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Periodic Verification Tests

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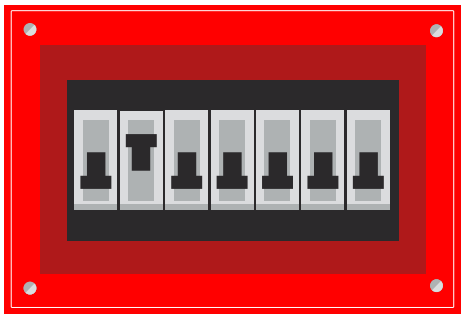
Testing, testing...

The checks to be completed in the periodic verification of electrical systems and installations comes are determined by recommendations in the New Zealand Standard – namely NZS 3019. In this sheet we look at the basics on what is expect.



Why do the inspections?

Checks are carried out to confirm that installations are neither damaged nor deteriorated, and that there are no dangerous defects. The parts must be safe for continued use to prevent fire and protect people from electric shock.

Three types of checks

The frequency and type of tests carried out boils down to a few factors, including what you have, what it's used for, and whether any issues are found in previous inspections.

Check	Overview
Basic visual inspection	Visual inspection – no physical testing required
Visual and limited testing	Basic visual inspection + tests completed with electrical supply remaining connected
Visual and full testing	Basic visual inspection + tests completed by disconnecting the electrical supply, including electrical insulation resistance testing Thermal imaging may be used to check the integrity of switchboard connections (your inspector will recommend a regimen that's right for you)

1. Basic visual inspection

Site inspection, no physical testing required. If evidence is shown of defective connections, overloading or arcing, you may also need limited or full testing.

- **Cables** show no undue evidence of insulation deterioration and have adequate mechanical protection
- No evidence of corrosion, damage or poor connection to visible portions of the earth electrode on the **main earthing conductor**
- **Adequate earthing** – e.g. metal pipes used for earthing (no plastic pipes)
- No evidence of **overheating** or **mechanical** damage to socket outlets, lamp holders, RCDs, MCBs, fuses and switches
- No deterioration of **conductor insulation** in switchboards and other electrical equipment
- Semi-enclosed **rewireable fuses** not deteriorated due to arcing and no exposed live parts when fitted
- **Covers for fixed wire appliances** not broken, missing or exposing live parts/basic insulation
- **Switchboard** equipment labelled correctly
- Electrical **fittings in damp areas** have correct protection rating and are appropriate for the area
- **Overhead lines** have no evidence of insulation deterioration, rusting anchor points or deterioration of line connection boxes
- **Safety distance clearances** not compromised between building and overhead lines

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2. Visual inspection plus limited testing

Everything as mentioned on the previous page is included here plus the following checks.
The electrical supply remains connected, so there is no electrical insulation resistance testing.

Item	What's involved
General	• No access to live parts without the use of tools – some exceptions to this requirement • No damage to electrical equipment and fixed wired appliances forming part of the electrical installation • Conductors and cables correctly identified and connected to correct terminals • Conductors securely held in fitting terminals and not subject to tension at terminations • Adequate insulation/distance between live conductors and between live conductors and earth • Adequate support of electrical equipment • Electrical equipment suitable for the environment or suitably enclosed • Lamps don't exceed fitting ratings • Fittings undamaged and serviceable, wiring checked where signs of overheating evidenced • Exposed metal liable to become live is earthed
Switchboards	• Appropriate rating/breaking capacity of protective devices • Semi-enclosed rewireable fuses not deteriorated due to arcing, with no exposed live parts when fitted • Correct labelling of switches and protective devices • Live conductors insulated or protected by a barrier • Neutral bars supported on insulated fittings • Earthing conductors fitted to both earth and neutral bars (when these are separate) • Main earthing connector correctly connected to earth electrode • Multiple Earth Neutral (MEN) connection present between neutral and earth at main switchboard • Correct construction/installation of switchboard • RCD devices for personal protection operate at correct residual current (less than 30mA)
Main earthing conductor	• Correctly sized • Main earthing connector correctly connected to earth electrode • Accessibility of main earthing conductor terminations • Mechanically sound and secure connections • Connections protected against mechanical damage/corrosion/ vibration • No mechanical strain on fittings by connections • Correct connection of earthing conductor at main switchboard • Correct labelling
Fixed wiring appliances	• Correctly positioned appliances and suitable for environment • Connections are correct • Appliances correctly mounted and protected against mechanical damage • Protection against access to live parts – e.g. covers or insulation
Overhead lines	• No evidence of insulation deterioration • No rusting anchor points or deterioration of line boxes
Testing requirements	• Earth continuity test • Equipotential bonding test • Polarity and correct connections test, including leakage current testing and RCD testing, if interruption to electrical supply tolerated

3. Visual inspection plus full testing

Everything as previously mentioned on page one is included here plus the following checks. The electrical supply is disconnected to all parts of the installation.

- Polarity testing
- Polarisation testing
- Insulation resistance testing
- Earth fault loop impedance test
- Protective device fault rating
- RCD verification
- Integrity of switchboard connections by thermographic imaging or infrared thermometer
- Testing of final sub circuits from electrically separated supply

Where periodic verification does not include thermographic imaging, consideration should be given to including thermographic imaging as part of the electrical maintenance programme.

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