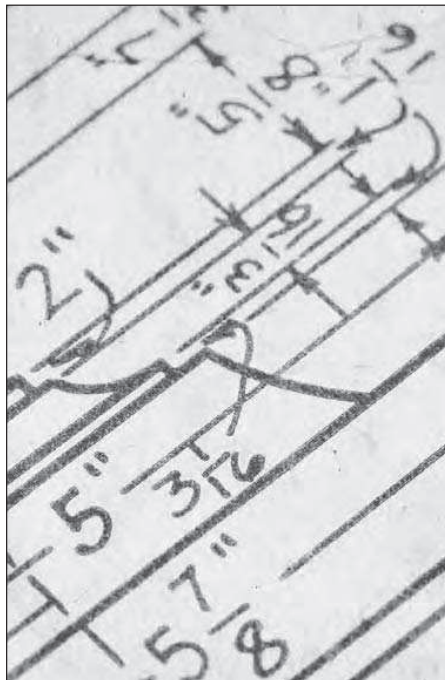

ELECTRICAL DRAWINGS AND SCHEMATICS



WHAT YOU WILL LEARN:

- How to interpret schematic diagrams
- The purpose of symbols in logic drawings
- The use of colours and line types in representing various objects
- How to interpret electrical, earthing and cabling layouts
- The governing standards in electro-technology and their symbols

WHO SHOULD ATTEND:

- Electronics Engineers
- Electrical Engineers
- Design Engineers
- Electricians
- Instrumentation Engineers
- Consulting Engineers
- Production Managers
- Process Engineers
- Maintenance Engineers

The Workshop

Electricity has long been recognised as a serious workplace hazard. The SANS electrical standards are designed to protect employees exposed to dangers such as electric shock, electrocution, fires and explosions. This unit standard is intended for use in the training of electricians and covers a basic understanding of the framework of standards, which govern their work in South Africa.

This workshop is designed to provide up-to-date information and training on the latest edition of South African Standard SANS 10142 - 'The Wiring of Premises'. With references to safety, maintenance, inspections, testing and wiring of premises, it provides a summary of some of the basic principles necessary for a good understanding of electrical installation technology.

It is compulsory for each user to follow the instructions given by authorized personnel to obtain the necessary certificate of compliance.

Practical Sessions

- Study of surge protection requirements
- Harmonic correction
- Earthing of information technology equipment
- Assessment of load in domestic installations
- Cable sizing considering correction factors for installation
- Voltage drop calculation
- Conduit selection
- Testing documentation
- Compliance documentation

The Program

DISTRIBUTION SYSTEM OVERVIEW

- Historical perspective of growth of 3 phase AC electrical systems
- Generation, transmission and distribution
- Transformers
- Switching equipment
- Circuit breakers LV and HV
- Dangers of electricity
- Need for safety in operation and maintenance

SAFETY REQUIREMENTS OF ELECTRICAL INSTALLATIONS BASICS (PARTS 1 AND 2)

- Electric shock
- Earthing and bonding for safety
- System classification based on earthing
- Safe clearances
- Arc danger in electrical installations
- Protection against arc faults
- Importance of isolation
- Insulation
- Enclosures of electrical equipment (IP ratings)
- Role of electrical protection
- Protection against surge voltages
- Harmonics - fundamentals and need for harmonic control
- Designing for safety
- Role of periodic maintenance and
- Safety procedures and safety education
- Certification and authorisation

INTRODUCTION TO SANS 10142 STANDARD

- Need for standards in industry
- Objectives of SANS 10142
- Overview of the standard
- Scope and exclusions
- Applicability of amendments to the standard in contracts
- Compliance with Acts for occupation Health and Safety and Mine Health and Safety
- Future development - part 2 for HV installations
- Mandatory and informative requirements of the standard
- Information given under annexure to the standard
- Comparison with IEC and UK codes of wiring

FUNDAMENTAL REQUIREMENTS

- Safety stipulations
- Basic requirements of electrical systems and wiring
- System characteristics
- Harmful effect of equipment on electrical systems
- Derating for altitudes exceeding 2000m
- Special requirements for medical location
- Safety by extra low voltage systems and special requirements

INSTALLATION REQUIREMENTS (PARTS 1 AND 2)

- General circuit arrangements
- Current - carrying capacity of conductors and cables
- Installation of conductors and cables
- Positioning and fixing of cables
- Rigid and flexible wire ways
- Distribution boards
- Protections against excessive currents and earth leakage
- Circuit breakers and their use as disconnectors
- Main switch disconnector
- Disconnection of neutral
- Fuses
- Earthing and consumer's earth terminal
- Bonding
- Requirements for lightning circuits
- Socket outlets
- Requirements for wiring of fixed appliances

SPECIAL LOCATIONS AND INSTALLATION (PARTS 1 AND 2)

- Bathrooms, showers and spas
- Swimming pools, paddling pools and ornamental pools
- Saunas
- Construction and demolition sites
- Agricultural and horticultural locations
- Caravan parks, mobile homes and marinas
- Medical locations
- Temporary installations
- Extra low voltage lighting installations
- Stage and theatre equipment
- Safety and emergency lighting
- Alternative supplies
- High-Voltage (HV) apparatus
- Hazardous locations
- DC system earthing

VERIFICATION AND CERTIFICATION OF INSTALLATIONS

- Responsibility
- Installation characteristics
- Electricity supply system
- Prospective short-circuit current
- Inspection
- Testing
- Certificate of Compliance

SUMMARY, OPEN FORUM AND CLOSING