

COMMERCIAL ELECTRICAL RACEWAY INSPECTION CHECKLIST

EMT · IMC/RMC · PVC · FMC · Busways · Cable Trays

NEC 2023 Articles 110 · 250 · 300 · 342 · 344 · 348 · 350 · 352 · 358 · 368 · 376 · 392

Project / Building Name:	_____	Inspection Date:	_____
	__		
Inspector Name:	_____	License / Cert #:	_____
	__		
Jurisdiction / AHJ:	_____	Permit #:	_____
	__		
Address:	_____	Report #:	_____
	__		
Electrical Contractor:	_____	Weather Conditions:	_____
	__		

SEVERITY LEGEND: ● CRITICAL — Immediate safety hazard; stop use / tag out ● MAJOR — Code violation; must correct before energizing ● MINOR — Correction required; not immediate hazard

This checklist covers visual inspection of electrical raceway systems in commercial buildings per the 2023 National Electrical Code (NEC). It is not a substitute for an electrical engineering assessment. Items marked CRITICAL require immediate notification of the building owner, facilities manager, and AHJ. All NEC article references are to the 2023 edition unless otherwise noted.

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1 | Scope, Standards & Inspector Notes

This checklist is designed for use during time-of-occupancy, periodic, or pre-energization inspections of commercial building electrical raceway systems. It addresses all primary wiring methods and raceway types found in commercial and light industrial facilities, including surface-mounted, overhead, embedded, and exposed installations.

Standard / Code	Article / Section	Topic Covered
NEC 2023	Art. 110.26	Working clearances around electrical equipment
NEC 2023	Art. 250	Grounding and bonding requirements
NEC 2023	Art. 300.21	Fire stopping at raceway penetrations
NEC 2023	Art. 342	Intermediate Metal Conduit (IMC)
NEC 2023	Art. 344	Rigid Metal Conduit (RMC)
NEC 2023	Art. 348	Flexible Metal Conduit (FMC)
NEC 2023	Art. 350	Liquidtight Flexible Metal Conduit (LFMC)
NEC 2023	Art. 352	Rigid PVC Conduit
NEC 2023	Art. 358	Electrical Metallic Tubing (EMT)
NEC 2023	Art. 368	Busways
NEC 2023	Art. 376 / 378	Metal Wireways / Nonmetallic Wireways
NEC 2023	Art. 392	Cable Trays
IBC 2021	§714	Through-penetration firestop systems
NFPA 70E	Art. 120	Establishing electrically safe work conditions
NEMA Standards	Various	Enclosure type ratings (1, 3R, 4, 4X, 12)

WARNING: Safety: Conduct all inspections with circuits de-energized when possible. Follow NFPA 70E Article 120 to establish an electrically safe work condition before approaching exposed energized parts. Maintain minimum approach distances per NFPA 70E Table 130.4(D).

Inspector Pre-Inspection Notes:

2 | EMT — Electrical Metallic Tubing

NEC Article 358 · ANSI C80.3

EMT (thinwall conduit) is the most common raceway in commercial construction. It is an unthreaded steel tubing listed under UL 797 / ANSI C80.3. Key inspection areas: corrosion, support spacing, fitting condition, bends, and grounding continuity.

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
2.1	Corrosion & Physical Damage	358.10(B) 300.6	Tubing is free of corrosion pits, deep rust, mechanical deformation, kinks, or crushing. Galvanized coating intact.	Visible rust pitting, white corrosion (aluminum), dents reducing internal diameter, mechanical crushing, or coating loss exposing bare metal in wet/damp areas.	CRITICAL	
2.2	Support Spacing	358.30(A)	Supported at intervals ≤10 ft (3 m). Support within 3 ft (900 mm) of each box, fitting, or termination point. Trapeze hangers acceptable.	Unsupported spans >10 ft. No support within 3 ft of terminations. Conduit sagging or bowing between supports.	MAJOR	
2.3	Fitting Type & Tightness	358.42 110.3(B)	Listed compression-type or setscrew connectors properly torqued. All fittings listed and labeled for EMT. No mix of conduit types in same connector.	Loose setscrew connectors, wrong-type fittings (e.g., RMC fittings on EMT), unlisted connectors, or open knockouts with no fitting installed.	MAJOR	
2.4	Bends — Radius & Count	358.24 358.26	Bends made without flattening or reducing ID. Max 4 quarter-bends (360°) between pull points. No kinked bends. Minimum bend radius maintained per trade size.	More than 360° total bends in a run without pull box. Kinked or buckled bends. Bends reducing internal diameter. Bird-caging or oval deformation visible.	MAJOR	
2.5	Conductor Fill (≤40%)	358.22 NEC Ch.9 Tables	Total conductor cross-section ≤40% of conduit interior area for 3+ conductors (31% for 2 conductors, 53% for 1 conductor). NEC Chapter 9 Tables used for calculation.	Conductors overfilled — difficult to pull, insulation visibly damaged, or fill calculation exceeds NEC Chapter 9 limits.	MAJOR	

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
2.6	Grounding Continuity / EGC	250.118 (4) 358.60	EMT system serves as EGC when all fittings are properly secured and listed. Separate EGC present where fittings are not listed for grounding. Continuity verified.	Loose or open fittings interrupting grounding path. Missing bonding bushings at concentric knockouts over 250V. No separate EGC where required.	CRITICAL	
2.7	Wet/Damp Location Protection	358.10(A) 300.6(A)	In wet or damp locations: corrosion-resistant fittings installed; galvanized or PVC-coated EMT used; drainage provisions present; raintight fittings outdoors.	Standard fittings (not listed for wet use) installed outdoors or in wet locations. EMT installed in areas subject to standing water without protection. Missing raintight covers.	MAJOR	
2.8	Prohibited Locations	358.12	EMT not installed where subject to severe physical damage (loading docks, warehouse floors) unless protected. Not directly buried without corrosion protection. Not in cinder fill.	EMT installed in concrete slab on grade without PVC jacketing. EMT exposed to heavy vehicle traffic or impact without mechanical protection. EMT embedded in cinder fill.	MAJOR	
2.9	Overheating Indicators	300.17 110.14(C)	No discoloration, melted insulation, or heat-scarring on conduit exterior. Fittings not loose from thermal cycling. No smoke staining at boxes or panels.	Yellow/brown heat staining on conduit. Melted conductor insulation visible at fittings. Burned or deformed connectors. Evidence of arcing or fault events.	CRITICAL	
2.10	Penetrations — Structural & Fire-Rated	300.21 358.10(A)	All penetrations through fire-rated assemblies fire-stopped with listed UL system. Bushings installed at all box entries. Conduit protected against abrasion at sharp-edged openings.	Open or unsealed penetrations through fire-rated walls, floors, or ceilings. Missing bushings at box knockouts causing conductor abrasion. Conduit edges cutting into conductor insulation.	CRITICAL	

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
2.1 1	Identification & Labeling	300.7(B)) 210.5(C)	Conduit systems serving different voltage levels or systems identifiable. High-voltage systems (>250V) labeled at intervals. Circuit directories updated at panels.	No identification on conduit systems where confusion between circuits exists. High-voltage EMT not labeled. Conduits in multi-tenant or multi-system buildings with no identification.	MINOR	
2.1 2	Expansion Fittings (Thermal)	300.7(B)	Expansion fittings installed in runs crossing building expansion joints or runs >100 ft in exposed environments where thermal expansion exceeds 1/4 in.	No expansion fittings at building expansion joints. Long runs pulling out of fittings due to thermal movement. Conduit racking or bowing due to thermal expansion.	MAJOR	

NOTE: EMT as EGC (NEC 250.118(4)): EMT serves as an equipment grounding conductor ONLY when all fittings are properly made up and listed. A single loose setscrew connector can interrupt the grounding path. In corrosive environments, verify electrical continuity with a low-resistance meter — visual inspection alone is insufficient.

3 | IMC / RMC — Intermediate & Rigid Metal Conduit

NEC Article 342 (IMC) · Article 344 (RMC) · ANSI C80.1 / C80.6

RMC is the heaviest and most protective metal conduit. IMC is intermediate-weight with threaded ends. Both use threaded fittings and can be used in all locations including direct burial and concrete encasement.

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
3.1	Corrosion — Exterior & Interior	342.10(B) 344.10(B) 300.6	Conduit free of rust pitting, scale, or coating failure. Galvanized interior intact. PVC-coated conduit with no cut or abraded PVC exposing metal.	Pitting corrosion reducing wall thickness. Scale flaking inside conduit. PVC coating abraded exposing steel to soil in direct-burial applications. White zinc corrosion on exterior.	CRITICAL	
3.2	Thread Integrity & Coupling	342.42 344.42	All threaded joints fully engaged (min 5 threads). Running threads not used. Coupling locks tight. No cracked or cross-threaded fittings.	Fewer than 5 threads engaged at couplings. Running threads used. Cracked or split couplings. Cross-threaded joints creating gaps in raceway continuity.	MAJOR	
3.3	Support Spacing	342.30 344.30	RMC/IMC supported at ≤10 ft intervals. Supported within 3 ft of each termination. Riser runs supported at each floor level.	Spans >10 ft. No support within 3 ft of terminations. Riser conduit unsupported between floors.	MAJOR	
3.4	Direct Burial & Concrete Encasement	342.10(A) 344.10(A) Table 300.5	Minimum burial depth per NEC Table 300.5 maintained. PVC-coated RMC where soil corrosivity requires. Concrete encasement continuous.	Burial depth insufficient per NEC Table 300.5. Bare steel RMC in highly corrosive soil without PVC coating. Voids in concrete encasement exposing conduit.	MAJOR	
3.5	Overheating & Arcing Evidence	110.14(C)	No heat discoloration, carbon deposits, or melted fittings. No arcing marks at coupling joints or terminations.	Heat staining or smoke marks at couplings. Melted locknut or bushing. Arc marks indicating fault history.	CRITICAL	
3.6	Bonding at Concentric Knockouts (>250V)	250.92(B) 250.97	Bonding bushing with jumper installed at concentric or eccentric knockouts on circuits >250V. Bonding jumper ≤6 ft if exterior to raceway.	Standard locknut used at concentric knockout on >250V circuit. No bonding bushing installed. Bonding jumper >6 ft exterior to raceway.	CRITICAL	

4 | PVC — Rigid Nonmetallic Conduit

NEC Article 352 · UL 651

Schedule 40 and Schedule 80 PVC conduit is widely used for underground runs, wet locations, and corrosive environments. Because PVC is nonmetallic, a separate EGC is always required. Thermal expansion is significant — approximately 4x that of steel conduit.

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
4.1	UV Degradation & Physical Damage	352.12(D)	PVC in exposed locations is sunlight-resistant (Schedule 80 or listed) and shows no chalking, crazing, or brittleness. No cracks or splits.	Chalky, brittle, cracked, or split conduit in sun-exposed locations. Schedule 40 PVC used above-grade in exposed locations without UV protection.	MAJOR	
4.2	Expansion Fittings (Thermal)	352.44 300.7(B)	Expansion couplings installed per manufacturer's instructions accounting for temperature range. Typically required every 30 ft in exposed runs with >25°F temperature variation.	No expansion fittings in long exposed runs. Conduit visibly bowing, cracking at joints, or pulling out of fittings due to thermal movement.	MAJOR	
4.3	Support Spacing	352.30 Table 352.30	Supported per NEC Table 352.30 based on conduit size and temperature. Maximum spacing typically 3-5 ft. Support within 3 ft of each termination.	Conduit sagging between supports beyond NEC Table 352.30 limits. No support within 3 ft of terminations. Conduit deflected in high-temperature zones.	MAJOR	
4.4	Separate EGC Required	352.60	Separate insulated equipment grounding conductor installed in all PVC conduit runs. EGC sized per NEC Table 250.122.	No EGC found inside PVC conduit. EGC undersized per NEC Table 250.122. EGC not continuous from source to termination.	CRITICAL	
4.5	Underground Burial Depth	Table 300.5	Minimum cover per NEC Table 300.5: 18 in. under buildings/slabs, 24 in. general. Increased depth at road crossings (24-36 in.).	Conduit depth less than NEC Table 300.5 minimums. Evidence of conduit exposure through erosion. No mechanical protection at depth transitions.	MAJOR	

CRITICAL: PVC is NEVER acceptable as an EGC. Always verify a separate copper EGC is present inside the conduit.

5 | FMC / LFMC — Flexible Metal Conduit

NEC Article 348 (FMC) · Article 350 (LFMC)

Flexible Metal Conduit (FMC, 'Greenfield') and Liquidtight Flexible Metal Conduit (LFMC) are used for final connections to equipment, vibration isolation, and where rigid conduit is impractical. Maximum length is strictly limited.

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
5.1	Maximum Length Limitation	348.20(A) 350.20(A)	FMC/LFMC ≤6 ft for equipment connections. ≤72 in. for manufactured wiring systems. Longer runs require special permission and justification.	FMC/LFMC exceeding 6 ft without written special permission from AHJ. Used as a substitute for fixed wiring method where rigid conduit is feasible.	MAJOR	
5.2	EGC Requirements	348.60 350.60 250.118(5)(6)	FMC serves as EGC if ≤6 ft, trade size ≥3/8 in., and fittings are listed for grounding. LFMC serves as EGC if ≤6 ft and ≤1¼ in. trade size. Separate EGC otherwise.	FMC >6 ft used as EGC without separate EGC. Fittings not listed for grounding. LFMC >1¼ in. used as EGC without separate EGC.	CRITICAL	
5.3	Physical Condition	300.4(G)	No kinking, crushing, or sharp bends. Armor intact with no separated interlocks. Liquidtight jacket undamaged with no cuts or abrasions exposing metal.	Kinked or crushed FMC restricting conductors. Separated armor interlocks creating sharp edges. LFMC jacket cut or abraded compromising liquidtight integrity.	MAJOR	
5.4	Liquidtight in Wet Locations	350.10	LFMC (not FMC) installed in wet, damp, or outdoor locations. Liquidtight fittings properly tightened. Drip loops at equipment entries.	FMC (not LFMC) installed in wet or outdoor locations. Liquidtight fittings not fully tightened allowing moisture intrusion. No drip loops.	MAJOR	
5.5	Support & Securing	348.30 350.30	Secured at intervals ≤4.5 ft and within 12 in. of each box or fitting. Unsupported lengths at vibration-isolated equipment per exception.	Flexible conduit hanging unsupported >4.5 ft. Not secured within 12 in. of boxes or fittings.	MINOR	

6 | Wireways & Auxiliary Gutters

NEC Article 376 (Metal Wireways) · Article 378 (Nonmetallic Wireways)

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
6.1	Fill — 20% Maximum (Conductors)	376.22 378.22	Sum of cross-sectional areas of all conductors ≤20% of interior wireway cross-section. Splices and taps may occupy 75% max at that point.	Wireway overfilled beyond 20%. Conductors jammed preventing proper closing of cover. Taps or splices exceeding 75% fill at that location.	MAJOR	
6.2	Cover Integrity & Latching	376.56	All wireway covers properly seated and latched. No missing covers. Outdoor wireways with weatherproof covers properly sealed.	Missing covers exposing conductors. Covers not latched or secured. Open sections in outdoor or wet locations without weatherproof enclosures.	CRITICAL	
6.3	Support Spacing	376.30	Metal wireways supported at ≤5 ft intervals. Supported at each end and at each corner or branch. Vertical wireways supported at each floor.	Wireway sections unsupported for >5 ft. Sagging or deflecting under conductor weight. No support at joints or branches.	MAJOR	
6.4	Conductor Bending Radius	376.23	Internal radius of bends in wireway ≥ conductor minimum bending radius. No conductor kinking at 90° turns.	Conductors kinked at corners due to undersized turn radius. Conductor insulation cracked at bends. Wireway elbow bend radius smaller than conductor requirements.	MAJOR	

7 | Busway Systems

NEC Article 368 · NEMA BU 1 · UL 857

Busways (bus ducts) are enclosed systems of bare or insulated copper or aluminum busbars used for high-capacity power distribution. They are found in main service areas, between transformers and switchboards, and as plug-in distribution systems in commercial and industrial facilities. Busway inspections are particularly critical — overheating at joints and plug-in units is a leading cause of commercial building fires.

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
7.1	Joint & Splice Connection Tightness	368.56 NEMA BU 1	All busway joint bolts torqued to manufacturer's specifications. Spring washers or bolt indicators present. No loose or missing joint hardware. Joint covers intact.	Loose joint bolts (audible rattle or visible gap). Missing joint hardware. Heat discoloration at joints indicating resistance heating. Joint covers missing or damaged.	CRITICAL	
7.2	Overheating — Visual & IR Indicators	368.56 110.3(B)	No discoloration, carbonization, or smoke staining on busway housing. Bus bar insulation (if present) intact without melting or cracking. Annual IR thermography current.	Brown/black heat staining at joints or plug-in locations. Melted bus insulation. Smoke staining. IR thermography showing >15°C temperature differential at joints above ambient.	CRITICAL	
7.3	Plug-In Unit Seating & Interlock	368.17(B)	All plug-in units fully seated and locked per manufacturer's instructions. Interlock mechanism engaged preventing energization until fully connected. Empty plug-in openings covered.	Plug-in units not fully seated or locked. Interlock mechanism bypassed or defeated. Open plug-in openings exposing live busbars without covers.	CRITICAL	
7.4	Water Protection — Indoor (Drip Protection)	368.14(C)	Drip shields or slant shields installed where water pipes, HVAC units, or roof drains are above busway. No evidence of water intrusion. Outdoor busway rated for wet location.	No drip protection under water piping or HVAC equipment above busway. Evidence of water staining, corrosion from moisture intrusion. Indoor busway used outdoors without wet-location listing.	CRITICAL	

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
7.5	Floor Penetration Curbs	368.14(B) 368.12(D)	4-inch minimum curb height at all floor penetrations for vertical busway risers. Curb watertight. Opening sealed around busway after installation.	Curb height less than 4 inches at floor penetrations. No curb installed. Opening around busway not sealed against liquid intrusion at floor penetrations.	CRITICAL	
7.6	Support & Suspension	368.30	Busway supported per manufacturer's instructions. Supports at each joint and not exceeding manufacturer's maximum span. Supports adequate for seismic zone requirements (if applicable).	Busway sagging between supports. Supports missing at joints. Support spacing exceeds manufacturer's limits. Seismic bracing absent in required zones.	MAJOR	
7.7	Overcurrent Protection at Tap Points	368.17(C) 368.17(D)	Each busway tap point protected by overcurrent device rated for the tap conductor ampacity. Fusible plug-in units with correct fuse ratings installed.	Oversized fuses or breakers in plug-in units relative to connected conductors. Missing overcurrent protection at tap points. Plug-in units with bypassed or missing fuses.	CRITICAL	
7.8	End Cap & Exposed End Protection	368.56	All busway terminations and dead ends fitted with listed end caps. Transition fittings to conduit properly listed and installed. No exposed live bars at ends.	Missing end caps exposing live bars. Makeshift end protection (tape, cardboard). Transition fittings to conduit not listed or improperly installed.	CRITICAL	
7.9	Grounding & Bonding Continuity	250.96 368.60	Busway housing/enclosure bonded to building grounding system. Bonding continuity verified through all joints and transitions. Ground bus present where required.	Busway housing not bonded to EGC. Grounding continuity interrupted at joints (isolated housing sections). No EGC in conduit transitions from busway.	CRITICAL	
7.10	Prohibited Locations	368.12	Busway not installed: outdoors unless listed for outdoor use; in hoistways; where subject to physical damage; through walls or floors except where listed.	Standard indoor busway installed outdoors. Busway passing through a fire-rated wall without listed fire stop assembly. Busway in elevator hoistway.	MAJOR	

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
7.1 1	Load Balance (Phase Observation)	Art. 220	Visual or instrument check shows reasonably balanced phase loading on 3-phase systems. No single phase heavily loaded relative to others. Load documentation available.	Visible evidence of phase imbalance (unequal heating at junction). Load exceeding busway continuous ampere rating (typically 80% of rated current for continuous loads).	MAJOR	
7.1 2	Maintenance Clearance	110.26(A)	Adequate working clearance around busway for maintenance access. Plug-in units accessible for operation. No stored materials blocking access.	Access to plug-in units blocked by equipment or storage. Inadequate space to operate plug-in disconnect handles. Busway inaccessible for IR thermography.	MAJOR	

CRITICAL: Busway overheating at joints is a critical fire hazard. NEC 368.56 and NEMA BU 1 require joint torque verification. NFPA recommends annual infrared thermography scans under full load on all busway systems. A ΔT of $>10^{\circ}\text{C}$ at any joint warrants immediate investigation and retorquing.

8 | Cable Tray Systems

NEC Article 392 · NEMA VE 1 · UL 568

Cable tray systems are open raceway systems that support cables in commercial, industrial, and data center applications. Types include ladder, ventilated trough, solid bottom, center rail, and wire mesh. Cable tray is not a raceway in the conduit sense — only tray-rated cables are permitted unless installed in conduit within the tray.

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
8.1	Approved Cable Types Only	392.3 392.10	Only listed tray-rated cables installed: Type TC, MC, MI, PLTC, ITC, MV, AC (in listed applications). Single conductors $\geq 1/0$ AWG in industrial applications only.	Non-tray-rated cable (NM-B, UF) installed in open cable tray. Single conductors $< 1/0$ AWG in tray. Non-tray-rated cable not enclosed in conduit within tray.	CRITICAL	
8.2	Fill Capacity — Ladder & Ventilated Trough	392.22	For multiconductor cables: sum of cable cross-sections $\leq 50\%$ of tray cross-section area. Cables installed in single layer where required. Calculated per NEC 392.22(A).	Cables piled higher than tray side rails. Calculated fill exceeds NEC 392.22 limits. Single-layer requirement violated for single conductors per 392.22(B).	MAJOR	
8.3	Structural Integrity & Damage	392.18	Tray components free of cracks, bent rungs, corroded structural sections, or missing splice plates. Load-bearing capacity maintained. No visible deflection under cable weight.	Cracked or broken tray rungs. Corroded structural members reducing load capacity. Missing splice plates at section joints. Visible deflection or sagging under cable load.	MAJOR	
8.4	Grounding & Bonding (Metal Trays)	392.60 250.96	Metallic cable trays bonded to the building grounding system. Bonding continuity across all section joints verified. Tray serves as EGC only if listed and sized per NEC 392.60(B).	Metal tray not bonded to grounding system. Grounding continuity interrupted at section joints (splice plates not making electrical contact). No bonding jumpers at expansion fittings.	CRITICAL	

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
8.5	Voltage Separation (Power vs. Low Voltage)	392.8(D)	Power cables (>600V) separated from low-voltage control/communications cables by a solid barrier. Line voltage and signal cables in dedicated tray sections or divided by barrier.	High-voltage cables commingled with low-voltage signal cables without barrier. Ethernet/fiber mixed with power cables in same tray without barrier.	MAJOR	
8.6	Fire Stopping at Wall/Floor Penetrations	392.10 300.21	All cable tray penetrations through fire-rated walls and floors firestopped with listed UL system. Fill material rated same as wall/floor assembly. Cables continuing through are individually firestopped.	Open or unsealed cable tray penetrations through fire walls. Temporary or unlisted firestop materials. Individual cables exiting tray at penetrations without firestop.	CRITICAL	
8.7	Support Spacing	392.30	Tray supported at manufacturer's recommended intervals (typically ≤5 ft for ladder tray, ≤3 ft for solid bottom). Supports at each splice joint. Adequate support at changes in direction.	Support spacing exceeds manufacturer's limits or NEC 392.30. No support at splice joints. Cable tray spanning building expansion joints without flexible connection.	MAJOR	
8.8	Cable Fastening — Non-Horizontal Runs	392.30(B)	Cables fastened with listed cable ties or clamps to tray rungs in vertical and inclined tray runs. Ties rated for UV, temperature, and chemical environment.	Cables in vertical tray sections not fastened, relying solely on friction. Use of non-listed ties (standard zip ties without UV/temperature rating). Cable bundles slipping on inclined runs.	MAJOR	
8.9	Prohibited Locations	392.12	Cable tray not installed in hoistways. Not in areas subject to severe physical damage. Not in hazardous locations unless specifically permitted cable types are used.	Cable tray installed in elevator hoistway. Cable tray in area subject to vehicular impact without protection. Non-hazardous-rated cables in classified locations.	MAJOR	

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
8.10	Sunlight-Resistant Cables (Outdoor)	392.3(C)	Cables exposed to direct sunlight in outdoor cable tray identified as 'sunlight resistant' per NEC 392.3(C). Cable jacket rated for UV exposure.	Standard non-UV-rated cables installed in outdoor cable tray exposed to direct sunlight. Cable jacket chalking, cracking, or becoming brittle.	MAJOR	
8.11	Cable Tray Covers	392.8	Solid covers installed where cables are protected from falling debris or physical damage. Ventilated covers maintain cable ampacity. Covers properly secured.	Missing covers in areas requiring protection from mechanical damage. Solid (non-ventilated) covers affecting cable ampacity without derating. Unsecured covers creating fall hazard.	MINOR	

9 | Fire Stopping & Penetrations

NEC 300.21 · IBC §714 · UL 1479 · ASTM E814

Fire stopping of raceway penetrations through fire-rated assemblies is one of the most frequently cited code violations in commercial buildings. NEC 300.21 and IBC Section 714 require that all penetrations maintain the fire-resistance rating of the assembly. Listed UL-system assemblies must be used — field-fabricated methods are not acceptable.

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
9.1	Penetration Identified & Firestopped	300.21 IBC 714.4	Each raceway penetration through a fire-rated wall, partition, floor, or ceiling is sealed with a listed UL-classified firestop system. System number posted or documented.	Open or incompletely sealed penetrations through fire-rated assemblies. Stuffed insulation, expanding foam only (unless listed), or spray paint as firestop. No system documentation.	CRITICAL	
9.2	Hourly Rating Match	IBC 714.4.1	F-rating of firestop system equals or exceeds the fire-resistance rating of the penetrated assembly (1-hr, 2-hr, 3-hr, 4-hr). T-rating requirement met for floor penetrations.	Firestop system with lower F-rating than the assembly. T-rating not met for floor penetrations. No documentation of system ratings available.	CRITICAL	
9.3	Annular Space — Proper Fill	UL 1479	Annular space between conduit and sleeve/opening properly sized per UL listing (<3 in. max typically). Fill material applied per listed installation instructions (depth, coverage).	Annular space too large for the listed firestop system used. Fill material not applied to full depth per system listing. Conduit loose in opening without intumescent collar or other annulus fill.	CRITICAL	
9.4	Firestop System Installation Label	IBC 703.5	Firestop assemblies labeled per IBC 703.5 with system manufacturer, UL design number, and hourly rating where required. Or equivalent documentation in building record.	No identification of firestop system type or rating. No documentation available. Labels removed or obscured after installation.	MAJOR	

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
9.5	Cable / Conduit Not Damaged at Penetration	300.21 300.4	Raceway and cables free of damage at penetration points. No abrasion, crushing, or sharp edges contacting conductors. Protective bushings installed at metallic sleeve edges.	Cables or conduits mechanically damaged at penetration. Sharp concrete or steel edges contacting conductor insulation. No bushing at metallic sleeve.	MAJOR	
9.6	Smoke Barrier Penetrations	IBC 714.5 NFPA 72	Penetrations through smoke barriers (not fire barriers) sealed to limit air/smoke transfer. L-rating firestop system used where required. Cable tray penetrations firestopped with listed fill system.	Smoke barrier penetrations open or unsealed. No L-rated assembly at required smoke barrier penetrations. Cable tray penetrating smoke wall without fill.	MAJOR	

WARNING: Common field error: expanding spray foam (Great Stuff, etc.) is NOT a listed firestop material unless the specific product is UL classified for the assembly. The only acceptable firestop materials are those installed per their UL listing as part of a classified system (e.g., 3M, Hilti, Specified Technologies Inc. STI). Maintain documentation of all UL system design numbers.

10 | Working Clearances

NEC Section 110.26 · NFPA 70E Art. 130

NEC Table 110.26(A)(1) — Minimum Depth of Clear Working Space

Voltage to Ground	Cond. 1 (No Live Parts Opposite)	Cond. 2 (Grounded Opp.)	Cond. 3 (Live Parts Opp.)
0-150V	3 ft (900 mm)	3 ft (900 mm)	3 ft (900 mm)
151-600V	3 ft (900 mm)	3.5 ft (1.07 m)	4 ft (1.2 m)
601-2500V	3 ft (900 mm)	4 ft (1.2 m)	5 ft (1.5 m)
2501-9000V	4 ft (1.2 m)	5 ft (1.5 m)	6 ft (1.8 m)
9001-25kV	5 ft (1.5 m)	6 ft (1.8 m)	9 ft (2.75 m)

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
10.1	Depth of Working Space	110.26(A)(1) Table 1 10.26(A)(1)	Minimum 3 ft clear working space in front of all electrical equipment (for ≤600V). Additional depth per Table 110.26(A)(1) for higher voltages and Conditions 2 and 3.	Less than 3 ft clear space in front of panelboard, MCC, switchboard, or other electrical equipment requiring access. Any obstruction within minimum working space.	CRITICAL	
10.2	Width of Working Space	110.26(A)(2)	Width of working space ≥ width of equipment or 30 inches, whichever is greater. Door swings 90° without entering another person's working space.	Working space width less than 30 inches or equipment width. Door cannot open 90 degrees. Equipment flanking on both sides narrows space below minimums.	CRITICAL	
10.3	Height of Working Space	110.26(A)(3)	Headroom in front of electrical equipment ≥6.5 ft or equipment height, whichever is greater. No overhead obstructions within the working space footprint.	Ceiling or beam below 6.5 ft in front of electrical equipment. Overhead pipe, duct, or conduit obstructions within working space height.	MAJOR	
10.4	Working Space Used for Storage	110.26(B)	No materials, equipment, or inventory stored in required working space in front of electrical equipment. Space clear at all times.	Boxes, equipment, shelving, or any stored materials within the required working space. Conduit, pipes, or other installations obstructing the required clear space.	CRITICAL	

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
10.5	Dedicated Space (Equipment Area)	110.26(E)(1)	Space above indoor equipment to structural ceiling (or 6 ft above equipment top) dedicated to electrical systems. No foreign systems (piping, HVAC ducts) in this zone.	Water piping, HVAC ductwork, gas piping, or other foreign systems in the dedicated electrical equipment space above panels or switchboards.	MAJOR	
10.6	Illumination	110.26(D)	Adequate illumination at all electrical service equipment, switchboards, panel boards, and motor control centers. Illumination operable from outside the working space where possible.	No lighting at electrical equipment locations. Burned-out or inoperative lighting. Inspector unable to safely read circuit directories or equipment nameplates.	MAJOR	
10.7	Entrance & Egress	110.26(C)	At least one entrance ≥24 in. wide and 6.5 ft high. Rooms with equipment ≥1200A require two entrances at opposite ends (or one entrance with a personnel door with panic hardware if one wall abuts).	Access door <24 in. wide or <6.5 ft high. Single entrance to electrical room with 1200A+ equipment without meeting exception. Door swings into working space reducing clear distance.	MAJOR	

11 | Grounding, Bonding & EGC Continuity

NEC Article 250 · 250.92 · 250.96 · 250.118 · Table 250.122

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
11.1	EGC Size vs. OCPD Rating	250.122 Table 250.122	Equipment grounding conductor in each raceway sized per NEC Table 250.122 based on rating of the largest OCPD ahead of the equipment. EGC is copper or listed aluminum.	EGC undersized relative to OCPD rating per NEC Table 250.122. No EGC in conduit where metallic conduit/fittings do not qualify as EGC. Green or bare EGC correctly identified.	CRITICAL	
11.2	Raceway as EGC — Fitting Continuity	250.118 250.96	Where metallic conduit serves as EGC (EMT, IMC, RMC per 250.118): all fittings properly made up with no loose connections. Grounding continuity uninterrupted end to end.	One or more loose fittings breaking EGC continuity in a metallic conduit system. PVC conduit system without separate EGC. Aluminum conduit without listed fittings used as EGC.	CRITICAL	
11.3	Bonding at Service Equipment	250.92(B)	All service raceways bonded at service equipment with bonding bushings, bonding locknuts, or threadless connectors. Bonding jumpers sized per 250.102. Equipment bonding jumper at each end of service conduit.	Standard locknuts only (no bonding bushing) at service equipment. Missing bonding at one or both ends of service entrance conduit. Bonding jumper undersized per 250.102.	CRITICAL	
11.4	Bonding at >250V Concentric Knockouts	250.97 250.92(B)	Bonding bushing with EGC jumper installed at all concentric or eccentric knockouts on circuits over 250V to ground. Jumper connected to equipment grounding terminal.	Standard locknut at concentric knockout on >250V circuit. Bonding bushing installed but not connected to EGC. Concentric knock out rings not removed or bonded.	CRITICAL	
11.5	Cable Tray Bonding	392.60 250.96	Metal cable tray sections bonded together with listed splice plates or with bonding jumpers at splices. System connected to building ground. Ground lug accessible.	Splice plates painted or isolated preventing electrical continuity. No bonding jumpers at expansion fittings. Cable tray not connected to building grounding electrode system.	CRITICAL	

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
11.6	Busway Grounding	368.60 250.96	Busway enclosure bonded to EGC system at both ends and at each section if required. Plug-in units with grounding contacts seating properly. Ground fault in busway system clears via low-impedance path.	Busway housing sections not bonded. Plug-in unit grounding contacts not seating properly. No EGC in conduit transitions from busway feeder.	CRITICAL	
11.7	Grounding Electrode Conductor (GEC)	250.64 250.66	GEC runs uninterrupted from service equipment to grounding electrode system. GEC sized per NEC Table 250.66. GEC protected from physical damage where exposed. GEC secured within 12 in. of service entrance.	GEC spliced without listed irreversible compression connector or exothermic weld. GEC undersized per Table 250.66. GEC exposed to physical damage without protection. No GEC connection to ground rod or other electrode.	CRITICAL	

12 | Panel / Equipment Connections & Terminations

NEC 110.14 · 408.36 · 312.8 · 314.16

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
12.1	Conductor Termination — Torque	110.14(D)	All conductors terminated to marked torque specifications. Listed torque indicator (driver or wrench) used. Terminal conductors not over-torqued or cracked.	Conductors loose at terminals (can be moved by hand). No evidence of torque verification. Terminals cracked from over-torquing. Bird-cage stranded conductor at lugs.	CRITICAL	
12.2	Wire Fill at Panelboards / Gutters	312.8 314.16	Raceway entry area (gutter space) not >40% filled with conductors at any cross-section. Conductor bending space maintained per NEC Table 312.6. Splices and taps not in panelboard wiring gutter unless code-listed.	Conductors jammed at panel knockouts. Bending space insufficient to make proper terminations. Unauthorized splices inside panel wiring gutter. Cover cannot close.	MAJOR	
12.3	Conductor Identification	200.6 2 10.5(C) 408.3(F)	Phase conductors identified per system (A=black, B=red, C=blue for 208V; A=brown, B=orange, C=yellow for 480V). Grounded conductor white/gray. EGC green/bare. Panel directory current.	Unidentified conductors at terminations. Panel directory blank, illegible, or outdated. Improper color-coding causing confusion between systems. Grounded conductor not white/gray.	MAJOR	
12.4	Unused Openings Closed	110.12 312.5(A) 408.7	All unused conduit knockouts in panels, gutters, junction boxes, and wireways closed with listed closures. No open holes in enclosures.	Open knockouts in panel enclosures. Missing conduit bushings. Unused conduit entries with open holes. Panel covers with missing knockout fillers.	MAJOR	
12.5	Overheating at Terminals	110.14(C)	No discoloration, melted insulation, carbon deposits, or arcing marks at terminal connections. Infrared inspection records current if available.	Brown/black discoloration at breaker terminals. Melted wire insulation at connections. Carbon deposits indicating arcing. Breaker handle discolored from heat.	CRITICAL	

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
12.6	Double-Tapped Breakers / Terminals	408.36 110.3(B)	Each breaker terminal used for the number of conductors it is listed and labeled for (most are listed for 1 conductor only). Multi-wire taps only at listed positions.	Two or more conductors under a single-conductor breaker terminal. Multiple conductors twisted together at a single lug not listed for multiple conductors.	CRITICAL	
12.7	Raceway Entry Bushings	300.4(G) 312.5(C)	All conduit entries to metal enclosures fitted with insulated bushings or listed connectors protecting conductor insulation. Insulated bushings required for conductors ≥4 AWG.	Missing bushings at conduit entries. Bare metal conduit edge contacting conductor insulation. Conductors showing abrasion where they enter enclosures.	MAJOR	

13 | Load Capacity, Fill & Ampacity Derating

NEC Chapter 9 · Art. 310 · 215.2 · 220

#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
13.1	Conductor Ampacity vs. Load	310.15 215.2	Conductor ampacity per NEC Table 310.16 (or 310.15 adjustment factors) meets or exceeds connected load. Feeder conductors sized for at least 125% of continuous loads.	Conductors visually too small for connected equipment ratings. Evidence of overheating indicating overloaded conductors. Feeder sized <125% of continuous loads.	CRITICAL	
13.2	Conduit Fill ≤40% Rule	NEC Ch.9 Table 1	For 3+ conductors: total conductor cross-section ≤40% of conduit interior area. Calculation documented. 31% for 2 conductors, 53% for 1 conductor.	Conductor fill exceeds NEC Chapter 9 limits. Conductors cannot be pulled through conduit without damaging insulation. Visual evidence of overfill (distorted conduit).	MAJOR	
13.3	Ampacity Adjustment for Conduit Fill (>3 Conductors)	310.15(C)(1) Table 3 10.15(C)(1)	When more than 3 current-carrying conductors in raceway: ampacity derated per NEC Table 310.15(C)(1). 4-6 conductors: 80%; 7-9: 70%; 10-20: 50%; 21-30: 45%; 31-40: 40%.	No derating applied where >3 current-carrying conductors in conduit. OCPD exceeds derated ampacity. Multiple circuits in conduit with no derating calculation.	MAJOR	
13.4	Cable Tray — Fill Limits	392.22	For multiconductor cable tray: sum of cable cross-sections ≤50% of tray usable cross-section. Tray fill calculated per applicable NEC 392.22 subsection.	Cable tray filled beyond NEC 392.22 limits. Cables piled above tray walls. No fill calculation available for review.	MAJOR	
13.5	Busway Ampere Rating vs. Connected Load	368.17(A)	Busway continuous current rating ≥125% of continuous load. No visible evidence of sustained overload (heat staining, tripped breakers, deformed insulation).	Busway current rating less than 125% of continuous load. Thermal staining indicating sustained overloads. OCP rating exceeds busway rating.	CRITICAL	

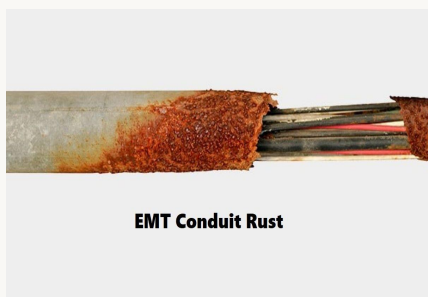
#	Inspection Item	NEC Ref.	PASS Criteria	FAIL / Deficiency	Severity	Result <input type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> N/A
13.6	Equipment Ampere Ratings Match Feeders	110.3(B) 430.52	Panelboard, MCC, switchboard, and busway ratings match or exceed feeder and load requirements. Equipment ampere rating not less than calculated load.	Equipment ampere rating less than feeder rating. Downstream equipment rating less than overcurrent protection rating. Service equipment rated less than calculated service load.	CRITICAL	

14 | Photo Reference Guide — Common Deficiencies

Visual reference examples for common raceway inspection defects

The following images illustrate common deficiencies encountered during commercial electrical raceway inspections. Use these as visual reference during field inspections. Photos are representative examples from publicly documented deficiencies.

EMT / Conduit — Corrosion & Physical Damage

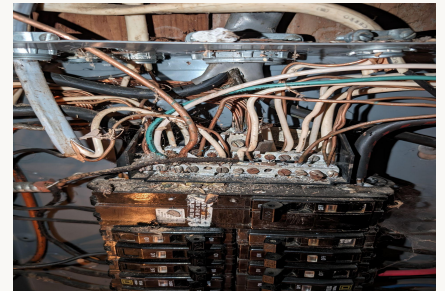


EMT Conduit Rust

FAIL — Rust/Corrosion
Surface rust on EMT in damp location —
NEC 358.10(B) / 300.6 violation



FAIL — Coating Failure
Galvanized conduit failure in wet/corrosive
environment — coating loss exposes bare
steel

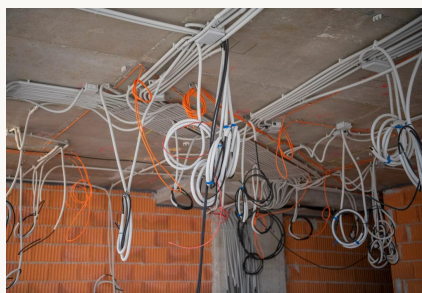


FAIL — Enclosure Corrosion
Panel enclosure corrosion from moisture
intrusion — indicates compromised
raceways

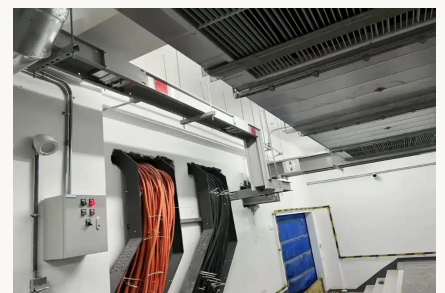
Cable Tray — Overcrowding & Hazards



FAIL — No Barrier
Cable tray with mixed cable types and no
separation barrier — NEC 392.8(D)
violation



FAIL — Overcrowded Tray
Severely overcrowded cable tray
exceeding 50% fill — NEC 392.22 violation



PASS — Correct Installation
Properly installed cable tray with correct
fill, separation, and support — PASS
example

Fire Stopping — Penetrations

[Photo: Improperly sealed wall penetrations — no listed firestop system — NEC 300.21 violation]

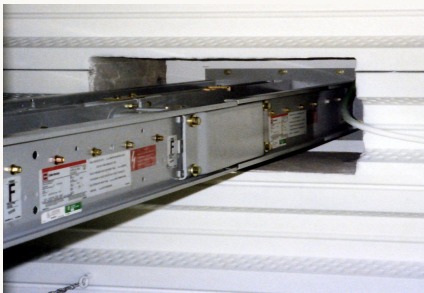


PASS — Listed Firestop
Listed UL firestop system at conduit penetration — correct F/T-rated assembly



PASS — Sealed Penetration
Firestopping electrical conduit penetration through fire-rated wall — sealed correctly

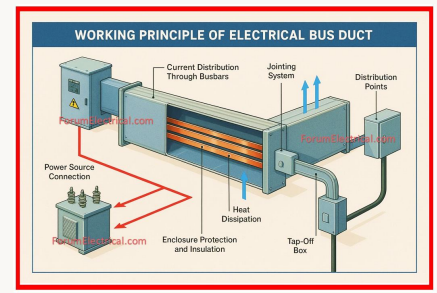
Busway — Installation & Hazard Examples



Reference — Busway System
Commercial bus duct installation — inspect joints for torque and heat indicators



FAIL — Thermal Damage
Thermal damage on busbar — discoloration indicates overheating at connections



Reference — Tap Box
Bus duct tap box and plug-in connections — verify plug-in seating and interlock

15 | Inspection Summary & Signature Block

Overall findings, corrective action tracking, and certification

Inspection Results Summary

Inspection Section	Total Items	Pass	Fail	N/A	Critical Issues	Inspector Notes
EMT Conduit (NEC 358)						
IMC / RMC Conduit (NEC 342/344)						
PVC Conduit (NEC 352)						
FMC / LFMC (NEC 348/350)						
Wireways / Auxiliary Gutters						
Busway Systems (NEC 368)						
Cable Tray Systems (NEC 392)						
Fire Stopping & Penetrations						
Working Clearances						
Grounding & Bonding						
Panel/Equipment Connections						
Load Capacity & Fill						
TOTALS						

OVERALL INSPECTION RESULT:	<input type="checkbox"/> SATISFACTORY — No critical deficiencies	<input type="checkbox"/> CONDITIONAL — Minor items require correction within 30 days	<input type="checkbox"/> UNSATISFACTORY — Critical/major deficiencies; immediate action required

Critical & Major Deficiency Tracking

