WIRING SYSTEMS

TPS WIRING SYSTEM

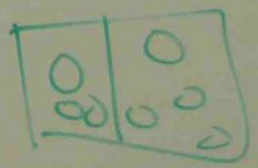
- MOST COMMONLY USED IN COMMERCIAL AND DOMESTIC INSTALLATIONS.
- DOUBLE INSULATION.
- THERE ARE RESTRICTIONS FOR USE OF TPS WIRING SYSTEM.

LIMITATION

THE MAXIMUM NUMBERS OF CABLES IN TRUNKING SYSTEM IS ONLY LIMITED BY THE SPACE AUAILABLE FOR CABLE AND TO PERMIT INSTALLATION OF CABLES WITHOUT DAMAGE.

THE CABLES WILL NEED TO BE DERATED IF MORE THAN ONE CIRCUIT IS ENCLOSED IN TRUNKING.

- LOW VOLTAGE CABLES ARE TO BE SEGARATED FROM THE CABLES OF OTHER SYSTEMS PARTICULARLY TELECOMMUNICATION SERVICE.



- L.V CABLES MUST BE SEGARATED FROM FIRE CONTROL, EVACUATION AND LIFT WIRING SYSTEM.

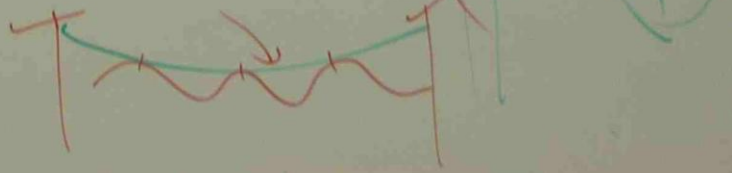
- USE OF SEPARATE CHANNEL IN TRUNKING SYSTEM TO SEGARATED CABLE.

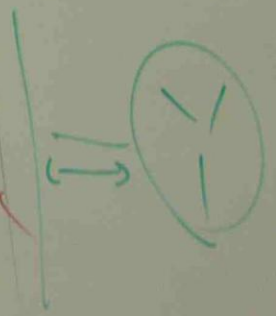
- THE CABLES SHOULD BE INSTALLED IN A POSITION WHERE THEY ARE NOT LIKELY TO BE DISTURBED.

INSTALLATION REQUIREMENT (READ THE RULE BOOK FOR THE FOLLOWINGS)

- IN CONCRETE, PLASTER, CEMENT RENDER
- THE WAY TO INSTALL THE CABLE IN THE AREAS LIKELY TO BE DISTURBED
- THE WAY TO INSTALL THE CABLE IN THE AREAS NOT LIKELY TO BE DISTURBED
- METHOD TO PASSING THROUGH JOISTS
- UNDERGROUND

- CONTROLLED ATMOSPHERE ROOM
- IN A WALL SPACE BEHIND AN ACCESSORY
- CATENARY.



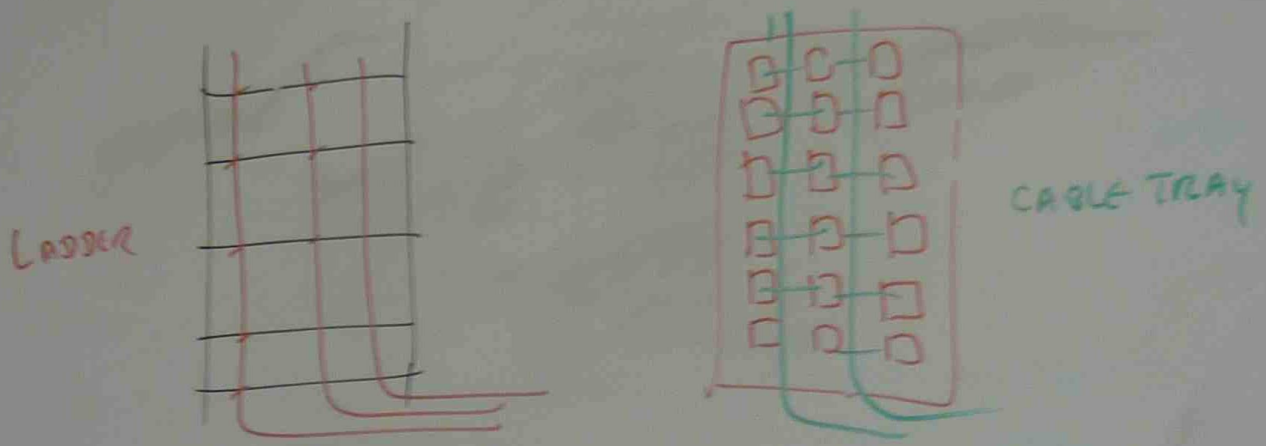


SAFETY TESTING

EACH CIRCUIT MUST BE TESTED BEFORE CONNECTION TO SUPPLY.

- EARTH RESISTANCE IS SAFE AND SUFFICIENTLY LOW
- INSULATION RESISTANCE IS SAFE AND SUFFICIENTLY HIGH
- POLARITY IS CORRECT. INCLUDING SWITCHES CONTROLLING ACTIVE CONDUCTORS.
- THERE IS NO TRANSPOSITION OF EARTH AND NEUTRAL CONDUCTORS.
- THERE IS NO SHORT CIRCUIT BETWEEN CONDUCTORS
- THERE IS NO INTERCONNECTION WITH ANOTHER CIRCUIT.
- CIRCUIT CONTROL AND PROTECTION DEVICES ON THE MAIN SWITCH BOARD ARE CORRECTLY MARKED TO INDICATE.
- THE CORRESPONDING ACTIVE AND NEUTRAL CONDUCTOR FOR EACH CIRCUIT.
- THE RELATIONSHIP OF EQUIPMENTS AND VARIOUS PARTS OF INSTALLATION
- THE NUMBER OF POINTS TO A CIRCUIT DO NOT EXCEED THE MAXIMUM PERMITTED
- THE CIRCUIT OPERATES AS INTENDED.

CIRCULAR TPS CABLE ON A CABLE TRAY



CABLE TRAY AND LADDER SUPPORT SYSTEM ARE OFTEN USED WITH TPS CABLES, FLAT AND CIRCULAR IN COMMERCIAL AND INDUSTRIAL INSTALLATIONS.

COMPARISON BETWEEN TWO SYSTEMS

	ADVANTAGE	DISADVANTAGE
LADDER	HEAVY DUTY CONSTRUCTION, MUCH STRONGER THAN TRAY	MORE EXPENSIVE THAN TRAY
	LARGER DISTANCES BETWEEN SUPPORTS COMPARED WITH TRAY	NOT AS ADAPTABLE AS TRAY AND NOT EASY TO WORK WITH
	VERY HIGH LEVEL OF AIR CIRCULATION PERMITTED AROUND CABLE	SMALLER RANGES OF SIZES
TRAY	LESS EXPENSIVE THAN LADDER	NEEDS MORE SUPPORT AND FIXINGS THAN LADDER
	WIDE RANGES OF SIZES AVAILABLE	
	HIGHLY ADAPTABLE, EASY TO FIT TO BUILDING PROFILE	LESS AIR CIRCULATION AROUND THAN LADDER

ACTUAL CURRENT CAPACITY of CABLES IS AFFECTED BY

- AREA OF CONDUCTOR
- TYPE OF INSULATION
- ARRANGEMENT OF CABLES
- INSTALLATION METHODS
- TYPE OF CABLE (SINGLE (OR) MULTI CORE)
- CLEARANCE BETWEEN CABLES AND OTHER TIERS OF CABLE SUPPORT SYSTEM.

CABLE SUPPORT

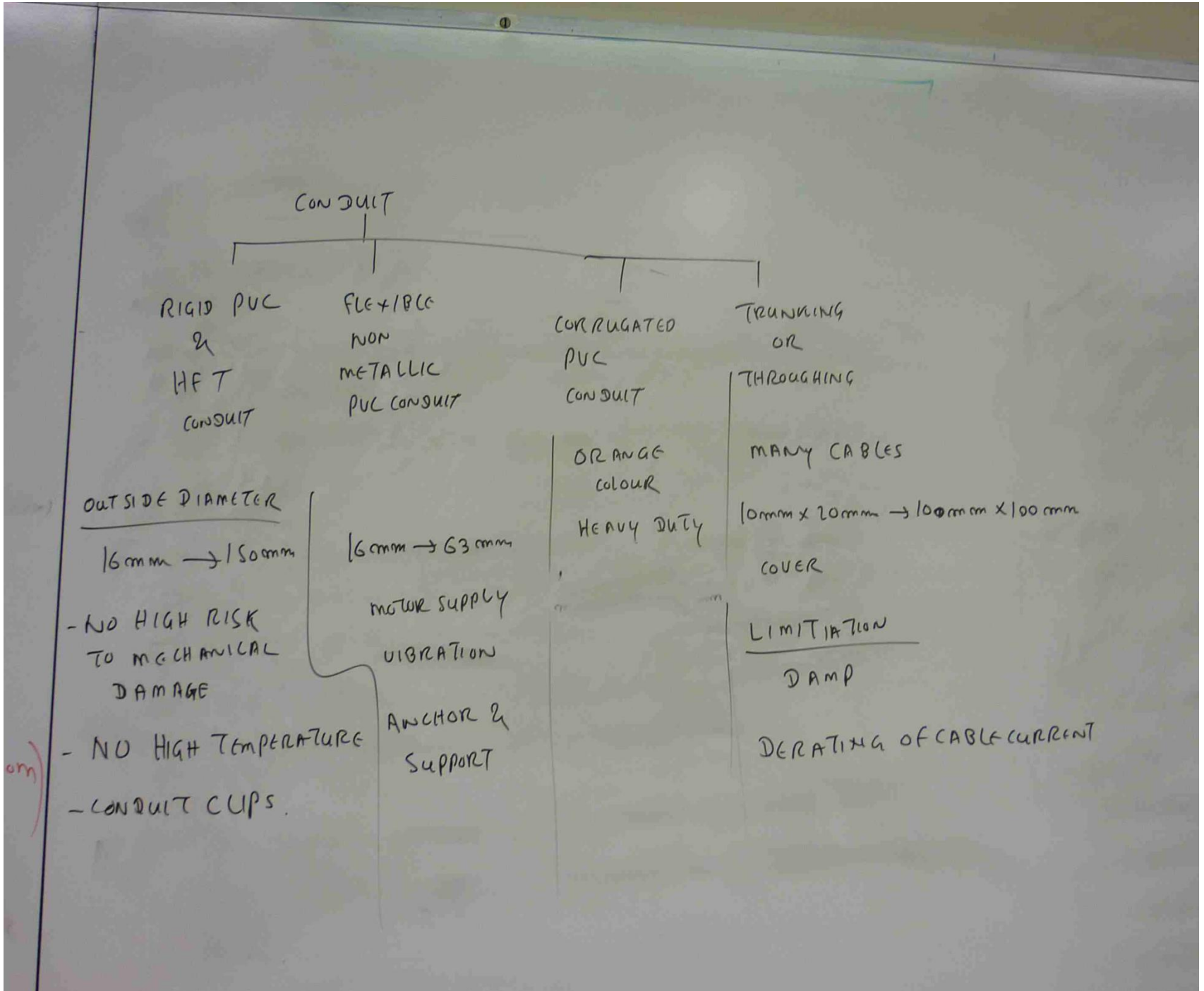
TIED BY NYLON TIERS AT SUITABLE INTERVAL

WEATHER PROOF

CABLE GLAND IS USED FOR WEATHER PROOFING

INSTALLATION REQUIREMENT (READ THE FOLLOWINGS FROM WIRING RULE BOOK)

- AREAS LIKELY TO BE DISTURBED
- PROTECTION AGAINST MECHANICAL DAMAGE
- CHANGE OF DIRECTION.
- MEAN OF FIXING
- DAMP SITUATION
- POOL ZONE
- GENERAL HOSING AREA


CONDUIT
RIGID PVC & HFT CONDUIT
FLEXIBLE NON METALLIC PVC CONDUIT
CORRUGATED PVC CONDUIT
TRUNKING OR THROUGHING
OUTSIDE DIAMETER
16mm → 150mm
- NO HIGH RISK TO MECHANICAL DAMAGE
- NO HIGH TEMPERATURE
- CONDUIT CUPS.
16mm → 63mm
MOTOR SUPPLY
VIBRATION
ANCHOR & SUPPORT
ORANGE COLOUR
HEAVY DUTY
MANY CABLES
10mm x 20mm → 100mm x 100mm
COVER
LIMITIATION
DAMP
DERATING OF CABLE CURRENT

INSTALLATION REQUIREMENT (FROM WIRING RULE BOOK)

RIGID NON METALLIC CONDUIT

FLEXIBLE CONDUIT

CORRUGATED NON METALLIC CONDUIT

CABLE TRUNKING

NUMBER OF CABLES IN CONDUIT

ENCLOSURE OF CABLE

MOUNTING ACCESSORIES

SEGREGATION OF WIRING SYSTEM

PENETRATION OF FIRE BARRIES

G003 / G004 Electrical Syst Safety 1. ZIP

G003 / G004 WIRING 2 part 1. ZIP

REVIEWS & ANSWERS TO BE STUDIED.

INTRODUCTION TO WIRING SYSTEMS

THE NECESSARY DISTRIBUTION OF POWER WITHIN A CONSUMER'S PREMISE IS ACHIEVED BY WIRING SYSTEM.

WIRING

THE METHOD USED FOR SUPPORTING CABLES AND WIRES, THE PROTECTION AGAINST AND PROTECTION AGAINST ELECTRIC SHOCK

WIRING SYSTEM CAN REFER TO TYPE OF CABLE, CABLE INSTALLED IN A CERTAIN WAY, VARIOUS COMBINATIONS OF CABLE (OR) CONDUCTORS.

TPS - THERMO PLASTIC SHEATHED WIRING IS THE MOST WIDELY USED WIRING SYSTEM.

MIMS - MINERAL INSULATED METAL SHEATH CABLE - USEFUL FOR HIGH TEMPERATURE.

SELECTION OF A SUITABLE WIRING SYSTEM

TYPE OF BUILDING STRUCTURE

WHETHER THE BUILDING IS TIMBER / STEEL / ALUMINIUM OR/ CONCRETE. WHAT IS FUNCTION.

TYPE OF WIRING SYSTEM USED IN TEMPORARY FIELD WORKSHOP IS DIFFERENT FROM PERMANENT WIRING SYSTEM INSTALLED IN A CONCRETE BUILDING.

APPEARANCE

THE WIRING SYSTEM USED IN WORK SHOP IS DIFFERENT FROM THE SYSTEM USED IN HOTEL, HOSPITAL ETC

AMBIENT TEMPERATURE OF ENVIRONMENT

THE WIRING SYSTEM USED FOR OFFICE IS UNSUITABLE FOR THE SYSTEM USED IN BOILER HOUSE.

MECHANICAL HAZARDS

SPECIAL PROTECTION IS TO BE PROVIDED FOR HIGH RISK OF MECHANICAL DAMAGE

HAZARDS ASSOCIATED WITH ENVIRONMENT

WET, EXPLOSIVE MATERIALS, LIFT WELLS, REFRIGERATION ROOM, PETROL PUMP.

THE WIRING SYSTEM USED FOR HAZARDOUS MUST HAVE

FIRE | MOISTURE | EXPLOSION PROOF.

COST

COST FOR INSTALLATION, REPLACEMENT, MAINTENANCE ARE TO BE CONSIDERED.

WIRING RULE PRACTICE

FIND AND STUDY THE CLAUSES RELATED TO

HAZARDOUS AREA, AMBIENT TEMPERATURE, MECHANICAL HAZARDS, WIRING SYSTEM,

OPEN WIRING, AERIAL, CATENARY SUPPORT

OPEN WIRING IS ESSENTIALLY A SURFACE METHOD WITH NO CONCEALED WIRING. THE CABLES ARE PROTECTED BY THE ENCLOSURE OF SHEATHING. EASY TO REPAIR AND LOCATE THE FAULT.

IT IS SUBJECT TO MECHANICAL DAMAGE. CONDUIT (OR) TRUNK IS USUAL FORM OF PROTECTION.

APPLICATIONS

- EXTRA LOW VOLTAGE INSTALLATIONS (< 50V AC , < 120V DC)
- FACTORY AND INDUSTRIAL INSTALLATIONS
- SWITCH BOARD WIRING
- TEMPORARY WIRING
- EARTH ELECTRODE WIRING.

USE OF BARE CONDUCTOR IS LIMITED.

- USE OF OPEN WIRING IN HAZARDOUS AREA IS PROHIBITED.

AERIAL WIRING

BARE (OR) INSULATED CONDUCTORS DIRECTLY EXPOSED TO THE WEATHER AND SUPPORTED ABOVE ARE CLASSIFIED AS AERIAL CONDUCTORS.

THE MAJOR PART of AN ENERGY DISTRIBUTOR'S DISTRIBUTION SYSTEM IS BY BARE AERIAL CONDUCTORS. THE USE of AS 3000 DOES TO APPLY TO THESE.

TYPE of CABLES

THERMO PLASTIC, ELASTOMER INSULATED CABLE

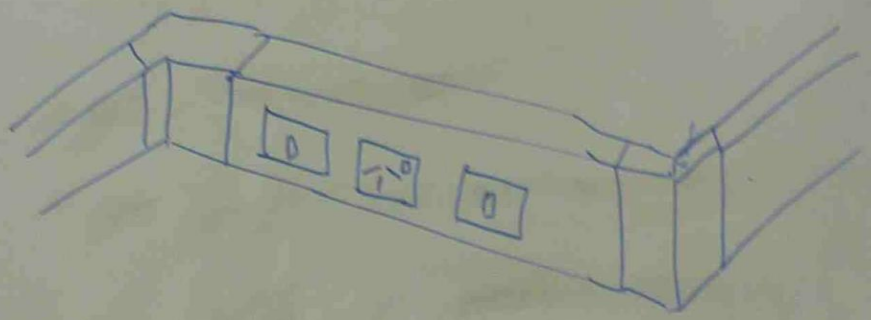
TWISTED AERIAL INSULATED CABLE

HARD DRAWN COPPER (OR) ALUMINIUM CONDUCTORS.

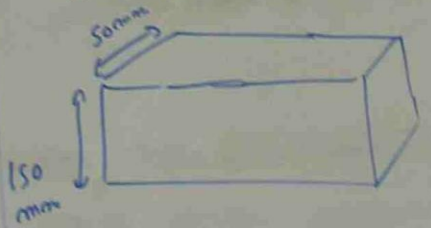
CANTENARY SUPPORT

THE CABLE SUPPLYING THE ELECTRICITY FROM POLE TO MAIN SWITCH BOARD IN HOME IS SUPPORTED BY CANTENARY (STEEL) WIRE.

TRUNKING SYSTEM



CABLE TRUNK IS INSTALLED AT CEILING, OR UNDER FLOOR. OR WALL FROM WHERE ELECTRICITY IS TAKEN TO SWITCHES AND SOCKET OUTLETS.



TRUNK SIZE = LENGTH × 150mm × 50mm

METAL.

APPLICATION

SUPERMARKET, BANKS, COMPUTER ROOM ETC.

CABLE TRAYS AND LADDERS

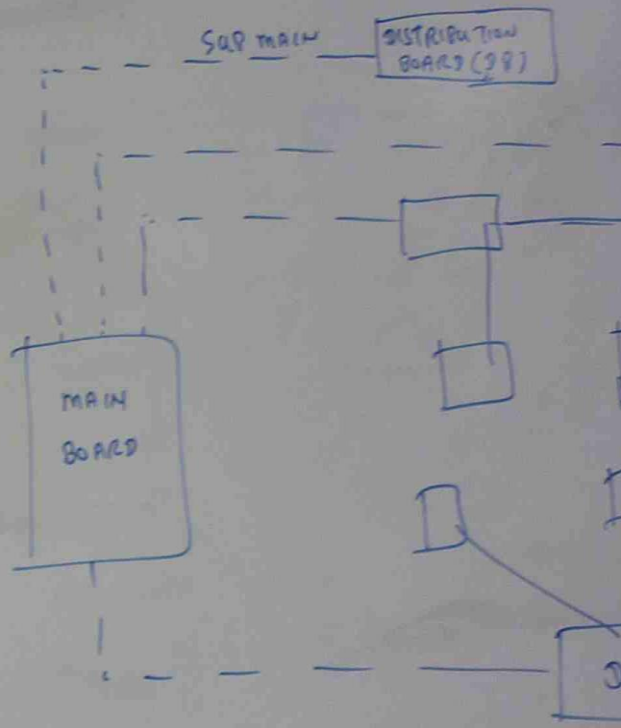
- UTILIZED FOR INDUSTRIAL AND COMMERCIAL APPLICATIONS
- PROVIDE AIR FLOW AROUND THE CABLE

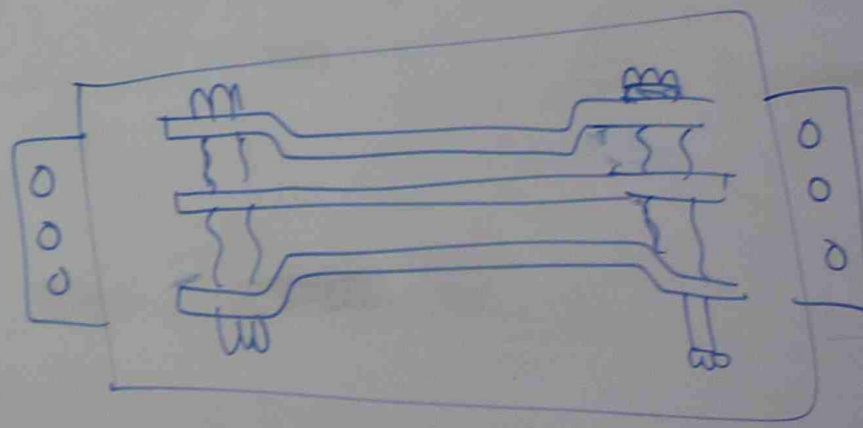
CABLE DUCT IS A CLOSED PASSAGE FORMED UNDER GROUND (OR) IN A STRUCTURE INTO WHICH CABLES ARE DRAWN.

BUSWAY SYSTEM CONSISTS OF SOLID COPPER OR ALUMINIUM CONDUCTORS SUPPORTED BY INSULATED BARRIERS AT INTERVALS WITHIN A FORMED DUCT, TRUNK (OR) SIMILAR ENCLOSURE

USE FOR DISTRIBUTION BOARDS.

USE OF ELECTRO BAR FEEDERS.





S

D COMMERCIAL APPLICATIONS

CABLE

E FORMED UNDER GROUND

HICH CABLES ARE DRAWN.

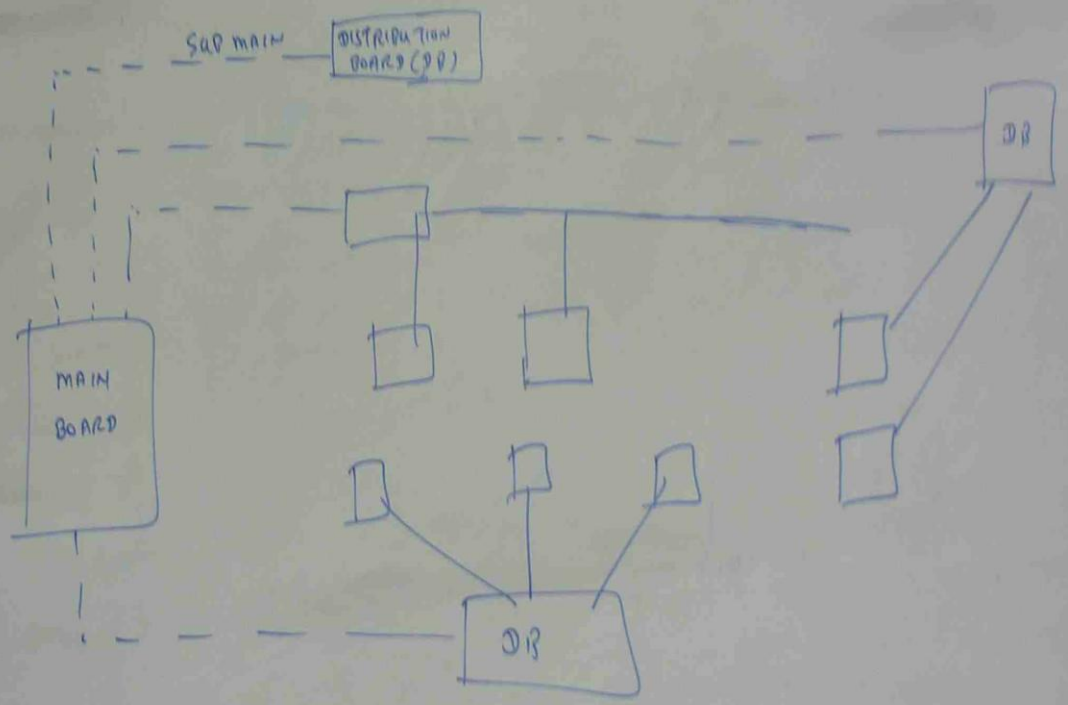
SOLID COPPER OR ALUMINIUM

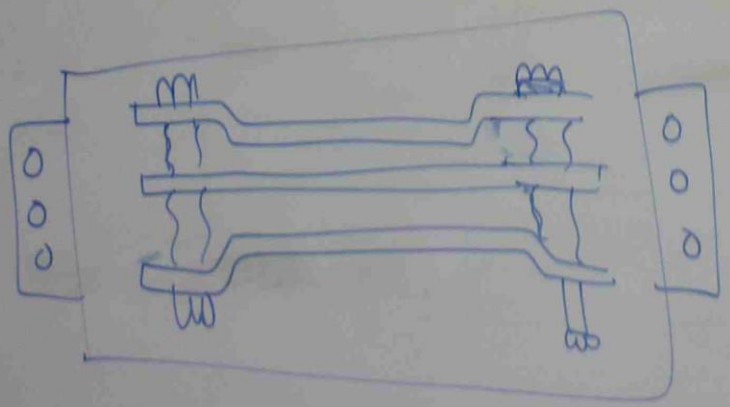
ATED BARRIERS AT INTERVALS

(OR) SIMILAR ENCLOSURE

BOARDS.

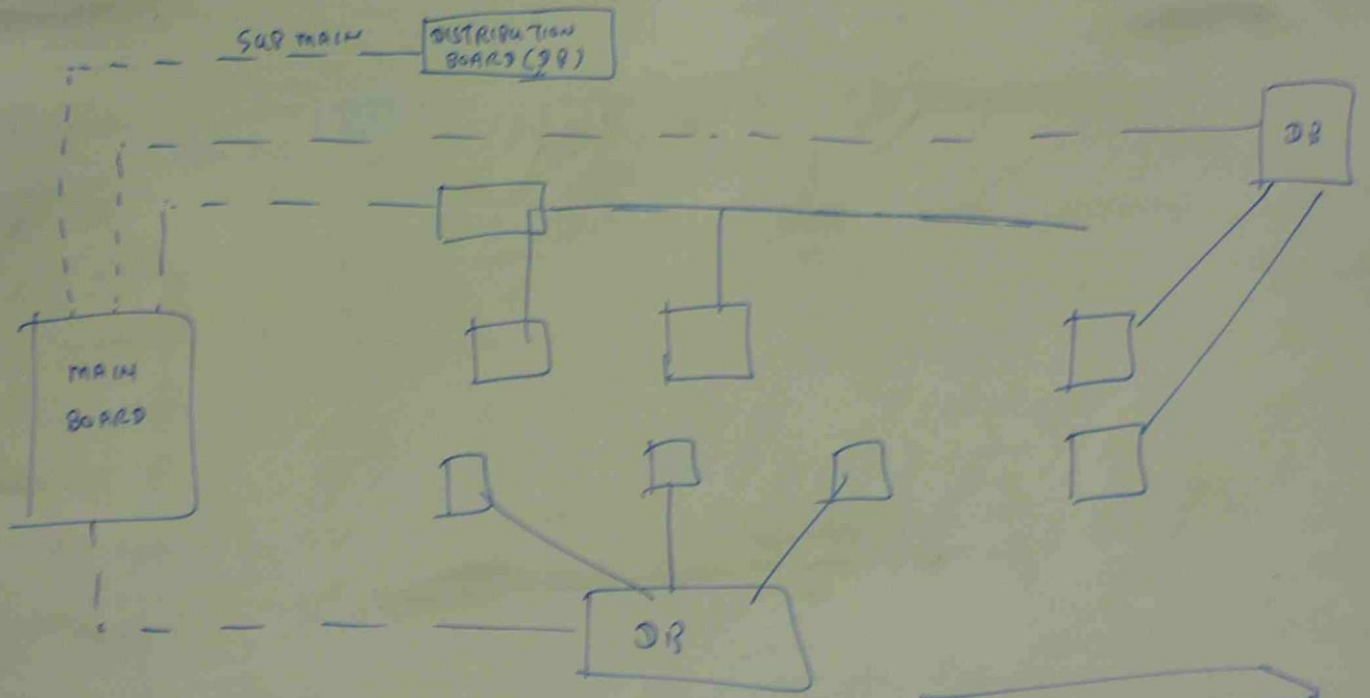
DERS.

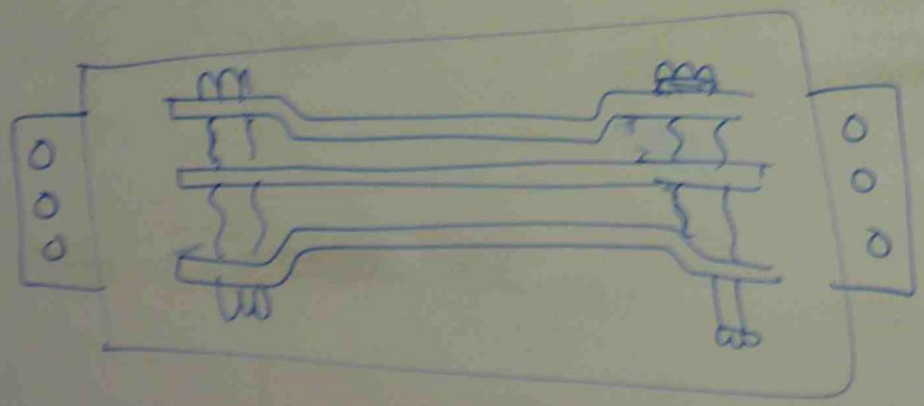


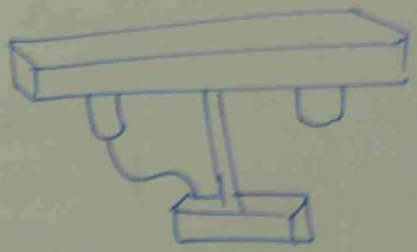


L APPLICATIONS

UNDER GROUND
ARE DRAWN.
OR ALUMINIUM
ERS AT INTERVALS
AR ENCLOSURE





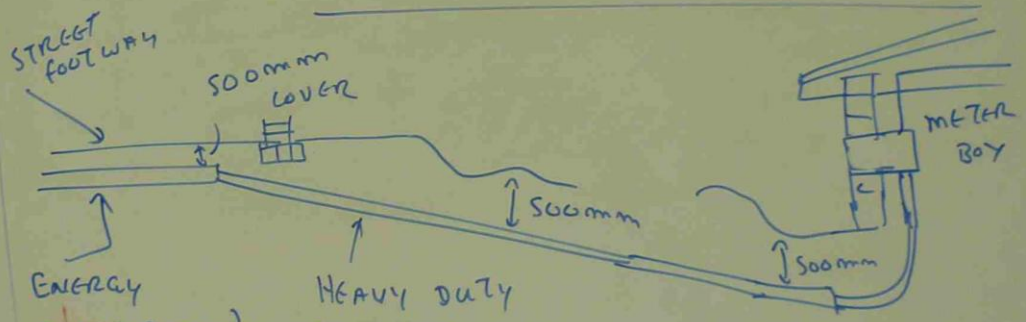


WIRING RULES PRACTICE

FIND THE CLAUSES FOR THE FOLLOWING TECHNICAL TERMS.

OPEN WIRING, SWITCH BOARD, LOW VOLTAGE, EXTRA LOW VOLTAGE HIGH VOLTAGE, AERIAL WIRING, CANTENARY SUPPORT, TRUNKING, LADDER, CABLE DUCT, BUSWAY

UNDER GROUND WIRING SYSTEM



IN THE DENSELY POPULATED AREA OF LARGE CITY, MOST OF AN ENERGY DISTRIBUTOR'S LOW AND HIGH VOLTAGE RECTIFICATION IS UNDERGROUND.

CATEGORY (A) SYSTEM

- USE NON METALLIC HEAVY DUTY RIGID PVC UNDER GROUND CONDUIT
- ENCLOSED IN CONCRETE FOR MECHANICAL PROTECTION

WIRING RULE PRACTICE

FIND THE CLAUSES FOR THE FOLLOWINGS.

HEAVY DUTY CONDUIT, UNDER GROUND WIRING SYSTEM,

DIFFERENT CATEGORIES OF UNDERGROUND WIRING

G003 + G004 | CABLE CKT PROT & ACCESSORIES (PART 2)

WORK BOOKS

G003_G004 WIRING 2 PART 1.ZIP

G003_G004 WIRING 2 PART 2.ZIP

G003_G004 TUTORIALS

D.

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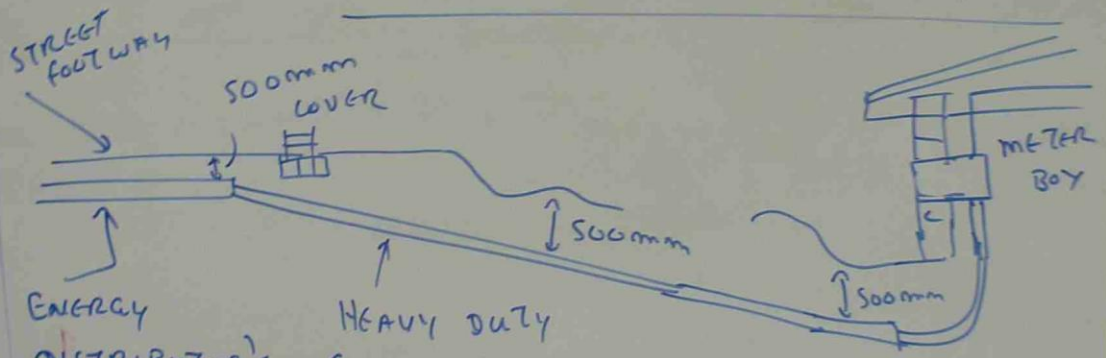
UNDER GROUND WIRING SYSTEM



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