



PORTABLE ELECTRICAL APPLIANCE TESTING 2005 -2006

1.0 SPECIFICATION OF WORKS

1.1 Acts and Regulations

The work shall be undertaken as detailed later in this document and shall fully comply with the following:-

- The Health and Safety at Work Act 1974
- The Electricity at Work Regulations 1989
- The Management of Health and Safety at Work Regulations 1999
- The Provision of Use of Work Equipment Regulations 1998
- The IEE Code of Practice for In-Service Inspection and Testing of Electrical Equipment, 2nd Edition 2001
- The 16th Edition of The IEE Wiring Regulations
- The University of Reading Safety Guide 12, Testing Electrical Equipment (see Annex C)

1.2 Competency

All testing engineers to be employed by the contractor for this project shall hold training / competency certificates to at least the following standards (or their industry recognised equivalents):-

- City and Guilds 2377, Inspection and Testing of Portable Electrical Appliances
- City & Guilds 2381, Level 3 Certificate in the Requirements for BS:7671 2001
- ECITB Passport to Safety

The successful contractor will be required to submit a list of engineers to be employed for this project together with copies of their current competency certificates as detailed above. The contractor will not be appointed by the University until this requirement has been satisfied.

1.3 Criminal Records Bureau Disclosure

The University will retain the right to ask the successful contractor to provide Criminal Record Bureau Disclosures for all testing engineers to be employed for this project. The University will not be responsible for any costs incurred by the contractor in obtaining such disclosures. At the discretion of the University, the contractor will not be appointed until this requirement has been satisfied.

1.4 Personal Identification

All engineers employed on this project will be required to carry adequate means of personal identification whilst they are present on University premises. Such

identification shall display the company name, company telephone number, a current photograph of the bearer, the name and title of the bearer.

A list of engineers' names will be required to be submitted to the University Liaison Officer and will be deposited with the University's Security Manager for information and record. The contractor shall keep the University Liaison Officer informed of any updates to the list as they arise.

Personnel without appropriate ID **WILL** be asked to leave site immediately and the University will not be liable for any delay, loss or expense occurring as a result.

1.5 Equipment to be Tested

The 16th Edition of the IEE Wiring Regulations defines a portable appliance as an electrical appliance that can be moved while it is connected or can be moved to be used elsewhere.

For the purpose of this contract, portable appliances are to be considered to be those, which are supplied with electricity by connection to a socket outlet.

All portable single phase 240V AC mains powered electrical equipment shall be tested such as:-

- Desk lamps
- Office equipment
- I T Equipment
- Photocopiers
- Kettles
- Cleaning equipment
- Heating appliances
- Pantry cooking equipment
- Refrigerators
- Freezers
- University owned equipment in staff lodgings

This list is not exhaustive.

The following items of equipment are excluded:-

- Fixed appliances
- 3 phase appliances
- Students' or staff members' personal equipment. (However see item 1.15)

Care must be taken to return appliances to the status in which they were found i.e. energised or de-energised. The contractor will be responsible for any loss incurred due to appliances not being left in the correct state after testing. This is particularly important for refrigerators and freezers.

1.6 Testing Methodology

Appliances are to be tested in situ and marked with coloured tape to indicate either a three year or a one year retest. Items which should not be subjected to a flash test (computer, fax machines etc) are to have a red tape flag fitted to the lead adjacent to the plug. All tapes and flags will be available as free issue items from the University stores.

FOR CLASS I APPLIANCES (as defined in the 16th Edition Wiring Regulations)

1. Visual Inspection

A Visual Inspection shall consist of

- A) The Plug Top including the inside to check conductor lengths, connections, cord grip and conductor colours and condition.
- B) The flexible cable for any sign of deterioration.
- C) The appliance for signs of deterioration or damage, which might allow contact with live conductors.
- D) The apparent age of the appliance; possible obsolescence
- E) The nature and environment the appliance is used in.

2. Testing of the appliance

The following tests are to be carried out

- A) Earth Bonding
- B) Electrical Insulation
- C) Leakage
- D) Polarity
- E) Functional Operation

FOR CLASS II APPLIANCES (as defined in the 16th Edition Wiring Regulations)

1. Visual Inspection

A Visual Inspection is to be undertaken as for Class I appliances with particular attention being paid to the electrical insulation of the appliance.

2. Testing of the appliance

The following tests will be required

- A) Electrical Insulation
- B) Leakage
- C) Functional Operation

1.7 Appliance Tests

All equipment shall have tests from the following list carried out as appropriate, by means of an approved portable appliance tester.

- **Earth Bond Test – for Class 1 Appliances**

Appropriate test current (1.5 x running current of the appliance) to the earth pin of the plug to an earth probe which should be connected by the tester to any exposed metal works on the casing of the equipment under test; then determine the resistance of the earth (safety conductor) bond.

- **Insulation Test**

Apply a Voltage typical 500 Vdc between live and neutral conductors and measure the resistance between live and neutral and the safety conductor (earth). The resistance is measured in Meg Ohms and should be within the guidelines for each particular appliance tested, shown in the regulations issued by the IEE.

- **Leakage Test**

During normal running operational Voltage (230 Vac) the resistance is measured between live, neutral and the Safety Conductor (earth). The resistance is measured in ohms and should be within the guidelines for each particular appliance tested shown in the regulations issued by the IEE. This test is to determine the deterioration of the appliance within its in-service lifetime.

- **Functional Test**

The appliance should operate at normal Voltage and conform to all its original manufacturers' specifications.

- **Polarity Test**

A Voltage of 40 Vac is applied to all conduction (live, neutral and earth) via the Plug Top and monitored at connector to ensure that all three conductors are correct.

- **Microwave Oven Radio Frequency Emissions Test**

1.8 On Site Repairs

Where appliances fail due to minor defects such as blown fuses or loose plug connections for instance and where an on-site repair can be completed in less than 10 minutes, the contractor shall allow for carrying out such minor on-site repairs immediately. The costs of minor on-site repairs shall be deemed to be included within the contractor's tendered rates for testing.

Additionally, for appliances with a monetary value in excess of circa £25.00, (i.e. where an on-site repair would still prove to be cost effective) an immediate on-site repair shall also be undertaken provided that:-

- The repair cost will not exceed £25.00
- The repair can be completed in less than 20 minutes

Where the contractor considers that a major repair would be economic he will be at liberty to submit an estimate for carrying it out for approval by the University.

1.9 Testing Equipment

Shall be purposely designed and certificated for carrying out the tests detailed above. The contractor shall produce documentation to show that the testing equipment is regularly calibrated for accuracy in accordance with HS (R) 25, Regulation 4 (4) and is traceable to National Standards.

1.10 Frequency of Tests

The frequency of tests shall be as prescribed by the above noted Regulations and as set out in The University of Reading Safety Guide 12, Testing Electrical Equipment (see Annex C)

Appliances are to be marked with coloured tape to indicate either a three year or a one year retest. Tape to be supplied free issue from the University stores (see item 1.6).

1.11 Test Results and Reports

Following completion of testing in a defined area i.e. Building or Department the contractor shall prepare and issue a report in both paper and electronic format to include the following information:-

- Date of tests
- Location of tests
- University Site Register Code for location of tests (these are four character alpha-numeric codes and a full list will be provided to the contractor before work commences)
- Test instrument information and calibration details
- Register of equipment tested – A list of equipment grouped by location with a unique appliance identifier number allocated to each item
- A list of failed items
- Test results including recommended dates for follow up tests.

It is appreciated that the contractor may have a preferred database software package that he is used to provide electronic format test reporting. The University will be

prepared to consider any reasonable proposal but the contractor will need to allow for providing the University with the software necessary to interrogate the report information. The proposed software package must be able to present the reports in a format compatible with Microsoft Excel.

1.12 Test Result Labels

An approved test label shall also be fixed to each appliance tested and shall show the following information:-

- Date of test
- Tester's name
- Tester's signature
- Appliance identifier number (must cross-reference with the report above)
- Date for re-test

The University keeps a stock of compliant labels in store and these can be made available free issue to the contractor. Alternatively, the contractor may use his own preferred labels by agreement with the University Liaison Officer.

1.13 Test Failures

All appliances that fail the tests, (unless they can be repaired immediately, see 1.8) shall have a prominent Red label attached stating "ELECTRICAL SAFETY TEST FAILED – DO NOT USE" as well as the appliance identifier number, the tester's signature and reason for the failure. Failed appliances, once labelled, shall be handed to a responsible person within the area where testing is being conducted and that person shall be advised to prohibit use of the appliance pending either repair or disposal. The contractor shall provide the University Liaison Officer with a written statement, signed by the responsible person to confirm that this has been done.

1.14 Restrictions and Special Conditions

All buildings will remain fully occupied during the works and the successful contractor shall ensure that the works are so organised and carried out as to cause as little inconvenience and the minimum of noise to the occupants. Hours of work are restricted to Monday to Friday, 8.30 am to 5.00 pm. The contractor must adhere strictly to any regulations that may be imposed by the University's liaison officer.

Weekend working will not be permitted without prior consultation and approval.

The contractor shall not allow his employees to play radios or other sound producing equipment whilst working on University property.

Smoking is prohibited inside any University building.

1.15 Fire and Safety Precautions

The contractor shall ensure that his employees take all reasonable precautions to prevent the outbreak of fire when working in University buildings. On attendance at each building the testing engineers shall:-

- Ensure that they comply with the local protocol for recording who is present in the building
- Obtain the name by which the location is known for emergency reporting of fire
- Familiarise themselves with the procedures for raising the alarm and the location of the evacuation muster point

The contractor shall ensure that his employees comply with the provisions of the Health and Safety at Work Act 1974, including where necessary or directed, the provision of protective clothing or equipment appropriate to the situation. This may well arise when testing is required within laboratory or workshop areas.