncertainty; Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of measurement data - Guide to the expression of uncertainty in measurement (2008 with minor corrections), <https://www.bipm.org/en/committees/jc/jcgm/publications>, uncertainty framework, limitation: linearised propagation requires suitable model and distributions; Joint Committee for Guides in Metrology, JCGM 101:2008, Evaluation of measurement data - Supplement 1 to the GUM - Propagation of distributions using a Monte Carlo method (2008), <https://www.bipm.org/en/committees/jc/jcgm/publications>, monte Carlo propagation, limitation: requires defensible input distributions, dependence model and convergence; Joint Committee for Guides in Metrology, JCGM 100:2008/Amd.1:2026, Evaluation of measurement data - Guide to the expression of uncertainty in measurement - Amendment 1: Nonlinearity in measurement models (2026 amendment to JCGM 100:2008), DOI 10.59161/PPDI3267, metrology guidance, limitation: addresses nonlinearity in measurement models; does not by itself define an acoustic-security acceptance criterion; Joint Committee for Guides in Metrology, JCGM GUM-6:2020, Guide to the expression of uncertainty in measurement - Part 6: Developing and using measurement models (2020), DOI 10.59161/JCGMGUM-6-2020, metrology guidance, limitation: general measurement-model guidance; application requires a complete acoustic model and stated assumptions; M. Granger Morgan and Max Henrion, Uncertainty: A Guide to Dealing with Uncertainty in Quantitative Risk and Policy Analysis (1990), Cambridge University Press, ISBN 978-0-521-42744-9, uncertainty and decision analysis reference, limitation: general uncertainty and decision-analysis framework; secure-room consequences and authority decisions remain project-specific.

MB-0852. International Organization for Standardization, ISO 12999-1:2020, Acoustics, Determination and application of measurement uncertainties in building acoustics, Part 1: Sound insulation, 2020; reconfirmed 2025. Status at the 14 August 2026 source freeze: Published and current at source freeze. Public locator: <https://www.iso.org/standard/73930.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 2 times in this edition.]

- MB-0853. International Organization for Standardization, ISO 12999-1:2020, Acoustics, Determination and Application of Measurement Uncertainties in Building Acoustics, Part 1: Sound Insulation, Edition 2, confirmed current in 2025; Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data, Guide to the Expression of Uncertainty in Measurement; International Laboratory Accreditation Cooperation, ILAC G8:09/2019, Guidelines on Decision Rules and Statements of Conformity.
- MB-0854. International Organization for Standardization, ISO 12999-1:2020, Measurement Uncertainty in Building Acoustics, Part 1: Sound Insulation (2020; confirmed current in 2025); Joint Committee for Guides in Metrology, JCGM 100:2008 and JCGM 106:2012, Evaluation of Measurement Data and the Role of Uncertainty in Conformity Assessment (2008 and 2012 public editions); International Organization for Standardization, ISO 16283-1:2014 with Amendment 1:2017, Field Measurement of Airborne Sound Insulation (2014; confirmed current in 2025). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.
- MB-0855. International Organization for Standardization, ISO 12999-1:2020, Uncertainty of measurement in building acoustics, 2020. Status at the 14 August 2026 source freeze: Published. Public locator: <https://www.iso.org/standard/74438.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room.
- MB-0856. International Organization for Standardization, ISO 12999-1:2020; Joint Committee for Guides in Metrology, JCGM 100:2008; International Laboratory Accreditation Cooperation, ILAC G8:09/2019, uncertainty and decision-rule frameworks. [Cited 5 times in this edition.]
- MB-0857. International Organization for Standardization, ISO 16063-11:1999, Methods for the calibration of vibration and shock transducers, Part 11: Primary vibration calibration by laser interferometry, confirmed 2026. Status at the source freeze: Published. Public locator: <https://www.iso.org/standard/24951.html>. Primary calibration scope does not establish field low-frequency validity by itself.
- MB-0858. International Organization for Standardization, ISO 16063-21:2003 with Amendments 1:2016 and 2:2024, Methods for the calibration of vibration and shock transducers - Part 21: Vibration calibration by comparison to a reference transducer (2003, amendments through 2024), Accelerometer calibration by comparison; does not define building acceptance., <https://www.iso.org/standard/44712.html>; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Structural mobility, force transmission, power flow and wave propagation., ISBN 9780123736338.

- MB-0859. International Organization for Standardization, ISO 16063-21:2003 with Amendments 1:2016 and 2:2024, Methods for the calibration of vibration and shock transducers - Part 21: Vibration calibration by comparison to a reference transducer (2003, amendments through 2024), Accelerometer calibration by comparison; does not define building acceptance., <https://www.iso.org/standard/44712.html>; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Structural mobility, force transmission, power flow and wave propagation., ISBN 9780123736338; Carl Hopkins, Sound Insulation (2007), Flanking, floors, junctions and building prediction., ISBN 9780750665261.
- MB-0860. International Organization for Standardization, ISO 16063-21:2003 with Amendments 1:2016 and 2:2024, Methods for the calibration of vibration and shock transducers - Part 21: Vibration calibration by comparison to a reference transducer (2003, amendments through 2024), Accelerometer calibration by comparison; does not define building acceptance., <https://www.iso.org/standard/44712.html>; International Organization for Standardization, ISO 20816-1:2016, Mechanical vibration - Measurement and evaluation of machine vibration - Part 1: General guidelines (2016), General machine-vibration measurement framework; expected replacement does not alter need for application-specific building interpretation., <https://www.iso.org/standard/63180.html>; ASHRAE, ASHRAE Handbook - HVAC Applications, chapter on sound and vibration control (2023), Mechanical equipment vibration, isolation and building-service noise., <https://www.ashrae.org/technical-resources/ashrae-handbook>; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Structural mobility, force transmission, power flow and wave propagation., ISBN 9780123736338.
- MB-0861. International Organization for Standardization, ISO 16063-21:2003 with Amendments 1:2016 and 2:2024, Methods for the Calibration of Vibration and Shock Transducers, Part 21.
- MB-0862. International Organization for Standardization, ISO 16063-21:2003 with Amendments 1:2016 and 2:2024, Methods for the calibration of vibration and shock transducers, Part 21: Vibration calibration by comparison to a reference transducer. Status at the 14 August 2026 source freeze: Published. Public locator: <https://www.iso.org/standard/27053.html>. Use is confined to calibration, synchronisation and transducer-chain scope. [Cited 4 times in this edition.]
- MB-0863. International Organization for Standardization, ISO 16063-21:2003, Methods for the calibration of vibration and shock transducers, Part 21: Vibration calibration by comparison to a reference transducer (2003 with Amendment 1:2016 and Amendment 2:2024), comparison-calibration provisions for vibration transducers; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration: Radiation, Transmission and Response (2nd ed., Academic Press, 2007), chapters on structural mobility, power flow, radiation, and transmission; Joint Committee for Guides in

Metrology, JCGM 100:2008, Evaluation of Measurement Data, Guide to the Expression of Uncertainty in Measurement (2008 with minor corrections), clauses on measurement models, standard uncertainty, covariance, and reporting. [Cited 6 times in this edition.]

MB-0864. International Organization for Standardization, ISO 16283-1:2014 and ISO 3382-2:2008, current confirmed editions. Status at the 14 August 2026 source freeze: Published. Public locator: <https://www.iso.org/>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 3 times in this edition.]

MB-0865. International Organization for Standardization, ISO 16283-1:2014 with Amendment 1:2017, Field Measurement of Airborne Sound Insulation (2014; confirmed current in 2025); International Electrotechnical Commission, IEC 60268-16:2020 with Corrigendum 1:2025, Objective Rating of Speech Intelligibility by Speech Transmission Index (2020; corrigendum 7 July 2025); FCDO Services, Secure Speech Environments, Secure Speech Environments (Current public service description accessed 16 August 2026); FCDO Services, UK NACE, Technical Surveillance Countermeasures, Technical Surveillance Countermeasures (Current public service description accessed 16 August 2026). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0866. International Organization for Standardization, ISO 16283-1:2014 with Amendment 1:2017, Field Measurement of Airborne Sound Insulation (2014; confirmed current in 2025); International Organization for Standardization, ISO 12999-1:2020, Measurement Uncertainty in Building Acoustics, Part 1: Sound Insulation (2020; confirmed current in 2025); Joint Committee for Guides in Metrology, JCGM 100:2008 and JCGM 106:2012, Evaluation of Measurement Data and the Role of Uncertainty in Conformity Assessment (2008 and 2012 public editions). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0867. International Organization for Standardization, ISO 16283-1:2014 with Amendment 1:2017, Field Measurement of Airborne Sound Insulation (2014; confirmed current in 2025); International Organization for Standardization, ISO 12999-1:2020, Measurement Uncertainty in Building Acoustics, Part 1: Sound Insulation (2020; confirmed current in 2025); National Protective Security Authority, Building Services and Internal Spaces, Building Services and Internal Spaces (Current public web guidance accessed 16 August 2026). Status verified against the official public sources

on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0868. International Organization for Standardization, ISO 16283-1:2014 with Amendment 1:2017, Field Measurement of Airborne Sound Insulation (2014; confirmed current in 2025); International Organization for Standardization, ISO 12999-1:2020, Measurement Uncertainty in Building Acoustics, Part 1: Sound Insulation (2020; confirmed current in 2025); National Protective Security Authority, Security Walling Systems, Security Walling Systems (Current public web guidance accessed 16 August 2026). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0869. International Organization for Standardization, ISO 16283-1:2014 with Amendment 1:2017, Field measurement of airborne sound insulation, 2014, confirmed 2025. Status at the 14 August 2026 source freeze: Published and current. Public locator: <https://www.iso.org/standard/55997.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 6 times in this edition.]

MB-0870. International Organization for Standardization, ISO 16283-1:2014, Acoustics - Field measurement of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation, with Amendment 1:2017.

MB-0871. International Organization for Standardization, ISO 16283-1:2014, Acoustics, Field measurement of sound insulation in buildings and of building elements, Part 1: Airborne sound insulation, Edition 1, 2014; reconfirmed 2025. Status at the 14 August 2026 source freeze: Published and current at source freeze. Public locator: <https://www.iso.org/standard/55997.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 14 times in this edition.]

MB-0872. International Organization for Standardization, ISO 16283-1:2014/Amd 1:2017, Field measurement of sound insulation in buildings and of building elements. Part 1: Airborne sound insulation (2014; Amendment 1:2017). Public locator: <https://www.iso.org/standard/55997.html>. International Organization for Standardization, ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories (2017; corrected 2018; confirmed 2023). Public locator: <https://www.iso.org/standard/66912.html>. Diagnostic work should define the measurand, source and receiver states, calibration, spatial sampling, raw data,

limitations, and the inference supported. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.

- MB-0873. International Organization for Standardization, ISO 16283-1:2014/Amd 1:2017, Field measurement of sound insulation in buildings and of building elements. Part 1: Airborne sound insulation (2014; Amendment 1:2017). Public locator: <https://www.iso.org/standard/55997.html>. National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994; current NIST publication page). Public locator: <https://www.nist.gov/pml/nist-technical-note-1297>. A discriminating intervention should have a predicted effect, preserve the original evidence where practicable, and be followed by repeat measurement under a reconciled state. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.
- MB-0874. International Organization for Standardization, ISO 16283-1:2025, Acoustics - Field Measurement of Sound Insulation in Buildings and of Building Elements - Part 1: Airborne Sound Insulation (2025).
- MB-0875. International Organization for Standardization, ISO 16283-1:2025, Acoustics, Field Measurement of Sound Insulation in Buildings and of Building Elements, Part 1 (2025). [Cited 3 times in this edition.]
- MB-0876. Cross-reference to MB-0874. The complete authority record is consolidated under the earlier identifier.
- MB-0877. International Organization for Standardization, ISO 16283-2:2020, Acoustics, Field Measurement of Sound Insulation in Buildings and of Building Elements, Part 2: Impact Sound Insulation (2020).
- MB-0878. International Organization for Standardization, ISO 18434-1:2008, Condition monitoring and diagnostics of machines, Thermography, Part 1: General procedures, confirmed 2023. Status at the source freeze: Published. Public locator: <https://www.iso.org/standard/41648.html>. Machinery thermography is not a building-acoustic test.
- MB-0879. International Organization for Standardization, ISO 19650 series, asset information and change management, 2018 to 2025 editions. Status at the 14 August 2026 source freeze: Published. Public locator: <https://www.iso.org/>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 3 times in this edition.]
- MB-0880. International Organization for Standardization, ISO 19650 series, delivery, operational and security-minded information management, 2018 to 2025 editions. Status at the 14 August 2026 source freeze: Published. Public locator: <https://www.iso.org/>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 3 times in this edition.]

- MB-0881. International Organization for Standardization, ISO 19650 series, information management over the asset lifecycle, 2018 to 2025 editions. Status at the 14 August 2026 source freeze: Published. Public locator: <https://www.iso.org/standard/68078.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 3 times in this edition.]
- MB-0882. International Organization for Standardization, ISO 19650 series, information-management principles and delivery-phase requirements. [Cited 3 times in this edition.]
- MB-0883. International Organization for Standardization, ISO 19650-1:2018 and ISO 19650-2:2018, information-management concepts and delivery-phase processes. Project security and access rules remain controlling. [Cited 4 times in this edition.]
- MB-0884. International Organization for Standardization, ISO 19650-5:2020, Security-minded approach to information management (2020). Public locator: <https://www.iso.org/standard/74206.html>. Stable identifiers, controlled access, version history, provenance, checksums, and retained prior states support security-minded information management. Digital records do not replace physical verification. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.
- MB-0885. International Organization for Standardization, ISO 19650-5:2020, security-minded approach to information management, 2020. Status at the 14 August 2026 source freeze: Published. Public locator: <https://www.iso.org/standard/74206.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 5 times in this edition.]
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- MB-0887. International Organization for Standardization, ISO 20816-1:2016, Mechanical vibration - Measurement and evaluation of machine vibration - Part 1: General guidelines (2016), General machine-vibration measurement framework; expected replacement does not alter need for application-specific building interpretation., <https://www.iso.org/standard/63180.html>; ASHRAE, ASHRAE Handbook - HVAC Applications, chapter on sound and vibration control (2023), Mechanical equipment vibration, isolation and building-service noise., <https://www.ashrae.org/technical-resources/ashrae-handbook>; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Structural mobility, force transmission, power flow and wave propagation., ISBN 9780123736338. [Cited 2 times in this edition.]
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MB-0889. International Organization for Standardization, ISO 20816-1:2016, Mechanical Vibration, Measurement and Evaluation of Machine Vibration, Part 1: General Guidelines (2016).

MB-0890. International Organization for Standardization, ISO 20816-1:2016, Mechanical vibration, Measurement and evaluation of machine vibration, Part 1: General guidelines (ISO 20816-1:2016; issuer metadata verified 10 August 2026), general machine-vibration measurement and evaluation guidance; ASHRAE, ASHRAE Handbook, HVAC Applications, Sound and Vibration Control (2023 HVAC Applications edition), sound and vibration control chapters for HVAC sources, paths, and isolation; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration: Radiation, Transmission and Response (2nd ed., Academic Press, 2007), chapters on structural mobility, power flow, radiation, and transmission. [Cited 10 times in this edition.]

MB-0891. International Organization for Standardization, ISO 3382-2:2008, Acoustics, Measurement of room acoustic parameters, Part 2: Reverberation time in ordinary rooms, Edition 1, 2008; confirmed 2022. Status at the 14 August 2026 source freeze: Published and current at source freeze. Public locator: <https://www.iso.org/standard/36201.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 7 times in this edition.]

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MB-0893. International Organization for Standardization, ISO 3382-2:2008, Reverberation time in ordinary rooms, 2008, confirmed 2022. Status at the 14 August 2026 source freeze: Published and current. Public locator: <https://www.iso.org/standard/36201.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 2 times in this edition.]

MB-0894. International Organization for Standardization, ISO 5348:2021, Mechanical vibration and shock, Mechanical mounting of accelerometers. Status at the 14 August 2026 source freeze: Published. Public locator:

<https://www.iso.org/standard/75108.html>. Mounting guidance does not validate the complete structural-transfer model.

- MB-0895. International Organization for Standardization, ISO 6721-1:2019, Plastics - Determination of Dynamic Mechanical Properties - Part 1: General Principles (Geneva: ISO, 2019), scope and general principles.
- MB-0896. International Organization for Standardization, ISO 6781-1:2023, Performance of buildings, Detection of heat, air and moisture irregularities in buildings by infrared methods, Part 1: General procedures. Status at the source freeze: Published. Public locator: <https://www.iso.org/standard/79848.html>. Thermographic patterns remain inferential and environment dependent.
- MB-0897. International Organization for Standardization, ISO 717-1, single-number rating of airborne sound insulation; ratings do not replace frequency data or project approval.
- MB-0898. International Organization for Standardization, ISO 717-1:2020 life-cycle record, showing Edition 4, publication in December 2020, and confirmation on 6 March 2026.
- MB-0899. International Organization for Standardization, ISO 717-1:2020, Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation, Edition 4, December 2020, confirmed 6 March 2026.
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- MB-0901. International Organization for Standardization, ISO 717-1:2020, airborne sound-insulation ratings; ISO 16283-1:2014 with Amendment 1:2017, field measurement of airborne sound insulation between rooms. Single-number and field results do not confer authority approval.
- MB-0902. International Organization for Standardization, ISO 717-1:2026, Acoustics - Rating of Sound Insulation in Buildings and of Building Elements - Part 1: Airborne Sound Insulation (2026).
- MB-0903. International Organization for Standardization, ISO 717-1:2026, Acoustics, Rating of Sound Insulation in Buildings and of Building Elements, Part 1 (2026).
- MB-0904. Cross-reference to MB-0902. The complete authority record is consolidated under the earlier identifier.
- MB-0905. International Organization for Standardization, ISO 717-2:2020, Acoustics, Rating of Sound Insulation in Buildings and of Building Elements, Part 2: Impact Sound Insulation (2020).

- MB-0906. International Organization for Standardization, ISO 7235, Acoustics, Laboratory measurement procedures for ducted silencers and air-terminal units, current edition at source freeze. Status at the 14 August 2026 source freeze: Published. Public locator: <https://www.iso.org/standard/42929.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 3 times in this edition.]
- MB-0907. International Organization for Standardization, ISO 9052-1:1989, Acoustics - Determination of dynamic stiffness - Part 1: Materials used under floating floors in dwellings (Edition 1, 1989), <https://www.iso.org/standard/16646.html>. Scope note: Dynamic stiffness of resilient layers under prescribed specimen and loading; not a complete floating-floor rating; Alessandro Schiavi, Andrea Pavoni Belli and Francesco Russo, Estimation of Acoustical Performance of Floating Floors from Dynamic Stiffness of Resilient Layers (Building Acoustics 12(2), 2005), DOI 10.1260/1351010054037938. Scope note: Empirical relation between apparent dynamic stiffness and impact reduction; ageing and damping limit transfer; Marco Caniato, C. Schmid and Andrea Gasparella, A comprehensive analysis of time influence on floating floors: Effects on acoustic performance and occupants comfort (Applied Acoustics 166, 2020, 107339), DOI 10.1016/j.apacoust.2020.107339. Scope note: Five-year material study of load and dynamic-stiffness change; application bounded to tested materials.
- MB-0908. International Organization for Standardization, ISO 9614-1:1993, Determination of sound power levels using sound intensity, Part 1: Measurement at discrete points, Edition 1, 1993; confirmed 2024. Status at the 14 August 2026 source freeze: Published and current at source freeze. Public locator: <https://www.iso.org/standard/17427.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 4 times in this edition.]
- MB-0909. International Organization for Standardization, ISO 9614-2, Determination of sound power levels using sound intensity, Part 2: Measurement by scanning, current edition at source freeze. Status at the 14 August 2026 source freeze: Published. Public locator: <https://www.iso.org/>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 3 times in this edition.]
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- MB-0911. International Organization for Standardization, ISO 9972:2015, Thermal performance of buildings, Determination of air permeability of buildings, Fan pressurization method. Status at the source freeze: Published and under systematic review. Public locator: <https://www.iso.org/standard/55718.html>. The method does not establish secure-room acoustic performance.

- MB-0912. International Organization for Standardization, ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories (2017; corrected 2018; confirmed 2023). Public locator: <https://www.iso.org/standard/66912.html>. ASTM International, ASTM E860, Practice for Examining and Preparing Items That Are or May Become Involved in Criminal or Civil Litigation (Applicable published edition). Public locator: <https://www.astm.org/e0860.html>. Evidence should distinguish contemporaneous observation, measurement, processing, inference, and decision. Counsel controls privilege, legal standards, and distribution of protected records. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.
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- MB-0915. International Organization for Standardization, Organization and Digitization of Information about Buildings and Civil Engineering Works, Security-Minded Approach to Information Management. Identifier: ISO 19650-5:2020. Status at the 16 August 2026 source freeze: Consensus standard metadata at source freeze. Public locator: <https://www.iso.org/standard/74206.html>. Technical role in this crosswalk: Consensus standard metadata. Limitation: Proprietary standard. Used only for public security-minded information-management principles. [Cited 3 times in this edition.]
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approach-information-management. Technical role in this crosswalk: Primary governmental information-security guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Canadian Centre for Cyber Security, Emission Security Guidance. Identifier: ITSG-11A. Status at the 16 August 2026 source freeze: Protected publication; superseded ITSG-11 in March 2025. Public locator: <https://www.cyber.gc.ca/en/guidance/emission-security-emsec-guidance-itsg-11a>. Technical role in this crosswalk: Authoritative protected EMSEC guidance under the Chief, CSE. Limitation: Only the public existence, status and access route are used. Protected criteria are not reconstructed.; Office of the Director of National Intelligence, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities. Identifier: Version 1.5.1. Status at the 16 August 2026 source freeze: Latest approved public release displayed by ODNI at source freeze. Public locator: <https://www.dni.gov/files/NCSC/documents/Regulations/Technical-Specifications-SCIF-V1.5.1.pdf>. Technical role in this crosswalk: Primary governmental technical specification. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-0917. International Organization for Standardization, Organization and Digitization of Information about Buildings and Civil Engineering Works, Security-Minded Approach to Information Management. Identifier: ISO 19650-5:2020. Status at the 16 August 2026 source freeze: Consensus standard metadata at source freeze. Public locator: <https://www.iso.org/standard/74206.html>. Technical role in this crosswalk: Consensus standard metadata. Limitation: Proprietary standard. Used only for public security-minded information-management principles.; National Protective Security Authority, Security-Minded Approach to Information Management. Identifier: Security-Minded Approach to Information Management. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.npsa.gov.uk/security-best-practices/build-it-secure/security-minded-approach-information-management>. Technical role in this crosswalk: Primary governmental information-security guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; International Organization for Standardization, Organization and digitization of information about buildings and civil engineering works, including building information modelling, Part 5: Security-minded approach. Identifier: ISO 19650-5:2020. Status at the 16 August 2026 source freeze: Confirmed

current at source freeze. Public locator: <https://www.iso.org/standard/74206.html>. Technical role in this crosswalk: Security-minded information management for built assets. Limitation: Does not supply national-security classification decisions or project-specific need-to-know rules.; Cabinet Office, Government Security Classifications Policy. Identifier: Government Security Classifications Policy. Status at the 16 August 2026 source freeze: Current public classification policy at source freeze. Public locator: <https://www.gov.uk/government/publications/government-security-classifications/government-security-classifications-policy.html>. Technical role in this crosswalk: Primary governmental policy. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-0918. International Organization for Standardization, Organization and Digitization of Information about Buildings and Civil Engineering Works, Security-Minded Approach to Information Management. Identifier: ISO 19650-5:2020. Status at the 16 August 2026 source freeze: Consensus standard metadata at source freeze. Public locator: <https://www.iso.org/standard/74206.html>. Technical role in this crosswalk: Consensus standard metadata. Limitation: Proprietary standard. Used only for public security-minded information-management principles.; National Protective Security Authority, Security-Minded Approach to Information Management. Identifier: Security-Minded Approach to Information Management. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.npsa.gov.uk/security-best-practices/build-it-secure/security-minded-approach-information-management>. Technical role in this crosswalk: Primary governmental information-security guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; International Organization for Standardization, Organization and digitization of information about buildings and civil engineering works, including building information modelling, Part 5: Security-minded approach. Identifier: ISO 19650-5:2020. Status at the 16 August 2026 source freeze: Confirmed current at source freeze. Public locator: <https://www.iso.org/standard/74206.html>. Technical role in this crosswalk: Security-minded information management for built assets. Limitation: Does not supply national-security classification decisions or project-specific need-to-know rules.; National Institute of Standards and Technology, Risk Management Framework and security and privacy controls. Identifier: NIST SP 800-37 Rev. 2 and SP 800-53 Rev. 5. Status at the 16 August 2026 source freeze: Official public technical guidance. Public locator: <https://csrc.nist.gov/publications>. Technical role in this crosswalk: Primary governmental technical guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify

or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed. [Cited 2 times in this edition.]

MB-0919. ISO 10005:2018, ISO 10006:2017 and public construction quality-control practice support planned hold points, evidence and corrective action. [Cited 4 times in this edition.]

MB-0920. ISO 10848 series and ASTM E1414/E1414M-21a support flanking and plenum analysis within method limitations. [Cited 3 times in this edition.]

MB-0921. ISO 10848-1:2017, Acoustics, Laboratory and Field Measurement of Flanking Transmission for Airborne, Impact and Building Service Equipment Sound Between Adjoining Rooms, Part 1: Frame Document, scope and framework clauses; ISO 12354-1:2017, Building Acoustics, Estimation of Acoustic Performance of Buildings from the Performance of Elements, Part 1: Airborne Sound Insulation Between Rooms, calculation framework. [Cited 10 times in this edition.]

MB-0922. ISO 11820:1996, Acoustics, Measurements on Silencers in Situ; ISO 5136:2003, in-duct source measurement limitations.

MB-0923. ISO 12354-1:2017, estimation of airborne sound insulation between rooms from element performance; ISO 10848 series, flanking transmission measurement. Whole-room prediction requires complete path representation.

MB-0924. ISO 12354-1:2017, ISO 12354-2:2017, ISO 12354-3:2017 and ISO 12354-5:2023 provide prediction frameworks within stated scopes and assumptions. [Cited 4 times in this edition.]

MB-0925. ISO 12999-1:2020 and JCGM 100:2008 support measurement-uncertainty treatment. Configuration uncertainty and model discrepancy remain separate unless represented defensibly. [Cited 4 times in this edition.]

MB-0926. ISO 12999-1:2020; JCGM 100:2008; JCGM 106:2012; ILAC-G8:09/2019. Measurement uncertainty, configuration uncertainty and model discrepancy require separate treatment.

MB-0927. ISO 13347-1:2025, Fans, Determination of Fan Sound Power Levels under Standardized Laboratory Conditions, Part 1: General Overview; ANSI/AMCA Standard 300-24, Reverberation Room Methods of Sound Testing of Fans.

MB-0928. ISO 13347-3:2026 and ISO 13347-4:2025, airborne fan sound-power methods and express exclusion of vibration sensitivity; Fahy and Gardonio, Sound and Structural Vibration, force transmission and mobility.

MB-0929. ISO 13347-4:2025, fan sound-power determination by intensity; Fahy and Gardonio, Sound and Structural Vibration, intensity, transfer functions and coherence.

MB-0930. ISO 16063-21:2003 with Amendments 1:2016 and 2:2024, Methods for the Calibration of Vibration and Shock Transducers, Part 21: Vibration Calibration by

Comparison to a Reference Transducer, calibration clauses. [Cited 10 times in this edition.]

MB-0931. ISO 16283-1:2014 and ISO 12999-1:2020. Field measurement and uncertainty treatment require the applicable method, sampling and reporting provisions. [Cited 2 times in this edition.]

MB-0932. ISO 16283-1:2014 with Amendment 1:2017. [Cited 2 times in this edition.]

MB-0933. ISO 19011:2026, Guidelines for auditing management systems, published May 2026. Audit guidance supports risk-based programmes, competence and evidence evaluation but does not replace technical inspection. [Cited 2 times in this edition.]

MB-0934. ISO 19650 series and RIBA Plan of Work 2020, staged information and change management; project authority and procurement law remain controlling.

MB-0935. ISO 19650 series, information management over the asset lifecycle; public United States guide specifications and closeout practice concerning record drawings, submittals and commissioning. These sources do not define secure-room performance.

MB-0936. ISO 19650-1:2018, ISO 19650-2:2018, ISO 19650-3:2020, ISO 19650-5:2020 and ISO 19650-6:2025. These standards support controlled delivery, operational, security-minded and safety information management within their respective scopes. [Cited 7 times in this edition.]

MB-0937. ISO 19650-6:2025. Structured health-and-safety information supports coordinated access and inspection, while applicable law and project safety procedures remain governing.

MB-0938. ISO 20816 family; ISO 5348:2021; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration; David A. Bies, Colin H. Hansen and Carl H. Howard, Engineering Noise Control, 6th edition. Structural path attribution requires force, response, mounting, operating-state and uncertainty evidence.

MB-0939. ISO 20816-1:2016, Mechanical Vibration, Measurement and Evaluation of Machine Vibration, Part 1: General Guidelines, measurement framework; ASHRAE, ASHRAE Handbook, HVAC Applications (2023), chapter on sound and vibration control. [Cited 10 times in this edition.]

MB-0940. ISO 3382-2:2008, Acoustics, Measurement of Room Acoustic Parameters, Part 2: Reverberation Time in Ordinary Rooms; ASTM E2235-04(2020), Determination of Decay Rates for Use in Sound Insulation Test Methods. [Cited 9 times in this edition.]

MB-0941. ISO 3382-2:2008, reverberation time in ordinary rooms; research and handbook treatments of masking, speech level and Lombard response. Masking is an operating state, not boundary isolation.

MB-0942. ISO 717-1:2020 lifecycle record.

MB-0943. ISO 717-1:2020. [Cited 4 times in this edition.]

- MB-0944. ISO 9001:2015 quality-management principles concerning corrective action, trend analysis and improvement; ISO 19650 lifecycle information-management principles. These standards do not prescribe acoustic-security criteria.
- MB-0945. ISO 9001:2015 with Amendment 1:2024, ISO 10005:2018 and ISO 10006:2017 support controlled quality planning and records. [Cited 3 times in this edition.]
- MB-0946. ISO 9001:2015, Amendment 1:2024; ISO 10005:2018; ISO 10006:2017. At the 13 August 2026 source freeze, ISO 9001:2015 remained current, with its replacement expected in September 2026. [Cited 4 times in this edition.]
- MB-0947. ISO 9052 series, dynamic stiffness of thermal and acoustic insulating materials under floating floors; published research on load and ageing effects in resilient floor layers. Product conditions and field load distribution remain relevant.
- MB-0948. ISO/IEC 17020:2026, Conformity assessment. Requirements for bodies performing inspection, published March 2026 and corrected June 2026. Apply where an inspection body or equivalent independent service is required. [Cited 2 times in this edition.]
- MB-0949. ISO/IEC 17025:2017 addresses competence, traceability, methods, technical records and result validity. [Cited 4 times in this edition.]
- MB-0950. ISO/IEC 17025:2017, confirmed 2023. Laboratory or measurement competence, calibration, method validation and reporting remain distinct from construction inspection authority. [Cited 2 times in this edition.]
- MB-0951. ISO/IEC 17025:2017, laboratory competence and scope; RIBA Plan of Work 2020 and public project-delivery frameworks concerning roles and information exchange. Authority and professional responsibility remain jurisdiction specific.
- MB-0952. ISO/IEC 17025:2017, laboratory competence, traceability, uncertainty and decision rules; ISO 12999-1:2020, measurement uncertainty in building acoustics.
- MB-0953. ISO/IEC 17025:2017, method validation, technical records and assurance of result validity; ISO 12999-1:2020, repeatability and uncertainty in building acoustics.
- MB-0954. ISO/IEC 17025:2017; ISO 12999-1:2020; JCGM 100:2008; JCGM 106:2012; ILAC-G8:09/2019. Decision rules and uncertainty treatment must be declared before results are known and do not create the acceptance criterion.
- MB-0955. J. A. Díaz-Cereceda et al., Sound transmission loss analysis through a multilayer lightweight concrete hollow brick wall by FEM and experimental validation (Building and Environment 45 (2010), 2373-2386), Periodic hollow masonry, gypsum linings and vibro-acoustic modelling., <https://doi.org/10.1016/j.buildenv.2010.04.013>; M. Villot et al., A homogenised vibratory model for predicting the acoustic properties of hollow brick walls (Journal of Sound and Vibration 330 (2011), 3400-3409), Anisotropic homogenisation and Lamb-wave behaviour of hollow brick walls., <https://doi.org/10.1016/j.jsv.2011.02.015>; Carl Hopkins, Sound Insulation (2007),

Frequency-resolved wall, junction and field sound-insulation theory., ISBN 9780750665261; Frank Fahy and Paolo Gardonio, Sound and Structural Vibration, 2nd edition (2007), Mobility, force transmission and structural coupling., ISBN 9780123736338.

MB-0956. J. A. Díaz-Cereceda et al., " Sound Transmission Loss Analysis Through a Multilayer Lightweight Concrete Hollow Brick Wall by FEM and Experimental Validation, " Building and Environment 45 (2010): 2373-2386. [Cited 2 times in this edition.]

MB-0957. J. M. Bravo et al., " Influence of Air Layers and Damping Layers Between Gypsum Boards on Sound Transmission, " Applied Acoustics 63, no. 10 (2002): 1051-1059, [https://doi.org/10.1016/S0003-682X\(02\)00028-2](https://doi.org/10.1016/S0003-682X(02)00028-2); Nicola Granzotto et al., " Sound Reduction Index Prediction of Double-Layer Gypsum Panels Through the Transfer Matrix Method, " Building Acoustics 28, no. 1 (2021): 3-16, <https://doi.org/10.1177/1351010X20921038>.

MB-0958. J. S. Bradley and J. A. Birta, " A Simple Model of the Sound Insulation of Gypsum Board on Resilient Supports, " Noise Control Engineering Journal 49, no. 5 (2001): 216-223, <https://doi.org/10.3397/1.2839663>.

MB-0959. J. S. Bradley and J. A. Birta, " On the Sound Insulation of Wood Stud Exterior Walls, " National Research Council Canada research; Halliwell et al., Gypsum Board Walls: Transmission Loss Data.

MB-0960. Internal cross-reference. Chapters 1 through 26 of this edition supply the cumulative physics, envelope, building-services, and evidence context required by the cited proposition. External propositions remain dependent upon the independent authorities identified at the point of use. [Cited 3 times in this edition.]

MB-0961. Internal cross-reference. Chapters 1 through 29 of this edition supply the cumulative physics, construction, measurement, and governmental-doctrine context required by the cited proposition. External propositions remain dependent upon the independent authorities identified at the point of use. [Cited 2 times in this edition.]

MB-0962. Jason E. Cambridge, John L. Davy, and John R. Pearse, " The Influence of the Wall Cavity on the Transmission Loss of Wall Systems: Experimental Trends, " Building Acoustics 20, no. 2 (2013): 87-106, <https://doi.org/10.1260/1351-010X.20.2.87>.

MB-0963. JCGM 100:2008 and JCGM 106:2012 support the separation of measurand, uncertainty and decision. They do not define secure-room criteria. [Cited 4 times in this edition.]

MB-0964. JCGM 100:2008, Evaluation of Measurement Data, Guide to the Expression of Uncertainty in Measurement; ISO 12999-1:2020, building-acoustic uncertainty framework; ILAC G8:09/2019, decision rules and guard bands.

MB-0965. JCGM 100:2008. [Cited 5 times in this edition.]

- MB-0966. JCGM 100:2008; JCGM 106:2012; ILAC-G8:09/2019. Measurement uncertainty and decision rules should be stated where conformity decisions depend upon quantitative evidence. [Cited 2 times in this edition.]
- MB-0967. Jeffrey Mahn, Sabrina Skoda, and Iara Cunha, "The Transmission Loss of Double Stud Walls with Layers of Gypsum Board Installed inside the Wall Cavity," *Canadian Acoustics* 52, no. 3 (2024), <https://jcaa.caa-aca.ca/index.php/jcaa/article/view/3976>.
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- MB-0969. John L. Davy, Mohammad Fard, Wayland Dong, and John Loverde, "Empirical Corrections for Predicting the Sound Insulation of Double Leaf Cavity Stud Building Elements with Stiffer Studs," *Journal of the Acoustical Society of America* 145, no. 2 (2019): 703, <https://doi.org/10.1121/1.5089222>.
- MB-0970. John L. Davy, Predicting the sound insulation of single leaf walls: extension of Cremer's model (*Journal of the Acoustical Society of America* 126(4), 2009), single-leaf prediction and coincidence analysis; Tor Erik Vigran, *Building Acoustics* (Taylor & Francis, 2008), chapters on plate transmission, double constructions, and building acoustics; Carl Hopkins, *Sound Insulation* (Elsevier, 2007), chapters on single and multiple elements, flanking, and building prediction. [Cited 4 times in this edition.]
- MB-0971. John L. Davy, Timothy J. Phillips and John R. Pearse, "The Damping of Gypsum Plaster Board Wooden Stud Cavity Walls," *Applied Acoustics* 88 (2015): 52-56, <https://doi.org/10.1016/j.apacoust.2014.08.006>.
- MB-0972. Cross-reference to MB-0971. The complete authority record is consolidated under the earlier identifier.
- MB-0973. John L. Davy, "Predicting the Sound Insulation of Single Leaf Walls: Extension of Cremer's Model," *Journal of the Acoustical Society of America* 126, no. 4 (2009), 1871-1877, <https://doi.org/10.1121/1.3206582>; Hopkins, *Sound Insulation*, single-leaf prediction chapters.
- MB-0974. John L. Davy, "Predicting the Sound Insulation of Single Leaf Walls: Extension of Cremer's Model," *Journal of the Acoustical Society of America* 126, no. 4 (2009), <https://doi.org/10.1121/1.3206582>; Hopkins, *Sound Insulation*, single-leaf prediction chapters. [Cited 7 times in this edition.]
- MB-0975. John L. Davy, "Sound Transmission of Cavity Walls Due to Structure-Borne Transmission via Point and Line Connections," *Journal of the Acoustical Society of America* 132, no. 2 (2012): 814-821, <https://doi.org/10.1121/1.4733533>.
- MB-0976. John L. Davy, "Sound Transmission of Cavity Walls Due to Structure-Borne Transmission via Point and Line Connections," *Journal of the Acoustical Society of America* 132, no. 2 (2012): 814-821, <https://doi.org/10.1121/1.4733533>; L. Cremer, M.

Heckl and B. A. T. Petersson, *Structure-Borne Sound*, 3rd ed. (Berlin: Springer, 2005), chapters on mobility and junction transmission.

MB-0977. John L. Davy, "The Improvement of a Simple Theoretical Model for the Prediction of the Sound Insulation of Double Leaf Walls," *Journal of the Acoustical Society of America* 127, no. 2 (2010), 841-849, <https://doi.org/10.1121/1.3273889>; ASTM International, ASTM E2190-19, *Standard Specification for Insulating Glass Unit Performance and Evaluation*.

MB-0978. Joint Committee for Guides in Metrology / International Organization for Standardization, JCGM 100:2008; JCGM 106:2012; ISO 12999-1:2020, *Measurement uncertainty, conformity assessment and uncertainty in building acoustics* (2008 to 2020 editions); ASTM International, ASTM E336-25a; ASTM E2638-24; ASTM E2964-26, *Field sound isolation, closed-room speech privacy and low-frequency field measurement standards* (2024 to 2026 editions). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-0979. Joint Committee for Guides in Metrology / International Organization for Standardization, *Measurement uncertainty, conformity assessment and uncertainty in building acoustics*. Identifier: JCGM 100:2008; JCGM 106:2012; ISO 12999-1:2020. Status at the 16 August 2026 source freeze: Published at source freeze. Public locator: <https://www.bipm.org/en/committees/jc/jcgm/publications>. Technical role in this crosswalk: International metrology guidance and consensus standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; International Organization for Standardization, *Field Measurement of Airborne Sound Insulation*. Identifier: ISO 16283-1:2014 with Amendment 1:2017. Status at the 16 August 2026 source freeze: Published and current at source freeze. Public locator: <https://www.iso.org/standard/55997.html>. Technical role in this crosswalk: Consensus standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; U.S. Department of State, *Department of State Facility Accreditation Program*. Identifier: 12 FAM 390. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0390.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Public governance language does not permit an engineer to grant accreditation or infer controlled criteria.; Office of the

Director of National Intelligence, Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information Facilities. Identifier: ICS 705-02. Status at the 16 August 2026 source freeze: Public standard listed by ODNI at source freeze. Public locator: <https://www.dni.gov/files/documents/ICD/ICS-705-2.pdf>. Technical role in this crosswalk: Primary governmental standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; FCDO Services, UK National Authority for Counter-Eavesdropping, The UK National Authority for Counter-Eavesdropping. Identifier: UK NACE. Status at the 16 August 2026 source freeze: Current official public description. Public locator: <https://www.fcdoservices.gov.uk/uk-nace/>. Technical role in this crosswalk: Primary governmental technical-security authority description. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; International Organization for Standardization and International Electrotechnical Commission, General requirements for the competence of testing and calibration laboratories. Identifier: ISO/IEC 17025:2017. Status at the 16 August 2026 source freeze: Confirmed current at source freeze. Public locator: <https://www.iso.org/standard/66912.html>. Technical role in this crosswalk: Laboratory competence, impartiality and consistent operation. Limitation: Accreditation scope must cover the actual method and does not confer governmental facility authority.

MB-0980. Joint Committee for Guides in Metrology, Evaluation of Measurement Data, Guide to the Expression of Uncertainty in Measurement. Identifier: JCGM 100:2008. Status at the 16 August 2026 source freeze: Current foundational public metrology guide. Public locator: <https://www.bipm.org/en/committees/jc/jcgm/publications>. Technical role in this crosswalk: Primary metrology guidance. Limitation: General uncertainty framework. The measurement model and acceptance risk remain project specific.

MB-0981. Joint Committee for Guides in Metrology, Evaluation of Measurement Data, Guide to the Expression of Uncertainty in Measurement. Identifier: JCGM 100:2008. Status at the 16 August 2026 source freeze: Current foundational public metrology guide. Public locator: <https://www.bipm.org/en/committees/jc/jcgm/publications>. Technical role in this crosswalk: Primary metrology guidance. Limitation: General uncertainty framework. The measurement model and acceptance risk remain project specific.; Joint Committee for Guides in Metrology / International Organization for Standardization, Measurement uncertainty, conformity assessment and uncertainty in building acoustics. Identifier: JCGM 100:2008; JCGM 106:2012; ISO 12999-1:2020. Status at the 16 August 2026 source freeze: Published at source freeze. Public locator: <https://www.bipm.org/en/committees/jc/jcgm/publications>. Technical role in this crosswalk: International metrology guidance and consensus standard. Limitation: Use

is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; International Organization for Standardization, Measurement Uncertainty in Building Acoustics, Part 1: Sound Insulation. Identifier: ISO 12999-1:2020. Status at the 16 August 2026 source freeze: Published and current at source freeze. Public locator: <https://www.iso.org/standard/73930.html>. Technical role in this crosswalk: Consensus standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Joint Committee for Guides in Metrology, Evaluation of measurement data, Guide to the expression of uncertainty in measurement. Identifier: JCGM 100:2008. Status at the 16 August 2026 source freeze: Current public metrology guide at source freeze. Public locator: <https://www.bipm.org/en/committees/jc/jcgm/publications>. Technical role in this crosswalk: Measurement models, uncertainty components, covariance and reporting. Limitation: General metrology guidance. It does not provide acoustic acceptance values.

MB-0982. Joint Committee for Guides in Metrology, JCGM 100:2008 and JCGM 106:2012, 2008 and 2012, with current GUM-family updates recorded in 2026. Status at the 14 August 2026 source freeze: Published. Public locator: <https://www.bipm.org/en/committees/jc/jcgm/publications>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room.

MB-0983. Joint Committee for Guides in Metrology, JCGM 100:2008 and JCGM 106:2012, 2008 and 2012. Status at the 14 August 2026 source freeze: Published. Public locator: <https://www.bipm.org/en/committees/jc/jcgm/publications>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room.

MB-0984. Joint Committee for Guides in Metrology, JCGM 100:2008 with Amendment 1:2026, Evaluation of measurement data, Guide to the expression of uncertainty in measurement, 2008 and 2026. Status at the 14 August 2026 source freeze: Current GUM-family publication at source freeze. Public locator: <https://www.bipm.org/en/committees/jc/jcgm/publications>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 7 times in this edition.]

MB-0985. Joint Committee for Guides in Metrology, JCGM 100:2008 with Amendment 1:2026, Guide to the Expression of Uncertainty in Measurement; JCGM 106:2012, uncertainty in conformity assessment; ISO 12999-1:2020.

MB-0986. Joint Committee for Guides in Metrology, JCGM 100:2008, clauses 4–5; Fahy and Gardonio, Sound and Structural Vibration, mobility, power-flow, and uncertainty discussions. [Cited 10 times in this edition.]

MB-0987. Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of measurement data - Guide to the expression of uncertainty in measurement (2008 with minor corrections), <https://www.bipm.org/en/committees/jc/jcgm/publications>, uncertainty framework, limitation: linearised propagation requires suitable model and distributions; Joint Committee for Guides in Metrology, JCGM 100:2008/Amd.1:2026, Evaluation of measurement data - Guide to the expression of uncertainty in measurement - Amendment 1: Nonlinearity in measurement models (2026 amendment to JCGM 100:2008), DOI 10.59161/PPDI3267, metrology guidance, limitation: addresses nonlinearity in measurement models; does not by itself define an acoustic-security acceptance criterion; Joint Committee for Guides in Metrology, JCGM GUM-6:2020, Guide to the expression of uncertainty in measurement - Part 6: Developing and using measurement models (2020), DOI 10.59161/JCGMGUM-6-2020, metrology guidance, limitation: general measurement-model guidance; application requires a complete acoustic model and stated assumptions.

MB-0988. Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of measurement data - Guide to the expression of uncertainty in measurement (2008 with minor corrections), <https://www.bipm.org/en/committees/jc/jcgm/publications>, uncertainty framework, limitation: linearised propagation requires suitable model and distributions; Joint Committee for Guides in Metrology, JCGM GUM-6:2020, Guide to the expression of uncertainty in measurement - Part 6: Developing and using measurement models (2020), DOI 10.59161/JCGMGUM-6-2020, metrology guidance, limitation: general measurement-model guidance; application requires a complete acoustic model and stated assumptions.

MB-0989. Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of measurement data - Guide to the expression of uncertainty in measurement, DOI 10.59161/JCGM100-2008E.

MB-0990. Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data, Guide to the Expression of Uncertainty in Measurement (2008 with minor corrections), clauses on measurement models, standard uncertainty, covariance, and reporting; National Institute of Standards and Technology, Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994 edition), sections on uncertainty components, propagation, expanded uncertainty, and reporting. [Cited 7 times in this edition.]

MB-0991. Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of Measurement Data, Guide to the Expression of Uncertainty in Measurement, clauses 4–5; Barry N. Taylor and Chris E. Kuyatt, NIST Technical Note 1297, Guidelines for

Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994), sections 3–6. [Cited 4 times in this edition.]

- MB-0992. Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of measurement data. Guide to the expression of uncertainty in measurement (2008). Public locator: <https://www.bipm.org/en/committees/jc/jcgm/publications>. International Organization for Standardization, ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories (2017; corrected 2018; confirmed 2023). Public locator: <https://www.iso.org/standard/66912.html>. Fire, acoustic, structural, electrical, moisture, configuration, and authority propositions require separate measurands, evidence, and decision owners. The matrix is an original non-equivalence control. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.
- MB-0993. Joint Committee for Guides in Metrology, JCGM 100:2008, Evaluation of measurement data. Guide to the expression of uncertainty in measurement (2008). Public locator: <https://www.bipm.org/en/committees/jc/jcgm/publications>. National Institute of Standards and Technology, NIST Technical Note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results (1994; current NIST publication page). Public locator: <https://www.nist.gov/pml/nist-technical-note-1297>. Combined uncertainty must follow an explicit measurement model and account for correlation where present. A data-sheet tolerance alone is not a complete uncertainty budget. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.
- MB-0994. Joint Committee for Guides in Metrology, JCGM 101:2008, Evaluation of measurement data - Supplement 1 to the GUM - Propagation of distributions using a Monte Carlo method (2008), <https://www.bipm.org/en/committees/jc/jcgm/publications>, monte Carlo propagation, limitation: requires defensible input distributions, dependence model and convergence; Joint Committee for Guides in Metrology, JCGM 100:2008/Amd.1:2026, Evaluation of measurement data - Guide to the expression of uncertainty in measurement - Amendment 1: Nonlinearity in measurement models (2026 amendment to JCGM 100:2008), DOI 10.59161/PPDI3267, metrology guidance, limitation: addresses nonlinearity in measurement models; does not by itself define an acoustic-security acceptance criterion.
- MB-0995. Joint Committee for Guides in Metrology, JCGM 106:2012, Evaluation of measurement data - The role of measurement uncertainty in conformity assessment (2012), <https://www.bipm.org/en/committees/jc/jcgm/publications>, conformity assessment, limitation: decision rule does not replace authority-specific consequence analysis; International Laboratory Accreditation Cooperation, ILAC G8:09/2019, Guidelines on Decision Rules and Statements of Conformity (2019),

<https://ilac.org/publications-and-resources/ilac-guidance-series/>, decision-rule guidance, limitation: guidance requires the rule and risk to be stated; not a secure-room acceptance criterion; M. Granger Morgan and Max Henrion, *Uncertainty: A Guide to Dealing with Uncertainty in Quantitative Risk and Policy Analysis* (1990), Cambridge University Press, ISBN 978-0-521-42744-9, uncertainty and decision analysis reference, limitation: general uncertainty and decision-analysis framework; secure-room consequences and authority decisions remain project-specific; International Organization for Standardization, ISO 31000:2018, *Risk management - Guidelines* (Edition 2, 2018; confirmed 2023), <https://www.iso.org/standard/65694.html>, risk-management guidance, limitation: generic risk-management framework; does not establish acoustic-security performance or accreditation criteria.

MB-0996. Joint Committee for Guides in Metrology, JCGM 106:2012, *Evaluation of measurement data - The role of measurement uncertainty in conformity assessment* (2012), <https://www.bipm.org/en/committees/jc/jcgm/publications>, conformity assessment, limitation: decision rule does not replace authority-specific consequence analysis; International Organization for Standardization and International Electrotechnical Commission, ISO/IEC 17025:2017, *General requirements for the competence of testing and calibration laboratories* (Edition 3, 2017; corrected 2018; confirmed 2023), <https://www.iso.org/standard/66912.html>, laboratory competence, limitation: competence and traceability requirements do not validate an incorrect measurement model; International Laboratory Accreditation Cooperation, ILAC G8:09/2019, *Guidelines on Decision Rules and Statements of Conformity* (2019), <https://ilac.org/publications-and-resources/ilac-guidance-series/>, decision-rule guidance, limitation: guidance requires the rule and risk to be stated; not a secure-room acceptance criterion.

MB-0997. Joint Committee for Guides in Metrology, JCGM 106:2012, *The role of measurement uncertainty in conformity assessment*, 2012. Status at the 14 August 2026 source freeze: Published and technically current at source freeze. Public locator: <https://www.bipm.org/en/committees/jc/jcgm/publications>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 4 times in this edition.]

MB-0998. Joint Committee for Guides in Metrology, JCGM GUM-1:2023 and JCGM GUM-6:2020, 2023 and 2020. Status at the 14 August 2026 source freeze: Published and current at source freeze. Public locator: <https://www.bipm.org/en/committees/jc/jcgm/publications>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 9 times in this edition.]

MB-0999. Joint Committee for Guides in Metrology, JCGM GUM-5:2026, *Guide to the expression of uncertainty in measurement, Part 5: Examples*, 2026. Status at the 14 August 2026 source freeze: Published at source freeze. Public locator:

<https://www.bipm.org/en/committees/jc/jcgm/publications>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 2 times in this edition.]

- MB-1000. Jorgen Olsson and Andreas Linderholt, Low-frequency impact sound of timber floors: A finite element-based study of conceptual designs (Building Acoustics 28(1), 2021), DOI 10.1177/1351010X20917874. Scope note: Conceptual finite-element study highlighting 20-50 Hz behaviour and excitation-position sensitivity; Anders Homb and Simone Conta, Timber hollow-box floors: Sound insulation measurement results and analysis (Building Acoustics, 2022), DOI 10.1177/1351010X221100604. Scope note: Laboratory measurements of specific hollow-box timber assemblies and floating-floor variants; results remain specimen-specific; Jorgen Olsson and Andreas Linderholt, Force to sound pressure frequency response measurements using a modified tapping machine on timber floor structures (Engineering Structures 196, 2019, 109343), DOI 10.1016/j.engstruct.2019.109343. Scope note: Force-to-pressure characterisation of timber floors; modified source and laboratory setup limit direct code use.
- MB-1001. Jorgen Olsson and Andreas Linderholt, Low-frequency impact sound of timber floors: A finite element-based study of conceptual designs (Building Acoustics 28(1), 2021), DOI 10.1177/1351010X20917874. Scope note: Conceptual finite-element study highlighting 20-50 Hz behaviour and excitation-position sensitivity; Jorgen Olsson and Andreas Linderholt, Force to sound pressure frequency response measurements using a modified tapping machine on timber floor structures (Engineering Structures 196, 2019, 109343), DOI 10.1016/j.engstruct.2019.109343. Scope note: Force-to-pressure characterisation of timber floors; modified source and laboratory setup limit direct code use; Moritz Spah and colleagues, Subjective and Objective Evaluation of Impact Noise Sources in Wooden Buildings (International Journal of Aeroacoustics 20(3), 2013), DOI 10.1260/1351-010X.20.3.193. Scope note: Psychoacoustic comparison of impact sources in timber buildings; subjective findings do not replace standard ratings.
- MB-1002. José María Bravo, Jaime Sinisterra, Antonio Uris, Jaime Llinares, and Hermelando Estelles, "Influence of Air Layers and Damping Layers Between Gypsum Boards on Sound Transmission," Applied Acoustics 63, no. 10 (2002): 1051-1059, [https://doi.org/10.1016/S0003-682X\(02\)00028-2](https://doi.org/10.1016/S0003-682X(02)00028-2).
- MB-1003. Jukka Keränen and Valtteri Hongisto, "Effect of Resilient Joints on the Airborne Sound Insulation of Single-Leaf Heavyweight Constructions," Journal of Building Engineering 56 (2022): 104711. [Cited 2 times in this edition.]
- MB-1004. Lawrence E. Kinsler, Austin R. Frey, Alan B. Coppens, and James V. Sanders, Fundamentals of Acoustics (4th ed., Wiley, 2000), chapters on wave motion, impedance, energy, and sound fields; Leo L. Beranek and Tim Mellow, Acoustics: Sound Fields and Transducers (Academic Press, 2012), chapters on sound fields, transducers, intensity, and array measurement. [Cited 6 times in this edition.]

- MB-1005. Lawrence E. Kinsler, Austin R. Frey, Alan B. Coppens, and James V. Sanders, *Fundamentals of Acoustics*, 4th ed. (Wiley, 2000), chapters 5–7; Leo L. Beranek and Tim Mellow, *Acoustics: Sound Fields and Transducers* (Academic Press, 2012), chapters 3–6. [Cited 4 times in this edition.]
- MB-1006. Leo L. Beranek and Tim Mellow, *Acoustics: Sound Fields and Transducers* (Academic Press, 2012), chapters on sound fields, transducers, intensity, and array measurement; Frank Fahy and Paolo Gardonio, *Sound and Structural Vibration: Radiation, Transmission and Response* (2nd ed., Academic Press, 2007), chapters on structural mobility, power flow, radiation, and transmission; David A. Bies, Colin H. Hansen, and Carl H. Howard, *Engineering Noise Control: Theory and Practice* (6th ed., CRC Press, 2024), chapters on measurement, source characterisation, vibration control, and building elements. [Cited 5 times in this edition.]
- MB-1007. M. L. Munjal, *Acoustics of Ducts and Mufflers*, 2nd ed. (Wiley, 2014), duct modes, cut-on and transfer matrices; ISO 5136:2003, in-duct method and duct-size limits.
- MB-1008. M. Villot et al., “A Homogenised Vibratory Model for Predicting the Acoustic Properties of Hollow Brick Walls,” *Journal of Sound and Vibration* 330 (2011): 3400–3409. [Cited 2 times in this edition.]
- MB-1009. Mahn, Skoda, and Cunha, “Transmission Loss of Double Stud Walls,” abstract and reported low-frequency resonances.
- MB-1010. Manufacturer reports are acceptable only when specimen, laboratory, method, date, configuration and limitations are complete and relevant to the proposed work. [Cited 2 times in this edition.]
- MB-1011. Manzello et al., “Measurement of Thermal Properties of Gypsum Board at Elevated Temperatures,” results and abstract.
- MB-1012. Marc C. Kennedy and Anthony O’Hagan, Bayesian Calibration of Computer Models (*Journal of the Royal Statistical Society Series B* 63(3), 2001, 425–464), DOI 10.1111/1467-9868.00294, peer-reviewed statistical modelling, limitation: general computer-model calibration framework; identifiability and model discrepancy require problem-specific treatment; Andrea Saltelli, Paola Annoni, Ivano Azzini, Francesca Campolongo, Marco Ratto and Stefano Tarantola, Variance based sensitivity analysis of model output. Design and estimator for the total sensitivity index (*Computer Physics Communications* 181(2), 2010, 259–270), DOI 10.1016/j.cpc.2009.09.018, peer-reviewed sensitivity analysis, limitation: general variance-based method; computational cost and input-dependence assumptions must be stated; Max D. Morris, Factorial Sampling Plans for Preliminary Computational Experiments (*Technometrics* 33(2), 1991, 161–174), DOI 10.1080/00401706.1991.10484804, peer-reviewed screening design, limitation: screening method identifies influential inputs but does not by itself quantify complete output uncertainty.

- MB-1013. Marc C. Kennedy and Anthony O'Hagan, Bayesian Calibration of Computer Models (Journal of the Royal Statistical Society Series B 63(3), 2001, 425-464), DOI 10.1111/1467-9868.00294, peer-reviewed statistical modelling, limitation: general computer-model calibration framework; identifiability and model discrepancy require problem-specific treatment; Judea Pearl, Causality: Models, Reasoning, and Inference, 2nd edition (2009), Cambridge University Press, ISBN 978-0-521-89560-6, causal inference reference, limitation: general causal framework; building-acoustic interventions require physical and metrological validation; M. Granger Morgan and Max Henrion, Uncertainty: A Guide to Dealing with Uncertainty in Quantitative Risk and Policy Analysis (1990), Cambridge University Press, ISBN 978-0-521-42744-9, uncertainty and decision analysis reference, limitation: general uncertainty and decision-analysis framework; secure-room consequences and authority decisions remain project-specific.
- MB-1014. Marshall Long, Architectural Acoustics, 2nd ed. (Academic Press, 2014), glazing, façades, room and isolation treatments; Tor Erik Vigran, Building Acoustics (Taylor & Francis, 2008).
- MB-1015. Marshall Long, Architectural Acoustics, 2nd ed. (Academic Press, 2014), sound-isolation chapters; Bies, Hansen, and Howard, Engineering Noise Control, building-element chapters. [Cited 7 times in this edition.]
- MB-1016. Marshall Long, Architectural Acoustics, 2nd ed. (Waltham, MA: Academic Press, 2014), chapters on sound transmission, composite partitions, apertures and flanking.
- MB-1017. Marshall Long, Architectural Acoustics, 2nd edition, 2014. Status at the 14 August 2026 source freeze: Published. Public locator: Publisher record. Secondary authority. Current project criteria and standards remain controlling. [Cited 3 times in this edition.]
- MB-1018. Michael Raley and Benjamin M. Shafer, "Sound Transmission Loss Through Steel-Framed Building Partitions," Journal of the Acoustical Society of America 155, no. 3 supplement (2024), <https://doi.org/10.1121/10.0026754>.
- MB-1019. Ministry of Defence, Industry Security Assurance Centre, Security Aspects Letter guidance, Security Aspects Letters and contractual security obligations (Current public guidance accessed 16 August 2026); Ministry of Defence, Industry Security Notices, including ISN 2026/04 and ISN 2025/08, Industry Security Notices (Register updated 18 June 2026); Cabinet Office, PPN 012, Security Classifications Policy (17 February 2025); Cabinet Office, PPN 025, Protecting the UK National Security Through Public Procurement (Published 19 June 2026; updated 3 July 2026). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-1020. Ministry of Housing, Communities and Local Government, Approved Document B, Volume 2, Fire Safety in Buildings Other Than Dwellings (2019 edition incorporating amendments; page updated 11 March 2025); Ministry of Housing, Communities and Local Government, Approved Document M, Volume 2, Access to and Use of Buildings Other Than Dwellings (2015 edition incorporating 2024 amendments; page updated 1 October 2024); Ministry of Housing, Communities and Local Government, Approved Document E, Resistance to the Passage of Sound (2015 public edition); Cabinet Office, Security Policy Framework, Protecting Government Assets (2 December 2022). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-1021. Ministry of Housing, Communities and Local Government, Fire Safety in Buildings Other Than Dwellings. Identifier: Approved Document B, Volume 2. Status at the 16 August 2026 source freeze: Current statutory guidance page at source freeze; jurisdiction and transition require project confirmation. Public locator: <https://www.gov.uk/government/publications/fire-safety-approved-document-b>. Technical role in this crosswalk: Primary governmental statutory guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-1022. Ministry of Housing, Communities and Local Government, Fire Safety in Buildings Other Than Dwellings. Identifier: Approved Document B, Volume 2. Status at the 16 August 2026 source freeze: Current statutory guidance page at source freeze; jurisdiction and transition require project confirmation. Public locator: <https://www.gov.uk/government/publications/fire-safety-approved-document-b>. Technical role in this crosswalk: Primary governmental statutory guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Ministry of Housing, Communities and Local Government, Access to and Use of Buildings Other Than Dwellings. Identifier: Approved Document M, Volume 2. Status at the 16 August 2026 source freeze: Current statutory guidance page at source freeze; jurisdiction requires project confirmation. Public locator: <https://www.gov.uk/government/publications/access-to-and-use-of-buildings-approved-document-m>. Technical role in this crosswalk: Primary governmental statutory guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United

Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; U.S. Department of Defense / Whole Building Design Guide, SCIF/SAPF Planning, Design, and Construction. Identifier: UFC 4-010-05. Status at the 16 August 2026 source freeze: Active at source freeze. Public locator: <https://www.wbdg.org/dod/ufc/ufc-4-010-05>. Technical role in this crosswalk: Primary governmental facilities criterion. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; National Research Council Canada, Codes Canada, National Model Codes and public code-development information. Status at the 16 August 2026 source freeze: Current public code information at source freeze. Public locator: <https://nrc.canada.ca/en/certifications-evaluations-standards/codes-canada>. Technical role in this crosswalk: Building, fire, plumbing and energy-code interfaces. Limitation: Model codes require provincial or territorial adoption and do not establish acoustic-security approval.

MB-1023. National Counterintelligence and Security Center, Public technical-security and counterintelligence resources, current public web material. Status at the 14 August 2026 source freeze: Public source. Public locator: <https://www.dni.gov/index.php/ncsc-home>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 2 times in this edition.]

MB-1024. National Cyber Security Centre, Public technical-security policy and guidance resources, current public pages at source freeze. Status at the 14 August 2026 source freeze: Current public guidance. Public locator: <https://www.ncsc.gov.uk/section/products-services/ncsc-assured-services>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 3 times in this edition.]

MB-1025. National Cyber Security Centre, TEMPEST and electromagnetic security public information, public pages current at source freeze. Status at the 14 August 2026 source freeze: Current public guidance. Public locator: <https://www.ncsc.gov.uk/>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 6 times in this edition.]

MB-1026. National Fire Protection Association, NFPA 105, Standard for Smoke Door Assemblies and Other Opening Protectives (2022 edition).

MB-1027. National Fire Protection Association, NFPA 13 and related applicable fire-protection requirements; ASTM E2174-24 and ASTM E2393-24. Life safety, movement and acoustic performance remain parallel obligations.

MB-1028. National Fire Protection Association, NFPA 13, Standard for the Installation of Sprinkler Systems (2025 edition). Public locator: <https://www.nfpa.org/product/nfpa-13-standard-for-the-installation-of-sprinkler-systems/p0013code>. National Fire Protection

Association, NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems (Current edition applicable to project). Public locator: <https://www.nfpa.org/product/nfpa-25-standard-for-the-inspection-testing-and-maintenance-of-water-based-fire-protection-systems/p0025code>. Sprinkler installation, restraint, inspection, testing, and maintenance obligations must remain intact while acoustic paths are controlled. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.

MB-1029. National Fire Protection Association, NFPA 13, Standard for the Installation of Sprinkler Systems, 2025 edition. Status at the 14 August 2026 source freeze: Current edition shown by NFPA. Public locator: <https://www.nfpa.org/product/nfpa-13-standard-for-the-installation-of-sprinkler-systems/p0013code>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 2 times in this edition.]

MB-1030. National Fire Protection Association, NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems (Current edition applicable to project). Public locator: <https://www.nfpa.org/product/nfpa-25-standard-for-the-inspection-testing-and-maintenance-of-water-based-fire-protection-systems/p0025code>. National Fire Protection Association, NFPA 70B, Standard for Electrical Equipment Maintenance (2026 edition identified at source freeze). Public locator: <https://www.nfpa.org/product/nfpa-70b-standard-for-electrical-equipment-maintenance/p0070bcode>. International Organization for Standardization, ISO 19650-5:2020, Security-minded approach to information management (2020). Public locator: <https://www.iso.org/standard/74206.html>. Readiness and continuing assurance require named custodians, controlled records, inspection intervals, change triggers, and authority dispositions. Construction completion is not use authorisation. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.

MB-1031. National Fire Protection Association, NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems (Current edition applicable to project). Public locator: <https://www.nfpa.org/product/nfpa-25-standard-for-the-inspection-testing-and-maintenance-of-water-based-fire-protection-systems/p0025code>. National Fire Protection Association, NFPA 70B, Standard for Electrical Equipment Maintenance (2026 edition identified at source freeze). Public locator: <https://www.nfpa.org/product/nfpa-70b-standard-for-electrical-equipment-maintenance/p0070bcode>. U.S. Department of Defense, UFGS 07 84 00, Firestopping (1 May 2010; active in May 2026 UFGS master). Public locator: <https://www.wbdg.org/dod/ufgs/ufgs-07-84-00>. Maintenance access and lifecycle work must preserve fire, electrical, service, and acoustic functions. A maintainable route is a security control because it reduces uncontrolled later openings. Use is confined to the

cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.

MB-1032. National Fire Protection Association, NFPA 70, National Electrical Code, 2026 edition as referenced in current public UFGS. Status at the 14 August 2026 source freeze: Current. Public locator: <https://www.nfpa.org/codes-and-standards>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 3 times in this edition.]

MB-1033. National Fire Protection Association, NFPA 72, National Fire Alarm and Signaling Code, 2025 edition. Status at the 14 August 2026 source freeze: Current edition shown by NFPA. Public locator: <https://www.nfpa.org/product/nfpa-72-national-fire-alarm-and-signaling-code/p0072code>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 2 times in this edition.]

MB-1034. National Fire Protection Association, NFPA 80, Standard for Fire Doors and Other Opening Protectives (2022), Fire-door installation, inspection, testing and maintenance; not an acoustic rating standard., <https://link.nfpa.org/all-publications/80/2022>; Builders Hardware Manufacturers Association, ANSI/BHMA A156.4-2024, Door Closers and Pivots (2024), Closer cycles, operation and force; field performance affected by pressure, installation and maintenance., <https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/A1564-2024-Door-Closers-and-Pivots>; Builders Hardware Manufacturers Association, ANSI/BHMA A156.17-2025, Self Closing Hinges and Pivots (2025), Self-closing hinges and pivots; use in acoustic openings requires complete system review., <https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/artmid/495/articleid/46>; Builders Hardware Manufacturers Association, ANSI/BHMA A156.26-2025, Continuous Hinges (2025), Continuous hinge requirements; leaf alignment and seal compression remain installation variables., <https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/artmid/495/articleid/46>; Builders Hardware Manufacturers Association, ANSI/BHMA A156.25-2023, Electrified Locking Devices (2023), Electrified locking devices; cable routes and strikes must not compromise acoustic or fire performance., <https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/artmid/495/articleid/46>; Builders Hardware Manufacturers Association, ANSI/BHMA A156.31-2024, Electric Strikes and Frame Mounted Actuators (2024), Frame-mounted electrified hardware; frame cuts and wiring require acoustic coordination., <https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/artmid/495/articleid/46>.

MB-1035. National Fire Protection Association, NFPA 80, Standard for Fire Doors and Other Opening Protectives (2022), Fire-door installation, inspection, testing and maintenance; not an acoustic rating standard., <https://link.nfpa.org/all-publications/80/2022>; Builders

Hardware Manufacturers Association, ANSI/BHMA A156.4-2024, Door Closers and Pivots (2024), Closer cycles, operation and force; field performance affected by pressure, installation and maintenance., <https://buildershardware.com/ANSI-BHMA-Standards/Hardware-Highlights/A1564-2024-Door-Closers-and-Pivots>; International Code Council, 2024 International Building Code (2024), Egress, accessibility, fire-resistance and door requirements subject to local adoption., <https://codes.iccsafe.org/content/IBC2024P1>.

MB-1036. National Fire Protection Association, NFPA 80, Standard for Fire Doors and Other Opening Protectives (2022), Fire-door installation, inspection, testing and maintenance; not an acoustic rating standard., <https://link.nfpa.org/all-publications/80/2022>; International Code Council, 2024 International Building Code (2024), Egress, accessibility, fire-resistance and door requirements subject to local adoption., <https://codes.iccsafe.org/content/IBC2024P1>; Underwriters Laboratories, UL 10C, Positive Pressure Fire Tests of Door Assemblies (current listing standard metadata), Positive-pressure fire testing of door assemblies; not an acoustic test., <https://www.shopulstandards.com/ProductDetail.aspx?productId=UL10C>. [Cited 2 times in this edition.]

MB-1037. National Fire Protection Association, NFPA 80, Standard for Fire Doors and Other Opening Protectives (2025 edition).

MB-1038. National Fire Protection Association, NFPA 99, Health Care Facilities Code (Current edition applicable to project). Public locator: <https://www.nfpa.org/product/nfpa-99-health-care-facilities-code/p0099code>. American Society of Plumbing Engineers, Plumbing Engineering Design Handbook (current published handbook set). Public locator: <https://www.aspe.org/education-credentialing/plumbing-engineering-design-handbook/>. Medical gas, vacuum, compressed-air, and process-system safety, cleanliness, material, pressure, purging, alarm, and maintenance requirements take precedence over acoustic convenience. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.

MB-1039. National Gypsum, "Why Control Joints Are Essential," OnBoard (February 2021), guidance keyed to GA-216 and ASTM C840, <https://www.nationalgypsum.com/newsroom/newsletters/onboard-february2021>.

MB-1040. National Institute of Building Sciences, Whole Building Design Guide commissioning resources; ASHRAE commissioning guidance and recognised commissioning practice. Commissioning verifies integrated operation but does not constitute governmental accreditation. [Cited 5 times in this edition.]

MB-1041. National Institute of Building Sciences, Whole Building Design Guide project-planning, security and commissioning resources; U.S. Department of Defense, UFC 4-010-05, SCIF/SAPF Planning, Design, and Construction; Royal Institute of British Architects, RIBA Plan of Work 2020 Overview. These sources support structured

project definition and staged delivery within their stated scopes. [Cited 2 times in this edition.]

MB-1042. National Institute of Building Sciences, Whole Building Design Guide public building-commissioning resources, consulted 13 August 2026. Commissioning and turnover should preserve owner requirements, issue closure and operational usability.

MB-1043. National Institute of Building Sciences, Whole Building Design Guide public secure-facility and commissioning resources, current public web resources. Status at the 14 August 2026 source freeze: Public source. Public locator: <https://www.wbdg.org/>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 3 times in this edition.]

MB-1044. National Institute of Building Sciences, Whole Building Design Guide, public resources on project planning, commissioning, security and high-performance buildings. [Cited 2 times in this edition.]

MB-1045. National Institute of Standards and Technology, FIPS 180-4, Secure Hash Standard, and NIST digital-evidence preservation guidance, 2015 and 2022. Status at the 14 August 2026 source freeze: Current public standards and guidance. Public locator: <https://csrc.nist.gov/publications/detail/fips/180/4/final>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room.

MB-1046. National Institute of Standards and Technology, FIPS PUB 180-4, Secure Hash Standard, August 2015. Status at the 14 August 2026 source freeze: Current public standard at source freeze. Public locator: <https://csrc.nist.gov/publications/detail/fips/180/4/final>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 4 times in this edition.]

MB-1047. National Institute of Standards and Technology, NIST SP 800-53 Rev. 5, Security and Privacy Controls for Information Systems and Organizations, September 2020 with updates. Status at the 14 August 2026 source freeze: Current public guidance. Public locator: <https://csrc.nist.gov/publications/detail/sp/800-53/rev-5/final>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 6 times in this edition.]

MB-1048. National Institute of Standards and Technology, NIST SP 800-82 Rev. 3, Guide to Operational Technology Security, September 2023, used for monitoring and control-system security concepts within its public scope. It does not establish acoustic performance or room authorisation.

MB-1049. National Institute of Standards and Technology, NIST SP 800-82 Rev. 3, Guide to Operational Technology Security, September 2023. Status at the 14 August 2026 source freeze: Current public guidance. Public locator: <https://csrc.nist.gov/pubs/sp/800/82/r3/final>. Use is confined to the source scope. The

document does not itself approve, accredit or authorise a secure room. [Cited 7 times in this edition.]

MB-1050. National Institute of Standards and Technology, NISTIR 8387, Digital Evidence Preservation: Considerations for Evidence Handlers (2022); FIPS 180-4, Secure Hash Standard. Digital integrity is separate from physical truth and technical validity.

MB-1051. National Institute of Standards and Technology, NISTIR 8387, Digital Evidence Preservation: Considerations for Evidence Handlers (2022); FIPS 180-4, Secure Hash Standard; ISO/IEC 27037:2012; NIST OSAC 2024-N-0011, Standard Guide for Forensic Digital Image Management. Apply proportionately. File integrity does not by itself prove depicted fact, authorship or lawful custody. [Cited 3 times in this edition.]

MB-1052. National Institute of Standards and Technology, NISTIR 8387, Digital Evidence Preservation: Considerations for Evidence Handlers, 2022. Status at the 14 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://nvlpubs.nist.gov/nistpubs/ir/2022/NIST.IR.8387.pdf>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 5 times in this edition.]

MB-1053. National Institute of Standards and Technology, NISTIR 8387, Digital Evidence Preservation: Considerations for Evidence Handlers, 2022; and NIST, FIPS PUB 180-4, Secure Hash Standard, 2015. These sources support preservation and byte-level integrity concepts, not the correctness of an acoustic algorithm.

MB-1054. National Institute of Standards and Technology, Risk Management Framework and security and privacy controls. Identifier: NIST SP 800-37 Rev. 2 and SP 800-53 Rev. 5. Status at the 16 August 2026 source freeze: Official public technical guidance. Public locator: <https://csrc.nist.gov/publications>. Technical role in this crosswalk: Primary governmental technical guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1055. National Institute of Standards and Technology, Risk Management Framework and security and privacy controls. Identifier: NIST SP 800-37 Rev. 2 and SP 800-53 Rev. 5. Status at the 16 August 2026 source freeze: Official public technical guidance. Public locator: <https://csrc.nist.gov/publications>. Technical role in this crosswalk: Primary governmental technical guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; National Cyber Security Centre, Principles for secure radio frequency communications in operational technology. Identifier: Secure RF Communications in Operational Technology. Status at the 16 August 2026 source freeze: Current official public guidance at source freeze. Public locator:

<https://www.ncsc.gov.uk/collection/operational-technology/secure-rf-communications>. Technical role in this crosswalk: Primary governmental cyber and RF guidance.

Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Canadian Centre for Cyber Security, Direction on the use of voice and audio technology in public-facing services.

Status at the 16 August 2026 source freeze: Current public direction at source freeze.

Public locator: <https://www.cyber.gc.ca/en/guidance/direction-use-voice-audio-technology-public-facing-services>. Technical role in this crosswalk: Public-facing voice and audio technology for unclassified and protected information within scope.

Limitation: Scope-limited direction. It does not authorise classified discussion or specialised-facility use.; U.S. Department of State, Scope and Authority, including Definitions of Diplomatic Security Terms. Identifier: 12 FAM 010. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0010.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Defines public terminology and authority. It does not disclose controlled room criteria or approve a project.

MB-1056. National Institute of Standards and Technology, Risk Management Framework and security and privacy controls. Identifier: NIST SP 800-37 Rev. 2 and SP 800-53 Rev. 5. Status at the 16 August 2026 source freeze: Official public technical guidance. Public locator: <https://csrc.nist.gov/publications>. Technical role in this crosswalk: Primary governmental technical guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; National Protective Security Authority, Security-Minded Approach to Information Management. Identifier: Security-Minded Approach to Information Management. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.npsa.gov.uk/security-best-practices/build-it-secure/security-minded-approach-information-management>. Technical role in this crosswalk: Primary governmental information-security guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Canadian Centre for Cyber Security, Security and privacy controls and assurance activities catalogue. Identifier: ITSP.10.033. Status at the 16 August 2026 source freeze: Current; effective 31 March 2026. Public locator: <https://www.cyber.gc.ca/en/guidance/cyber-security-privacy-risk-management/itsp10033/foreword-overview-introduction>. Technical role in this crosswalk: Current Canadian control and assurance catalogue superseding ITSG-33 Annex 3A. Limitation:

Controls require selection, tailoring, allocation and assessment. Catalogue inclusion is not automatic project applicability.; U.S. Department of Defense / Whole Building Design Guide, Cybersecurity of Facility-Related Control Systems. Identifier: UFC 4-010-06. Status at the 16 August 2026 source freeze: Active digital criterion at source freeze. Public locator: <https://www.wbdg.org/dod/ufc/ufc-4-010-06>. Technical role in this crosswalk: Primary governmental facilities criterion. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1057. National Institute of Standards and Technology, "Calibration Policies," section "Reporting Measurement Uncertainty," accessed 10 August 2026, <https://www.nist.gov/calibrations/policies>.

MB-1058. National Institute of Standards and Technology, "Calibration Policies."

MB-1059. National Park Service, Preservation Brief 1, Assessing Cleaning and Water-Repellent Treatments for Historic Masonry Buildings (2000). [Cited 2 times in this edition.]

MB-1060. National Park Service, Preservation Brief 1: Assessing Cleaning and Water-Repellent Treatments for Historic Masonry Buildings (public preservation guidance), Historic masonry cleaning and water-repellent assessment; not acoustic criteria., <https://www.nps.gov/orgs/1739/preservation-briefs.htm>; National Park Service, Preservation Brief 16: The Use of Substitute Materials on Historic Building Exteriors (public preservation guidance), Substitute-material decisions and visual/physical compatibility., <https://www.nps.gov/orgs/1739/preservation-briefs.htm>; ICOMOS, Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage (2003), Minimum intervention, diagnosis and respect for historic fabric., https://www.icomos.org/charters/structures_e.pdf; ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), Laboratory transmission loss of defined specimens., <https://store.astm.org/e0090-23.html>; ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025a), Field room performance including flanking., <https://store.astm.org/e0336-25a.html>.

MB-1061. National Park Service, Preservation Brief 1: Assessing Cleaning and Water-Repellent Treatments for Historic Masonry Buildings (public preservation guidance), Historic masonry cleaning and water-repellent assessment; not acoustic criteria., <https://www.nps.gov/orgs/1739/preservation-briefs.htm>; National Park Service, Preservation Brief 2: Repointing Mortar Joints in Historic Masonry Buildings (public preservation guidance), Compatible repointing and mortar analysis., <https://www.nps.gov/orgs/1739/upload/preservation-brief-02-repointing.pdf>; ICOMOS,

Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage (2003), Minimum intervention, diagnosis and respect for historic fabric., https://www.icomos.org/charters/structures_e.pdf. [Cited 2 times in this edition.]

MB-1062. National Park Service, Preservation Brief 1: Assessing Cleaning and Water-Repellent Treatments for Historic Masonry Buildings (public preservation guidance), Historic masonry cleaning and water-repellent assessment; not acoustic criteria., <https://www.nps.gov/orgs/1739/preservation-briefs.htm>; National Park Service, Preservation Brief 2: Repointing Mortar Joints in Historic Masonry Buildings (public preservation guidance), Compatible repointing and mortar analysis., <https://www.nps.gov/orgs/1739/upload/preservation-brief-02-repointing.pdf>; National Park Service, Preservation Brief 16: The Use of Substitute Materials on Historic Building Exteriors (public preservation guidance), Substitute-material decisions and visual/physical compatibility., <https://www.nps.gov/orgs/1739/preservation-briefs.htm>; ICOMOS, Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage (2003), Minimum intervention, diagnosis and respect for historic fabric., https://www.icomos.org/charters/structures_e.pdf. [Cited 2 times in this edition.]

MB-1063. National Park Service, Preservation Brief 2, Repointing Mortar Joints in Historic Masonry Buildings (1998). [Cited 2 times in this edition.]

MB-1064. National Park Service, Preservation Brief 2: Repointing Mortar Joints in Historic Masonry Buildings (public preservation guidance), Compatible repointing and mortar analysis., <https://www.nps.gov/orgs/1739/upload/preservation-brief-02-repointing.pdf>; ICOMOS, Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage (2003), Minimum intervention, diagnosis and respect for historic fabric., https://www.icomos.org/charters/structures_e.pdf. [Cited 2 times in this edition.]

MB-1065. National Park Service, Preservation Brief 2: Repointing Mortar Joints in Historic Masonry Buildings (public preservation guidance), Compatible repointing and mortar analysis., <https://www.nps.gov/orgs/1739/upload/preservation-brief-02-repointing.pdf>; ICOMOS, Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage (2003), Minimum intervention, diagnosis and respect for historic fabric., https://www.icomos.org/charters/structures_e.pdf; ASTM International, ASTM E90-23, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements (2023), Laboratory transmission loss of defined specimens., <https://store.astm.org/e0090-23.html>; ASTM International, ASTM E336-25a, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings (2025a), Field room performance including flanking., <https://store.astm.org/e0336-25a.html>.

MB-1066. National Protective Security Authority, Build it Secure, Security risk management, Operational Requirement and project-lifecycle guidance (Current public web guidance

accessed 16 August 2026); National Protective Security Authority, Secure Working Areas, Secure Working Areas (Current public web guidance accessed 16 August 2026); National Protective Security Authority, Introduction to ISO 23234:2021, Major infrastructure projects, security considerations for clients (Current public web guidance accessed 16 August 2026); Cabinet Office, Security Policy Framework, Protecting Government Assets (2 December 2022). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-1067. National Protective Security Authority, Build it Secure, Security risk management, Operational Requirement and project-lifecycle guidance (Current public web guidance accessed 16 August 2026); National Protective Security Authority, Security-Minded Approach to Information Management, Security-Minded Approach to Information Management (Current public web guidance accessed 16 August 2026); National Protective Security Authority, Building Services and Internal Spaces, Building Services and Internal Spaces (Current public web guidance accessed 16 August 2026). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-1068. National Protective Security Authority, Building Services and Internal Spaces, Building Services and Internal Spaces (Current public web guidance accessed 16 August 2026); FCDO Services, Secure Speech Environments, Secure Speech Environments (Current public service description accessed 16 August 2026); International Organization for Standardization, ISO 16283-1:2014 with Amendment 1:2017, Field Measurement of Airborne Sound Insulation (2014; confirmed current in 2025); International Organization for Standardization, ISO 3382-2:2008 with Corrigendum 1:2009, Measurement of Reverberation Time in Ordinary Rooms (2008; confirmed current in 2022). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-1069. National Protective Security Authority, Building Services and Internal Spaces, Building Services and Internal Spaces (Current public web guidance accessed 16 August 2026); Ministry of Housing, Communities and Local Government, Approved Document B, Volume 2, Fire Safety in Buildings Other Than Dwellings (2019 edition incorporating amendments; page updated 11 March 2025); National Protective Security

Authority, Security-Minded Approach to Information Management, Security-Minded Approach to Information Management (Current public web guidance accessed 16 August 2026). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-1070. National Protective Security Authority, Protective Security Considerations, public guidance current at source freeze. Status at the 14 August 2026 source freeze: Current public guidance. Public locator: <https://www.npsa.gov.uk/specialised-guidance/secure-business/protective-security-considerations>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 3 times in this edition.]

MB-1071. National Protective Security Authority, public guidance on secure rooms and secure working areas, accessed 12 August 2026; FCDO Services, "Secure Speech Environments," public service description, accessed 12 August 2026. These public materials support terminology and assessment context but do not disclose controlled acceptance thresholds.

MB-1072. National Protective Security Authority, Secure Rooms, public guidance current at source freeze. Status at the 14 August 2026 source freeze: Current public guidance. Public locator: <https://www.npsa.gov.uk/building-protection/building-services-internal-spaces/secure-rooms>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 4 times in this edition.]

MB-1073. National Protective Security Authority, Secure Rooms, Secure Rooms (Current public web guidance accessed 16 August 2026); National Protective Security Authority, Secure Working Areas, Secure Working Areas (Current public web guidance accessed 16 August 2026); Ministry of Housing, Communities and Local Government, Approved Document B, Volume 2, Fire Safety in Buildings Other Than Dwellings (2019 edition incorporating amendments; page updated 11 March 2025); Ministry of Housing, Communities and Local Government, Approved Document M, Volume 2, Access to and Use of Buildings Other Than Dwellings (2015 edition incorporating 2024 amendments; page updated 1 October 2024). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-1074. National Protective Security Authority, Secure Working Areas, public guidance current at source freeze. Status at the 14 August 2026 source freeze: Current public guidance. Public locator: <https://www.npsa.gov.uk/secure-working-areas>. Use is

confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 4 times in this edition.]

- MB-1075. National Protective Security Authority, Secure Working Areas, Secure Working Areas (Current public web guidance accessed 16 August 2026); FCDO Services, Secure Speech Environments, Secure Speech Environments (Current public service description accessed 16 August 2026); Cabinet Office, GovS 007, Version 2.0, Government Functional Standard: Security (13 September 2021). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.
- MB-1076. National Protective Security Authority, Secure Working Areas, Secure Working Areas (Current public web guidance accessed 16 August 2026); National Protective Security Authority, Building Services and Internal Spaces, Building Services and Internal Spaces (Current public web guidance accessed 16 August 2026); FCDO Services, UK NACE, Listening with Lasers, Public technical-security note on laser eavesdropping (5 June 2024). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.
- MB-1077. National Protective Security Authority, Secure Working Areas, Secure Working Areas (Current public web guidance accessed 16 August 2026); National Protective Security Authority, Secure Rooms, Secure Rooms (Current public web guidance accessed 16 August 2026); FCDO Services, Secure Speech Environments, Secure Speech Environments (Current public service description accessed 16 August 2026). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.
- MB-1078. National Protective Security Authority, Secure Working Areas. Identifier: Secure Working Areas. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.npsa.gov.uk/secure-working-areas>. Technical role in this crosswalk: Primary governmental protective-security guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

- MB-1079. National Protective Security Authority, Secure Working Areas. Identifier: Secure Working Areas. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.npsa.gov.uk/secure-working-areas>. Technical role in this crosswalk: Primary governmental protective-security guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; U.S. Department of State, Physical Security of Facilities Abroad. Identifier: 12 FAM 310. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0310.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Public policy and responsibility framework. Detailed OSPB and handbook criteria may be controlled or nonpublic.; Office of the Director of National Intelligence, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities. Identifier: Version 1.5.1. Status at the 16 August 2026 source freeze: Latest approved public release displayed by ODNI at source freeze. Public locator: <https://www.dni.gov/files/NCSC/documents/Regulations/Technical-Specifications-SCIF-V1.5.1.pdf>. Technical role in this crosswalk: Primary governmental technical specification. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; Treasury Board of Canada Secretariat, Directive on Security Management. Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role in this crosswalk: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions.
- MB-1080. National Protective Security Authority, Security-Minded Approach to Information Management, Security-Minded Approach to Information Management (Current public web guidance accessed 16 August 2026); Cabinet Office, Government Security Classifications Policy, Government Security Classifications Policy (2024 public edition); Cabinet Office, PPN 012, Security Classifications Policy (17 February 2025). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.
- MB-1081. National Protective Security Authority, "Secure Rooms," accessed 10 August 2026, <https://www.npsa.gov.uk/secure-rooms>.

MB-1082. National Protective Security Authority, "Secure Rooms." [Cited 2 times in this edition.]

MB-1083. National Protective Security Authority, "Secure Working Areas," accessed 10 August 2026, <https://www.npsa.gov.uk/secure-working-areas>.

MB-1084. National Protective Security Authority, "Secure Working Areas." [Cited 2 times in this edition.]

MB-1085. National Research Council Canada, Codes Canada, National Model Codes and public code-development information. Status at the 16 August 2026 source freeze: Current public code information at source freeze. Public locator: <https://nrc.canada.ca/en/certifications-evaluations-standards/codes-canada>. Technical role: Building, fire, plumbing and energy-code interfaces. Limitation: Model codes require provincial or territorial adoption and do not establish acoustic-security approval. [Cited 2 times in this edition.]

MB-1086. National Research Council Canada, Codes Canada, National Model Codes and public code-development information. Status at the 16 August 2026 source freeze: Current public code information at source freeze. Public locator: <https://nrc.canada.ca/en/certifications-evaluations-standards/codes-canada>. Technical role: Building, fire, plumbing and energy-code interfaces. Limitation: Model codes require provincial or territorial adoption and do not establish acoustic-security approval. ASTM International, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings. Identifier: ASTM E336-25a. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator: <https://www.astm.org/e0336-25a.html>. Technical role: Field room-to-room airborne sound measurement. Limitation: Proprietary standard. Results depend on configuration and do not alone establish speech-security approval. Internal cross-reference: the relevant chapters of this edition provide the governing integration of acoustic physics, construction, measurement, uncertainty, and lifecycle doctrine. This navigation statement is not an external authority and does not enlarge the scope of the cited primary sources.

MB-1087. National Research Council Canada, Codes Canada, National Model Codes and public code-development information. Status at the 16 August 2026 source freeze: Current public code information at source freeze. Public locator: <https://nrc.canada.ca/en/certifications-evaluations-standards/codes-canada>. Technical role: Building, fire, plumbing and energy-code interfaces. Limitation: Model codes require provincial or territorial adoption and do not establish acoustic-security approval. ASTM International, Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room. Identifier: ASTM E2638-24. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator: <https://www.astm.org/e2638-24.html>. Technical role: Closed-room speech-privacy measurement framework. Limitation: Not a universal governmental accreditation

threshold and not a substitute for competent-authority criteria. Internal cross-reference: the relevant chapters of this edition provide the governing integration of acoustic physics, construction, measurement, uncertainty, and lifecycle doctrine. This navigation statement is not an external authority and does not enlarge the scope of the cited primary sources.

- MB-1088. National Research Council Canada, Codes Canada, National Model Codes and public code-development information. Status at the 16 August 2026 source freeze: Current public code information at source freeze. Public locator: <https://nrc.canada.ca/en/certifications-evaluations-standards/codes-canada>. Technical role: Building, fire, plumbing and energy-code interfaces. Limitation: Model codes require provincial or territorial adoption and do not establish acoustic-security approval. International Organization for Standardization, Organization and digitization of information about buildings and civil engineering works, including building information modelling, Part 3: Operational phase of assets. Identifier: ISO 19650-3:2020. Status at the 16 August 2026 source freeze: Confirmed current at source freeze. Public locator: <https://www.iso.org/standard/75109.html>. Technical role: Operational information management and lifecycle configuration. Limitation: Does not replace departmental security, records, maintenance or accreditation requirements. Internal cross-reference: the relevant chapters of this edition provide the governing integration of acoustic physics, construction, measurement, uncertainty, and lifecycle doctrine. This navigation statement is not an external authority and does not enlarge the scope of the cited primary sources.
- MB-1089. NFPA 90A-2024, Standard for the Installation of Air-Conditioning and Ventilating Systems, chapters on ducts, connectors, plenums, dampers, controls and acceptance testing. Acoustic modifications remain subject to the applicable listing and authority.
- MB-1090. NFPA, Society of Fire Protection Engineers and adopted code or listed-system sources applicable to the project. Acoustic construction may not waive fire, smoke, movement, egress or life-safety requirements.
- MB-1091. Nicola Granzotto, Chiara Scrosati, Fabio Scamoni, and Edoardo A. Piana, "Sound Reduction Index Prediction of Double-Layer Gypsum Panels Through the Transfer Matrix Method," *Building Acoustics* 28, no. 1 (2021): 3-16, <https://doi.org/10.1177/1351010X20921038>.
- MB-1092. NIST FIPS PUB 180-4 supports SHA-256 integrity practice. A hash detects byte-level difference but does not establish accuracy, provenance or meaning. [Cited 3 times in this edition.]
- MB-1093. NISTIR 8387; FIPS 180-4; ISO/IEC 27037:2012; NIST OSAC guidance for forensic digital image management. Apply proportionately to legal and security context.
- MB-1094. NISTIR 8387; ISO/IEC 27037:2012; NIST OSAC 2024-N-0011. Construction photography should preserve originals, provenance, controlled derivatives and

recoverable custody where project consequence justifies high-assurance treatment.
[Cited 2 times in this edition.]

MB-1095. Office of the Director of National Intelligence, ICD 705, Sensitive Compartmented Information Facilities (26 May 2010); Office of the Director of National Intelligence, ICS 705-01, Physical and Technical Security Standards for Sensitive Compartmented Information Facilities (17 September 2010); Office of the Director of National Intelligence, ICS 705-02, Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information Facilities (22 December 2016). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1096. Office of the Director of National Intelligence, ICD 705, Sensitive Compartmented Information Facilities (26 May 2010); Office of the Director of National Intelligence, ICS 705-01, Physical and Technical Security Standards for Sensitive Compartmented Information Facilities (17 September 2010); Office of the Director of National Intelligence, ICS 705-02, Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information Facilities (22 December 2016); Office of the Director of National Intelligence, Version 1.5.1, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities (26 July 2021). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1097. Office of the Director of National Intelligence, ICD 705, Sensitive Compartmented Information Facilities (26 May 2010); U.S. Department of Defense / Whole Building Design Guide, UFC 4-010-05, SCIF/SAPF Planning, Design, and Construction (26 May 2023); Defense Counterintelligence and Security Agency / eCFR, 32 CFR Part 117, National Industrial Security Program Operating Manual Rule (Effective 24 February 2021; current electronic rule at source freeze); U.S. Department of Energy, DOE O 470.1A; DOE O 470.4C; DOE O 470.6 Chg 1; DOE O 471.6 Chg 4; DOE O 473.1A, Safeguards and security operations, planning, technical security, information security and physical protection directives (2017 to 2024 current editions listed by DOE); U.S. General Services Administration, 1000.3A OMA, Responsibilities for Implementation of Facility Security Assessment Countermeasures (23 June 2026). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific

threat information and protected approval thresholds are not reconstructed. [Cited 2 times in this edition.]

MB-1098. Office of the Director of National Intelligence, ICS 705-01, Physical and Technical Security Standards for Sensitive Compartmented Information Facilities (17 September 2010); U.S. Department of Defense, DoDM 5105.21, Volume 2, Change 2, SCI Administrative Security Manual: Administration of Physical Security, Visitor Control, and Technical Security (19 October 2012; Change 2, 2 November 2020). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed. [Cited 2 times in this edition.]

MB-1099. Office of the Director of National Intelligence, ICS 705-02, Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information Facilities (22 December 2016); ASTM International, ASTM E336-25a; ASTM E2638-24; ASTM E2964-26, Field sound isolation, closed-room speech privacy and low-frequency field measurement standards (2024 to 2026 editions); Joint Committee for Guides in Metrology / International Organization for Standardization, JCGM 100:2008; JCGM 106:2012; ISO 12999-1:2020, Measurement uncertainty, conformity assessment and uncertainty in building acoustics (2008 to 2020 editions). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1100. Office of the Director of National Intelligence, ICS 705-02, Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information Facilities (22 December 2016); Office of the Director of National Intelligence, Version 1.5.1, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities (26 July 2021). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed. [Cited 2 times in this edition.]

MB-1101. Office of the Director of National Intelligence, ICS 705-02, Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information Facilities (22 December 2016); U.S. Department of Defense, DoDI 5200.01, Change 2, DoD Information Security Program and Protection of Sensitive Compartmented Information (21 April 2016; Change 2, 1 October 2020). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility,

room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1102. Office of the Director of National Intelligence, ICS 706-01, Domestic Facility Security Risk Assessments Standards (18 June 2019); U.S. Department of Defense / Whole Building Design Guide, UFC 4-020-01, DoD Security Engineering Facilities Planning Manual (11 September 2008); U.S. Department of Defense / Whole Building Design Guide, UFC 4-010-05, SCIF/SAPF Planning, Design, and Construction (26 May 2023). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1103. Office of the Director of National Intelligence, ICS 706-02, Protecting Mission Critical Facility-Related Control Systems in Mission Critical Facilities (23 December 2019); U.S. Department of Defense / Whole Building Design Guide, UFC 4-010-06, Cybersecurity of Facility-Related Control Systems (10 October 2023); National Institute of Standards and Technology / U.S. Department of Defense, NIST SP 800-82 Rev. 3 and UFC 4-010-06, Operational technology security and facility-related control-system cybersecurity (2023 editions). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1104. Office of the Director of National Intelligence, ICS 706-02, Protecting Mission Critical Facility-Related Control Systems in Mission Critical Facilities (23 December 2019); U.S. Department of Defense / Whole Building Design Guide, UFC 4-010-06, Cybersecurity of Facility-Related Control Systems (10 October 2023); National Institute of Standards and Technology / U.S. Department of Defense, NIST SP 800-82 Rev. 3 and UFC 4-010-06, Operational technology security and facility-related control-system cybersecurity (2023 editions); National Institute of Standards and Technology, NIST SP 800-37 Rev. 2 and SP 800-53 Rev. 5, Risk Management Framework and security and privacy controls (Current public editions at source freeze). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1105. Office of the Director of National Intelligence, ICS 731-02, Supply Chain Threat Revisions (25 September 2019); Office of the Director of National Intelligence, Version 1.5.1, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities (26 July 2021); U.S. Department of Defense, DoDI

5200.01, Change 2, DoD Information Security Program and Protection of Sensitive Compartmented Information (21 April 2016; Change 2, 1 October 2020). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1106. Office of the Director of National Intelligence, Intelligence Community Directive 705, Sensitive Compartmented Information Facilities, publicly available edition. Status at the 14 August 2026 source freeze: Public source. Public locator: <https://www.dni.gov/index.php/ic-legal-reference-book>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 5 times in this edition.]

MB-1107. Office of the Director of National Intelligence, Intelligence Community Standard 705-1 and 705-2, public editions, publicly available editions. Status at the 14 August 2026 source freeze: Public source. Public locator: <https://www.dni.gov/index.php/ic-legal-reference-book>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 3 times in this edition.]

MB-1108. Office of the Director of National Intelligence, Intelligence Community Standard 705-1, Physical and Technical Security Standards for SCIFs, publicly available edition. Status at the 14 August 2026 source freeze: Public source. Public locator: <https://www.dni.gov/files/documents/ICD/ICS-705-1.pdf>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 5 times in this edition.]

MB-1109. Office of the Director of National Intelligence, Intelligence Community Standard 705-2, Standards for Accreditation and Reciprocal Use of SCIFs, publicly available edition. Status at the 14 August 2026 source freeze: Public source. Public locator: <https://www.dni.gov/files/documents/ICD/ICS-705-2.pdf>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 5 times in this edition.]

MB-1110. Office of the Director of National Intelligence, Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information Facilities. Identifier: ICS 705-02. Status at the 16 August 2026 source freeze: Public standard listed by ODNI at source freeze. Public locator: <https://www.dni.gov/files/documents/ICD/ICS-705-2.pdf>. Technical role in this crosswalk: Primary governmental standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

- MB-1111. Office of the Director of National Intelligence, Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information Facilities. Identifier: ICS 705-02. Status at the 16 August 2026 source freeze: Public standard listed by ODNI at source freeze. Public locator: <https://www.dni.gov/files/documents/ICD/ICS-705-2.pdf>. Technical role in this crosswalk: Primary governmental standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; Cabinet Office, Government Security Classifications Policy. Identifier: Government Security Classifications Policy. Status at the 16 August 2026 source freeze: Current public classification policy at source freeze. Public locator: <https://www.gov.uk/government/publications/government-security-classifications/government-security-classifications-policy.html>. Technical role in this crosswalk: Primary governmental policy. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role in this crosswalk: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public.; U.S. Department of State, Scope and Authority, including Definitions of Diplomatic Security Terms. Identifier: 12 FAM 010. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0010.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Defines public terminology and authority. It does not disclose controlled room criteria or approve a project.
- MB-1112. Office of the Director of National Intelligence, Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information Facilities. Identifier: ICS 705-02. Status at the 16 August 2026 source freeze: Public standard listed by ODNI at source freeze. Public locator: <https://www.dni.gov/files/documents/ICD/ICS-705-2.pdf>. Technical role in this crosswalk: Primary governmental standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; Defense Counterintelligence and Security Agency / eCFR, National Industrial Security Program Operating Manual Rule. Identifier: 32 CFR

Part 117. Status at the 16 August 2026 source freeze: Current federal rule and DCSA implementation guidance. Public locator:

<https://www.dcsa.mil/Industrial-Security/National-Industrial-Security-Program-Oversight/32-CFR-Part-117-NISPOM-Rule/ddd/>. Technical role in this crosswalk: Primary federal regulation and official implementation guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; Cabinet Office, Protecting Government Assets. Identifier: Security Policy Framework. Status at the 16 August 2026 source freeze: Current public policy framework at source freeze. Public locator:

<https://www.gov.uk/government/publications/security-policy-framework/hmg-security-policy-framework>. Technical role in this crosswalk: Primary governmental policy.

Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Public Services and

Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>.

Technical role in this crosswalk: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public.

MB-1113. Office of the Director of National Intelligence, Technical Specifications for Construction and Management of SCIFs, Version 1.5.1, 26 July 2021 public version. Status at the 14 August 2026 source freeze: Publicly available version. Public locator: <https://www.dni.gov/files/NCSC/documents/Regulations/Technical-Specifications-SCIF-V1.5.1.pdf>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 6 times in this edition.]

MB-1114. Office of the Director of National Intelligence, Version 1.5.1, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities (26 July 2021); ASTM International, ASTM E336-25a; ASTM E2638-24; ASTM E2964-26, Field sound isolation, closed-room speech privacy and low-frequency field measurement standards (2024 to 2026 editions). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1115. Office of the Director of National Intelligence, Version 1.5.1, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities (26 July 2021); U.S. Department of Defense / Whole Building Design Guide, UFC 4-010-05, SCIF/SAPF Planning, Design, and Construction (26 May 2023). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed. [Cited 2 times in this edition.]

MB-1116. Office of the Director of National Intelligence, Version 1.5.1, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities (26 July 2021); U.S. Department of Defense, DoDI 5200.01, Change 2, DoD Information Security Program and Protection of Sensitive Compartmented Information (21 April 2016; Change 2, 1 October 2020); U.S. Department of Defense, DoDM 5200.01, Volume 3, Change 4, DoD Information Security Program: Protection of Classified Information (24 February 2012; Change 4, 17 January 2025). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1117. Office of the Director of National Intelligence, “ CI & Security Governance / Regulations,” public listings for IC Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities, version 1.5.1, Construction Security Plan, Inspectable Materials Checklist, SCIF Pre-Construction Checklist and SCIF Fixed Facility Checklist, accessed 11 August 2026, <https://www.odni.gov/index.php/ncsc-how-we-work/ncsc-ci-security-governance-regulations>.

MB-1118. Office of the Director of National Intelligence, “ CI & Security Governance / Regulations,” public listings for the IC SCIF technical specification and associated checklists. The public listing supports governance and document existence only; it does not authorise inference of controlled criteria.

MB-1119. Internal provenance note. The editorial recovery history of Part XII is preserved in the non-reader-facing release archive. The technical propositions published in Part XII depend upon the cited primary and secondary authorities, not upon internal production records. [Cited 3 times in this edition.]

MB-1120. Pekka Saarinen, Jukka Keränen and Valtteri Hongisto, “ Dynamic Properties of Resilient Studs Used in Soundproof Multilayer Constructions: Measurement Method and Database,” Construction and Building Materials (2024), <https://doi.org/10.1016/j.conbuildmat.2024.136629>.

- MB-1121. Pekka Saarinen, Jukka Keränen and Valtteri Hongisto, "Dynamic Properties of Resilient Studs Used in Soundproof Multilayer Constructions: Measurement Method and Database," *Construction and Building Materials* 435 (2024): 136629, <https://doi.org/10.1016/j.conbuildmat.2024.136629>.
- MB-1122. Precast/Prestressed Concrete Institute, *PCI Design Handbook: Precast and Prestressed Concrete*, 9th ed. (Chicago: PCI, 2026).
- MB-1123. Project-specific controlled criteria remain with the competent authority and are not reproduced in public procurement documents beyond authorised handling. [Cited 3 times in this edition.]
- MB-1124. Project-specific controlled criteria, approved submittals, listed systems, manufacturer instructions and the owning assembly chapters remain the direct comparison basis for construction surveillance. Public general sources do not supply undisclosed secure-facility thresholds.
- MB-1125. Public commissioning, maintenance and facilities-management guidance, together with Chapters 34 through 36 of this work. Inspection interval and retest scope remain project- and consequence-specific.
- MB-1126. Public construction-contracting and specification-practice principles concerning scope definition, submittals, quality control, testing and corrective work. Contract allocation and legal remedies remain jurisdiction specific.
- MB-1127. Public governmental doctrine discussed in Chapters 28 through 32, together with ISO/IEC 17025:2017 and JCGM 106:2012. Public methods, controlled criteria and competent-authority decisions remain separate.
- MB-1128. Public incident-management and facility-security principles. Immediate protective actions and notification duties remain organisation-, jurisdiction- and authority-specific.
- MB-1129. Public security and facility doctrine discussed in Chapters 28 through 32. Engineering susceptibility, authority authorisation and demonstrated compromise remain separate propositions.
- MB-1130. Public Services and Procurement Canada, *Contract Security Manual*, effective 13 August 2020, section 5.5, "Specialized secure facilities," accessed 10 August 2026, <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>.
- MB-1131. Public Services and Procurement Canada, *Contract Security Manual*, sec. 5.5. [Cited 5 times in this edition.]
- MB-1132. Public Services and Procurement Canada, *Contract Security Program, Contract Security Manual*. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator:

<https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public. [Cited 4 times in this edition.]

MB-1133. Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public. Canadian Centre for Cyber Security, Direction on the use of voice and audio technology in public-facing services. Status at the 16 August 2026 source freeze: Current public direction at source freeze. Public locator: <https://www.cyber.gc.ca/en/guidance/direction-use-voice-audio-technology-public-facing-services>. Technical role: Public-facing voice and audio technology for unclassified and protected information within scope. Limitation: Scope-limited direction. It does not authorise classified discussion or specialised-facility use. Canadian Centre for Cyber Security, Communications security public information. Status at the 16 August 2026 source freeze: Current public information at source freeze. Public locator: <https://www.cyber.gc.ca/en/comsec>. Technical role: COMSEC governance, secure communications and authorised custody concepts. Limitation: Operational COMSEC procedures, keying material and controlled criteria are excluded.

MB-1134. Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public. Canadian Centre for Cyber Security, Emission Security Guidance. Identifier: ITSG-11A. Status at the 16 August 2026 source freeze: Protected publication; superseded ITSG-11 in March 2025. Public locator: <https://www.cyber.gc.ca/en/guidance/emission-security-emsec-guidance-itgs-11a>. Technical role: Authoritative protected EMSEC guidance under the Chief, CSE. Limitation: Only the public existence, status and access route are used. Protected criteria are not reconstructed. Canadian Centre for Cyber Security, Canadian Industrial TEMPEST Program. Identifier: CIP. Status at the 16 August 2026 source

freeze: Current public programme description at source freeze. Public locator: <https://www.cyber.gc.ca/en/tools-services/canadian-industrial-tempest-program-citp>. Technical role: TEMPEST equipment certification and support for EMSEC facility evaluations. Limitation: Public programme information does not disclose controlled test methods or facility thresholds. [Cited 2 times in this edition.]

MB-1135. Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public. Public Services and Procurement Canada, Contract Security Program, Approval for visits to secure sites. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/approval-visits-secure-sites.html>. Technical role: Requests for visit, visitor authorisation, escorting, visual and auditory exposure control. Limitation: Visit approval does not expand the authorised content, time or area of access.

MB-1136. Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public. Public Services and Procurement Canada, Contract Security Program, Levels of security. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/levels-security.html>. Technical role: DOS, FSC, document safeguarding, production, IT, COMSEC and personnel-screening distinctions. Limitation: The summary does not replace contractual clauses, the SRCL or written CSP approval. Public Services and Procurement Canada, Contract Security Program, Information technology security requirements. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/>

security-requirements-contracting/safeguarding-equipment-sites-assets-information/information-technology-security-requirements.html. Technical role: Authority to process, store and transmit sensitive information electronically. Limitation: IT approval is distinct from acoustic, physical, COMSEC and EMSEC approval.

MB-1137. Public Services and Procurement Canada, Contract Security Program, Information technology security requirements. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/information-technology-security-requirements.html>. Technical role: Authority to process, store and transmit sensitive information electronically. Limitation: IT approval is distinct from acoustic, physical, COMSEC and EMSEC approval. Canadian Centre for Cyber Security, Direction on the use of voice and audio technology in public-facing services. Status at the 16 August 2026 source freeze: Current public direction at source freeze. Public locator: <https://www.cyber.gc.ca/en/guidance/direction-use-voice-audio-technology-public-facing-services>. Technical role: Public-facing voice and audio technology for unclassified and protected information within scope. Limitation: Scope-limited direction. It does not authorise classified discussion or specialised-facility use. Canadian Centre for Cyber Security, Security and privacy controls and assurance activities catalogue. Identifier: ITSP.10.033. Status at the 16 August 2026 source freeze: Current; effective 31 March 2026. Public locator: <https://www.cyber.gc.ca/en/guidance/cyber-security-privacy-risk-management/itsp10033/foreword-overview-introduction>. Technical role: Current Canadian control and assurance catalogue superseding ITSG-33 Annex 3A. Limitation: Controls require selection, tailoring, allocation and assessment. Catalogue inclusion is not automatic project applicability.

MB-1138. Public Services and Procurement Canada, Contract Security Program, Work site security requirements. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-requirements.html>. Technical role: Document safeguarding capability, inspections, access control, plans and corrective measures. Limitation: The page describes public process. Site-specific inspection requirements and recommendations remain controlled by the programme.

MB-1139. Public Services and Procurement Canada, Contract Security Program, Work site security requirements. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: [https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-](https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-requirements.html)

requirements.html. Technical role: Document safeguarding capability, inspections, access control, plans and corrective measures. Limitation: The page describes public process. Site-specific inspection requirements and recommendations remain controlled by the programme. National Research Council Canada, Codes Canada, National Model Codes and public code-development information. Status at the 16 August 2026 source freeze: Current public code information at source freeze. Public locator: <https://nrc.canada.ca/en/certifications-evaluations-standards/codes-canada>. Technical role: Building, fire, plumbing and energy-code interfaces. Limitation: Model codes require provincial or territorial adoption and do not establish acoustic-security approval. ASTM International, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings. Identifier: ASTM E336-25a. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator: <https://www.astm.org/e0336-25a.html>. Technical role: Field room-to-room airborne sound measurement. Limitation: Proprietary standard. Results depend on configuration and do not alone establish speech-security approval.

MB-1140. Public Services and Procurement Canada, Contract Security Program, Work site security requirements. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-requirements.html>. Technical role: Document safeguarding capability, inspections, access control, plans and corrective measures. Limitation: The page describes public process. Site-specific inspection requirements and recommendations remain controlled by the programme. Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public.

MB-1141. Public Services and Procurement Canada, Contract Security Program, Work site security requirements. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-requirements.html>. Technical role: Document safeguarding capability, inspections, access control, plans and corrective measures. Limitation: The page describes public process. Site-specific inspection requirements and recommendations remain controlled by the programme. Public Services and Procurement Canada, Contract

Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator:

<https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public. International Organization for Standardization, Organization and digitization of information about buildings and civil engineering works, including building information modelling, Part 5: Security-minded approach. Identifier: ISO 19650-5:2020. Status at the 16 August 2026 source freeze: Confirmed current at source freeze. Public locator: <https://www.iso.org/standard/74206.html>. Technical role: Security-minded information management for built assets. Limitation: Does not supply national-security classification decisions or project-specific need-to-know rules.

MB-1142. Public Services and Procurement Canada, Contract Security Program, Work site security requirements. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-requirements.html>. Technical role: Document safeguarding capability, inspections, access control, plans and corrective measures. Limitation: The page describes public process. Site-specific inspection requirements and recommendations remain controlled by the programme. Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public. Internal cross-reference: the relevant chapters of this edition provide the governing integration of acoustic physics, construction, measurement, uncertainty, and lifecycle doctrine. This navigation statement is not an external authority and does not enlarge the scope of the cited primary sources.

MB-1143. Public Services and Procurement Canada, Contract Security Program, Work site security requirements. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-requirements.html>. Technical role: Document safeguarding capability, inspections,

access control, plans and corrective measures. Limitation: The page describes public process. Site-specific inspection requirements and recommendations remain controlled by the programme. Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze.

Public locator:

<https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public. Public Services and Procurement Canada, Contract Security Program, Levels of security. Status at the 16 August 2026 source freeze: Current public guidance at source freeze.

Public locator:

<https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/levels-security.html>. Technical role: DOS, FSC, document safeguarding, production, IT, COMSEC and personnel-screening distinctions. Limitation: The summary does not replace contractual clauses, the SRCL or written CSP approval.

MB-1144. Public United States, United Kingdom and Canadian governmental sources establish disclosed terminology and authority structures. Protected criteria and formal decisions remain with competent authorities. [Cited 3 times in this edition.]

MB-1145. Public-source and controlled-document boundaries developed in Chapters 2 and 28 through 32; applicable organisational prepublication, privacy, security and intellectual-property review remains controlling.

MB-1146. Research and engineering literature on resilient channels, clips, fastener bridging and double-leaf systems as cited in Chapters 12 through 14. Product and laboratory evidence apply only to the represented configuration.

MB-1147. Robert J. M. Craik, Sound Transmission through Buildings Using Statistical Energy Analysis (1996), Gower/Ashgate, technical monograph, limitation: sEA framework depends on subsystem definition, modal density and coupling assumptions; Richard H. Lyon and Richard G. DeJong, Theory and Application of Statistical Energy Analysis, 2nd edition (1995), Butterworth-Heinemann, technical monograph, limitation: sEA assumptions and power balance.

MB-1148. Royal Canadian Mounted Police, Guide to the Application of Physical Security Zones. Identifier: GCPSG-015 (2024). Status at the 16 August 2026 source freeze: Current public guide; effective 1 July 2024. Public locator: <https://www.rcmp-grc.gc.ca/en/security-information/guide-application-physical-security-zones-gcpsg-015-2024>. Technical role: Five-zone physical-security architecture and risk-based

application. Limitation: Zoning is not an acoustic rating, EMSEC evaluation or specialised-facility accreditation. [Cited 2 times in this edition.]

- MB-1149. Royal Canadian Mounted Police, Guide to the Application of Physical Security Zones. Identifier: GCPSG-015 (2024). Status at the 16 August 2026 source freeze: Current public guide; effective 1 July 2024. Public locator: <https://www.rcmp-grc.gc.ca/en/security-information/guide-application-physical-security-zones-gcpsg-015-2024>. Technical role: Five-zone physical-security architecture and risk-based application. Limitation: Zoning is not an acoustic rating, EMSEC evaluation or specialised-facility accreditation. ASTM International, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings. Identifier: ASTM E336-25a. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator: <https://www.astm.org/e0336-25a.html>. Technical role: Field room-to-room airborne sound measurement. Limitation: Proprietary standard. Results depend on configuration and do not alone establish speech-security approval. ASTM International, Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room. Identifier: ASTM E2638-24. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator: <https://www.astm.org/e2638-24.html>. Technical role: Closed-room speech-privacy measurement framework. Limitation: Not a universal governmental accreditation threshold and not a substitute for competent-authority criteria.
- MB-1150. Royal Canadian Mounted Police, Guide to the Application of Physical Security Zones. Identifier: GCPSG-015 (2024). Status at the 16 August 2026 source freeze: Current public guide; effective 1 July 2024. Public locator: <https://www.rcmp-grc.gc.ca/en/security-information/guide-application-physical-security-zones-gcpsg-015-2024>. Technical role: Five-zone physical-security architecture and risk-based application. Limitation: Zoning is not an acoustic rating, EMSEC evaluation or specialised-facility accreditation. National Research Council Canada, Codes Canada, National Model Codes and public code-development information. Status at the 16 August 2026 source freeze: Current public code information at source freeze. Public locator: <https://nrc.canada.ca/en/certifications-evaluations-standards/codes-canada>. Technical role: Building, fire, plumbing and energy-code interfaces. Limitation: Model codes require provincial or territorial adoption and do not establish acoustic-security approval. ASTM International, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings. Identifier: ASTM E336-25a. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator: <https://www.astm.org/e0336-25a.html>. Technical role: Field room-to-room airborne sound measurement. Limitation: Proprietary standard. Results depend on configuration and do not alone establish speech-security approval.
- MB-1151. Royal Canadian Mounted Police, Guide to the Application of Physical Security Zones. Identifier: GCPSG-015 (2024). Status at the 16 August 2026 source freeze:

Current public guide; effective 1 July 2024. Public locator: <https://www.rcmp-grc.gc.ca/en/security-information/guide-application-physical-security-zones-gcpsg-015-2024>. Technical role: Five-zone physical-security architecture and risk-based application. Limitation: Zoning is not an acoustic rating, EMSEC evaluation or specialised-facility accreditation. Public Services and Procurement Canada, Contract Security Program, Work site security requirements. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-requirements.html>. Technical role: Document safeguarding capability, inspections, access control, plans and corrective measures. Limitation: The page describes public process. Site-specific inspection requirements and recommendations remain controlled by the programme.

MB-1152. Royal Canadian Mounted Police, Guide to the Application of Physical Security Zones. Identifier: GCPSPG-015 (2024). Status at the 16 August 2026 source freeze: Current public guide; effective 1 July 2024. Public locator: <https://www.rcmp-grc.gc.ca/en/security-information/guide-application-physical-security-zones-gcpsg-015-2024>. Technical role: Five-zone physical-security architecture and risk-based application. Limitation: Zoning is not an acoustic rating, EMSEC evaluation or specialised-facility accreditation. Public Services and Procurement Canada, Contract Security Program, Work site security requirements. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-requirements.html>. Technical role: Document safeguarding capability, inspections, access control, plans and corrective measures. Limitation: The page describes public process. Site-specific inspection requirements and recommendations remain controlled by the programme. ASTM International, Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings. Identifier: ASTM E336-25a. Status at the 16 August 2026 source freeze: Current edition identified at source freeze. Public locator: <https://www.astm.org/e0336-25a.html>. Technical role: Field room-to-room airborne sound measurement. Limitation: Proprietary standard. Results depend on configuration and do not alone establish speech-security approval.

MB-1153. Royal Canadian Mounted Police, Guide to the Application of Physical Security Zones. Identifier: GCPSPG-015 (2024). Status at the 16 August 2026 source freeze: Current public guide; effective 1 July 2024. Public locator: <https://www.rcmp-grc.gc.ca/en/security-information/guide-application-physical-security-zones-gcpsg-015-2024>. Technical role: Five-zone physical-security architecture and risk-based application. Limitation: Zoning is not an acoustic rating, EMSEC evaluation or specialised-facility accreditation. Public Services and Procurement Canada, Contract

Security Program, Work site security requirements. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-requirements.html>. Technical role: Document safeguarding capability, inspections, access control, plans and corrective measures. Limitation: The page describes public process. Site-specific inspection requirements and recommendations remain controlled by the programme. Canadian Centre for Cyber Security, Emission Security Guidance. Identifier: ITSG-11A. Status at the 16 August 2026 source freeze: Protected publication; superseded ITSG-11 in March 2025. Public locator: <https://www.cyber.gc.ca/en/guidance/emission-security-emsec-guidance-itsg-11a>. Technical role: Authoritative protected EMSEC guidance under the Chief, CSE. Limitation: Only the public existence, status and access route are used. Protected criteria are not reconstructed.

MB-1154. Royal Institute of British Architects, RIBA Plan of Work 2020; Construction Specifications Institute, MasterFormat. These frameworks support staged delivery and work-result coordination but do not define secure-room performance or information-handling authority.

MB-1155. Samuel L. Manzello, Seul-Hyun Park, Dale P. Bentz, and Tensei Mizukami, "Measurement of Thermal Properties of Gypsum Board at Elevated Temperatures," Fire Technology (2005), NIST publication record and paper, <https://www.nist.gov/publications/measurement-thermal-properties-gypsum-board-elevated-temperatures>.

MB-1156. Simone Secchi, Fabio Cellai and colleagues, research on sound transmission through curtain-wall façades and lateral flanking; Y. Lalonde and collaborators, Canadian façade flanking case studies; K. Kruger and R. Ogle, "Complexities of Curtain Wall Flanking Transmission, A Case Study," Canadian Acoustics 47, no. 3 (2019).

MB-1157. SMACNA, HVAC Duct Construction Standards, Metal and Flexible, 4th ed.; SMACNA, HVAC Duct Systems Inspection Guide, 4th ed. (2024); these construction sources do not establish acoustic ratings.

MB-1158. SMACNA, HVAC Systems Testing, Adjusting & Balancing, 4th ed. (2024); ASHRAE, HVAC Applications, Chapter 49, system operating state and commissioning context.

MB-1159. Society of Fire Protection Engineers, NFPA and listed-system sources, used for fire and life-safety interface coordination within their stated scopes.

MB-1160. Steel Deck Institute, ANSI/SDI AISI S916-20(R2024), scope.

MB-1161. Steel Deck Institute, ANSI/SDI AISI S916-20(R2024); Steel Framing Industry Association, "Limiting Heights for Nonstructural Standard and EQ Wall Studs," Technical Bulletin, vol. 2, no. 3 (March 2018).

- MB-1162. Steel Deck Institute, ANSI/SDI AISI S916-20(R2024), Test Standard for Determining the Strength and Stiffness of Cold-Formed Steel-Framed Nonstructural Interior Partition Walls Sheathed with Gypsum Board; ANSI/SDI AISI S917-17(R2024); ANSI/SDI AISI S918-17(R2024).
- MB-1163. Steel Deck Institute, ANSI/SDI AISI S917-17(R2024), Test Standard for Determining the Fastener-Sheathing Local Translational Stiffness of Sheathed Cold-Formed Steel Assemblies; Steel Deck Institute, ANSI/SDI AISI S918-17(R2024), Test Standard for Determining the Fastener-Sheathing Rotational Stiffness of Sheathed Cold-Formed Steel Assemblies.
- MB-1164. Steel Door Institute, SDI 128-24, Guidelines for Acoustical Performance of Standard Steel Doors and Frames (2024). [Cited 2 times in this edition.]
- MB-1165. Steel Framing Industry Association, PB101-23, Guide to the Performance-Based Nonstructural Partition Selection of Cold-Formed Steel Framing (2023).
- MB-1166. Steel Framing Industry Association, RC101-24, question 4 and related installation guidance.
- MB-1167. Steel Framing Industry Association, RC101-24, Four Frequently Asked Questions about Cold-Formed Steel Resilient Channels (2024), question 4.
- MB-1168. Steel Framing Industry Association, RC101-24, Four Frequently Asked Questions about Cold-Formed Steel Resilient Channels (2024), questions 1-4, <https://buildsteel.org/full-report-four-frequently-asked-questions-about-cold-formed-steel-resilient-channels/>.
- MB-1169. Steel Framing Industry Association, "Head of Wall Connections and Composite Wall Heights," Technical Bulletin, vol. 2, no. 1 (November 2021), listed in the SFIA Documents Repository.
- MB-1170. Steel Framing Industry Association, "Use of Steel Posts Within the Cavity of CFS Framed Walls," Technical Bulletin, vol. 2, no. 5 (October 2025), listed in the SFIA Documents Repository.
- MB-1171. T. E. Vigran, "Sound Transmission in Multilayered Structures: Introducing Finite Structural Connections in the Transfer Matrix Method," Applied Acoustics 71, no. 1 (2010): 39-44, <https://doi.org/10.1016/j.apacoust.2009.07.005>; T. E. Vigran, "Sound Insulation of Double-Leaf Walls: Allowing for Studs of Finite Stiffness in a Transfer Matrix Scheme," Applied Acoustics 71, no. 7 (2010): 616-621, <https://doi.org/10.1016/j.apacoust.2010.02.003>.
- MB-1172. T. R. T. Nightingale and Andreas Mayr, "On Transmission of Structure-Borne Power from Wood Studs to Gypsum Board Mounted on Resilient Metal Channels, Part 2: Some Simplifications for Modelling," Canadian Acoustics 32, no. 3 (2004); John L. Davy, "Sound Transmission of Cavity Walls Due to Structure-Borne Transmission via

Point and Line Connections," *Journal of the Acoustical Society of America* 132, no. 2 (2012): 814-821, <https://doi.org/10.1121/1.4733533>.

MB-1173. T. R. T. Nightingale and J. D. Quirt, "Degradation of Wood Stud Wall Sound Isolation by Electrical Boxes," *Canadian Acoustics* 23, no. 3 (1995): 55-56.

MB-1174. T. R. T. Nightingale, R. E. Halliwell, and J. D. Quirt, "Sound Transmission Through Gypsum Board Walls: Effect of Shear Membranes and Framing Details," *Canadian Acoustics* 29, no. 3 (2001): 62-63.

MB-1175. Taylor and Kuyatt, NIST Technical Note 1297. [Cited 5 times in this edition.]

MB-1176. The complete issuer, edition, status, locator, project use and limitation record appears in the Chapter 33 Source Register. [Cited 3 times in this edition.]

MB-1177. The equations and numerical examples in this chapter are screening tools developed for teaching and project planning. They do not create universal sampling rates, acceptance thresholds, probabilities or evidentiary presumptions. [Cited 4 times in this edition.]

MB-1178. The final acceptance dossier must distinguish as-designed, as-submitted, as-built, as-tested and as-authorised states. [Cited 2 times in this edition.]

MB-1179. The Masonry Society, *Masonry Designers' Guide - 2022* (2022), with errata dated 19 December 2024.

MB-1180. The Masonry Society, *TMS 402-22 Building Code Requirements for Masonry Structures and TMS 602-22 Specification for Masonry Structures* (2022), with errata dated 2 January 2024.

MB-1181. The Masonry Society, *TMS 402-22 Building Code Requirements for Masonry Structures and TMS 602-22 Specification for Masonry Structures* (2022), with published errata dated 2 January 2024.

MB-1182. The Masonry Society, *TMS 402-22 Building Code Requirements for Masonry Structures and TMS 602-22 Specification for Masonry Structures* (2022; errata current to 2024-01-02), Structural design, materials, construction, quality assurance and inspection. Public metadata and errata verified; detailed clauses require licensed access., <https://masonrysociety.org/2022-edition-of-tms-402-602-now-available/>; ASTM International, ASTM C476-23, *Standard Specification for Grout for Masonry* (2023), Conventional and self-consolidating masonry grout material requirements., <https://store.astm.org/c0476-23.html>; ASTM International, ASTM C1019-26, *Standard Test Method for Sampling and Testing Grout for Masonry* (2026), Grout sampling and compressive testing; does not prove complete filling of all cells., <https://store.astm.org/c1019-26.html>; Concrete Masonry & Hardscapes Association, TEK 18-08B, *Grout Quality Assurance* (public edition), Field sampling and QA guidance for masonry grout., <https://www.masonryandhardscapes.org/resource/tek-18-08b/>; Concrete Masonry & Hardscapes Association, TEK 03-02A, *Grouting Concrete Masonry*

Walls (public edition), Grout placement, lift, consolidation and cleanout guidance., <https://www.masonryandhardscapes.org/resource/tek-03-02a/>; Concrete Masonry & Hardscapes Association, TEK 09-04A, Grout for Concrete Masonry (public edition), Grout types and material properties., <https://www.masonryandhardscapes.org/resource/tek-09-04a/>.

MB-1183. The Masonry Society, TMS 402-22 Building Code Requirements for Masonry Structures and TMS 602-22 Specification for Masonry Structures (2022; errata through 2024-01-02), Structural design, movement joints, construction, inspection and quality assurance; not an acoustic rating standard., <https://masonrysociety.org/2022-edition-of-tms-402-602-now-available/>; ASTM International, ASTM C919-24, Standard Practice for Use of Sealants in Acoustical Applications (2024), Sealing joints, voids and penetrations to reduce airborne flanking; excludes fire-stopping requirements., <https://store.astm.org/c0919-24.html>; International Code Council, 2024 International Building Code (2024), Fire-resistance, special inspection, penetrations and movement-joint obligations subject to local adoption., <https://codes.iccsafe.org/content/IBC2024P1>.

MB-1184. The Masonry Society, TMS 402-22 Building Code Requirements for Masonry Structures and TMS 602-22 Specification for Masonry Structures (2022; errata through 2024-01-02), Structural design, movement joints, construction, inspection and quality assurance; not an acoustic rating standard., <https://masonrysociety.org/2022-edition-of-tms-402-602-now-available/>; ASTM International, ASTM C920-18(2024), Standard Specification for Elastomeric Joint Sealants (2018, reapproved 2024), Sealant classification and laboratory properties; installed joint performance depends on design, substrate, preparation and movement., <https://store.astm.org/c0920-18r24.html>; ASTM International, ASTM C1193-25, Standard Guide for Use of Joint Sealants (2025), Joint design, backing, primers, preparation, installation and service-life considerations., <https://store.astm.org/c1193-25.html>; ASTM International, ASTM C919-24, Standard Practice for Use of Sealants in Acoustical Applications (2024), Sealing joints, voids and penetrations to reduce airborne flanking; excludes fire-stopping requirements., <https://store.astm.org/c0919-24.html>; International Code Council, 2024 International Building Code (2024), Fire-resistance, special inspection, penetrations and movement-joint obligations subject to local adoption., <https://codes.iccsafe.org/content/IBC2024P1>.

MB-1185. The Masonry Society, TMS 402/602-22, masonry code requirements and specification; ASTM C90-24a, loadbearing concrete masonry units; National Concrete Masonry Association or Concrete Masonry and Hardscapes Association public technical guidance on sound and construction. Structural and material conformity do not prove acoustic closure.

- MB-1186. The Masonry Society, TMS 402/602-22; ASTM C90-24a; ASTM C476-24; ASTM C1019-20. Material and structural conformity do not establish grout continuity, closure or field acoustic performance.
- MB-1187. Tilt-Up Concrete Association, public design and construction resources, accessed 11 August 2026.
- MB-1188. Tor Erik Vigran, Building Acoustics, 2008. Status at the 14 August 2026 source freeze: Published. Public locator: Publisher record. Secondary authority. Current standards and project evidence remain controlling.
- MB-1189. Treasury Board of Canada Secretariat, Directive on Security Management. Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions. [Cited 5 times in this edition.]
- MB-1190. Treasury Board of Canada Secretariat, Directive on Security Management. Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions. Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public. Canadian Centre for Cyber Security, Protecting specified information in non-Government of Canada systems and organizations. Identifier: ITSP.10.171. Status at the 16 August 2026 source freeze: Current; second release 28 October 2025. Public locator: <https://www.cyber.gc.ca/en/guidance/protecting-specified-information-non-government-canada-systems-and-organizations-itsp10171>. Technical role: Security requirements for specified information in non-GC systems. Limitation: Applies to specified information within stated scope, not classified facility accreditation.
- MB-1191. Treasury Board of Canada Secretariat, Directive on Security Management. Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs->

sct.canada.ca/pol/doc-eng.aspx?id=32611. Technical role: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions. Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator:

<https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public. Canadian Centre for Cyber Security, Security and privacy controls and assurance activities catalogue. Identifier: ITSP.10.033. Status at the 16 August 2026 source freeze: Current; effective 31 March 2026. Public locator: <https://www.cyber.gc.ca/en/guidance/cyber-security-privacy-risk-management/itsp10033/foreword-overview-introduction>.

Technical role: Current Canadian control and assurance catalogue superseding ITSG-33 Annex 3A. Limitation: Controls require selection, tailoring, allocation and assessment. Catalogue inclusion is not automatic project applicability.

MB-1192. Treasury Board of Canada Secretariat, Directive on Security Management.

Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions. Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator:

<https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public. International Organization for Standardization, Organization and digitization of information about buildings and civil engineering works, including building information modelling, Part 5: Security-minded approach. Identifier: ISO 19650-5:2020. Status at the 16 August 2026 source freeze: Confirmed current at source freeze. Public locator:

<https://www.iso.org/standard/74206.html>. Technical role: Security-minded information management for built assets. Limitation: Does not supply national-security classification decisions or project-specific need-to-know rules.

MB-1193. Treasury Board of Canada Secretariat, Directive on Security Management.

Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions. Public Services and Procurement Canada, Contract Security Program, Work site security requirements. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-requirements.html>. Technical role: Document safeguarding capability, inspections, access control, plans and corrective measures. Limitation: The page describes public process. Site-specific inspection requirements and recommendations remain controlled by the programme. International Organization for Standardization, Organization and digitization of information about buildings and civil engineering works, including building information modelling, Part 5: Security-minded approach. Identifier: ISO 19650-5:2020. Status at the 16 August 2026 source freeze: Confirmed current at source freeze. Public locator: <https://www.iso.org/standard/74206.html>. Technical role: Security-minded information management for built assets. Limitation: Does not supply national-security classification decisions or project-specific need-to-know rules.

MB-1194. Treasury Board of Canada Secretariat, Directive on Security Management.

Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions. Treasury Board of Canada Secretariat, Directive on Security Screening. Identifier: Policy instrument 32805. Status at the 16 August 2026 source freeze: Current; effective 6 January 2025. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32805>. Technical role: Security-screening model, lifecycle assurance, temporary access and need-related access governance. Limitation: Screening does not itself confer need-to-know, facility approval or authority to discuss sensitive information. International Organization for Standardization, Organization and digitization of information about buildings and civil engineering works, including building information modelling, Part 3: Operational phase of assets. Identifier: ISO 19650-3:2020. Status at the 16 August 2026 source freeze: Confirmed current at source freeze. Public locator: <https://www.iso.org/standard/75109.html>. Technical role: Operational information management and lifecycle configuration. Limitation: Does not replace departmental security, records, maintenance or accreditation requirements.

MB-1195. Treasury Board of Canada Secretariat, Directive on Security Management.

Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions. Treasury Board of Canada Secretariat, Directive on Security Screening. Identifier: Policy instrument 32805. Status at the 16 August 2026 source freeze: Current; effective 6 January 2025. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32805>. Technical role: Security-screening model, lifecycle assurance, temporary access and need-related access governance. Limitation: Screening does not itself confer need-to-know, facility approval or authority to discuss sensitive information. Public Services and Procurement Canada, Contract Security Program, Work site security requirements. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-requirements.html>. Technical role: Document safeguarding capability, inspections, access control, plans and corrective measures. Limitation: The page describes public process. Site-specific inspection requirements and recommendations remain controlled by the programme.

MB-1196. Treasury Board of Canada Secretariat, Directive on Security Management.

Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions. Treasury Board of Canada Secretariat, Directive on Security Screening. Identifier: Policy instrument 32805. Status at the 16 August 2026 source freeze: Current; effective 6 January 2025. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32805>. Technical role: Security-screening model, lifecycle assurance, temporary access and need-related access governance. Limitation: Screening does not itself confer need-to-know, facility approval or authority to discuss sensitive information. Royal Canadian Mounted Police, Guide to the Application of Physical Security Zones. Identifier: GCPSPG-015 (2024). Status at the 16 August 2026 source freeze: Current public guide; effective 1 July 2024. Public locator: <https://www.rcmp-grc.gc.ca/en/security-information/guide-application-physical-security-zones-gcpspg-015-2024>. Technical role: Five-zone physical-security architecture and risk-based application. Limitation: Zoning is not an acoustic rating, EMSEC evaluation or specialised-facility accreditation.

MB-1197. Treasury Board of Canada Secretariat, Directive on Security Management.

Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze:

Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role: Departmental security

management, physical security, information protection, contracting and event

management. Limitation: Departmental implementation and project-specific control

selection remain authority decisions. Treasury Board of Canada Secretariat, Standard

on Security Event Reporting. Identifier: Directive on Security Management, Appendix I.

Status at the 16 August 2026 source freeze: Current; effective 1 March 2024. Public

locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32613>. Technical role:

Security-event reporting and escalation framework. Limitation: Public reporting

requirements do not disclose investigative methods or project-specific response

thresholds. Public Services and Procurement Canada, Contract Security Program, Work

site security requirements. Status at the 16 August 2026 source freeze: Current public

guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-requirements.html>. Technical role: Document safeguarding capability, inspections,

access control, plans and corrective measures. Limitation: The page describes public

process. Site-specific inspection requirements and recommendations remain

controlled by the programme.

MB-1198. Treasury Board of Canada Secretariat, Directive on Security Screening. Identifier:

Policy instrument 32805. Status at the 16 August 2026 source freeze: Current; effective

6 January 2025. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32805>. Technical role: Security-screening model, lifecycle assurance, temporary

access and need-related access governance. Limitation: Screening does not itself

confer need-to-know, facility approval or authority to discuss sensitive information.

MB-1199. Treasury Board of Canada Secretariat, Directive on Security Screening. Identifier:

Policy instrument 32805. Status at the 16 August 2026 source freeze: Current; effective

6 January 2025. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32805>. Technical role: Security-screening model, lifecycle assurance, temporary

access and need-related access governance. Limitation: Screening does not itself

confer need-to-know, facility approval or authority to discuss sensitive information.

Public Services and Procurement Canada, Contract Security Program, Work site

security requirements. Status at the 16 August 2026 source freeze: Current public

guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-requirements.html>. Technical role: Document safeguarding capability, inspections,

access control, plans and corrective measures. Limitation: The page describes public

process. Site-specific inspection requirements and recommendations remain

controlled by the programme. Public Services and Procurement Canada, Contract Security Program, Approval for visits to secure sites. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/approval-visits-secure-sites.html>. Technical role: Requests for visit, visitor authorisation, escorting, visual and auditory exposure control. Limitation: Visit approval does not expand the authorised content, time or area of access.

MB-1200. Treasury Board of Canada Secretariat, Policy on Government Security. Identifier: Policy instrument 16578. Status at the 16 August 2026 source freeze: Current; amended effective 6 January 2025. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=16578>. Technical role: Government-wide security governance, accountability and lifecycle protection. Limitation: High-level policy. It does not disclose project-specific acoustic, EMSEC or specialised-facility criteria. [Cited 3 times in this edition.]

MB-1201. Treasury Board of Canada Secretariat, Policy on Government Security. Identifier: Policy instrument 16578. Status at the 16 August 2026 source freeze: Current; amended effective 6 January 2025. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=16578>. Technical role: Government-wide security governance, accountability and lifecycle protection. Limitation: High-level policy. It does not disclose project-specific acoustic, EMSEC or specialised-facility criteria. Treasury Board of Canada Secretariat, Directive on Security Management. Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions.

MB-1202. Treasury Board of Canada Secretariat, Policy on Government Security. Identifier: Policy instrument 16578. Status at the 16 August 2026 source freeze: Current; amended effective 6 January 2025. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=16578>. Technical role: Government-wide security governance, accountability and lifecycle protection. Limitation: High-level policy. It does not disclose project-specific acoustic, EMSEC or specialised-facility criteria. Treasury Board of Canada Secretariat, Directive on Security Management. Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and

project-specific control selection remain authority decisions. Canadian Centre for Cyber Security, Security and privacy controls and assurance activities catalogue. Identifier: ITSP.10.033. Status at the 16 August 2026 source freeze: Current; effective 31 March 2026. Public locator: <https://www.cyber.gc.ca/en/guidance/cyber-security-privacy-risk-management/itsp10033/foreword-overview-introduction>. Technical role: Current Canadian control and assurance catalogue superseding ITSG-33 Annex 3A. Limitation: Controls require selection, tailoring, allocation and assessment. Catalogue inclusion is not automatic project applicability.

MB-1203. Treasury Board of Canada Secretariat, Policy on Government Security. Identifier: Policy instrument 16578. Status at the 16 August 2026 source freeze: Current; amended effective 6 January 2025. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=16578>. Technical role: Government-wide security governance, accountability and lifecycle protection. Limitation: High-level policy. It does not disclose project-specific acoustic, EMSEC or specialised-facility criteria. Treasury Board of Canada Secretariat, Directive on Security Management. Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions. International Organization for Standardization and International Electrotechnical Commission, General requirements for the competence of testing and calibration laboratories. Identifier: ISO/IEC 17025:2017. Status at the 16 August 2026 source freeze: Confirmed current at source freeze. Public locator: <https://www.iso.org/standard/66912.html>. Technical role: Laboratory competence, impartiality and consistent operation. Limitation: Accreditation scope must cover the actual method and does not confer governmental facility authority.

MB-1204. Treasury Board of Canada Secretariat, Policy on Government Security. Identifier: Policy instrument 16578. Status at the 16 August 2026 source freeze: Current; amended effective 6 January 2025. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=16578>. Technical role: Government-wide security governance, accountability and lifecycle protection. Limitation: High-level policy. It does not disclose project-specific acoustic, EMSEC or specialised-facility criteria. Treasury Board of Canada Secretariat, Directive on Security Management. Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions. Joint Committee for

Guides in Metrology, Evaluation of measurement data, The role of measurement uncertainty in conformity assessment. Identifier: JCGM 106:2012. Status at the 16 August 2026 source freeze: Current public guide at source freeze. Public locator: <https://www.bipm.org/en/committees/jc/jcgm/publications>. Technical role: Decision rules, guard bands and conformity risk. Limitation: Requires an adopted tolerance, decision rule and risk policy.

MB-1205. Treasury Board of Canada Secretariat, Policy on Government Security. Identifier: Policy instrument 16578. Status at the 16 August 2026 source freeze: Current; amended effective 6 January 2025. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=16578>. Technical role: Government-wide security governance, accountability and lifecycle protection. Limitation: High-level policy. It does not disclose project-specific acoustic, EMSEC or specialised-facility criteria. Treasury Board of Canada Secretariat, Directive on Security Management. Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions. Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public.

MB-1206. Treasury Board of Canada Secretariat, Policy on Government Security. Identifier: Policy instrument 16578. Status at the 16 August 2026 source freeze: Current; amended effective 6 January 2025. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=16578>. Technical role: Government-wide security governance, accountability and lifecycle protection. Limitation: High-level policy. It does not disclose project-specific acoustic, EMSEC or specialised-facility criteria. Treasury Board of Canada Secretariat, Directive on Security Management. Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions. Public Services and Procurement Canada, Contract Security Program, Work site security requirements.

Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator:

<https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-requirements.html>. Technical role: Document safeguarding capability, inspections, access control, plans and corrective measures. Limitation: The page describes public process. Site-specific inspection requirements and recommendations remain controlled by the programme.

MB-1207. Treasury Board of Canada Secretariat, Policy on Government Security. Identifier: Policy instrument 16578. Status at the 16 August 2026 source freeze: Current; amended effective 6 January 2025. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=16578>. Technical role: Government-wide security governance, accountability and lifecycle protection. Limitation: High-level policy. It does not disclose project-specific acoustic, EMSEC or specialised-facility criteria. Treasury Board of Canada Secretariat, Directive on Security Management. Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions. Royal Canadian Mounted Police, Guide to the Application of Physical Security Zones. Identifier: GCPSG-015 (2024). Status at the 16 August 2026 source freeze: Current public guide; effective 1 July 2024. Public locator: <https://www.rcmp-grc.gc.ca/en/security-information/guide-application-physical-security-zones-gcpsg-015-2024>. Technical role: Five-zone physical-security architecture and risk-based application. Limitation: Zoning is not an acoustic rating, EMSEC evaluation or specialised-facility accreditation. [Cited 2 times in this edition.]

MB-1208. Treasury Board of Canada Secretariat, Policy on Government Security. Identifier: Policy instrument 16578. Status at the 16 August 2026 source freeze: Current; amended effective 6 January 2025. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=16578>. Technical role: Government-wide security governance, accountability and lifecycle protection. Limitation: High-level policy. It does not disclose project-specific acoustic, EMSEC or specialised-facility criteria. Treasury Board of Canada Secretariat, Directive on Security Management. Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions. Royal Canadian Mounted

Police, Guide to the Application of Physical Security Zones. Identifier: GCPSPG-015 (2024). Status at the 16 August 2026 source freeze: Current public guide; effective 1 July 2024. Public locator: <https://www.rcmp-grc.gc.ca/en/security-information/guide-application-physical-security-zones-gcpsg-015-2024>. Technical role: Five-zone physical-security architecture and risk-based application. Limitation: Zoning is not an acoustic rating, EMSEC evaluation or specialised-facility accreditation. Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public. Canadian Centre for Cyber Security, Emission Security Guidance. Identifier: ITSG-11A. Status at the 16 August 2026 source freeze: Protected publication; superseded ITSG-11 in March 2025. Public locator: <https://www.cyber.gc.ca/en/guidance/emission-security-emsec-guidance-itsg-11a>. Technical role: Authoritative protected EMSEC guidance under the Chief, CSE. Limitation: Only the public existence, status and access route are used. Protected criteria are not reconstructed.

MB-1209. Treasury Board of Canada Secretariat, Standard on Security Event Reporting. Identifier: Directive on Security Management, Appendix I. Status at the 16 August 2026 source freeze: Current; effective 1 March 2024. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32613>. Technical role in this crosswalk: Security-event reporting and escalation framework. Limitation: Public reporting requirements do not disclose investigative methods or project-specific response thresholds.; FCDO Services, UK NACE, Technical Surveillance Countermeasures. Identifier: Technical Surveillance Countermeasures. Status at the 16 August 2026 source freeze: Current official public description. Public locator: <https://www.fcdoservices.gov.uk/uk-nace/uk-nace-operations/tscm/>. Technical role in this crosswalk: Primary governmental technical-security service description. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; U.S. Department of State, Bureau of Diplomatic Security. Identifier: 1 FAM 260. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/01fam/01fam0260.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Defines organisational roles. It does not authorise a contractor to perform governmental certification or accreditation.; Defense Counterintelligence and Security Agency / eCFR, National Industrial Security Program Operating Manual Rule. Identifier: 32 CFR Part 117. Status

at the 16 August 2026 source freeze: Current federal rule and DCSA implementation guidance. Public locator: <https://www.dcsa.mil/Industrial-Security/National-Industrial-Security-Program-Oversight/32-CFR-Part-117-NISPOM-Rule/ddd/>. Technical role in this crosswalk: Primary federal regulation and official implementation guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed. [Cited 2 times in this edition.]

MB-1210. Treasury Board of Canada Secretariat, Standard on Security Event Reporting.

Identifier: Directive on Security Management, Appendix I. Status at the 16 August 2026 source freeze: Current; effective 1 March 2024. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32613>. Technical role: Security-event reporting and escalation framework. Limitation: Public reporting requirements do not disclose investigative methods or project-specific response thresholds. Public Services and Procurement Canada, Contract Security Program, Work site security requirements. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator:

<https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-requirements.html>. Technical role: Document safeguarding capability, inspections, access control, plans and corrective measures. Limitation: The page describes public process. Site-specific inspection requirements and recommendations remain controlled by the programme. International Organization for Standardization, Organization and digitization of information about buildings and civil engineering works, including building information modelling, Part 3: Operational phase of assets. Identifier: ISO 19650-3:2020. Status at the 16 August 2026 source freeze: Confirmed current at source freeze. Public locator: <https://www.iso.org/standard/75109.html>. Technical role: Operational information management and lifecycle configuration. Limitation: Does not replace departmental security, records, maintenance or accreditation requirements.

MB-1211. U.S. Department of Defense / Whole Building Design Guide, SCIF/SAPF Planning, Design, and Construction. Identifier: UFC 4-010-05. Status at the 16 August 2026 source freeze: Active at source freeze. Public locator: <https://www.wbdg.org/dod/ufc/ufc-4-010-05>. Technical role in this crosswalk: Primary governmental facilities criterion. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1212. U.S. Department of Defense / Whole Building Design Guide, SCIF/SAPF Planning, Design, and Construction. Identifier: UFC 4-010-05. Status at the 16 August 2026 source

freeze: Active at source freeze. Public locator: <https://www.wbdg.org/dod/ufc/ufc-4-010-05>. Technical role in this crosswalk: Primary governmental facilities criterion. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; National Protective Security Authority, Building Services and Internal Spaces. Identifier: Building Services and Internal Spaces. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.npsa.gov.uk/building-protection/building-services-internal-spaces>. Technical role in this crosswalk: Primary governmental physical-security guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Treasury Board of Canada Secretariat, Directive on Security Management. Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role in this crosswalk: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions.; U.S. Department of State, Facility Operations. Identifier: 15 FAM 620. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/15fam/15fam0620.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: General operations policy does not establish technical-security status for a specialised room.

MB-1213. U.S. Department of Defense / Whole Building Design Guide, SCIF/SAPF Planning, Design, and Construction. Identifier: UFC 4-010-05. Status at the 16 August 2026 source freeze: Active at source freeze. Public locator: <https://www.wbdg.org/dod/ufc/ufc-4-010-05>. Technical role in this crosswalk: Primary governmental facilities criterion. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; National Protective Security Authority, Security Walling Systems. Identifier: Security Walling Systems. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.npsa.gov.uk/building-protection/building-services-internal-spaces/security-walling-systems>. Technical role in this crosswalk: Primary governmental physical-security guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.;

National Research Council Canada, Codes Canada, National Model Codes and public code-development information. Status at the 16 August 2026 source freeze: Current public code information at source freeze. Public locator: <https://nrc.canada.ca/en/certifications-evaluations-standards/codes-canada>. Technical role in this crosswalk: Building, fire, plumbing and energy-code interfaces. Limitation: Model codes require provincial or territorial adoption and do not establish acoustic-security approval.; International Organization for Standardization, Field Measurement of Airborne Sound Insulation. Identifier: ISO 16283-1:2014 with Amendment 1:2017. Status at the 16 August 2026 source freeze: Published and current at source freeze. Public locator: <https://www.iso.org/standard/55997.html>. Technical role in this crosswalk: Consensus standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-1214. U.S. Department of Defense / Whole Building Design Guide, UFC 4-010-01, Change 3, DoD Minimum Antiterrorism Standards for Buildings (12 December 2018; Change 3, 24 May 2024); U.S. Department of Defense / Whole Building Design Guide, UFC 4-010-05, SCIF/SAPF Planning, Design, and Construction (26 May 2023). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1215. U.S. Department of Defense / Whole Building Design Guide, UFC 4-010-05, SCIF/SAPF Planning, Design, and Construction (26 May 2023); ASTM International, ASTM E336-25a; ASTM E2638-24; ASTM E2964-26, Field sound isolation, closed-room speech privacy and low-frequency field measurement standards (2024 to 2026 editions). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1216. U.S. Department of Defense / Whole Building Design Guide, UFC 4-010-05, SCIF/SAPF Planning, Design, and Construction (26 May 2023); Defense Counterintelligence and Security Agency, NISP Oversight and Security Review Process, National Industrial Security Program oversight, review and rating resources (Current public web resources at source freeze). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility,

room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1217. U.S. Department of Defense / Whole Building Design Guide, UFC 4-010-05, SCIF/SAPF Planning, Design, and Construction (26 May 2023); Office of the Director of National Intelligence, Version 1.5.1, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities (26 July 2021); ASTM International, ASTM E336-25a; ASTM E2638-24; ASTM E2964-26, Field sound isolation, closed-room speech privacy and low-frequency field measurement standards (2024 to 2026 editions). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1218. U.S. Department of Defense / Whole Building Design Guide, UFC 4-010-05, SCIF/SAPF Planning, Design, and Construction (26 May 2023); U.S. Department of Defense / Whole Building Design Guide, UFC 4-010-06, Cybersecurity of Facility-Related Control Systems (10 October 2023); U.S. Department of Defense / Whole Building Design Guide, UFC 4-021-02, Electronic Security Systems (28 July 2025). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1219. U.S. Department of Defense / Whole Building Design Guide, UFC 4-010-05, SCIF/SAPF Planning, Design, and Construction (26 May 2023); U.S. Department of Defense / Whole Building Design Guide, UFC 4-020-01, DoD Security Engineering Facilities Planning Manual (11 September 2008). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1220. U.S. Department of Defense / Whole Building Design Guide, UFC 4-010-05, SCIF/SAPF Planning, Design, and Construction (26 May 2023); U.S. Department of Defense, DoDM 5200.01, Volume 3, Change 4, DoD Information Security Program: Protection of Classified Information (24 February 2012; Change 4, 17 January 2025). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

- MB-1221. U.S. Department of Defense / Whole Building Design Guide, UFC 4-010-05, SCIF/SAPF Planning, Design, and Construction (26 May 2023); U.S. General Services Administration, 2025 PBS Core Building Standards and 2024 P100 reference materials, Facilities standards for the Public Buildings Service (2025 standards; page updated 3 February 2026). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.
- MB-1222. U.S. Department of Defense UFC 4-010-05, public Intelligence Community doctrine, U.S. Department of State public policy, FCDO Services secure-speech public information, NPSA guidance and Canadian public security sources. Protected criteria and formal authority decisions are not reconstructed from public sources.
- MB-1223. U.S. Department of Defense, DoD Manual 5200.01 family, Information Security Program, current public volumes at source freeze. Status at the 14 August 2026 source freeze: Public source. Public locator: <https://www.esd.whs.mil/DD/>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 4 times in this edition.]
- MB-1224. U.S. Department of Defense, DoDD 5205.07, Special Access Program Policy (12 September 2024); U.S. Department of Defense, DoDM 5205.07, Special Access Program Security Manual (17 January 2025); U.S. Department of Defense / Whole Building Design Guide, UFC 4-010-05, SCIF/SAPF Planning, Design, and Construction (26 May 2023). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.
- MB-1225. U.S. Department of Defense, DoDI 5200.01, Change 2, DoD Information Security Program and Protection of Sensitive Compartmented Information (21 April 2016; Change 2, 1 October 2020); U.S. Department of Defense, DoDM 5200.01, Volume 3, Change 4, DoD Information Security Program: Protection of Classified Information (24 February 2012; Change 4, 17 January 2025); Defense Counterintelligence and Security Agency / eCFR, 32 CFR Part 117, National Industrial Security Program Operating Manual Rule (Effective 24 February 2021; current electronic rule at source freeze). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

- MB-1226. U.S. Department of Defense, DoDM 5105.21, Volume 2, Change 2, SCI Administrative Security Manual: Administration of Physical Security, Visitor Control, and Technical Security (19 October 2012; Change 2, 2 November 2020); Office of the Director of National Intelligence, Version 1.5.1, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities (26 July 2021). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.
- MB-1227. U.S. Department of Defense, UFC 3-401-01, Mechanical Engineering (28 July 2025; Change 2, 14 May 2026). Public locator: <https://www.wbdg.org/dod/ufc/ufc-3-401-01>. ASHRAE, 2023 ASHRAE Handbook. HVAC Applications, Chapter 49, Noise and Vibration Control (2023). Public locator: <https://www.ashrae.org/technical-resources/ashrae-handbook>. Condensation, moisture migration, corrosion, insulation continuity, vapour control, and thermal bridging can alter long-term acoustic and firestop performance. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.
- MB-1228. U.S. Department of Defense, UFC 3-401-01, Mechanical Engineering (28 July 2025; Change 2, 14 May 2026). Public locator: <https://www.wbdg.org/dod/ufc/ufc-3-401-01>. International Organization for Standardization, ISO 16283-1:2014/Amd 1:2017, Field measurement of sound insulation in buildings and of building elements. Part 1: Airborne sound insulation (2014; Amendment 1:2017). Public locator: <https://www.iso.org/standard/55997.html>. Exterior and below-grade routes add weather, pressure, moisture, access, and termination states. The actual route endpoint must be included in the authorised source-path-receiver model. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.
- MB-1229. U.S. Department of Defense, UFC 3-520-01, Interior Electrical Systems (16 January 2025; Change 1, 21 January 2026). Public locator: <https://www.wbdg.org/dod/ufc/ufc-3-520-01>. U.S. Department of Defense, UFC 3-501-01, Electrical Engineering (27 November 2024). Public locator: <https://www.wbdg.org/dod/ufc/ufc-3-501-01>. The cited UFCs establish current public electrical-engineering context at the source freeze. Their applicability must be determined by the responsible programme and project authority. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.
- MB-1230. U.S. Department of Defense, UFC 3-520-01, Interior Electrical Systems (16 January 2025; Change 1, 21 January 2026). Public locator: <https://www.wbdg.org/dod/ufc/ufc-3-520-01>. U.S. Department of Defense, UFC 3-580-01, Information and Communications Technology Infrastructure Planning and Design (21 November 2024). Public locator:

<https://www.wbdg.org/dod/ufc/ufc-3-580-01>. U.S. Department of Defense, UFC 3-401-01, Mechanical Engineering (28 July 2025; Change 2, 14 May 2026). Public locator: <https://www.wbdg.org/dod/ufc/ufc-3-401-01>. U.S. Department of Defense, UFGS 07 84 00, Firestopping (1 May 2010; active in May 2026 UFGS master). Public locator: <https://www.wbdg.org/dod/ufgs/ufgs-07-84-00>. The listed publication and change dates were recorded at the 16 August 2026 source freeze. Status does not establish applicability to every project. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorize a secure room.

MB-1231. U.S. Department of Defense, UFC 3-520-01, Interior Electrical Systems, 16 January 2025, Change 1 dated 21 January 2026. Status at the 14 August 2026 source freeze: Current public UFC. Public locator: <https://www.wbdg.org/dod/ufc>. Use is confined to the source scope. The document does not itself approve, accredit or authorize a secure room. [Cited 2 times in this edition.]

MB-1232. U.S. Department of Defense, UFC 3-540-01, Engine-Driven Generator Systems for Prime and Standby Power Applications (Current public issue; Change 4, 16 January 2026). Public locator: <https://www.wbdg.org/dod/ufc/ufc-3-540-01>. U.S. Department of Defense, UFC 3-520-02, Facility Energy System Resilience and Reliability (Current public issue; Change 1, 29 January 2025). Public locator: <https://www.wbdg.org/dod/ufc/ufc-3-520-02>. Normal, transfer, emergency, and resilience states can change vibration, noise, source level, background, and room availability. Each consequential state requires explicit treatment. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorize a secure room.

MB-1233. U.S. Department of Defense, UFC 3-580-01, Information and Communications Technology Infrastructure Planning and Design (21 November 2024). Public locator: <https://www.wbdg.org/dod/ufc/ufc-3-580-01>. Optical media remove one conductive signalling path but do not remove armour, conduit, messenger, support, open-bore, equipment, or lifecycle paths. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorize a secure room.

MB-1234. U.S. Department of Defense, UFC 3-580-01, Information and Communications Technology Infrastructure Planning and Design (21 November 2024). Public locator: <https://www.wbdg.org/dod/ufc/ufc-3-580-01>. U.S. Department of Defense, UFGS 07 84 00, Firestopping (1 May 2010; active in May 2026 UFGS master). Public locator: <https://www.wbdg.org/dod/ufgs/ufgs-07-84-00>. ASTM International, ASTM E814-24, Standard Test Method for Fire Tests of Penetration Firestop Systems (2024; accessed edition used for this release). Public locator: <https://store.astm.org/standards/e814>. ICT pathway planning, cable fill, access, firestop configuration, and future changes must be coordinated as one controlled installation. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorize a secure room.

- MB-1235. U.S. Department of Defense, UFC 3-580-01, Information and Communications Technology Infrastructure Planning and Design, public edition current at source freeze. Status at the 14 August 2026 source freeze: Current public UFC. Public locator: <https://www.wbdg.org/dod/ufc>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 8 times in this edition.]
- MB-1236. U.S. Department of Defense, UFC 3-600-01, Fire Protection Engineering for Facilities, 12 June 2026 public edition. Status at the 14 August 2026 source freeze: Current public UFC. Public locator: <https://www.wbdg.org/dod/ufc/ufc-3-600-01>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 2 times in this edition.]
- MB-1237. U.S. Department of Defense, UFC 4-010-05, SCIF/SAPF Planning, Design, and Construction, 26 May 2023. Public secure-facility criteria are used only within their stated scope. Project-controlled criteria and competent-authority decisions remain governing. [Cited 2 times in this edition.]
- MB-1238. U.S. Department of Defense, UFC 4-010-05, SCIF/SAPF Planning, Design, and Construction, 26 May 2023. Status at the 14 August 2026 source freeze: Current public UFC at source freeze. Public locator: <https://www.wbdg.org/dod/ufc/ufc-4-010-05>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 5 times in this edition.]
- MB-1239. U.S. Department of Defense, UFC 4-010-06, Cybersecurity of Facility-Related Control Systems, public edition current at source freeze. Status at the 14 August 2026 source freeze: Current public UFC. Public locator: <https://www.wbdg.org/dod/ufc/ufc-4-010-06>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 6 times in this edition.]
- MB-1240. U.S. Department of Defense, UFGS 01 32 33.00 10, Photographic Documentation, 1 May 2025. Secure projects require additional device, transfer, access, distribution and retention controls. [Cited 2 times in this edition.]
- MB-1241. U.S. Department of Defense, UFGS 01 45 00, Quality Control (Current UFGS master applicable to project). Public locator: <https://www.wbdg.org/dod/ufgs/ufgs-01-45-00>. NIST/SEMATECH, e-Handbook of Statistical Methods, Process capability chapter (current public web handbook). Public locator: <https://www.itl.nist.gov/div898/handbook/pmc/section1/pmc16.htm>. First-article work should test the real production process. Capability indices are meaningful only when the process and measurement system are stable and the metric represents the controlling physical requirement. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.
- MB-1242. U.S. Department of Defense, UFGS 01 45 00, Quality Control, 1 August 2023, with Change 3 recorded in the August 2025 public release; ISO 10005:2018; ISO 10006:2017.

These sources support planned control phases, quality plans, responsibilities, records and corrective action within their stated scopes. [Cited 5 times in this edition.]

- MB-1243. U.S. Department of Defense, UFGS 01 45 35, Special Inspections, 1 May 2024; ISO/IEC 17020:2026. Code special inspection, contractual quality control, acoustic surveillance and security observation remain distinct authorities unless the project expressly assigns an integrated role.
- MB-1244. U.S. Department of Defense, UFGS 01 78 00, Closeout Submittals, 1 May 2019, with later public change history; ISO 19650-2:2018 and ISO 19650-3:2020. Record drawings and asset information must be reconciled with field evidence and controlled change. [Cited 2 times in this edition.]
- MB-1245. U.S. Department of Defense, UFGS 01 91 00.15, Building Commissioning, 1 May 2023 with later public release history. Status at the 14 August 2026 source freeze: Public guide specification at source freeze. Public locator: <https://www.wbdg.org/dod/ufigs>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 5 times in this edition.]
- MB-1246. U.S. Department of Defense, UFGS 01 91 00.15, Building Commissioning, 1 May 2023, with later public release history. Commissioning verifies integrated operation within the defined scope but does not itself constitute security accreditation.
- MB-1247. U.S. Department of Defense, UFGS 07 84 00, Firestopping (1 May 2010; active in May 2026 UFGS master). Public locator: <https://www.wbdg.org/dod/ufigs/ufigs-07-84-00>. ASTM International, ASTM E814-24, Standard Test Method for Fire Tests of Penetration Firestop Systems (2024; accessed edition used for this release). Public locator: <https://store.astm.org/standards/e814>. Annular limits, penetrant geometry, substrate, sleeve, fill, backing, and installation configuration are applicability variables. The minimum local clearance, not a favourable average, can control a structural bridge. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.
- MB-1248. U.S. Department of Defense, UFGS 07 84 00, Firestopping (1 May 2010; active in May 2026 UFGS master). Public locator: <https://www.wbdg.org/dod/ufigs/ufigs-07-84-00>. ASTM International, ASTM E814-24, Standard Test Method for Fire Tests of Penetration Firestop Systems (2024; accessed edition used for this release). Public locator: <https://store.astm.org/standards/e814>. ASTM International, ASTM E3037-20, Standard Test Method for Measuring Relative Movement Capabilities of Through-Penetration Firestop Systems (2020). Public locator: <https://store.astm.org/standards/e3037>. Field tolerance must remain within the applicable tested, specified, or formally evaluated range while preserving movement and acoustic-path control. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.

- MB-1249. U.S. Department of Defense, UFGS 07 84 00, Firestopping (1 May 2010; active in May 2026 UFGS master). Public locator: <https://www.wbdg.org/dod/ufgs/ufgs-07-84-00>. UL Solutions, Inspection Based Service Offerings, public firestop special-inspection programme information (available at 16 August 2026 source freeze). Public locator: <https://www.ul.com/services/inspection-based-service-offerings>. U.S. Department of Defense, UFGS 01 45 00, Quality Control (Current UFGS master applicable to project). Public locator: <https://www.wbdg.org/dod/ufgs/ufgs-01-45-00>. Hold points are placed where decisive configuration evidence remains visible. Missed inspection is missing evidence, not a silent pass. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.
- MB-1250. U.S. Department of Defense, UFGS 07 84 00, Firestopping, 1 May 2010, active in the May 2026 UFGS master. Status at the 14 August 2026 source freeze: Active. Public locator: <https://www.wbdg.org/dod/ufgs/ufgs-07-84-00>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 2 times in this edition.]
- MB-1251. U.S. Department of Defense, UFGS public quality-control, photographic-documentation and closeout sections, current public UFGS master at source freeze. Status at the 14 August 2026 source freeze: Active public specifications. Public locator: <https://www.wbdg.org/dod/ufgs>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 3 times in this edition.]
- MB-1252. U.S. Department of Defense, UFGS quality control, special inspection, photographic documentation and closeout sections, current public UFGS master at source freeze. Status at the 14 August 2026 source freeze: Active. Public locator: <https://www.wbdg.org/dod/ufgs>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 2 times in this edition.]
- MB-1253. U.S. Department of Defense, Unified Facilities Criteria and Unified Facilities Guide Specifications relevant to secure construction, acoustics, commissioning and building services, used only within their public stated scopes. [Cited 3 times in this edition.]
- MB-1254. U.S. Department of Energy, DOE O 470.1A; DOE O 470.4C; DOE O 470.6 Chg 1; DOE O 471.6 Chg 4; DOE O 473.1A, Safeguards and security operations, planning, technical security, information security and physical protection directives (2017 to 2024 current editions listed by DOE); U.S. Department of Energy, Office of Security Policy and Office of Enterprise Assessments, Public safeguards and security policy resources, Security Policy and National Security Assessments (Current public web resources at source freeze); Office of the Director of National Intelligence, ICD 705, Sensitive Compartmented Information Facilities (26 May 2010). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility,

room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1255. U.S. Department of Energy, Technical Surveillance Countermeasures, public guide, July 2024, <https://www.energy.gov/sites/default/files/2024-07/Technical-Surveillance-Countermeasures.pdf>.

MB-1256. U.S. Department of Energy, Technical Surveillance Countermeasures.

MB-1257. U.S. Department of State, 12 FAM 010, Scope and Authority, including public diplomatic-security definitions, CT:DS-439, 23 April 2025. Status at the 14 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0010.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 4 times in this edition.]

MB-1258. U.S. Department of State, 12 FAM 010, sec. 013.

MB-1259. U.S. Department of State, 12 FAM 310.

MB-1260. U.S. Department of State, 12 FAM 510, Safeguarding Classified Information, public web text current at source freeze. Status at the 14 August 2026 source freeze: Current public policy text. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0510.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 6 times in this edition.]

MB-1261. U.S. Department of State, 12 FAM 510, Safeguarding Classified Information, public web text current at source freeze. Status at the 14 August 2026 source freeze: Current public text. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0510.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 5 times in this edition.]

MB-1262. U.S. Department of State, 12 FAM 710, cited sections. [Cited 7 times in this edition.]

MB-1263. U.S. Department of State, 12 FAM 710, Security Policy for Sensitive Compartmented Information, CT:DS-419, 28 September 2023. Status at the 14 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0710.html>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 5 times in this edition.]

MB-1264. U.S. Department of State, Bureau of Overseas Buildings Operations, Overseas Buildings Operations Project Portfolio. Identifier: OBO public project portfolio. Status at the 16 August 2026 source freeze: Current public website at source freeze. Public locator: <https://oboportfolio.state.gov/>. Technical role in this crosswalk: Official public

programme source. Limitation: Public programme descriptions and project summaries only. No controlled facility details are inferred.

MB-1265. U.S. Department of State, Bureau of Overseas Buildings Operations, Overseas Buildings Operations Project Portfolio. Identifier: OBO public project portfolio. Status at the 16 August 2026 source freeze: Current public website at source freeze. Public locator: <https://oboportfolio.state.gov/>. Technical role in this crosswalk: Official public programme source. Limitation: Public programme descriptions and project summaries only. No controlled facility details are inferred.; Ministry of Housing, Communities and Local Government, Access to and Use of Buildings Other Than Dwellings. Identifier: Approved Document M, Volume 2. Status at the 16 August 2026 source freeze: Current statutory guidance page at source freeze; jurisdiction requires project confirmation. Public locator: <https://www.gov.uk/government/publications/access-to-and-use-of-buildings-approved-document-m>. Technical role in this crosswalk: Primary governmental statutory guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; National Protective Security Authority, Secure Rooms. Identifier: Secure Rooms. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.npsa.gov.uk/building-protection/building-services-internal-spaces/secure-rooms>. Technical role in this crosswalk: Primary governmental protective-security guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; National Research Council Canada, Codes Canada, National Model Codes and public code-development information. Status at the 16 August 2026 source freeze: Current public code information at source freeze. Public locator: <https://nrc.canada.ca/en/certifications-evaluations-standards/codes-canada>. Technical role in this crosswalk: Building, fire, plumbing and energy-code interfaces. Limitation: Model codes require provincial or territorial adoption and do not establish acoustic-security approval.

MB-1266. U.S. Department of State, Bureau of Overseas Buildings Operations, Overseas Buildings Operations Project Portfolio. Identifier: OBO public project portfolio. Status at the 16 August 2026 source freeze: Current public website at source freeze. Public locator: <https://oboportfolio.state.gov/>. Technical role in this crosswalk: Official public programme source. Limitation: Public programme descriptions and project summaries only. No controlled facility details are inferred.; U.S. General Services Administration, Facilities standards for the Public Buildings Service. Identifier: 2025 PBS Core Building Standards and 2024 P100 reference materials. Status at the 16 August 2026 source freeze: Current standards page at source freeze; project applicability must be

confirmed. Public locator: <https://www.gsa.gov/real-estate/facilities-standards-for-the-public-buildings-service>. Technical role in this crosswalk: Primary governmental facilities standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; National Protective Security Authority, Secure Working Areas. Identifier: Secure Working Areas. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.npsa.gov.uk/secure-working-areas>. Technical role in this crosswalk: Primary governmental protective-security guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Public Services and Procurement Canada, Contract Security Program, Work site security requirements. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-requirements.html>. Technical role in this crosswalk: Document safeguarding capability, inspections, access control, plans and corrective measures. Limitation: The page describes public process. Site-specific inspection requirements and recommendations remain controlled by the programme.

MB-1267. U.S. Department of State, Bureau of Overseas Buildings Operations, Public mission and project-delivery information, current public web material. Status at the 14 August 2026 source freeze: Public source. Public locator: <https://www.state.gov/bureaus-offices/under-secretary-for-management/bureau-of-overseas-buildings-operations/>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 4 times in this edition.]

MB-1268. U.S. Department of State, Construction Security Certification Program. Identifier: 12 FAM 360. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/12fam/12fam0360.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Establishes public certification processes and applicability. Project-specific memoranda, risk findings and controlled criteria remain outside this chapter.

MB-1269. U.S. Department of State, Construction Security Certification Program. Identifier: 12 FAM 360. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/12fam/12fam0360.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Establishes public certification processes and applicability. Project-specific memoranda, risk findings and

controlled criteria remain outside this chapter.; Office of the Director of National Intelligence, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities. Identifier: Version 1.5.1. Status at the 16 August 2026 source freeze: Latest approved public release displayed by ODNI at source freeze. Public locator: <https://www.dni.gov/files/NCSC/documents/Regulations/Technical-Specifications-SCIF-V1.5.1.pdf>. Technical role in this crosswalk: Primary governmental technical specification. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; FCDO Services, UK NACE, Construction Security. Identifier: Construction Security. Status at the 16 August 2026 source freeze: Current official public description. Public locator: <https://www.fcdoservices.gov.uk/uk-nace/uk-nace-operations/construction-security/>. Technical role in this crosswalk: Primary governmental construction-security service description. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Public Services and Procurement Canada, Contract Security Program, Work site security requirements. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-requirements.html>. Technical role in this crosswalk: Document safeguarding capability, inspections, access control, plans and corrective measures. Limitation: The page describes public process. Site-specific inspection requirements and recommendations remain controlled by the programme.

MB-1270. U.S. Department of State, Construction Security Certification Program. Identifier: 12 FAM 360. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/12fam/12fam0360.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Establishes public certification processes and applicability. Project-specific memoranda, risk findings and controlled criteria remain outside this chapter.; U.S. Department of State, Department of State Facility Accreditation Program. Identifier: 12 FAM 390. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0390.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Public governance language does not permit an engineer to grant accreditation or infer controlled criteria.; Office of the Director of National Intelligence, Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information Facilities. Identifier: ICS 705-02. Status at the 16 August 2026 source freeze: Public standard listed by ODNI at source freeze. Public

locator: <https://www.dni.gov/files/documents/ICD/ICS-705-2.pdf>. Technical role in this crosswalk: Primary governmental standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role in this crosswalk: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public.

MB-1271. U.S. Department of State, Construction Security Standards, Procurement, and Transit Security of Construction Materials. Identifier: 12 FAM 350. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/12fam/12fam0350.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Describes roles and public processes. It does not reproduce the controlled technical standards referenced in 12 FAH-6. [Cited 2 times in this edition.]

MB-1272. U.S. Department of State, Construction Security Standards, Procurement, and Transit Security of Construction Materials. Identifier: 12 FAM 350. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/12fam/12fam0350.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Describes roles and public processes. It does not reproduce the controlled technical standards referenced in 12 FAH-6.; Office of the Director of National Intelligence, Sensitive Compartmented Information Facilities. Identifier: ICD 705. Status at the 16 August 2026 source freeze: Public directive listed by ODNI at source freeze. Public locator: <https://www.dni.gov/index.php/what-we-do/ic-related-menus/ic-related-links/intelligence-community-directives>. Technical role in this crosswalk: Primary governmental policy. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; Cabinet Office, Government Functional Standard: Security. Identifier: GovS 007, Version 2.0. Status at the 16 August 2026 source freeze: Current public functional standard at source freeze. Public locator: <https://www.gov.uk/government/publications/government-functional-standard-govs-007-security>. Technical role in this crosswalk: Primary governmental standard. Limitation: Use is confined to the public source scope. The cited material does not by

itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Treasury Board of Canada Secretariat, Directive on Security Management. Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role in this crosswalk: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions.

MB-1273. U.S. Department of State, Construction Security Standards, Procurement, and Transit Security of Construction Materials. Identifier: 12 FAM 350. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/12fam/12fam0350.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Describes roles and public processes. It does not reproduce the controlled technical standards referenced in 12 FAH-6.; U.S. Department of Defense / Whole Building Design Guide, SCIF/SAPF Planning, Design, and Construction. Identifier: UFC 4-010-05. Status at the 16 August 2026 source freeze: Active at source freeze. Public locator: <https://www.wbdg.org/dod/ufc/ufc-4-010-05>. Technical role in this crosswalk: Primary governmental facilities criterion. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; FCDO Services, UK NACE, Construction Security. Identifier: Construction Security. Status at the 16 August 2026 source freeze: Current official public description. Public locator: <https://www.fcdoservices.gov.uk/uk-nace/uk-nace-operations/construction-security/>. Technical role in this crosswalk: Primary governmental construction-security service description. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Public Services and Procurement Canada, Contract Security Program, Work site security requirements. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-requirements.html>. Technical role in this crosswalk: Document safeguarding capability, inspections, access control, plans and corrective measures. Limitation: The page describes public process. Site-specific inspection requirements and recommendations remain controlled by the programme.

MB-1274. U.S. Department of State, Construction Security Standards, Procurement, and Transit Security of Construction Materials. Identifier: 12 FAM 350. Status at the 16

August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/12fam/12fam0350.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Describes roles and public processes. It does not reproduce the controlled technical standards referenced in 12 FAH-6.; U.S. Department of Defense / Whole Building Design Guide, SCIF/SAPF Planning, Design, and Construction. Identifier: UFC 4-010-05. Status at the 16 August 2026 source freeze: Active at source freeze. Public locator: <https://www.wbdg.org/dod/ufc/ufc-4-010-05>. Technical role in this crosswalk: Primary governmental facilities criterion. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; Ministry of Housing, Communities and Local Government, Fire Safety in Buildings Other Than Dwellings. Identifier: Approved Document B, Volume 2. Status at the 16 August 2026 source freeze: Current statutory guidance page at source freeze; jurisdiction and transition require project confirmation. Public locator: <https://www.gov.uk/government/publications/fire-safety-approved-document-b>. Technical role in this crosswalk: Primary governmental statutory guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; National Research Council Canada, Codes Canada, National Model Codes and public code-development information. Status at the 16 August 2026 source freeze: Current public code information at source freeze. Public locator: <https://nrc.canada.ca/en/certifications-evaluations-standards/codes-canada>. Technical role in this crosswalk: Building, fire, plumbing and energy-code interfaces. Limitation: Model codes require provincial or territorial adoption and do not establish acoustic-security approval.

MB-1275. U.S. Department of State, Construction Security Standards, Procurement, and Transit Security of Construction Materials. Identifier: 12 FAM 350. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/12fam/12fam0350.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Describes roles and public processes. It does not reproduce the controlled technical standards referenced in 12 FAH-6.; U.S. Department of Defense / Whole Building Design Guide, SCIF/SAPF Planning, Design, and Construction. Identifier: UFC 4-010-05. Status at the 16 August 2026 source freeze: Active at source freeze. Public locator: <https://www.wbdg.org/dod/ufc/ufc-4-010-05>. Technical role in this crosswalk: Primary governmental facilities criterion. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval

thresholds are not reconstructed.; National Protective Security Authority, Security risk management, Operational Requirement and project-lifecycle guidance. Identifier: Build it Secure. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.npsa.gov.uk/security-best-practices/build-it-secure>. Technical role in this crosswalk: Primary governmental protective-security guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Public Services and Procurement Canada, Contract Security Program, Work site security requirements. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/safeguarding-equipment-sites-assets-information/work-site-security-requirements.html>. Technical role in this crosswalk: Document safeguarding capability, inspections, access control, plans and corrective measures. Limitation: The page describes public process. Site-specific inspection requirements and recommendations remain controlled by the programme.

MB-1276. U.S. Department of State, Construction Security Standards, Procurement, and Transit Security of Construction Materials. Identifier: 12 FAM 350. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/12fam/12fam0350.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Describes roles and public processes. It does not reproduce the controlled technical standards referenced in 12 FAH-6.; U.S. Department of State, Construction Security Certification Program. Identifier: 12 FAM 360. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/12fam/12fam0360.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Establishes public certification processes and applicability. Project-specific memoranda, risk findings and controlled criteria remain outside this chapter.; Office of the Director of National Intelligence, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities. Identifier: Version 1.5.1. Status at the 16 August 2026 source freeze: Latest approved public release displayed by ODNI at source freeze. Public locator: <https://www.dni.gov/files/NCSC/documents/Regulations/Technical-Specifications-SCIF-V1.5.1.pdf>. Technical role in this crosswalk: Primary governmental technical specification. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; FCDO Services, UK NACE, Construction Security. Identifier: Construction Security. Status at the 16 August 2026 source freeze: Current official public description. Public locator:

<https://www.fcdoservices.gov.uk/uk-nace/uk-nace-operations/construction-security/>. Technical role in this crosswalk: Primary governmental construction-security service description. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.

MB-1277. U.S. Department of State, Department of State Facility Accreditation Program.

Identifier: 12 FAM 390. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0390.html>.

Technical role in this crosswalk: Primary governmental authority. Limitation: Public governance language does not permit an engineer to grant accreditation or infer controlled criteria.; Office of the Director of National Intelligence, Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information Facilities.

Identifier: ICS 705-02. Status at the 16 August 2026 source freeze: Public standard listed by ODNI at source freeze. Public locator:

<https://www.dni.gov/files/documents/ICD/ICS-705-2.pdf>. Technical role in this crosswalk: Primary governmental standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.;

Cabinet Office, Government Functional Standard: Security. Identifier: GovS 007, Version 2.0. Status at the 16 August 2026 source freeze: Current public functional standard at source freeze. Public locator:

<https://www.gov.uk/government/publications/government-functional-standard-govs-007-security>. Technical role in this crosswalk: Primary governmental standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.;

Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>.

Technical role in this crosswalk: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public.

MB-1278. U.S. Department of State, Department of State Facility Accreditation Program.

Identifier: 12 FAM 390. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0390.html>.

Technical role in this crosswalk: Primary governmental authority. Limitation: Public

governance language does not permit an engineer to grant accreditation or infer controlled criteria.; Office of the Director of National Intelligence, Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information Facilities. Identifier: ICS 705-02. Status at the 16 August 2026 source freeze: Public standard listed by ODNI at source freeze. Public locator:

<https://www.dni.gov/files/documents/ICD/ICS-705-2.pdf>. Technical role in this crosswalk: Primary governmental standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not

reconstructed.; Cabinet Office, Government Functional Standard: Security. Identifier: GovS 007, Version 2.0. Status at the 16 August 2026 source freeze: Current public functional standard at source freeze. Public locator:

<https://www.gov.uk/government/publications/government-functional-standard-govs-007-security>. Technical role in this crosswalk: Primary governmental standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Treasury Board of Canada Secretariat, Policy on Government Security. Identifier: Policy instrument 16578. Status at the 16 August 2026 source freeze: Current; amended effective 6 January 2025. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=16578>. Technical role in this crosswalk: Government-wide security governance, accountability and lifecycle protection. Limitation: High-level policy. It does not disclose project-specific acoustic, EMSEC or specialised-facility criteria.

MB-1279. U.S. Department of State, Department of State Facility Accreditation Program.

Identifier: 12 FAM 390. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0390.html>.

Technical role in this crosswalk: Primary governmental authority. Limitation: Public governance language does not permit an engineer to grant accreditation or infer controlled criteria.; Office of the Director of National Intelligence, Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information Facilities. Identifier: ICS 705-02. Status at the 16 August 2026 source freeze: Public standard listed by ODNI at source freeze. Public locator:

<https://www.dni.gov/files/documents/ICD/ICS-705-2.pdf>. Technical role in this crosswalk: Primary governmental standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; FCDO Services, UK National Authority for Counter-Eavesdropping, The UK National Authority for Counter-Eavesdropping. Identifier: UK NACE. Status at the 16

August 2026 source freeze: Current official public description. Public locator: <https://www.fcdoservices.gov.uk/uk-nace/>. Technical role in this crosswalk: Primary governmental technical-security authority description. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role in this crosswalk: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public. [Cited 2 times in this edition.]

MB-1280. U.S. Department of State, Department of State Facility Accreditation Program. Identifier: 12 FAM 390. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0390.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Public governance language does not permit an engineer to grant accreditation or infer controlled criteria.; Office of the Director of National Intelligence, Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information Facilities. Identifier: ICS 705-02. Status at the 16 August 2026 source freeze: Public standard listed by ODNI at source freeze. Public locator: <https://www.dni.gov/files/documents/ICD/ICS-705-2.pdf>. Technical role in this crosswalk: Primary governmental standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; National Protective Security Authority, Security-Minded Approach to Information Management. Identifier: Security-Minded Approach to Information Management. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.npsa.gov.uk/security-best-practices/build-it-secure/security-minded-approach-information-management>. Technical role in this crosswalk: Primary governmental information-security guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Treasury Board of Canada Secretariat, Policy on Government Security. Identifier: Policy instrument 16578. Status at the 16 August 2026 source freeze: Current; amended effective 6 January 2025. Public locator:

<https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=16578>. Technical role in this crosswalk: Government-wide security governance, accountability and lifecycle protection. Limitation: High-level policy. It does not disclose project-specific acoustic, EMSEC or specialised-facility criteria.

MB-1281. U.S. Department of State, Facility Operations. Identifier: 15 FAM 620. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/15fam/15fam0620.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: General operations policy does not establish technical-security status for a specialised room.

MB-1282. U.S. Department of State, Facility Operations. Identifier: 15 FAM 620. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/fam/15fam/15fam0620.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: General operations policy does not establish technical-security status for a specialised room.; Cabinet Office, Government Functional Standard: Security. Identifier: GovS 007, Version 2.0. Status at the 16 August 2026 source freeze: Current public functional standard at source freeze. Public locator: <https://www.gov.uk/government/publications/government-functional-standard-govs-007-security>. Technical role in this crosswalk: Primary governmental standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Treasury Board of Canada Secretariat, Directive on Security Management. Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role in this crosswalk: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions.; Office of the Director of National Intelligence, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities. Identifier: Version 1.5.1. Status at the 16 August 2026 source freeze: Latest approved public release displayed by ODNI at source freeze. Public locator: <https://www.dni.gov/files/NCSC/documents/Regulations/Technical-Specifications-SCIF-V1.5.1.pdf>. Technical role in this crosswalk: Primary governmental technical specification. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1283. U.S. Department of State, Facility Operations. Identifier: 15 FAM 620. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator:

<https://fam.state.gov/fam/15fam/15fam0620.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: General operations policy does not establish technical-security status for a specialised room.; Office of the Director of National Intelligence, Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information Facilities. Identifier: ICS 705-02. Status at the 16 August 2026 source freeze: Public standard listed by ODNI at source freeze. Public locator: <https://www.dni.gov/files/documents/ICD/ICS-705-2.pdf>. Technical role in this crosswalk: Primary governmental standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; National Protective Security Authority, Secure Working Areas. Identifier: Secure Working Areas. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.npsa.gov.uk/secure-working-areas>. Technical role in this crosswalk: Primary governmental protective-security guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Treasury Board of Canada Secretariat, Directive on Security Management. Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role in this crosswalk: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions.

MB-1284. U.S. Department of State, ODNI, NPSA, NCSC, FCDO Services, Treasury Board of Canada, RCMP, CSE and PSPC public sources from Chapters 28-32, used to preserve authority and public-source boundaries in procurement documents. [Cited 2 times in this edition.]

MB-1285. U.S. Department of State, Office of Inspector General, Review of the Department of State Physical Security Waivers and Exceptions Process. Identifier: ISP-I-24-19. Status at the 16 August 2026 source freeze: Official public oversight report. Public locator: https://www.stateoig.gov/uploads/report/report_pdf_file/isp-i-24-19.pdf. Technical role in this crosswalk: Primary governmental oversight. Limitation: Supports governance analysis without publishing controlled vulnerabilities or authorising a project disposition.

MB-1286. U.S. Department of State, Office of Inspector General, Review of the Department of State Physical Security Waivers and Exceptions Process. Identifier: ISP-I-24-19. Status at the 16 August 2026 source freeze: Official public oversight report. Public locator:

https://www.stateoig.gov/uploads/report/report_pdf_file/isp-i-24-19.pdf. Technical role in this crosswalk: Primary governmental oversight. Limitation: Supports governance analysis without publishing controlled vulnerabilities or authorising a project disposition.; Office of the Director of National Intelligence, Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information Facilities. Identifier: ICS 705-02. Status at the 16 August 2026 source freeze: Public standard listed by ODNI at source freeze. Public locator:

<https://www.dni.gov/files/documents/ICD/ICS-705-2.pdf>. Technical role in this crosswalk: Primary governmental standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; Cabinet Office, Government Functional Standard: Security. Identifier: GovS 007, Version 2.0. Status at the 16 August 2026 source freeze: Current public functional standard at source freeze. Public locator:

<https://www.gov.uk/government/publications/government-functional-standard-govs-007-security>. Technical role in this crosswalk: Primary governmental standard. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Treasury Board of Canada Secretariat, Directive on Security Management. Identifier: Policy instrument 32611. Status at the 16 August 2026 source freeze: Current public directive and mandatory procedures. Public locator: <https://www.tbs-sct.canada.ca/pol/doc-eng.aspx?id=32611>. Technical role in this crosswalk: Departmental security management, physical security, information protection, contracting and event management. Limitation: Departmental implementation and project-specific control selection remain authority decisions.

MB-1287. U.S. Department of State, Physical Security of Facilities Abroad. Identifier: 12 FAM 310. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0310.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Public policy and responsibility framework. Detailed OSPB and handbook criteria may be controlled or nonpublic.

MB-1288. U.S. Department of State, Physical Security of Facilities Abroad. Identifier: 12 FAM 310. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0310.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Public policy and responsibility framework. Detailed OSPB and handbook criteria may be controlled or nonpublic.; Defense Counterintelligence and Security Agency / eCFR, National Industrial Security Program Operating Manual Rule. Identifier: 32 CFR Part 117. Status at the 16 August 2026 source freeze: Current federal rule and DCSA implementation

guidance. Public locator: <https://www.dcsa.mil/Industrial-Security/National-Industrial-Security-Program-Oversight/32-CFR-Part-117-NISPOM-Rule/ddd/>. Technical role in this crosswalk: Primary federal regulation and official implementation guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; Cabinet Office, Protecting Government Assets. Identifier: Security Policy Framework. Status at the 16 August 2026 source freeze: Current public policy framework at source freeze. Public locator: <https://www.gov.uk/government/publications/security-policy-framework/hmg-security-policy-framework>. Technical role in this crosswalk: Primary governmental policy. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role in this crosswalk: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public.

MB-1289. U.S. Department of State, Physical Security of Facilities Abroad. Identifier: 12 FAM 310. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0310.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Public policy and responsibility framework. Detailed OSPB and handbook criteria may be controlled or nonpublic.; Office of the Director of National Intelligence, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities. Identifier: Version 1.5.1. Status at the 16 August 2026 source freeze: Latest approved public release displayed by ODNI at source freeze. Public locator: <https://www.dni.gov/files/NCSC/documents/Regulations/Technical-Specifications-SCIF-V1.5.1.pdf>. Technical role in this crosswalk: Primary governmental technical specification. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; National Protective Security Authority, Secure Working Areas. Identifier: Secure Working Areas. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.npsa.gov.uk/secure-working-areas>. Technical role in this crosswalk:

Primary governmental protective-security guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use.

Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Royal Canadian Mounted Police, Guide to the Application of Physical Security Zones. Identifier: GCPSPG-015 (2024). Status at the 16 August 2026 source freeze: Current public guide; effective 1 July 2024. Public locator: <https://www.rcmp-grc.gc.ca/en/security-information/guide-application-physical-security-zones-gcpsg-015-2024>. Technical role in this crosswalk: Five-zone physical-security architecture and risk-based application. Limitation: Zoning is not an acoustic rating, EMSEC evaluation or specialised-facility accreditation.

MB-1290. U.S. Department of State, Physical Security of Facilities Abroad. Identifier: 12 FAM 310. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0310.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Public policy and responsibility framework. Detailed OSPB and handbook criteria may be controlled or nonpublic.; U.S. Department of Defense / Whole Building Design Guide, SCIF/SAPF Planning, Design, and Construction. Identifier: UFC 4-010-05. Status at the 16 August 2026 source freeze: Active at source freeze. Public locator: <https://www.wbdg.org/dod/ufc/ufc-4-010-05>. Technical role in this crosswalk: Primary governmental facilities criterion. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; National Protective Security Authority, Secure Rooms. Identifier: Secure Rooms. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.npsa.gov.uk/building-protection/building-services-internal-spaces/secure-rooms>. Technical role in this crosswalk: Primary governmental protective-security guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role in this crosswalk: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public.

MB-1291. U.S. Department of State, Public definitions and descriptions of Acoustic Conference Room, Treated Conference Room and Modular Treated Conference Room, public terminology current at source freeze. Status at the 14 August 2026 source freeze: Public source. Public locator: <https://fam.state.gov/>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 4 times in this edition.]

MB-1292. U.S. Department of State, Public diplomatic-security and facility-security programme descriptions, current public web material. Status at the 14 August 2026 source freeze: Public source. Public locator: <https://www.state.gov/bureaus-offices/under-secretary-for-management/bureau-of-diplomatic-security/>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 3 times in this edition.]

MB-1293. U.S. Department of State, Scope and Authority, including Definitions of Diplomatic Security Terms. Identifier: 12 FAM 010. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0010.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Defines public terminology and authority. It does not disclose controlled room criteria or approve a project.; Office of the Director of National Intelligence, Sensitive Compartmented Information Facilities. Identifier: ICD 705. Status at the 16 August 2026 source freeze: Public directive listed by ODNI at source freeze. Public locator: <https://www.dni.gov/index.php/what-we-do/ic-related-menus/ic-related-links/intelligence-community-directives>. Technical role in this crosswalk: Primary governmental policy. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; National Protective Security Authority, Secure Working Areas. Identifier: Secure Working Areas. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator: <https://www.npsa.gov.uk/secure-working-areas>. Technical role in this crosswalk: Primary governmental protective-security guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Public Services and Procurement Canada, Contract Security Program, Contract Security Manual. Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze: Current public manual at source freeze. Public locator: <https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role in this crosswalk: Industrial-security governance, safeguarding, specialised secure facilities, visits and

communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public. [Cited 3 times in this edition.]

MB-1294. U.S. Department of State, Scope and Authority, including Definitions of Diplomatic Security Terms. Identifier: 12 FAM 010. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0010.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Defines public terminology and authority. It does not disclose controlled room criteria or approve a project.; Office of the Director of National Intelligence, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities. Identifier: Version 1.5.1. Status at the 16 August 2026 source freeze: Latest approved public release displayed by ODNI at source freeze. Public locator: <https://www.dni.gov/files/NCSC/documents/Regulations/Technical-Specifications-SCIF-V1.5.1.pdf>. Technical role in this crosswalk: Primary governmental technical specification. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; National Cyber Security Centre, TEMPEST and Electromagnetic Security. Identifier: TEMPEST and Electromagnetic Security. Status at the 16 August 2026 source freeze: Current official public service description. Public locator: <https://www.ncsc.gov.uk/information/tempest-and-electromagnetic-security>. Technical role in this crosswalk: Primary governmental electromagnetic-security guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Canadian Centre for Cyber Security, Emission Security Guidance. Identifier: ITSG-11A. Status at the 16 August 2026 source freeze: Protected publication; superseded ITSG-11 in March 2025. Public locator: <https://www.cyber.gc.ca/en/guidance/emission-security-emsec-guidance-itsg-11a>. Technical role in this crosswalk: Authoritative protected EMSEC guidance under the Chief, CSE. Limitation: Only the public existence, status and access route are used. Protected criteria are not reconstructed.

MB-1295. U.S. Department of State, Scope and Authority, including Definitions of Diplomatic Security Terms. Identifier: 12 FAM 010. Status at the 16 August 2026 source freeze: Current public text at source freeze. Public locator: <https://fam.state.gov/FAM/12FAM/12FAM0010.html>. Technical role in this crosswalk: Primary governmental authority. Limitation: Defines public terminology and authority. It does not disclose controlled room criteria or approve a project.; Office of the Director of National Intelligence, Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities. Identifier: Version 1.5.1. Status at the

16 August 2026 source freeze: Latest approved public release displayed by ODNI at source freeze. Public locator:

<https://www.dni.gov/files/NCSC/documents/Regulations/Technical-Specifications-SCIF-V1.5.1.pdf>. Technical role in this crosswalk: Primary governmental technical

specification. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.; National Protective Security Authority, Secure Rooms. Identifier: Secure Rooms. Status at the 16 August 2026 source freeze: Current public guidance at source freeze. Public locator:

<https://www.npsa.gov.uk/building-protection/building-services-internal-spaces/secure-rooms>. Technical role in this crosswalk: Primary governmental protective-security guidance. Limitation: Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular United Kingdom facility, room, system or operating use. Protected criteria, project-specific threat information and controlled technical thresholds are not reconstructed.; Public Services and Procurement Canada, Contract Security Program, Contract Security Manual.

Identifier: Effective 13 August 2020. Status at the 16 August 2026 source freeze:

Current public manual at source freeze. Public locator:

<https://www.canada.ca/en/public-services-procurement/services/industrial-security/security-requirements-contracting/contract-security-manual-contracting-government-canada/contract-security-manual.html>. Technical role in this crosswalk: Industrial-security governance, safeguarding, specialised secure facilities, visits and communications. Limitation: Specialised facility criteria and accreditation evidence are not fully public.

MB-1296. U.S. Department of State, "1 FAM 262.1-2(A)(1), Emanations Countermeasures Branch," CT:ORG-604, 9 June 2022, accessed 10 August 2026, <https://fam.state.gov/FAM/01FAM/01FAM0260.html>.

MB-1297. U.S. Department of State, "12 FAM 010, Scope and Authority," section 013, Definitions of Diplomatic Security Terms, CT:DS-439, 23 April 2025, accessed 10 August 2026, <https://fam.state.gov/FAM/12FAM/12FAM0010.html>.

MB-1298. U.S. Department of State, "12 FAM 010," definitions of Acoustic Conference Room, Modular Treated Conference Room, Secure Room, and Treated Conference Room, CT:DS-439, 23 April 2025.

MB-1299. U.S. Department of State, "12 FAM 310, Physical Security of Facilities Abroad," CT:DS-452, 14 November 2025, accessed 10 August 2026, <https://fam.state.gov/FAM/12FAM/12FAM0310.html>.

MB-1300. U.S. Department of State, "12 FAM 710, Security Policy for Sensitive Compartmented Information," CT:DS-419, 28 September 2023, especially sections

713.4-2, 715.1, 715.4, 715.4-2, 717 and 718, accessed 10 August 2026, <https://fam.state.gov/FAM/12FAM/12FAM0710.html>.

MB-1301. U.S. General Services Administration, 2025 PBS Core Building Standards and 2024 P100 reference materials, Facilities standards for the Public Buildings Service (2025 standards; page updated 3 February 2026); U.S. General Services Administration, 1000.3A OMA, Responsibilities for Implementation of Facility Security Assessment Countermeasures (23 June 2026); Cybersecurity and Infrastructure Security Agency, Interagency Security Committee, Risk Management Process for Federal Facilities, Federal facility security risk-management policies and standards (Current public programme page at source freeze); Office of the Director of National Intelligence, ICS 705-02, Standards for the Accreditation and Reciprocal Use of Sensitive Compartmented Information Facilities (22 December 2016). Status verified against the official public sources on 16 August 2026. Use is confined to the public source scope. The cited material does not by itself approve, accredit, certify or authorise a particular facility, room, system or operating use. Controlled criteria, project-specific threat information and protected approval thresholds are not reconstructed.

MB-1302. UK Government, Approved Document E: Resistance to the Passage of Sound, published 4 March 2015, <https://www.gov.uk/government/publications/resistance-to-sound-approved-document-e>.

MB-1303. UK Government, Government Functional Standard GovS 007: Security, public edition current at source freeze. Status at the 14 August 2026 source freeze: Current public standard. Public locator: <https://www.gov.uk/government/publications/government-functional-standard-govs-007-security>. Use is confined to the source scope. The document does not itself approve, accredit or authorise a secure room. [Cited 5 times in this edition.]

MB-1304. UL Solutions Code Authorities, "Can I Add Structural Wood Panels Like Plywood to a Wall Assembly?" accessed 11 August 2026.

MB-1305. UL Solutions Code Authorities, "If I Add an Additional Layer of Gypsum, or Increase the Thickness, Can I Achieve a Higher Fire Resistance Rating?" accessed 11 August 2026.

MB-1306. UL Solutions, Inspection Based Service Offerings, public firestop special-inspection programme information (available at 16 August 2026 source freeze). Public locator: <https://www.ul.com/services/inspection-based-service-offerings>. UL Solutions, Qualified Contractor Program, public firestop-contractor programme information (available at 16 August 2026 source freeze). Public locator: <https://www.ul.com/services/ul-solutions-qualified-contractor-program>. Qualification and inspection provide different evidence classes. Neither permits an installer or reviewer to depart from the applicable tested or evaluated configuration. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.

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Public locator: <https://www.pearson.com/>. The Joukowsky relation is used here as a one-dimensional screening equation. Elasticity, entrained gas, closure law, cavitation, friction, and network reflections can require a fuller transient model. Use is confined to the cited source scope. The cited material does not by itself certify, accredit, approve, or authorise a secure room.

APPENDIX AJ. MASTER SUBJECT INDEX AND CROSS-REFERENCE GUIDE

This cross-reference guide identifies stable chapter, Part, tome, and page ownership throughout the final paginated edition. Its verified locators are derived from the controlled manufacturing proofs and remain subordinate to the immutable release identifier and checksum manifest. The subject architecture is intentionally polyhierarchical because secure construction, acoustical propagation, metrology, forensic inference, institutional authority, and lifecycle control intersect rather than occupying isolated doctrinal compartments.

Main entry	Subentries and cross-references	Verified volume and page locators
acceptance	Governance; see related chapter treatment	V112, pp. 21, 26; V113, pp. 29, 46; V115, pp. 12, 30; V117, pp. 20, 22, 457-458; V118, pp. 173, 175
acceptance record	chapter glossary; see related chapter treatment	V112, pp. 61, 91; V113, pp. 210, 269; V115, pp. 75, 205; V117, pp. 22, 76, 641, 666; V118, p. 432
access control	listener access; construction surveillance; authority boundaries	V112, pp. 41-42, 117; V114, p. 90; V117, pp. 39, 44, 136-137, 581, 621; V118, pp. 206-207
accessible receiving position	chapter glossary; see related chapter treatment	V112, pp. 22, 55; V113, p. 234; V116, p. 327; V117, p. 209

Main entry	Subentries and cross-references	Verified volume and page locators
accreditation	four-proposition doctrine; authority to operate; lifecycle	V112, pp. 26, 28, 59, 61; V117, pp. 19, 26, 99-100; V118, pp. 92, 158, 173, 175
acoustic boundary	chapter glossary; see related chapter treatment	V112, pp. 45, 54; V113, pp. 19, 72; V115, pp. 12, 105; V117, pp. 548, 590; V118, pp. 209, 212
acoustic doors	frames; seals; thresholds; sound locks; maintenance	V115, pp. 13, 50; V117, pp. 570, 633, 729; V118, pp. 23, 169
acoustic intensity	measurement; leakage localisation; path ranking	V112, p. 136; V115, p. 239; V117, pp. 633, 729; V118, p. 169
acoustic path topology	chapter glossary; see related chapter treatment	V112, p. 57
acoustic security	system-level condition; speech consequence; lifecycle	V112, pp. 22-23, 58-59; V115, pp. 13-14, 82-83; V117, pp. 18-19, 99-100, 458-459, 545-546; V118, pp. 169-170
adverse state	System modelling; see related chapter treatment	V112, pp. 514, 524; V117, p. 794; V118, pp. 73, 169, 171
airborne path	Acoustics; see related chapter treatment	V112, pp. 205, 263; V113, pp. 32, 78; V116, pp. 136, 149; V117, p. 210; V118, pp. 11, 32, 405, 486

Main entry	Subentries and cross-references	Verified volume and page locators
airflow noise	HVAC self-noise; background; commissioning	V116, pp. 11, 276; V117, p. 633; V118, p. 169
apparent sound reduction index, r'	chapter glossary; see related chapter treatment	V112, p. 127
apparent sound transmission class, $astc$	chapter glossary; see related chapter treatment	V112, pp. 122, 127
apparent transmission loss	field measurement; flanking; limitations	V112, pp. 435, 496, 498, 566; V115, p. 239; V117, p. 633; V118, p. 217
applicability	chapter glossary; see related chapter treatment	V112, pp. 62-63; V113, pp. 261, 293; V115, pp. 143, 251; V117, pp. 34, 89, 475, 853; V118, pp. 194-195
applicability statement	chapter glossary; see related chapter treatment	V112, pp. 66, 92
as-built condition	chapter glossary; see related chapter treatment	V112, pp. 118, 127; V113, p. 314; V117, p. 330
as-built evidence	configuration; surveillance; closeout	V113, p. 234; V116, pp. 140, 264; V117, pp. 458, 545; V118, p. 229
as-built state	Configuration; see related chapter treatment	V113, p. 75; V117, p. 106; V118, pp. 88, 190, 405
as-designed condition	chapter glossary; see related chapter treatment	V112, p. 127
as-operated condition	chapter glossary; see related chapter treatment	V112, p. 127; V117, p. 817

Main entry	Subentries and cross-references	Verified volume and page locators
as-operated state	Configuration; see related chapter treatment	V112, pp. 117-118; V116, pp. 104, 217; V117, pp. 29, 111, 531, 648; V118, pp. 190-191
as-tested condition	chapter glossary; see related chapter treatment	V112, p. 127; V113, p. 213
as-tested state	Metrology; see related chapter treatment	V112, p. 118; V113, pp. 75, 178; V115, pp. 76, 96; V118, pp. 88, 190, 406
authority boundary	Governance; see related chapter treatment	V115, p. 134; V116, p. 203; V118, pp. 69, 257, 261
authority to operate	chapter glossary; see related chapter treatment	V112, pp. 26, 28; V117, pp. 261-262; V118, pp. 405, 473
background correction	Measurement; see related chapter treatment	V112, pp. 48, 52; V114, pp. 121, 265; V115, pp. 199, 322; V117, pp. 77, 153, 465, 499; V118, pp. 218, 306
background sound	masking; corrections; receiver state	V112, pp. 370, 379, 498, 509; V116, pp. 282-283; V117, pp. 633, 729; V118, pp. 216-217

Main entry	Subentries and cross-references	Verified volume and page locators
band result	Acoustics; see related chapter treatment	V112, pp. 39, 104; V114, pp. 43, 63; V115, pp. 101, 135; V117, pp. 132, 700; V118, pp. 406, 766
boundary continuity	Construction; see related chapter treatment	V113, p. 234; V114, p. 50; V117, p. 468; V118, pp. 406, 766
bridge	Construction; see related chapter treatment	V112, pp. 31, 44; V113, pp. 9, 28; V115, pp. 16, 31; V117, pp. 26-27, 502, 518; V118, pp. 169, 197
bridging	resilient systems; fasteners; services; temporary supports	V113, pp. 75, 78, 179, 184; V116, p. 89; V117, p. 561; V118, p. 169
calibration	instrumentation; traceability; uncertainty	V112, pp. 566, 568; V117, pp. 633, 636, 730-731; V118, pp. 182, 217
Canadian doctrine	physical security; EMSEC; specialised facilities	V117, pp. 344, 351; V118, p. 169
change control	materiality; configuration; recommissioning	V116, pp. 101, 109, 250, 296; V117, pp. 488-489, 554, 585; V118, pp. 169, 236

Main entry	Subentries and cross-references	Verified volume and page locators
change state	Lifecycle; see related chapter treatment	V112, pp. 338, 574; V116, pp. 10, 188; V117, p. 700; V118, pp. 169, 171
claim-to-source matrix	chapter glossary; see related chapter treatment	V112, pp. 64, 74; V113, p. 58; V117, p. 262
claim-to-source record	Scholarship; see related chapter treatment	V118, pp. 406, 768
coincidence	critical frequency; plate behaviour	V112, pp. 193-194, 429, 455; V113, pp. 14, 16; V114, pp. 172, 175; V118, pp. 197-198
commissioning	readiness; testing; baseline; deficiencies	V116, pp. 12, 14, 92, 95; V117, pp. 458, 466, 548, 554; V118, pp. 169, 180
composite boundary	Acoustics; see related chapter treatment	V112, p. 440; V118, pp. 88, 130, 206, 279
composite transmission	parallel paths; openings; area weighting	V115, pp. 13, 107-108, 154; V118, pp. 11, 169
concrete	cast-in-place; precast; tilt-up; structural continuity	V114, pp. 171-172, 254-255; V115, pp. 244, 273; V118, pp. 18, 21, 202-203
configuration baseline	Configuration; see related chapter treatment	V112, p. 57; V113, pp. 128, 170; V115, p. 136; V116, p. 215; V117, pp. 165, 174, 474, 613; V118, pp. 171, 173

Main entry	Subentries and cross-references	Verified volume and page locators
configuration control	chapter glossary; see related chapter treatment	V112, pp. 38, 56; V113, pp. 140, 222; V115, pp. 64, 125; V117, pp. 46, 61, 476, 514; V118, pp. 241, 349
configuration drift	chapter glossary; see related chapter treatment	V112, pp. 42, 57; V116, p. 75; V117, pp. 112, 163, 621-622; V118, pp. 471-472
consensus standard	chapter glossary; see related chapter treatment	V112, pp. 54, 60; V117, pp. 194, 262, 846; V118, pp. 54, 194, 241
construction hold points	concealed work; witness; evidence	V113, p. 234; V116, p. 89; V117, pp. 458, 545; V118, p. 169
construction surveillance	access; observation; evidence custody	V117, pp. 20, 24, 103, 106, 517, 545-546; V118, pp. 169, 198
controlled criterion	chapter glossary; see related chapter treatment	V112, pp. 21, 91; V116, p. 197; V117, pp. 34, 36, 463, 490
controlled documents	public-source boundary; authority; source status	V112, pp. 72, 94; V117, pp. 18, 99, 177, 259; V118, p. 242

Main entry	Subentries and cross-references	Verified volume and page locators
controlled intervention	Forensics; see related chapter treatment	V112, pp. 147, 208; V113, p. 287; V114, p. 71; V115, pp. 122, 241; V117, pp. 152, 233, 684, 755; V118, pp. 180-181
controlling authority	chapter glossary; see related chapter treatment	V112, p. 91; V117, pp. 47, 195
critical frequency	Structural acoustics; see related chapter treatment	V112, pp. 96, 196; V113, pp. 12, 16; V115, pp. 86, 88; V118, pp. 60, 280, 286
decision consequence	chapter glossary; see related chapter treatment	V112, pp. 99, 125; V115, p. 325; V116, p. 64; V118, p. 311
decision rule	Metrology; see related chapter treatment	V112, pp. 23, 50; V113, pp. 8, 216; V115, pp. 43, 50; V117, pp. 22, 26, 462, 465; V118, pp. 196-197
decision rules	uncertainty; guard bands; acceptance risk	V112, pp. 566, 571; V117, pp. 633, 657, 798, 821; V118, pp. 196-197
diagnostic measurement	Forensics; see related chapter treatment	V112, pp. 83, 91; V116, pp. 13, 59; V117, pp. 210, 537, 752; V118, pp. 407, 432
digital fixity	chapter glossary; see related chapter treatment	V112, pp. 88, 92

Main entry	Subentries and cross-references	Verified volume and page locators
direct path	chapter glossary; see related chapter treatment	V112, pp. 56, 210; V114, pp. 113, 119; V115, pp. 195, 227; V118, p. 459
dominant-path migration	Acoustics; see related chapter treatment	V117, pp. 810, 812; V118, pp. 250, 342
doors	see acoustic doors	V115, pp. 13, 15; V117, pp. 548, 555, 637, 639; V118, pp. 169, 173
ducts	cross-talk; silencers; breakout; common paths	V116, pp. 22, 40; V117, pp. 635, 645, 729; V118, pp. 17, 171-172
electrical conduits	communication paths; seals; cable growth	V113, p. 234; V116, pp. 89, 96; V117, pp. 545, 729; V118, p. 169
EMSEC	discipline boundaries; governmental doctrine	V116, p. 250; V117, pp. 18, 109, 134, 254; V118, p. 169
energetic path addition	chapter glossary; see related chapter treatment	V112, p. 57
evidence chain	Governance; see related chapter treatment	V112, pp. 143, 163; V113, pp. 46, 66; V116, pp. 312, 328; V117, pp. 36, 107, 509, 538; V118, pp. 176, 190
evidence class	chapter glossary; see related chapter treatment	V112, pp. 61, 78; V114, pp. 24, 51; V115, pp. 72, 83; V117, pp. 21, 89, 593, 628; V118, pp. 426, 432

Main entry	Subentries and cross-references	Verified volume and page locators
evidence expiry	chapter glossary; see related chapter treatment	V112, p. 128; V117, p. 533
evidence hierarchy	source fitness; propositions; authority	V112, pp. 58-59, 94; V117, pp. 18, 99, 177, 259, 729; V118, pp. 193, 196
expanded uncertainty	chapter glossary; see related chapter treatment	V112, pp. 52, 84; V113, pp. 214, 301; V115, pp. 34, 129; V117, pp. 79, 152, 484, 670; V118, pp. 222, 311
failure analysis	preservation; hypotheses; interventions; causation	V113, p. 234; V117, pp. 632, 729-730; V118, pp. 91, 233, 236
field measurement	room-to-room; facade; diagnostics; uncertainty	V112, pp. 433, 455, 499, 515; V115, pp. 251, 256; V117, pp. 633, 643, 853, 859; V118, p. 169
field performance	Measurement; see related chapter treatment	V112, pp. 34, 61; V113, pp. 20, 63; V115, pp. 50, 96; V117, pp. 30, 172, 558, 633; V118, pp. 173, 175
fire stopping	penetrations; life safety; acoustic continuity	V113, pp. 235, 270; V116, pp. 89, 100; V117, p. 545; V118, p. 169

Main entry	Subentries and cross-references	Verified volume and page locators
flanking path	Acoustics; see related chapter treatment	V112, pp. 23, 56; V113, pp. 8, 22; V115, pp. 163-164; V117, pp. 179, 206, 642, 655; V118, pp. 407, 416
flanking transmission	junctions; structure; services; networks	V112, pp. 208, 269, 291; V114, pp. 118, 171, 254; V115, pp. 195, 225, 248, 253; V117, p. 859; V118, p. 169
forensic engineering	preservation; causation; remediation; expert evidence	V113, p. 234; V117, pp. 545, 633, 851-852; V118, p. 169
formal acceptance	chapter glossary; see related chapter treatment	V112, pp. 115, 121; V113, pp. 149, 227; V115, pp. 12, 156; V117, pp. 112, 118, 483, 566; V118, pp. 173, 175
four-proposition model	chapter glossary; see related chapter treatment	V112, pp. 94, 116; V117, p. 635
glazing	panes; frames; mullions; secondary glazing; optical vibration	V115, pp. 82-83; V117, pp. 183-184, 548, 559, 639, 699; V118, pp. 205-206
governmental crosswalk	non-equivalence; jurisdiction; reciprocity	V117, pp. 18, 99, 177, 259; V118, p. 169

Main entry	Subentries and cross-references	Verified volume and page locators
granularity	chapter glossary; see related chapter treatment	V112, pp. 62-63; V117, pp. 404, 462, 573; V118, pp. 194-195
guard band	Metrology; see related chapter treatment	V112, pp. 52, 60; V115, pp. 34, 199; V117, pp. 77, 79, 657, 671; V118, pp. 222-223
gypsum board	mass; joints; layers; fire; workmanship	V113, pp. 9, 11, 74, 97; V118, pp. 21, 199, 201
historical source	chapter glossary; see related chapter treatment	V112, pp. 76, 87; V116, p. 197; V117, pp. 185, 191; V118, p. 258
hold point	Construction; see related chapter treatment	V112, pp. 212, 245; V113, pp. 53-54; V115, pp. 75-76; V117, pp. 31, 37, 482-483; V118, pp. 210, 225
HVAC	ducts; silencers; airflow; controls; maintenance	V116, pp. 11-12, 282, 285; V117, pp. 635, 637, 751, 764; V118, pp. 186, 190
information consequence	audibility; intelligibility; repetition; context	V112, pp. 22, 94, 345, 498; V116, p. 289; V117, pp. 834-835; V118, pp. 181-182
inspection	hold points; concealed work; lifecycle	V113, pp. 235, 237; V116, pp. 89-90; V117, pp. 462, 464, 545-546; V118, pp. 177, 179

Main entry	Subentries and cross-references	Verified volume and page locators
installed equivalence	Evidence; see related chapter treatment	V118, pp. 407, 773
intelligibility	speech privacy; metrics; listener conditions	V112, pp. 24-25, 348, 353; V116, pp. 284, 286; V117, pp. 656, 664, 777, 836; V118, pp. 182, 214
laboratory performance	Measurement; see related chapter treatment	V112, p. 208; V113, pp. 94, 230; V115, p. 108; V118, pp. 69, 71, 173, 407
laboratory specimen	chapter glossary; see related chapter treatment	V112, pp. 94-95; V113, pp. 66, 89; V115, pp. 14, 82; V117, pp. 535, 635; V118, pp. 175-176
laboratory testing	specimens; transmission loss; transfer limits	V112, pp. 234, 426; V113, pp. 9, 74, 147; V115, pp. 13, 115; V117, p. 633; V118, p. 169
listener access	receiver state; threat class; dwell	V112, pp. 36, 94, 547, 554; V117, pp. 22, 96, 100, 104; V118, pp. 169-170
listener domain	chapter glossary; see related chapter treatment	V112, p. 128
listener model	chapter glossary; see related chapter treatment	V112, pp. 36-37; V116, pp. 325, 327; V117, pp. 54, 201, 636; V118, p. 262

Main entry	Subentries and cross-references	Verified volume and page locators
manufacturer report	chapter glossary; see related chapter treatment	V112, pp. 77, 79; V113, p. 172; V117, pp. 513, 519; V118, pp. 258, 354
masking	background; operational control; availability	V112, pp. 501, 504; V116, pp. 276, 283; V117, pp. 634-635, 733-734; V118, pp. 179, 187
masking dependence	Operations; see related chapter treatment	V118, pp. 125, 252, 408
masonry	CMU; brick; grout; joints; linings	V114, pp. 18-19, 99-100; V115, p. 250; V118, pp. 27, 30, 202-203
mass-air-mass resonance	double leaves; cavity depth; framing	V112, pp. 199-200; V113, pp. 80, 83, 147; V118, pp. 23, 27, 197, 199
material change	Lifecycle; see related chapter treatment	V114, pp. 189, 220; V115, pp. 76, 201; V117, pp. 103, 107, 555, 821; V118, pp. 190, 238
maximum credible vocal effort	Source state; see related chapter treatment	V112, pp. 23, 603; V117, pp. 180-181; V118, pp. 16, 56, 183, 408

Main entry	Subentries and cross-references	Verified volume and page locators
maximum vocal effort	chapter glossary; see related chapter treatment	V112, pp. 25, 40; V114, pp. 120, 221; V117, pp. 217, 257; V118, pp. 182, 636
measurand	Metrology; see related chapter treatment	V112, pp. 51, 58; V114, pp. 22, 120; V115, pp. 217, 240; V117, pp. 34, 53, 465, 540; V118, pp. 175-176
measurement uncertainty	budgets; covariance; decision risk	V112, pp. 566-567; V117, pp. 657, 669, 729, 731; V118, pp. 222-223
metric crosswalk	chapter glossary; see related chapter treatment	V112, p. 128
microphones	arrays; calibration; positions; electronic capture	V112, pp. 159, 169, 504, 512; V116, pp. 204, 206; V117, pp. 633, 647, 774; V118, p. 255
mock-ups	first-of-type; interfaces; destructive verification	V113, pp. 9, 74, 147, 234; V116, pp. 104, 190; V117, pp. 473-474, 545, 561; V118, pp. 199, 201
narrow conclusion	chapter glossary; see related chapter treatment	V112, pp. 50, 125
noise isolation class, nic	chapter glossary; see related chapter treatment	V112, pp. 122, 127
non-equivalence doctrine	Comparative doctrine; see related chapter treatment	V118, pp. 408, 774

Main entry	Subentries and cross-references	Verified volume and page locators
nonconformance	classification; corrective action; closeout	V113, pp. 237, 277; V116, pp. 109, 112; V117, pp. 480-481, 545, 550; V118, pp. 192-193
normalised noise isolation class, nnic	chapter glossary; see related chapter treatment	V112, pp. 122, 127
normative provision	chapter glossary; see related chapter treatment	V112, p. 92
occupied speech performance	chapter glossary; see related chapter treatment	V112, pp. 94, 121; V114, p. 381; V115, p. 68; V118, p. 549
operating state	System modelling; see related chapter treatment	V112, pp. 23, 34; V113, pp. 213, 231; V115, pp. 43, 55; V117, pp. 21, 23, 483, 499; V118, pp. 171, 173
operational state	chapter glossary; see related chapter treatment	V112, pp. 39, 42; V113, pp. 122, 215; V115, pp. 46, 121; V117, pp. 32, 114, 653, 679; V118, pp. 230-231
optical vibrometry	glazing vibration; technical-security boundary	V112, p. 25; V115, p. 82; V117, pp. 177, 729; V118, p. 169
parallel path	chapter glossary; see related chapter treatment	V112, pp. 29-30; V113, pp. 41, 79; V115, pp. 110, 180; V117, pp. 152, 207, 746, 763; V118, pp. 415, 417
Part XII apparatus	forms; registers; synthesis; release controls	V118, p. 169

Main entry	Subentries and cross-references	Verified volume and page locators
path budget	Acoustics; see related chapter treatment	V112, pp. 152, 212; V116, pp. 63, 65; V117, pp. 463, 518; V118, pp. 180, 254
penetration register	Construction; see related chapter treatment	V112, pp. 245, 316; V113, pp. 48, 97; V115, pp. 200-201; V117, pp. 44, 106, 583, 589; V118, pp. 209-210
penetrations	services; sleeves; seals; registers	V113, pp. 234, 250; V115, pp. 154, 157; V116, pp. 94, 106; V117, pp. 554, 561, 759, 769; V118, pp. 198, 252
pinpoint citation	chapter glossary; see related chapter treatment	V112, pp. 75, 91; V113, p. 316; V118, p. 353
plumbing	pipes; drains; traps; supports; vibration	V116, pp. 89, 120; V117, pp. 545, 633, 729; V118, pp. 210, 213
power transmission coefficient, tau	chapter glossary; see related chapter treatment	V112, pp. 33, 127
primary source	chapter glossary; see related chapter treatment	V112, p. 92; V117, pp. 41, 353; V118, p. 194
proposition matrix	Evidence; see related chapter treatment	V116, p. 151; V118, pp. 173, 175
proposition-to-method matrix	chapter glossary; see related chapter treatment	V112, pp. 51, 57

Main entry	Subentries and cross-references	Verified volume and page locators
protected conversation	chapter glossary; see related chapter treatment	V112, pp. 20, 22; V115, pp. 239, 300; V117, pp. 42, 160; V118, p. 415
public-source boundaries	controlled criteria; citations; release	V112, pp. 58, 94; V117, pp. 18, 99, 177, 259, 828; V118, pp. 193, 196
public-source boundary	Scholarship; see related chapter treatment	V112, p. 92; V116, pp. 110, 225; V117, pp. 40, 94, 661; V118, pp. 241, 259
r_w	chapter glossary; see related chapter treatment	V112, pp. 20, 23; V113, pp. 10-11; V115, pp. 20, 25; V117, pp. 19, 30, 459, 466; V118, pp. 178, 186
receiver state	System modelling; see related chapter treatment	V112, p. 261; V115, pp. 307-308; V117, pp. 181, 326, 499, 543; V118, pp. 173, 175
receiving condition	chapter glossary; see related chapter treatment	V112, pp. 26, 36; V113, pp. 153-154; V115, pp. 201, 217; V117, pp. 176, 266, 465, 661; V118, pp. 188, 190
recommissioning	change; repair; degradation; incident	V116, pp. 171, 203, 268-269; V117, pp. 697, 699, 729, 818; V118, pp. 169, 229

Main entry	Subentries and cross-references	Verified volume and page locators
research lead	chapter glossary; see related chapter treatment	V112, pp. 66, 87
residual risk	uncertainty; limitations; authority disposition	V112, pp. 94, 566; V117, pp. 30, 82, 107, 114, 489, 548, 606, 672; V118, pp. 173, 178
resilient channels	clips; fasteners; bridging; loads	V113, pp. 147, 151, 234; V118, pp. 11, 197
reverberation time	room response; speech; masking; test	V112, pp. 351-352, 502, 519; V116, pp. 276-277; V117, pp. 634, 643; V118, pp. 214, 217
room data sheet	Design; see related chapter treatment	V112, p. 426; V116, pp. 103, 217; V117, pp. 29, 42, 458, 464; V118, pp. 333, 369
room data sheets	owner requirements; states; criteria	V112, pp. 22, 94; V117, pp. 458, 464; V118, p. 169
secure construction	continuous boundaries; surveillance; evidence	V112, pp. 22-23; V113, pp. 234-235; V114, pp. 18-19; V115, pp. 13-14, 82-83; V117, pp. 458- 459, 545-546; V118, pp. 169-170
security in depth	chapter glossary; see related chapter treatment	V112, pp. 45, 56

Main entry	Subentries and cross-references	Verified volume and page locators
single-number rating	Measurement; see related chapter treatment	V112, pp. 30, 56; V113, p. 309; V114, p. 64; V115, pp. 35, 89; V117, pp. 112, 466, 498; V118, pp. 250, 409
sound engineering	system design; services; testing; lifecycle	V112, pp. 133, 193, 264, 345; V115, pp. 13, 82, 154, 239; V117, pp. 633, 729; V118, pp. 11, 91, 270-271
sound masking	see masking	V112, p. 509; V116, pp. 276, 283; V117, pp. 633, 776-777; V118, pp. 49, 169
sound transmission class	STC; single-number ratings; limitations	V112, pp. 430, 496; V113, pp. 9, 74, 147, 234; V115, pp. 13, 82, 154, 239; V117, p. 633; V118, pp. 11, 169
sound transmission class, stc	chapter glossary; see related chapter treatment	V112, pp. 121, 128; V118, p. 777
source fitness	chapter glossary; see related chapter treatment	V112, pp. 62, 93; V118, pp. 195, 771
source state	System modelling; see related chapter treatment	V112, pp. 144, 165; V113, pp. 67, 214; V115, pp. 50, 84; V117, pp. 26, 29, 458, 461; V118, pp. 169, 173

Main entry	Subentries and cross-references	Verified volume and page locators
source states	speech; amplified audio; alarms; operating cases	V112, pp. 22, 94, 358, 360; V116, pp. 215, 217, 288, 296; V117, pp. 636, 648, 746; V118, pp. 181-182
source-conflict memorandum	chapter glossary; see related chapter treatment	V112, pp. 85-86
source-path-receiver model	chapter glossary; see related chapter treatment	V112, pp. 25, 46; V116, p. 85; V118, pp. 11, 499, 737
specimen crosswalk	chapter glossary; see related chapter treatment	V112, p. 93; V118, p. 251
speech audibility	chapter glossary; see related chapter treatment	V112, pp. 56, 108; V115, p. 214; V117, pp. 387, 449, 636
speech intelligibility	Speech security; see related chapter treatment	V112, pp. 25, 57; V114, p. 325; V115, p. 302; V116, p. 219; V117, pp. 139, 217, 664, 667; V118, pp. 409, 491
speech privacy	audibility; intelligibility; probability; limitations	V112, pp. 28, 36, 94, 108; V116, pp. 297, 327; V117, pp. 633-634; V118, p. 169
speech privacy room, spr	chapter glossary; see related chapter treatment	V112, p. 128
speech security	chapter glossary; see related chapter treatment	V112, pp. 51, 107; V113, pp. 20, 46; V115, pp. 13, 43; V117, pp. 30, 99, 458, 460; V118, pp. 173, 175

Main entry	Subentries and cross-references	Verified volume and page locators
standard uncertainty	chapter glossary; see related chapter treatment	V112, pp. 52, 92; V113, pp. 51, 214; V115, pp. 85, 112; V117, pp. 79, 153, 484, 671; V118, pp. 276, 295
standardised level difference, d_{nt}	chapter glossary; see related chapter treatment	V112, p. 128
state vector	System modelling; see related chapter treatment	V118, pp. 169, 171
stone	historic construction; conservation; voids; moisture	V114, pp. 330-331; V115, p. 239; V118, pp. 33-34, 184, 201
structural isolation	mobility; transmissibility; supports; vibration	V112, pp. 281, 303; V113, p. 147; V114, pp. 171, 254; V116, pp. 11, 89; V118, p. 169
structure-borne path	Structural acoustics; see related chapter treatment	V112, pp. 304, 463; V113, pp. 89, 94; V115, pp. 57, 257; V117, pp. 214, 305; V118, pp. 32, 409, 499
submittals	equivalence; source evidence; configuration	V113, pp. 52, 61, 139, 147; V115, pp. 13, 125, 142, 200; V117, pp. 472-473; V118, pp. 190, 225
supported inference	Forensics; see related chapter treatment	V117, pp. 152, 695; V118, pp. 93, 204-205
system boundary	System modelling; see related chapter treatment	V116, pp. 225, 227; V117, pp. 164, 240; V118, pp. 171, 173

Main entry	Subentries and cross-references	Verified volume and page locators
technical closure	Governance; see related chapter treatment	V117, pp. 113, 716, 824; V118, pp. 180, 196
technical surveillance countermeasures	chapter glossary; see related chapter treatment	V112, pp. 36, 43; V116, pp. 204, 270; V117, pp. 139, 218; V118, pp. 580-581
TEMPEST	discipline boundaries; public doctrine; authority	V116, p. 204; V117, pp. 18, 106-107, 177; V118, p. 169
temporary bridge	Construction; see related chapter treatment	V118, pp. 143, 168, 410, 780
test planning	measurand; method; states; decision rule	V112, pp. 498, 566; V117, pp. 633, 729; V118, p. 169
traceability	calibration; configuration; evidence; release	V112, pp. 60, 90, 579, 635; V117, pp. 459, 461, 565, 572; V118, pp. 218, 222
transferability	chapter glossary; see related chapter treatment	V112, pp. 96-97; V115, pp. 132, 321; V117, p. 800; V118, pp. 351, 354
transmission loss, tl	chapter glossary; see related chapter treatment	V112, pp. 121, 128
trusted state	chapter glossary; see related chapter treatment	V112, pp. 42, 57
type a evaluation	chapter glossary; see related chapter treatment	V112, pp. 92, 569
type b evaluation	chapter glossary; see related chapter treatment	V112, pp. 92, 569; V118, pp. 615-616

Main entry	Subentries and cross-references	Verified volume and page locators
unavailable verified source	chapter glossary; see related chapter treatment	V112, p. 93
uncertainty budget	Metrology; see related chapter treatment	V112, pp. 84, 154; V114, pp. 24, 197; V115, pp. 135, 211; V117, pp. 152, 233, 650, 670; V118, pp. 223, 225
United Kingdom doctrine	secure working areas; secure rooms; secure speech	V117, pp. 253, 351; V118, p. 169
United States doctrine	Department of State; DoD; Intelligence Community	V117, pp. 18, 99, 351; V118, p. 169
unresolved source	chapter glossary; see related chapter treatment	V112, pp. 74, 93; V117, p. 196; V118, pp. 245, 256
verification status	chapter glossary; see related chapter treatment	V112, pp. 74, 92
vibration	structure-borne paths; mobility; machinery; glazing	V112, pp. 264-265; V113, pp. 147, 163; V114, pp. 171, 175; V115, pp. 97, 102; V116, pp. 11, 13; V117, pp. 634, 656, 733, 754; V118, pp. 180-181
vulnerability	Security; see related chapter treatment	V112, pp. 50, 392; V113, pp. 110, 266; V115, p. 48; V116, p. 262; V117, pp. 107, 114, 560, 695; V118, pp. 234, 236

Main entry	Subentries and cross-references	Verified volume and page locators
weakest path	parallel contributions; dominant-path migration	V112, pp. 29, 57, 193; V115, pp. 13, 82, 154, 264; V117, p. 729; V118, pp. 90-91, 178- 179
weighted rating	chapter glossary; see related chapter treatment	V112, p. 128; V113, p. 34; V114, p. 340