

# 3-PHASE COMMERCIAL ELECTRICAL SYSTEMS INSPECTION CHECKLIST

NEC 2023 · OSHA 29 CFR 1910 · NFPA 70E 2024 · IBC 2021 · InterNACHI SOP

Property Address: _____	City / State / ZIP: _____
Client Name: _____	Panel ID / Location: _____
Service Voltage: _____	Ampacity (A): _____
Inspection Date: _____	Weather / Conditions: _____

OVERALL SYSTEM RATING:

SATISFACTORY   
  DEFICIENT   
  HAZARDOUS   
  N/A

■ HIGH — Immediate safety hazard / code violation

■ MED — Deficiency requiring correction

■ LOW — Minor item / maintenance recommendation

## SECTION 1 · COMPLIANCE & DOCUMENTATION [NEC 408 · 210.8 · 210.12 · OSHA 1910.37 · NFPA 70E]

#	Inspection Item / Code Reference	Priority	Notes / Observations
1.1	<input type="checkbox"/> <b>NEC Compliance Verification</b> Confirm installation meets applicable NEC 2023 edition and local amendments	HIGH	
1.2	<input type="checkbox"/> <b>Permits &amp; Inspection Records</b> Verify electrical permits pulled; AHJ final inspection sticker present	HIGH	
1.3	<input type="checkbox"/> <b>Panel &amp; Circuit Labeling</b> All breakers/disconnects legibly labeled; directory current and accurate — NEC 408.4	HIGH	
1.4	<input type="checkbox"/> <b>GFCI Protection — Wet / Damp Locations</b> All required GFCI receptacles/breakers tested and operational — NEC 210.8	HIGH	
1.5	<input type="checkbox"/> <b>AFCI Protection</b> AFCI breakers installed where required by NEC 210.12; verify trip-test function	MED	
1.6	<input type="checkbox"/> <b>OSHA-Required Emergency Lighting</b> Exit signs, emergency egress lighting functional; battery backup tested — OSHA 1910.37	HIGH	
1.7	<input type="checkbox"/> <b>Arc Flash Hazard Labels</b> Equipment ≥ 240V labeled with incident energy / PPE category — NFPA 70E 130.5(H)	HIGH	

1.8	<input type="checkbox"/>	<b>Short-Circuit Current Rating (SCCR) Labels</b> Switchgear / panelboards labeled with AIC/SCCR rating meeting available fault current	MED	
1.9	<input type="checkbox"/>	<b>Utility Coordination Documentation</b> Utility service agreement, metering records, and power factor documentation on file	LOW	

Section \_\_\_\_\_

Notes: \_\_\_\_\_

**SECTION 2 · ELECTRICAL PANELS & BREAKERS [NEC 110.26 · 240.4 · 230.70 · 250.24 · 408.54]**

#		Inspection Item / Code Reference	Priority	Notes / Observations
2.1	<input type="checkbox"/>	<b>Panel Accessibility</b> 36" clear working space in front maintained; no storage obstructions — NEC 110.26	HIGH	
2.2	<input type="checkbox"/>	<b>Panel Enclosure Condition</b> Cabinet free of corrosion, moisture intrusion, pest entry, and physical damage	HIGH	
2.3	<input type="checkbox"/>	<b>Breaker Overheating / Discoloration</b> Inspect for heat staining, melted insulation, burned contacts — schedule thermal scan	HIGH	
2.4	<input type="checkbox"/>	<b>Proper Grounding / Bonding of Enclosure</b> Main panel ground bar bonded to neutral only at service entrance — NEC 250.24	HIGH	
2.5	<input type="checkbox"/>	<b>Double-Tapping / Shared Breaker Terminals</b> Verify no un-listed multi-conductor terminations unless breaker rated for same — NEC 110.14	HIGH	
2.6	<input type="checkbox"/>	<b>Breaker Ratings vs. Conductor Ampacity</b> Over-current protection does not exceed conductor ampacity — NEC 240.4	HIGH	
2.7	<input type="checkbox"/>	<b>Main Disconnect Location &amp; Labeling</b> Service disconnect accessible, properly rated, and clearly labeled — NEC 230.70	HIGH	
2.8	<input type="checkbox"/>	<b>Load Adequacy — Spare Capacity</b> Panel load calculation performed; minimum 20% spare capacity recommended	MED	
2.9	<input type="checkbox"/>	<b>Tandem / Piggyback Breakers</b> Tandem breakers used only in approved positions per panel directory — NEC 408.54	MED	
2.10	<input type="checkbox"/>	<b>Bus Bar Condition</b> Bus bars free of oxidation, pitting, arc damage; lugs torqued to manufacturer spec	HIGH	
2.11	<input type="checkbox"/>	<b>Knockout / Openings Sealed</b> All unused openings in panels and enclosures filled — NEC 110.12	MED	

2.12  Sub-Panel Feeder OCPD Sizing  
 Feeder breaker sized to match sub-panel bus rating and load demand

MED

Section \_\_\_\_\_  
 Notes: \_\_\_\_\_

**SECTION 3 · WIRING & CONDUIT [NEC 300 · 314 · 358 · 362 · IBC 714]**

#	Inspection Item / Code Reference	Priorit y	Notes / Observations
3.1	<input type="checkbox"/> Conduit Type / Application Suitability EMT, IMC, RMC, or PVC selected per location (wet, dry, direct burial) — NEC 358-358	HIGH	
3.2	<input type="checkbox"/> Conduit Support & Spacing Supports at required intervals; no sagging, missing straps — NEC 358.30	MED	
3.3	<input type="checkbox"/> Physical Damage to Conduit / Cables No crimps, crush marks, abrasion damage, or exposed conductors	HIGH	
3.4	<input type="checkbox"/> Conduit Fill Compliance Number of conductors does not exceed NEC Chapter 9 fill percentages	MED	
3.5	<input type="checkbox"/> Junction Box Covers & Accessibility All J-boxes covered, accessible (not hidden in walls/ceilings), properly secured — NEC 314.29	HIGH	
3.6	<input type="checkbox"/> Conductor Insulation Rating THHN/THWN-2 or equivalent rated for application temperature and environment	MED	
3.7	<input type="checkbox"/> Splices Within J-Boxes All splices made within approved boxes; wire nuts or listed connectors only — NEC 300.15	HIGH	
3.8	<input type="checkbox"/> Cable / Conduit Penetration Firestopping Fire-rated wall/floor penetrations firestopped with listed materials — IBC 714	HIGH	
3.9	<input type="checkbox"/> Conductor Color Coding — 3-Phase Phase A/B/C color standards followed (black/red/blue or brown/orange/yellow)	MED	
3.10	<input type="checkbox"/> Minimum Wire Bending Space Conductors not bent beyond minimum radius at terminal connections — NEC 314.28	LOW	

Section \_\_\_\_\_  
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**SECTION 4 · GROUNDING & BONDING [NEC 250.24 · 250.50 · 250.53 · 250.104 · 230.95]**

#	Inspection Item / Code Reference	Priority	Notes / Observations
4.1	<input type="checkbox"/> <b>Grounding Electrode System (GES)</b> Ground rods, water pipe, structural steel, or concrete-encased electrode verified — NEC 250.50	HIGH	
4.2	<input type="checkbox"/> <b>Ground Rod Depth &amp; Resistance</b> 8' minimum depth (2 rods if >25Ω); connections accessible for testing — NEC 250.53	HIGH	
4.3	<input type="checkbox"/> <b>Equipment Grounding Conductors (EGC)</b> EGC present, properly sized, and continuous throughout all circuits — NEC 250.118	HIGH	
4.4	<input type="checkbox"/> <b>Bonding of Metal Water Piping</b> Interior metal water piping system bonded within 5' of entry — NEC 250.104	HIGH	
4.5	<input type="checkbox"/> <b>Bonding of Structural Steel</b> Building steel bonded to GES where used as a grounding electrode — NEC 250.68	MED	
4.6	<input type="checkbox"/> <b>Bonding Jumpers at Service Entrance</b> Main and system bonding jumpers sized per NEC Table 250.102(C)(1)	HIGH	
4.7	<input type="checkbox"/> <b>Separate Ground / Neutral Buses in Sub-Panels</b> Neutral and ground buses isolated in all sub-panels (bond only at service) — NEC 250.24	HIGH	
4.8	<input type="checkbox"/> <b>Ground Fault Protection of Equipment (GFPE)</b> GFPE provided on solidly grounded 480Y/277V services > 1000A — NEC 230.95	HIGH	
4.9	<input type="checkbox"/> <b>Equipment Bonding for Motor Circuits</b> Motor frames, conduit, and associated equipment bonded; ground fault path verified	MED	

Section \_\_\_\_\_  
Notes: \_\_\_\_\_

**SECTION 5 · LOAD ANALYSIS & DISTRIBUTION [NEC 220 · 215 · NEMA MG-1 · IEEE 519]**

#	Inspection Item / Code Reference	Priority	Notes / Observations
5.1	<input type="checkbox"/> <b>Service Entrance Load Calculation</b> Calculated load does not exceed service ampacity; demand factors applied — NEC 220	HIGH	
5.2	<input type="checkbox"/> <b>Phase Balance / Load Imbalance</b> Measure line current on all three phases; imbalance should be < 5% of average	HIGH	
5.3	<input type="checkbox"/> <b>Power Factor</b> Power factor ≥ 0.90 under full load; correct with capacitor bank if below threshold	MED	

5.4	<input type="checkbox"/> <b>Voltage — 3-Phase Balance</b> Measure L-L and L-N voltages; imbalance < 2% for motor loads — NEMA MG-1	HIGH	
5.5	<input type="checkbox"/> <b>Harmonic Distortion (THD)</b> THD voltage < 5%; current THD noted; K-rated transformers if high harmonic loads present	MED	
5.6	<input type="checkbox"/> <b>Distribution Transformer Condition</b> No oil leaks, cooling fins unobstructed, temperature rise within nameplate rating	HIGH	
5.7	<input type="checkbox"/> <b>Capacitor Bank Inspection</b> Capacitors properly fused, switches functional, no bulging or leaks	MED	
5.8	<input type="checkbox"/> <b>Motor Control Center (MCC) Condition</b> Buckets properly seated, starter contacts not pitted, overloads properly sized	HIGH	
5.9	<input type="checkbox"/> <b>Circuit Directory Accuracy</b> Every circuit in distribution panel identified; orphaned/unknown circuits investigated	MED	
5.10	<input type="checkbox"/> <b>Dedicated Circuits — Critical Equipment</b> HVAC, elevators, fire alarm, emergency lighting on dedicated circuits	MED	

Section \_\_\_\_\_  
Notes: \_\_\_\_\_

**SECTION 6 · LIGHTING SYSTEMS [IES RP-7 · IBC 1008 · 1013 · ASHRAE 90.1]**

#	Inspection Item / Code Reference	Priorit y	Notes / Observations
6.1	<input type="checkbox"/> <b>General Illumination Levels</b> Footcandle levels meet IES RP-7 minimums for occupancy type; measure at task height	MED	
6.2	<input type="checkbox"/> <b>Emergency / Egress Lighting</b> Test 90-minute battery backup; 1.0 fc average along egress path — IBC 1008.3.4	HIGH	
6.3	<input type="checkbox"/> <b>Exit Sign Illumination</b> All exits covered; lettering height ≥ 6"; battery backup operational — IBC 1013	HIGH	
6.4	<input type="checkbox"/> <b>Lighting Branch Circuit OCPD</b> Lighting circuits protected at 20A max; no overloaded circuits	MED	
6.5	<input type="checkbox"/> <b>Lighting Control Systems</b> Occupancy sensors, timeclocks, and dimmer controls functional and properly programmed	LOW	
6.6	<input type="checkbox"/> <b>High-Bay Fixture Mounting &amp; Guards</b> Fixtures properly secured; HID or LED high-bays have intact wire guards where required	MED	

6.7	<input type="checkbox"/> <b>Ballast / Driver Condition</b> No darkened ends, buzzing, or flickering indicating failed ballasts or LED drivers	LOW
6.8	<input type="checkbox"/> <b>Outdoor / Wet Location Fixtures</b> Fixtures rated for wet or damp location as applicable; sealed properly	HIGH
6.9	<input type="checkbox"/> <b>Energy Code Compliance (LPD)</b> Lighting power density meets ASHRAE 90.1 or IECC limits for building type	LOW

Section \_\_\_\_\_  
Notes: \_\_\_\_\_

**SECTION 7 · THERMAL IMAGING & SAFETY — NFPA 70E / LOTO [NFPA 70E 2024 · OSHA 1910.147 · NFPA 10]**

#	Inspection Item / Code Reference	Priorit y	Notes / Observations
7.1	<input type="checkbox"/> <b>Thermal Scan — Main Service Equipment</b> Conduct IR scan under >= 40% load; flag any delta-T > 10 deg C above baseline — NFPA 70E 130.5	HIGH	
7.2	<input type="checkbox"/> <b>Thermal Scan — Distribution Panels</b> Scan all sub-panels and MCC buckets; document hot spots with image reference	HIGH	
7.3	<input type="checkbox"/> <b>Thermal Scan — Motors &amp; Starters</b> Scan motor frames and starters; overloaded or imbalanced motors show elevated temp	HIGH	
7.4	<input type="checkbox"/> <b>Thermal Scan — Conductors &amp; Connections</b> Focus on lugs, terminals, and splices; loose connections exhibit high resistance heating	HIGH	
7.5	<input type="checkbox"/> <b>PPE Availability &amp; Condition</b> Arc-rated PPE (gloves, face shield, FR clothing) on-site and within rated arc energy	HIGH	
7.6	<input type="checkbox"/> <b>LOTO Program Documentation</b> Written Lockout/Tagout procedures for all energy sources present — OSHA 1910.147	HIGH	
7.7	<input type="checkbox"/> <b>LOTO Step 1 — Notify Affected Employees</b> Affected personnel notified prior to de-energizing equipment	HIGH	
7.8	<input type="checkbox"/> <b>LOTO Step 2 — Identify All Energy Sources</b> All electrical, mechanical, pneumatic, hydraulic energy sources identified and listed	HIGH	
7.9	<input type="checkbox"/> <b>LOTO Step 3 — Isolate / De-energize</b> All isolation points opened/locked; verify using test instrument before work begins	HIGH	
7.10	<input type="checkbox"/> <b>LOTO Step 4 — Apply Locks &amp; Tags</b> Each authorized employee applies personal lock and tag to energy isolation device	HIGH	

7.11	<input type="checkbox"/> <b>LOTO Step 5 — Release / Verify Zero Energy</b> Test all terminals with meter; verify capacitors discharged; confirm zero energy state	HIGH	
7.12	<input type="checkbox"/> <b>LOTO Step 6 — Restore Procedure</b> Locks/tags removed by owning employee; affected employees notified before energizing	HIGH	
7.13	<input type="checkbox"/> <b>Electrical Safety Training Records</b> Qualified electrician training current; annual NFPA 70E refresher documented	MED	
7.14	<input type="checkbox"/> <b>Portable Fire Extinguisher — Electrical Class</b> Class C or ABC extinguisher within 75' of electrical equipment — NFPA 10	MED	

Section \_\_\_\_\_  
Notes: \_\_\_\_\_

**INSPECTOR CERTIFICATION & SIGN-OFF**

By signing below, the inspector certifies that this inspection was conducted in accordance with InterNACHI Standards of Practice, applicable NEC requirements, and the inspector's professional judgment. This report does not constitute an engineering evaluation and does not guarantee future performance of any system or component.

Inspector Name	License #	Date of Inspection
_____	_____	_____
Signature	Company / Firm	Report #
_____	_____	_____

**SUMMARY FINDINGS / PRIORITY ACTION ITEMS:**

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Reference Standards: NEC 2023 (NFPA 70) · OSHA 29 CFR 1910.303-308 · NFPA 70E 2024 · IBC 2021 · ASHRAE 90.1 · NEMA MG-1 · IEEE 519 · IES RP-7 · InterNACHI SOP