

SECTION FOUR

SAFETY

Contents

4.1	GENERAL	
	4.1.1 - Statutory Regulations	
	4.1.2 - Basic Safety Points	
4.2	TOOLS AND EQUIPMENT	
	4.1.1 - Hand Tools	
	4.1.2 - Scaffolding and Ladders	
4.3	PERMITS TO WORK	

4.1.1 Statutory Regulations

All parties involved in the operation and maintenance of the electrical installation must be aware and act under, the requirements of the Health and Safety at Work Act 1974, the latest edition of the regulations for the Electrical Equipment of Buildings, and any other relevant statutory regulations and current amendments together with British Standards, that may apply.

4.1.2 Basic Safety Points

The following list which contains a number of basic rules that should be observed, is not necessarily comprehensive.

1. Always assume every circuit is "live" until it has been checked with a voltmeter, or smaller approved means.
2. Always check your instruments with a known "live" source before using them for testing
3. Before removing fuses, switch off or, if possible isolate the circuit which it is serving. Never remove a fuse from a circuit carrying its working current.
4. Never touch two sides of a circuit simultaneously whenever it is live or dead.
5. Do not use metal rules or measuring tapes when working on or near live equipment.
6. Always use an approved fuse puller, suitably rated and insulated for the line voltage, to remove fuses on circuits which cannot be isolated.
7. When removing fuses, always break contact on the "hot" side of the circuit first and when replacing insert fuses in the "cold" side first.
8. Always use tools with hand grips adequately insulated against the voltage of the circuit to be worked on.

Basic Safety Points Contd..

9. If, through necessity, work has to be carried out on a live circuit, make sure that someone else is present who is familiar with first aid procedures associated with electrocution (mouth to mouth resuscitation, etc) and that a permit authorising the work to be done is obtained from the building management personnel.
10. Use carbon dioxide or similar gas type extinguishers, not liquid or foam type, to fight electrical fires.
11. Careful attention must be given to securing the safety of personnel and equipment while maintenance or repair work is in progress. A code of safety rules based on a system of "permits to work", similar to that which is detailed in British Standard BS5405: 1976, Appendix A, is recommended.
12. Where maintenance work is in progress, a 'DANGER' notice must always be attached to any 'LIVE' apparatus calling attention to the danger of approach. A 'CAUTION' notice must always be attached to plant or its associated control equipment warning of possible damage to equipment which may be occasioned by interference.
13. Before any work is commenced on any item of equipment, supply and ancillary circuits must be made 'dead' and locked off.
14. When working on medium and low voltage switchgear it is recommended that caution notices and adequate screens are used and voltage indicators are used to prove that the apparatus is dead before any work is commenced. Where it is necessary to work on 'live' low-voltage or medium-voltage switchgear, steps should be taken to guard against shock and short-circuit by the use of insulating stands, screens, boots, gloves and tools as may be necessary; these should be maintained in sound condition and checked immediately before use.
15. Only fully-insulated handlamps with non-metallic guards should be used. Danger and caution notices in the vicinity of 'live' conductors should be non-metallic.

Basic Safety Points Contd..

16. Any automatic fire-extinguishing equipment should be rendered temporarily inoperative.
17. Any plates fitted to switching devices, giving operating instructions, should be maintained in a legible condition.
18. It is important that maintenance personnel should be fully familiar with the operation of the various devices that they are called upon to handle.
19. All voltage indicators should always be tested on a known 'live' source immediately before and after use. The use of improvised indicators must be discouraged.
20. On low and medium voltage circuits where filament lamps in series (test lamps) are employed as portable voltage indicators these should be adequately guarded by insulating material and should be provided with high breaking capacity fuses in both leads. The leads should terminate in well-guarded test probes.
21. Precautions should be taken to ensure that control circuits to automatic equipment are disconnected from the supply before work is commenced on such equipment. It should not be assumed that the isolation of the main supply to the equipment isolates auxiliary circuits. For example a voltage transformer may be made 'live' back from another source.

In isolating auxiliary circuits to automatic equipment, care should be taken to ensure that the tripping supplies to other units are not affected.
22. Whenever removing fuses, resetting overloads, throwing switches, etc., always observe the 'one hand' rule and ensure that your 'spare' hand is not touching any equipment.

The above rules must be constantly applied if accidents are to be avoided.

FINALLY AND ABOVE ALL, TREAT ELECTRICITY WITH RESPECT AND DO NOT TAKE RISKS.

4.2 TOOLS AND EQUIPMENT

All tools and equipment should be kept clean and in good condition. They should be regularly inspected and any which show signs of excessive wear or defects should be replaced immediately.

The following are a few notes on the use of tools and equipment:-

4.2.1 Hand Tools

1. Only use each tool for the purpose for which it was designed.
2. Never leave tools lying about. Collect them when finished and return them to their correct location.

4.2.2 Scaffolding and Ladders

1. Never tie two ladders together, always use the correct length ladder for the job.
2. Never have less than three feet overlap with extension ladders.
3. Ensure that all ladders used have non-slip feet.
4. Always secure the top of a ladder where there is a danger of it slipping.
5. Never place the bottom of a ladder more than a quarter the distance of its height away from the vertical.
6. Always ensure that both hands are free when climbing ladders using a tool bent to carry hand-tools or a hoisting rope. Keep your body weight as close to the ladder as possible when climbing.
7. Ensure that the area below the ladder or scaffolding is clear of personnel. Erect warning notices if necessary.
8. Use only approved scaffold clamps and adaptors for erecting scaffolding.
9. Ensure that all wheels, swivels, etc. are locked when scaffolding is in use.

Scaffolding Ladders Contd..

10. Make sure all tools and equipment have been removed from removable scaffolding towers before they are moved.
11. Ensure that all planks are supported without any extensive overlaps at a maximum of eight feet centres.

Before commencing work on any item of plant or equipment it is suggested that authorisation be obtained. This authorisation should be in the form of a "permit to Work" ensuring that the equipment in question is isolated from the system and that ancilliary supply circuits are isolated and locked off. "Danger" and "Caution" notices must be displayed and firmly attached to supply and control switchgear.

A permit to Work, typical examples of which are shown in BS5405: 1976, Appendix A, is a written authorisation to carry out work on or about electrical apparatus, signed for or on behalf of the person on whom the occupier's responsibility for safety rests. It should as a minimum, set out clearly and concisely the apparatus on which the work is to be done, the extent of the work, and the precautions which are to be taken or have been taken to ensure that the designated apparatus is safe to work on.

"Permits to Work" should only be issued by persons specially authorised in writing by the occupier to do so.

The permits should be numbered serially for reference and should be in duplicate. One copy should be retained by the issuer and one copy handed to and signed as an acknowledgement of its terms by the person carrying out or in charge of the work; he should retain it until the work is completed or stopped.

When the work is completed or stopped, the appropriate section of the permit should be signed by the person to whom it was issued and the permit returned to the issuer for cancellation. In instances where the permit is retained prior to the completion of the work, a note to that effect should appear on the permit and work should not be recommenced until a fresh permit is issued.

The apparatus designated in the permit or permits as 'dead' must not be made 'live' until every permit covering that apparatus has been cleared by the person to whom it was issued and returned to and cancelled by the issuer.

Permits to Work Contd..

When a person authorised to issue "Permits to Work" intends to do work on the apparatus himself, he should complete a "Permits to Work" form to ensure he is taking the same precautions as he would when authorising work by others.