

SCIF Low-Voltage Installer Quick Reference

Doors · IDS & UL 2050 Extent 3 · Access control · Penetrations · Filters · Waveguides · PEDs, telecom & CCTV

Public-level field reference for integrators, electricians and GCs. Based on ICD 705 (2010), ICS 705-1 (2010), IC Tech Spec v1.5.1 (26 Jul 2021), UFC 4-010-05 (26 May 2023), UL 2050 Edition 6 (7 Apr 2025), and 32 CFR Parts 117 and 2001. Current as of September 2026. Cites like **7.A.2.d** are Tech Spec paragraphs unless marked UFC, CFR or FF-L.

Read this first. Many items below are left to AO or CSA determination, and exceeding a published standard requires a waiver; your CTTA decides TEMPEST countermeasures. This card deliberately contains **no RED/BLACK separation distances, no shielding attenuation requirements and no site-specific details**. Take those only from the TEMPEST Countermeasures Review (TCR), the shield designer and the stamped drawings. Never write facility addresses or findings on this card.

Extent 3 UL 2050 installation · 7.A.2.b	≤ 30 s entry delay, primary door · 7.A.3.a(6)	24 h uninterruptible IDS backup power · 7.B.5	3 of 4 motion walk-test trials must alarm · 7.D.3
≤ 1 / 30 days false alarms per IDS partition · 7.A.2.p	15 / 5 min response: closed or open + SID / open, no SID · 3.H	> 96 sq in duct opening needs bars unless a side is < 6 in · 3.G.7	½ in @ 6 in steel man-bars, welded, on center · 3.G.7

1 Door stack & hardware

1.1 Perimeter door categories (Tech Spec 3.E.1–3.E.4)

Category	Locking hardware	2890C types	Access control	Alarm
Primary	FF-L-2890 deadbolt lock extension plus FF-L-2740 combination lock. By-pass keyway allowed for ACS failure only. One primary door unless the AO approves.	I–IV	Approved ACS device, at least two technologies (card + PIN). Controls the latch during duty hours only.	UL 634 Level II HSS and motion sensor (7.A.3.a(7))
Secondary	FF-L-2890 egress device with deadbolt. No extra standalone or flush-mounted deadbolts. Needs AO authorization.	VII–VIII	ACS per Ch. 8, deactivated when the SCIF is unoccupied (3.E.3).	HSS and motion
Emergency egress-only	FF-L-2890 exit-only device with deadbolt. No exterior hardware of any kind. Number set by code / AHJ.	IX–X	None	HSS and motion; alarmed 24/7 with local audible annunciator; stays armed when the IDS is disarmed (3.E.4; 7.B.2)

1.2 Every perimeter door, and door fabrication

Item	Requirement	Cite
Closer	Heavy-duty automatic non-hold closer on the SCIF side. No hold-open arms, magnetic hold-opens or wedges.	3.E.5; UFC 3-4.6.4
Hinge pins	Pins reachable from outside secured against removal (welded, set screws, dog bolts).	3.E.5; UFC 3-4.6.6.1
Glass	Solid doors, no lites or sidelites.	UFC 3-4.6
Acoustic / TEMPEST	Meet Ch. 9 acoustics unless declared a non-discussion area. Meet TEMPEST requirements per CTTA guidance.	3.E.5
Vestibule	Recommended at the primary entrance to preclude visual observation and improve acoustics. Interlocks need AHJ approval.	3.E.5; UFC 3-4.6.9
Door leaf	Wood: 1¾ in solid wood core (wood stave or structural composite lumber). Steel: 1¾ in thick, face steel equal to minimum 18-gauge.	3.E.6
Reinforcement	Hinges 7-gauge (cam-lift for acoustic assemblies, UFC). Closer 12-gauge. Lock area predrilled and/or reinforced to 10-gauge. Factory items: put them on the door schedule.	3.E.6; UFC 3-4.6.6
STC assembly (DoD)	Factory tested per ASTM E90: at least STC 50 for an STC 45 perimeter; at least STC 55 for an STC 50 perimeter. Do not mix components.	UFC 3-4.6.1

Item	Requirement	Cite
Strike	Withstands 600 lbf from the outside. Electric strikes UL 1034 listed, positive engagement, fail-secure.	FF-L-2890C; UFC 3-4.6.5
Double doors	Fixed leaf deadbolted top and bottom; astragal on one leaf; each leaf has its own alarm contact.	3.E.6
Roll-up / adjoining	Roll-up: minimum 18-gauge steel, deadbolts on both sides secured inside, alarmed. Between adjoining SCIFs: deadbolted and alarmed on both sides, SOP names who controls it.	3.E.6
Vault door	Never the day-access door; a vestibule with ACS may sit in front. DoD: GSA-approved Class 5 vault door meeting ABA.	3.E.6; UFC 3-4.6.11

1.3 FF-L-2890C device types (22 Feb 2019) and approved locks

Type	Door application	Trim	Access control	FF-L-2740B lock
I	Primary, any swing	Lever	Stand-alone keypad (≥ 4-digit code)	Yes
II	Primary, any swing	Lever	Integrated with building ACS (fail-secure electric release)	Yes
III	Primary, outswing	Panic bar	Stand-alone keypad	Yes
IV	Primary, outswing	Panic bar	Integrated with building ACS (fail-secure electric release)	Yes
V	Room not regularly occupied	Lever	Keyed reset	Yes
VI	Room not regularly occupied	Escape knob	None	Yes
VII	Secondary, any swing	Lever	Integrated with building ACS (fail-secure electric release)	No
VIII	Secondary, any swing	Panic bar	Integrated with building ACS (fail-secure electric release)	No
IX	Exit-only, any swing	Lever	None	No
X	Exit-only, outswing	Panic bar	None	No

Types I–IV and VII–X meet life safety requirements (DoD Lock Program); all types are field-handed. Types V and VI are for rooms not regularly occupied, such as telecom closets, not normally occupied SCIF space. Electric strikes in Types II, IV, VII and VIII are UL 1034 listed. Once the combination-lock bolt is thrown, it cannot be opened from outside without dialing the combination.

Lock / list	Status (DoD Lock Program)
FF-L-2740B (15 Jun 2011)	20 man-hours surreptitious entry, 30 man-minutes covert entry, at least 1,000,000 combinations. Sales restricted to the government and authorized contractors. All approved models are electromechanical dial locks.
Kaba Mas X-10 / S&G 2740B	Current. X-10: self-powered by turning the dial (Style 1). S&G 2740B: battery powered (Style 2).
Kaba Mas X-07, X-08, X-09	Existing installations only. X-07/X-08 past expected service life (replacement recommended). X-09 no longer manufactured, no parts. Retired locks go back to the DoD Lock Program.
QPL-FF-L-2890-5 (21 Mar 2022)	Kaba Mas CDX-10 (Type VI) · Lockmasters LKM10K series (I–IV, VII, IX–X) · Sargent & Greenleaf 2890 series (I–X). Not on the QPL = not an FF-L-2890 device, whatever the catalog calls it; any alternate needs AO approval.
Revision check	The DoD Lock Program posts FF-L-2890C; one industry source reports a later revision. The Tech Spec says "most current version." Confirm before you specify, and check with the AHJ before procurement.

2 Intrusion detection: the numbers

2.1 Twelve numbers every IDS installer should know (Tech Spec Ch. 7 as quoted from the public v1.4 copy, confirm against v1.5.1; 3.H from v1.5.1)

#	Requirement	Value	Cite
1	UL installation level	UL 2050 Extent 3	7.A.2.b
2	Perimeter door switch	UL 634 listed high-security switch (HSS), Level II for new accreditations. Level II switches are balanced magnetic switches (UFC).	7.A.2.d; UFC 3-4.17.3.3
3	Motion sensors	UL 639 listed. HSS and motion on every perimeter door.	7.A.2.d; 7.A.3.a(7)
4	Entry delay, primary door	≤ 30 seconds . Arming station inside, reachable within the delay.	7.A.3.a(6)
5	Backup power	24 hours uninterruptible (batteries, UPS, generator or a mix). DoD: with a generator, IDS batteries still give ≥ 4 hours .	7.B.5; UFC 3-4.17.3.7
6	False alarms	≤ 1 per 30-day period per IDS partition	7.A.2.p
7-8	Response force arrival	See 2.2: 15 min closed storage or open storage with SID; 5 min open storage without SID.	3.H
9	SCI-indoctrinated person on site	60 minutes (UL 2050) or the AO-approved time	7.C.1.c
10	Service start after trouble signal	Within 4 hours ; SCIF staffed 24 h until repaired unless AO-approved alternate procedures	7.C.2
11	Recurring IDS test	Semiannual	7.D.3
12	Motion walk-test pass	Alarm on at least 3 of every 4 consecutive four-step trials	7.D.3
+	Records	Arm/disarm failures, test records and battery maintenance kept 2 years . NISPOM alarm records 12 months .	7.B.3; 7.C.2; 12.L.6; 32 CFR 117.15(d)(2)
+	Networked IDS passwords	≥ 12 characters , changed every 6 months, unless PIV/CAC certificate authentication is used	7.A.3.c(2)(e)

2.2 Alarm response times and investigator options

Storage condition (U.S.)	Response force arrives within	Then
Closed storage	15 minutes (3.H(a))	SCI-indoctrinated person arrives within 60 min or AO-approved time, inspects, finds cause and resets IDS before the response force leaves (7.C.1)
Open storage with AO-accepted Security-in-Depth	15 minutes (3.H(b))	Same. SID can extend response to a maximum of 15 minutes (2.B). Wall A allowed.
Open storage without Security-in-Depth	5 minutes (3.H(b))	Same. Enhanced perimeter (Wall B or C).
Continuous operation	<i>Not separately stated in 3.H</i>	Get the AO's decision in writing.

UL CS-ASD-NISS investigator option	Condition (UL form / instructions)
5 minutes	"applies to SAP or SCI systems"
15 minutes	"the maximum time permitted for an investigator to respond to a signal is 15 minutes"
20 or 30 minutes	Prior approval from the cognizant security office. Never assume for SCI / SAP.
60 minutes	Contractor representative as primary investigator (prior approval)
CSA signature items	Extent 5, no line security, data-network transmission, law enforcement as monitor or investigator, 20- or 30-minute response

2.3 Extent 3: the exact wording

Source	Wording
Tech Spec 7.A.2.b	"Installation shall comply with an Extent 3 installation as referenced in UL 2050."
Tech Spec 7.A.2.c (paraphrase)	U.S. Government-developed systems do not require UL certification but must meet the Extent 3 installation requirements. Contractor SCIFs keep a current UL certificate of installation and service, renewed after any IDS change (ICS 705-1).
UL CS-ASD-NISS instructions	"The 'extent of protection' is the designation used to describe the amount of alarm protection installed to protect a particular area, room or container."
32 CFR 117.15(d)(4)(ii)	Extent 5 is based on "patrolling employees and CSA approval of security-in-depth." It is a NISPOM closed-area option with prior approval. The Tech Spec has no Extent 5 option: never for a SCIF or SAPF.
Watch out	A mercantile (UL 681, CCN CVSG) "Extent 3" certificate is not a UL 2050 certificate. SCIF work needs the National Industrial Security System certificate from a CRZH -listed company. Web "Extent 1–5" ladders that call Extent 5 "complete coverage" are wrong.

2.4 Sensors, PCU, cabling and communicators

Topic	Rule	Cite
Sensor location	Inside the SCIF. Sensors outside need AO approval and protected cabling. Failed sensors cause immediate, continuous alarm. Dual-tech OK if each technology reports independently.	7.A.3.a(1)–(4)
Emergency exits	Alarmed and monitored 24 hours; local audible annunciator.	7.A.3.a(8); 3.E.4.c
Plenums	Motion above false ceilings / below raised floors not normally required (UFC); may be required overseas (Cat. I–II) or by the AO, for example where a plenum opens to non-SCIF space. Perimeter walls must still run true floor to true ceiling.	7.A.3.a(5); UFC 3-4.17.3
PCU	Inside the SCIF; only SCIF personnel change modes; not observable by unauthorized persons; shows which sensor tripped; auto-reset disabled ; defaults (master, maintenance, PINs) changed.	7.A.3.b(1)–(11)
Sensor-to-PCU wiring	Dedicated to the IDS, contained within the SCIF, compliant with electrical codes and CNSS standards.	7.A.3.b(3)
Cable leaving the SCIF	Encrypted line security, or ferrous EMT / rigid conduit with permanently sealed joints (no set screws); service and junction boxes with GSA-approved locks.	7.A.2.e
Independence	Separate from fire, smoke, radon, water and other systems. ACS events never outrank IDS alarms. No video-verified sensors or microphones without AO approval.	7.A.2.h; 7.A.2.i; 7.A.2.l
Communicator	FIPS-certified encryption panel to station. UL 1610 PCU: FIPS 197 (AES) or FIPS 140-2. UL 1076 PCU: FIPS 140-2. Other methods need AO approval. Wireless/cellular secondary path: AO approval after CTTA consult.	7.A.3.b(10); 7.A.3.c(2)(d)
FIPS 140-2 sunset	FIPS 140-2 validations move to NIST's Historical List on 21 Sep 2026 . Prefer FIPS 140-3 modules; keep the CMVP certificate number; ask the AO before specifying a 140-2-only module.	NIST CMVP
Monitoring station	Government, AO-operated, GCMS, national industrial (NIMS, CCN CRZM) or cleared commercial central station. Operators U.S. citizens, trained, eligible for SECRET.	7.B.6
People	Install and test: U.S. companies using U.S. citizens. Maintenance: TOP SECRET-cleared or escorted. System variables and passwords: SCI-indoctrinated U.S. personnel only.	7.D.1; 7.C.2; 7.A.2.j

2.5 Walk test, acceptance test and battery calculation

Test	Method and pass criterion
Motion walk test	Each trial = four consecutive steps at one step per second, about 30 in ± 3 in per step, 3–5 s pause between trials. Alarm on at least 3 of every 4 consecutive trials moving progressively through the SCIF (7.D.3). No four-step path to the material may go undetected; check behind tall cabinets and containers.
HSS	Alarm before the non-hinged side opens farther than the door's thickness (on a 1¾ in door: within 1¾ in of travel at the strike edge). Re-check after seals take a set and at every semiannual test.

Test	Method and pass criterion
Tamper	Open every equipment cover in both secure (armed) and access (disarmed) modes; each must alarm.
Annunciation	Intrusion, failed sensor, tamper, maintenance mode and shunted/masked points show at the PCU and the station. Masked points re-arm at the next armed-to-disarmed transition (7.B.4).
Power	Remove AC: automatic transfer to backup with no alarm; power change shown locally and at station (7.B.5; 7.A.3.b(8)).
Battery calc	Measured standby current of PCU, sensors, keypads, communicators, encryption modules and network/PoE gear in the signal path × 24 h, plus alarm-state load per the panel listing, then manufacturer derating; next size up. Put it in the FFC package.
Paperwork	Every item above recorded: test dates, tester, equipment, malfunctions, corrective action (2-year retention). UL certificate: Extent 3, correct CCN, approved response time, encrypted line security, not expired.

3 Access control rules

#	Rule	Cite
1	Automated entry uses at least two technologies (badge, PIN, biometric). Minimum: card reader with keypad at the primary and any secondary entrance. PIV/CAC + PIN qualifies; card-only or keypad-only does not. The configured mode counts, not reader capability.	ICS 705-1 G.2.b; UFC 3-4.17.1
2	ACS and personal recognition are not approved for securing an unoccupied SCIF . The FF-L-2740 lock throws the FF-L-2890 deadbolt and the IDS is armed.	ICS 705-1 G.2.b
3	Head-end equipment holding ACS software: inside the SCIF or an alarmed area controlled at the SECRET level (or an AO-approved architecture). Cloud or building-wide servers in unsecured space need AO approval before bid.	FFC §C.1; UFC 3-4.17.1
4	ACS lines leaving protected space: FIPS AES certified encryption (FFC asks about 128-bit / FIPS 140). Includes reader-to-controller runs; plain Wiegand to an outside panel does not meet this unless the AO approves the installation (8.C.3).	FFC §C.1; 8.C.3
5	Readers, keypads and interface devices outside the SCIF: tamper-protected and securely fastened. Wiring and mechanical links accessible only from inside . No exterior junction boxes or splices.	8.C.1–8.C.2
6	Electric strikes / electrified mortise locks: positive engagement, fail-secure, UL 1034 . No maglocks. Free egress stays mechanical (2890 lever or panic bar).	UFC 3-4.6.5; FF-L-2890C
7	Secondary-door ACS deactivated when unoccupied . Tie it to the closing/IDS arming sequence, not just a clock schedule.	3.E.3
8	REX devices mounted inside; never triggerable from outside; never shunt the IDS HSS without an AO-approved design.	Practitioner; 7.A.2.i
9	ID data, PINs, enrollment, backups and admin rights: SCI-indoctrinated personnel only. No routine remote support by uncleared vendor technicians.	FFC §C.1; DoDM 5105.21 V2
10	Compartmented Areas: no spin-dial combination locks on CA doors; no independent alarm systems in a CA. Put high inside low: entry to a lower area cannot pass through a higher one.	2.C.4; UFC 3-3.3.2
11	Non-indoctrinated presence: flashing or rotating light, controls inside the perimeter at each entrance. Duress alarms: no audible or visual signal in the protected area.	UFC 3-4.15; 3-4.16
12	A GSA FIPS 201 APL listing does not make a PACS "SCIF-approved." Record make, model, firmware and crypto module certificate for every controller and reader.	Practitioner

SCIF state	Primary door	Secondary door	Egress-only door	IDS
Occupied	ACS (two technologies) or personal recognition controls the latch; visitor control here	ACS active (if AO-authorized)	Alarmed 24/7; no entry	Disarmed; tamper and exit-door circuits stay armed
Closing	Last person checks space, locks FF-L-2740 (throws 2890 deadbolt), arms IDS within delay	ACS deactivated	Alarmed	Armed; record of who armed
Unoccupied	FF-L-2740 lock + IDS only	ACS off; deadbolt secured	Alarmed	Armed (secure)

SCIF state	Primary door	Secondary door	Egress-only door	IDS
Opening	Dial combination, enter, disarm from inside within 30 s	Reactivate per SOP	Alarmed	Disarmed; record of who disarmed

4 Penetrations & perimeter wiring

Rule	Requirement	Cite
Minimize	"All penetrations of perimeter walls shall be kept to a minimum." Keep a penetration schedule: one line per duct, pipe, conduit, sleeve, cable bundle.	3.G.1
No pass-through	Utilities serving other areas shall not transit the SCIF unless mitigated with AO approval.	3.G.3
Single point of entry	Power and signal enter at a single point; cabling enters from a single location, labeled with purpose and destination, color-coded by classification.	3.G.4; UFC 3-4.11.1; 3-4.19
Treated walls	Distribution surface-mounted, in raceway, or on an added furred wall. No recessed boxes or panels in acoustic- or RF-treated perimeter walls.	3.G.5; UFC 3-4.4.7
Spare conduit	Allowed if filled with acoustic fill and capped . (On an RF shield, spares also need an RF closure and must be in the shield test.)	3.G.6
Sealing	Seal both sides with acoustical foam or sealant, finished to match; listed firestop in rated assemblies.	UFC 3-4.11.3
Metallic penetrations	May need TEMPEST countermeasures (dielectric breaks or grounding) when recommended by the CTTA . Not automatic; not optional when directed.	3.G.2

Duct / vent trigger (3.G.7)	Protection options	Inspection and acoustics
Opening > 96 sq in (619 cm ²) needs protection, unless one dimension is < 6 in (150 mm). 12 × 10 in = 120 sq in: bars . 24 × 5 in: no bars. 12 × 8 in = 96: no bars (not exceeding). Measure the opening at the perimeter line.	Man-bars: ½ in diameter steel, welded vertically and horizontally 6 in on center (± ½ in spacing). Grilles: ¾ in mesh #9 (10-ga) case-hardened expanded metal; 1½ in #10 diamond mesh; or 4×4 W2.9×W2.9 welded wire fabric. Baffles: permanently installed metal sound baffles or wave forms no more than 6 in apart.	Access port inside the perimeter to inspect bars/grilles/baffles; or outside with an AO-approved high-security lock. Every duct meets the SCIF acoustic requirement regardless of size (silencers, Z-duct). Finish the wall tight to the duct. IDS is not a listed substitute for bars. No in-duct motion "instead" without written AO approval.

When the TCR calls for countermeasures (DoD)	Treatment	Cite
Metal conduit	Nonconductive union inside the perimeter adjacent to the penetration, or ground within 6 in (150 mm) of the penetration with No. 4 wire to the building grounding system.	UFC 3-4.11.2
Sprinkler pipe / refrigerant lines	Ground within 6 in of the penetration with No. 4 copper wire to the building grounding system.	UFC 3-4.11.2
HVAC duct	Nonconductive flexible connection on a short duct section inside the perimeter, adjacent to the penetration.	UFC 3-4.11.2
Break length / type	Not fixed in the public Tech Spec. Take it from the TCR and stamped drawings. Dielectric fittings in sprinkler or rated piping must be listed and firestopped (AHJ).	Verify with AO / CTTA

5 Power & signal filters (only where the CTTA or shield design requires them)

Topic	Do this	Why
LINE side	"Dirty," unfiltered building power. Its conductors terminate at the dirty compartment and never cross the boundary. The case is bonded into the shield; which face the housing projects from is a mounting call (MIL-HDBK-1195 §2.8).	Unfiltered conductors must never run inside the room.

Topic	Do this	Why
LOAD side	"Clean," filtered output. The only conductors that continue into the room; penetration detail per the project spec.	Reversed line/load puts RF-carrying wires inside.
Separation	Input and output conductors never share a box, gutter, pull box or raceway.	RF couples around the filter; it passes NEC and fails the shield test.
Case bond	Metal-to-metal, paint-free mating surfaces; short flat braid, not a long round wire. Filter at the power entry point.	The filter shunts RF to its case; an unbonded case never reaches its rated dB.
Signal lines	Phone, fire alarm, door contacts, REX, readers, IDS loops: signal-line filters at the penetration panel, or fiber. Count every conductor before the panel is built.	A missed 2-conductor door contact means a new penetration and a retest.
Data	All-dielectric fiber through a waveguide with media converters on filtered power. No PoE or copper Ethernet through the shield unless the CTTA accepts a data filter. Fiber answers RF, not security: a classified circuit still needs a PDS (CNSSI 7003), Type 1 encryption or approved CsFC.	Low-pass filters struggle with high-speed Ethernet; CNSSI 7003 covers optical fiber too.
Leakage & GFCI	Filter leakage current is inherent and adds across filters and phases. GFCI placement is an EE / AHJ review item; load-side branch-circuit GFCI is one approach engineers evaluate. Never lift grounds to stop trips.	Upstream GFCIs can nuisance-trip; a lost ground can energize the case.
Generators & UPS	Give the EE total filter kVAR; test generator start and transfer with filters energized; consider low-kVAR designs.	High capacitance can overload, destabilize or stop a generator.
Ratings & tests	Bench insertion loss is per MIL-STD-220 at 50 Ω ; installed performance is proven only by the whole-room shielding test after all penetrations. Don't swap HEMP and TEMPEST filters without EOR and CTTA agreement.	Real impedances and bonds differ from the bench.

Stored charge: a de-energized filter can still shock you. (1) Lock out / tag out the feeder, including any UPS or generator source. (2) Wait at least the discharge time on the filter label. (3) Verify zero voltage on every line terminal, line-to-ground and line-to-line, with a rated meter. (4) Apply a shorting stick per the manufacturer. (5) Only then open the compartment. Coordinate any megger or hi-pot test of a filtered feeder with the filter manufacturer first. Any work that disturbs a filter bond or gasket is a shield-integrity event: tell the SSM.

6 Waveguide-beyond-cutoff basics

What may pass through a waveguide	What must NEVER pass through a waveguide
Air (honeycomb vents) · water in an engineered pipe waveguide · all-dielectric fiber (no armor, steel strength member or tracer wire)	Copper wire · coax · PoE or network cable · armored fiber · fiber with a steel member · tracer wire · metal pull string. A conductor turns the tube into a coaxial line with no cutoff: RF passes at every frequency.

Item	Rule of physics (textbook; the vendor's tested design governs)	Field meaning
Width / diameter	Sets cutoff frequency. Circular: $f_c \text{ (GHz)} \approx 6.9 / D \text{ (in)}$. Rectangular: $f_c \text{ (GHz)} \approx 5.9 / a \text{ (in)}$, a = widest inside dimension.	Smaller opening = higher cutoff = blocks higher frequencies.
Length	Sets attenuation below cutoff: theoretical $\approx 32 \text{ dB}$ per diameter of length (circular), well below cutoff.	Longer tube = more attenuation. Real limits come from the weld or bond to the shield.
Fill	A dielectric lowers cutoff by $\sqrt{\epsilon_r}$. Water ($\epsilon_r \approx 80$) lowers it about 9 $\times$.	A 1 in tube: $\approx 6.9 \text{ GHz}$ dry, $\approx 0.77 \text{ GHz}$ water-filled. Size sprinkler waveguides for water.
Honeycomb vents	Many small cells in parallel pass air; frame bonded by solder, braze, weld or RF gasket.	Don't cut, drill or screw through honeycomb or let insulation pins pierce it. Account for pressure drop.
Pipe waveguides	Metal section welded or bonded to the shield, sized for the fluid.	Tag: "RF waveguide: do not modify." A standard coupling swapped in fails the shield test.

At an RF shield you **BOND** metal penetrations and size openings as waveguides. At a non-shielded SCIF perimeter you may **BREAK** or **GROUND** the metal path, only if the CTTA directs (Tech Spec 3.G.2). Don't mix the two logics.

7 Never fasten through the shield

Tech Spec 3.G.5 and UFC 3-4.4.7: distribution on treated perimeter walls is surface-mounted, in raceway, or on a furred wall, and must not affect acoustic or RF performance. UFGS 13 49 20.00 10: no self-tapping screws for shielding attachment; seal fastener penetrations of steel shields with puddle or full circumferential EM welds. Historical MIL-HDBK-1195: "Penetrations of the shielding by screws, nails, bolts and other items shall be prohibited." Every screw through foil or steel is a leak you cannot see.

Mounting method	Good for	Watch-outs
Surface HSS on protected-side frame head; magnet on door top rail	Standard SCIF doors; factory-prepared frames	Screws must not pass through a shield-forming frame or reach acoustic fill or seals.
Manufacturer Z- or L-bracket	Out-swing doors, deep acoustic frames, drop-seal housings, knife-edge frames	Rigid so the gap doesn't flex. Fasten to factory prep or an inside steel plate. Keep clear of finger stock, knife edges and gaskets.
Non-ferrous spacers / shims	Steel doors, seal thickness, uneven faces	Re-check the gap after seals take a set; retest to 7.D.3.
Strut / standoff frame inside the shield	Welded or modular shields where nothing may touch the skin	Anchor to structure inside or vendor-approved points only. Strut touches the shield only at designed bonds.
Furred chase / secondary stud wall	Many devices; recessed boxes wanted	Allowed by 3.G.5. Self-supporting, not screwed through the shield. Some AOs dislike hidden boundaries.
Surface raceway or surface EMT	Retrofits, inspectability	Fasten to furring, strut or approved points, not through a shield. On acoustic-only walls, surface fastening into finish board is the normal approach.
Adhesive / epoxy	Raceway clips where the shield vendor approves	No public UL 634 Level II document describes adhesive-mounting the switch; the removal tamper needs a mechanical mount. Get written maker and AO acceptance.
Concealed HSS in the frame	Standard hollow-metal frames	Needs drilling. Don't field-drill an RF or knife-edge frame; may affect STC-tested or fire-labeled assemblies (ask the door maker).

Do	Don't
Get shield-vendor and door-maker attachment and wiring details before rough-in	Drive screws, nails, anchors, powder pins or hanger rod through foil, sheet steel or shield panels
Mount HSS, REX and raceway on the protected side (brackets, spacers, strut, furring)	Field-drill an RF or knife-edge frame for a concealed contact
Wire tampers to 24-hour zones; keep removal tamper working	Let ACS REX or door signals shunt the IDS HSS
Route all low-voltage to the single entry point: filter or fiber waveguide (shielded); sealed, labeled penetration (non-shielded)	Pass copper, PoE or steel-member fiber through a waveguide
Keep interior conduit and strut off the shield except at designed bonds	Improvise clamp or gasket bonds at the shield
Cover and protect finger stock and knife edges during construction	Paint, overspray or weld near RF door contacts
Report an accidental shield hole; vendor repair; retest; notify SSM (and CTTA/AO if accredited)	Caulk over a shield hole
Wire door contacts before the final shield test; get the door maker's wiring path (hinge or loop) as a submittal	Pass any wire through the knife-edge or finger-stock interface

8 PEDs, telecom & CCTV quick rules

Topic	Rule	Cite
PED lockers	Outside the primary entrance. Not recessed into the perimeter wall and not within 10 ft of equipment processing unencrypted national security information.	UFC 3-4.7

Topic	Rule	Cite
PED detection	RF detection only sees transmitting devices: powered-off phones are invisible, Wi-Fi/BT can stay on in airplane mode, MAC addresses rotate. Detector = ACS input, subordinate to IDS alarms. Never block egress. Sensors inside the SCIF need AO/CTTA review.	Practitioner; 7.A.2.i
PED approvals	Medical devices and other PEDs approved before introduction. RF transmitters: AO and CTTA collaborate and approve. Personally owned PEDs may not process SCI.	Tech Spec Ch. 10; DCSA SAP F-10
Wireless devices	Wireless locks, Wi-Fi/BLE readers, wireless sensors, cellular communicators: CTTA evaluation and AO approval first. Design wired.	ICS 705-1 G.2.a
Unclassified phones	On-hook protection: CNSSI 5006 (TSG-6) approved instrument or approved disconnect device. CTS/PBX per CNSSI 5002 (TSG-2) , must not force a station off-hook. VoIP per CNSSI 5000 (hold/mute/push-to-talk). Speakerphones and microphones disabled or AO-approved.	FFC §F.1–F.2
Speakers / PA / fire alarm voice	No audio back feed: fiber isolation, self-amplified speakers or another approved method. Coordinate AHJ, AO and CTTA. IDS separate from fire panel.	FFC Acoustics; 7.A.2.h
Sound masking	AO approval first. Generator permanently inside the SCIF; no AM/FM receiver; recording disabled; wires and transducers inside to the greatest extent possible; volume set and fixed; subject to TSCM. Networked platforms need AO/CTTA review.	Tech Spec 9.E
CCTV	Cameras not within the perimeter or enabling observation within it. Exterior camera at the primary entrance allowed for remote door control from inside, monitored by SCI-indoctrinated staff. Keep keypads and lock dials out of frame; no microphones.	UFC 3-4.17.2; 8.E
Keypads & PCU	Installed to preclude observation of the combination or PIN by unauthorized persons.	8.F.5.a; 7.A.3.b(5)
Telecom room / PDS	Telecom spaces with encryption equipment within or sharing a wall with the secure area. Avoid PDS whenever possible.	UFC 3-3.3.2; 3-4.20

9 Top traps that fail inspection

#	Trap	Fix	Rule
1	Perimeter door with an HSS but no motion, or motion with a standard contact	UL 634 Level II HSS and UL 639 motion on every perimeter door	7.A.3.a(7)
2	Keypad or PCU on the corridor side; mode changeable from outside	PCU and arming station inside, reachable within 30 s	7.A.3.b(1)
3	Sensor cable above corridor ceiling in set-screw EMT with unlocked box	Encrypt, or sealed ferrous conduit + GSA-approved locks	7.A.2.e
4	Battery calc forgets communicator, encryption and network switch	Include the whole signal path × 24 h	7.B.5
5	Installer / master codes at factory defaults; auto-reset on	Change defaults; disable auto-reset	7.A.3.b(9), (11)
6	Mercantile "Extent 3" certificate, or certificate not renewed after changes	UL 2050 certificate from a CRZH company; renew after any IDS change	7.A.2.a–b; ICS 705-1
7	Electric strike treated as the SCIF lock; maglocks; non-UL 1034 strikes	FF-L-2740 + 2890 deadbolt secures; fail-secure UL 1034 strike for the latch	ICS 705-1 G.2.b; UFC 3-4.6.5
8	Secondary-door reader still grants access after hours	Deactivate with the closing / arming sequence	3.E.3
9	Card reader, cylinder or pull on an egress-only door	No exterior hardware; alarmed 24/7 with annunciator	3.E.4
10	Double doors with one contact; inactive leaf bolted at top only	Contact on each leaf; bolts top and bottom	3.E.6
11	REX that shunts the HSS or can be triggered from outside	REX inside; never bypass IDS contacts	Practitioner
12	Head-end or database outside the SCIF or in the cloud; unencrypted Wiegand leaving the SCIF	Head-end in SCIF / SECRET alarmed area; FIPS-encrypted lines	FFC §C.1
13	Recessed back boxes, panels or PED/extinguisher cabinets in perimeter walls	Surface mount, raceway or furred wall	3.G.5; UFC 3-4.4.7, 3-4.7
14	Open spare sleeve "for the low-voltage guy"; late camera home run from another wall	Fill and cap spares; every new crossing approved by SSM and on the schedule	3.G.4; 3.G.6

#	Trap	Fix	Rule
15	Copper "temporary" cable or PoE through a fiber waveguide	All-dielectric fiber + converters on filtered power	Shield design
16	Filter line/load reversed, shared pull box, painted bond	Dirty outside, clean inside, separate raceways, bare-metal bond	Filter maker; CTTA
17	Anchor, hangers or strut through or touching the shield	Furring, strut to structure, designed bond points only	3.G.5; UFGS 13 49 20
18	Penetration added after the shield test	Freeze penetrations; review; retest	Shield design
19	Camera that sees into the SCIF or captures the PIN / dial; camera or intercom with a live mic	Exterior view of the approach only; no audio	UFC 3-4.17.2
20	Guessing RED/BLACK distances or dielectric-break lengths from old slides	Use only the TCR and stamped drawings	CTTA

10 References (public documents)

Document	Issuer	Version / date	Used for
ICD 705, Sensitive Compartmented Information Facilities	ODNI	26 May 2010	Policy, AO, waivers
ICS 705-1, Physical & Technical Security Standards	ODNI	17 Sep 2010	Two-technology ACS, RF devices
ICS 705-2, Accreditation & Reciprocal Use	ODNI	22 Dec 2016	Accreditation, co-use
IC Tech Spec for ICD/ICS 705	NCSC	v1.5.1, 26 Jul 2021	Build-to requirements, forms
SCIF Fixed Facility Checklist	NCSC	v1.5	IDS, ACS, telecom questions
SCIF TEMPEST Checklist	NCSC	v1.5	CTTA review input
UFC 4-010-05, SCIF/SAPF Planning, Design & Construction	DoD	26 May 2023	DoD design detail
DoDM 5205.07, SAP Security Manual	DoD	17 Jan 2025	SAPF requirements
DCSA SAP Security Compliance Checklist	DCSA	Jan 2026	SAPF inspection items
32 CFR 117.15, NISPOM safeguarding / IDS	eCFR	Current	Contractor IDS, Extent 5 rule
32 CFR 2001.43, Storage	eCFR	Current	Response times, locks
UL 2050, National Industrial Security Systems	UL Standards & Engagement	Ed. 6, 7 Apr 2025	Extent 3 certification
UL Form CS-ASD-NISS instructions	UL	2019 (Ed. 5 era)	Extent, line security, response
UL Code Authority / Product iQ	UL	Online	Verify CRZH / CRZM listings
FF-L-2890C / QPL-FF-L-2890-5	GSA / DoD Lock Program	22 Feb 2019 / 21 Mar 2022	Door device types, QPL
FF-L-2740B, Electromechanical Combination Locks	GSA	15 Jun 2011	Combination locks
DoD Lock Program	NAVFAC EXWC	Online	Approved hardware, tech support
NIST FIPS 140-3 transition	NIST	Online	Crypto module status
TSG Approved Equipment List (endpoints)	NCSC	May 2026	Approved phones
IEEE 299, shielding effectiveness measurement	IEEE	See contract edition	Shield test method

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