

Why I'm here?

MEP Coordination

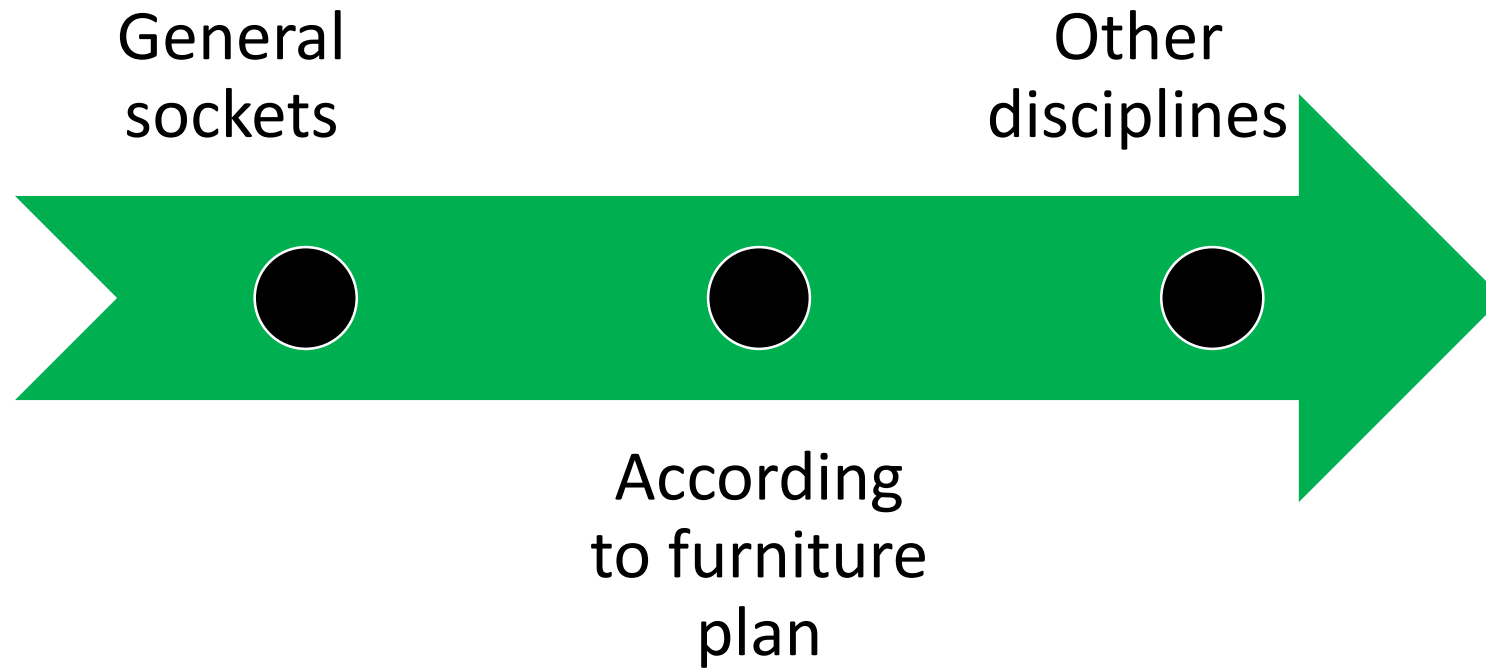
Technical overview for MEP system operation & Electrical installation required for proper operation

1-HVAC System

2-Fire Fighting System

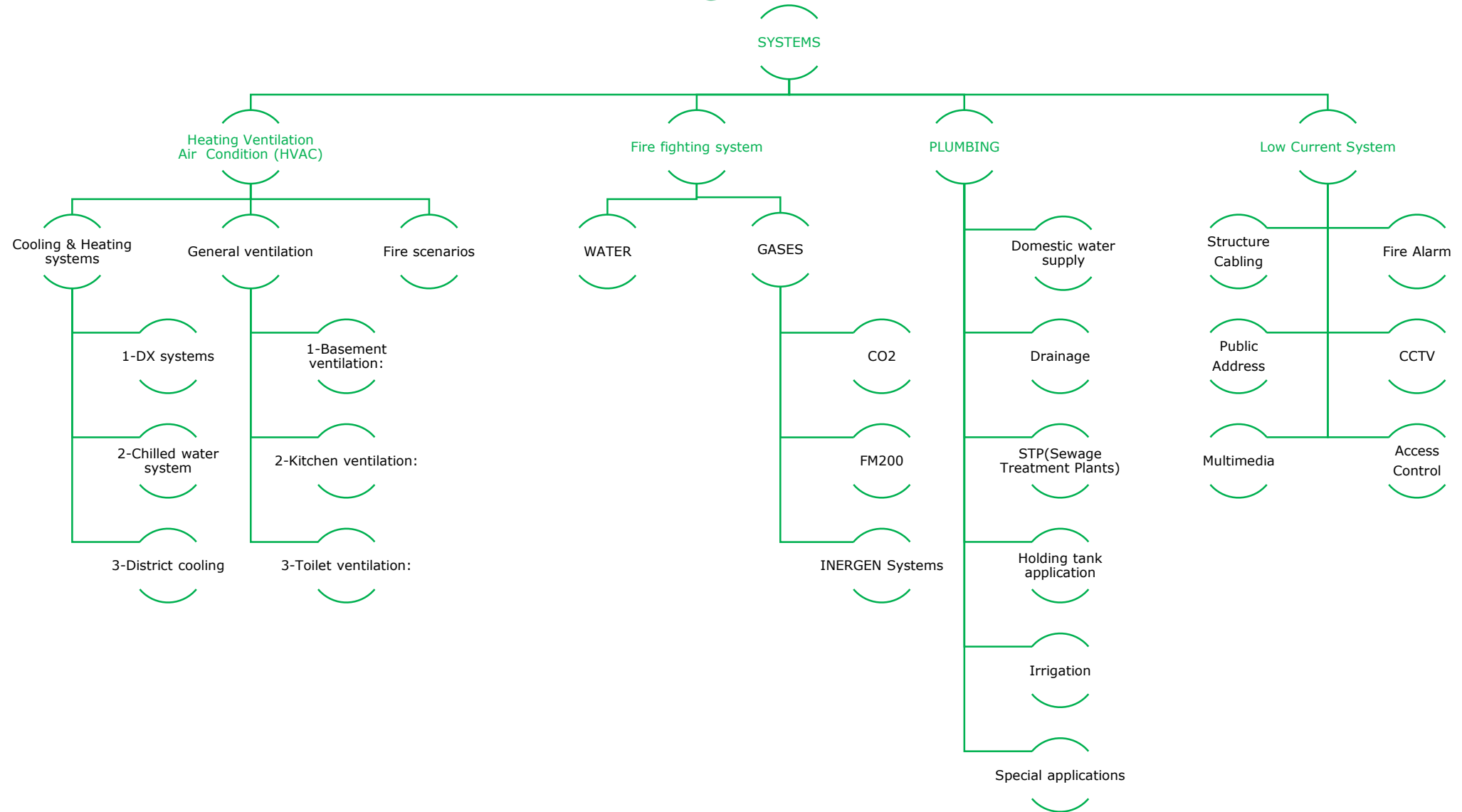
3-Plumbing System

4-Low Current System



Data Exchange matrix:

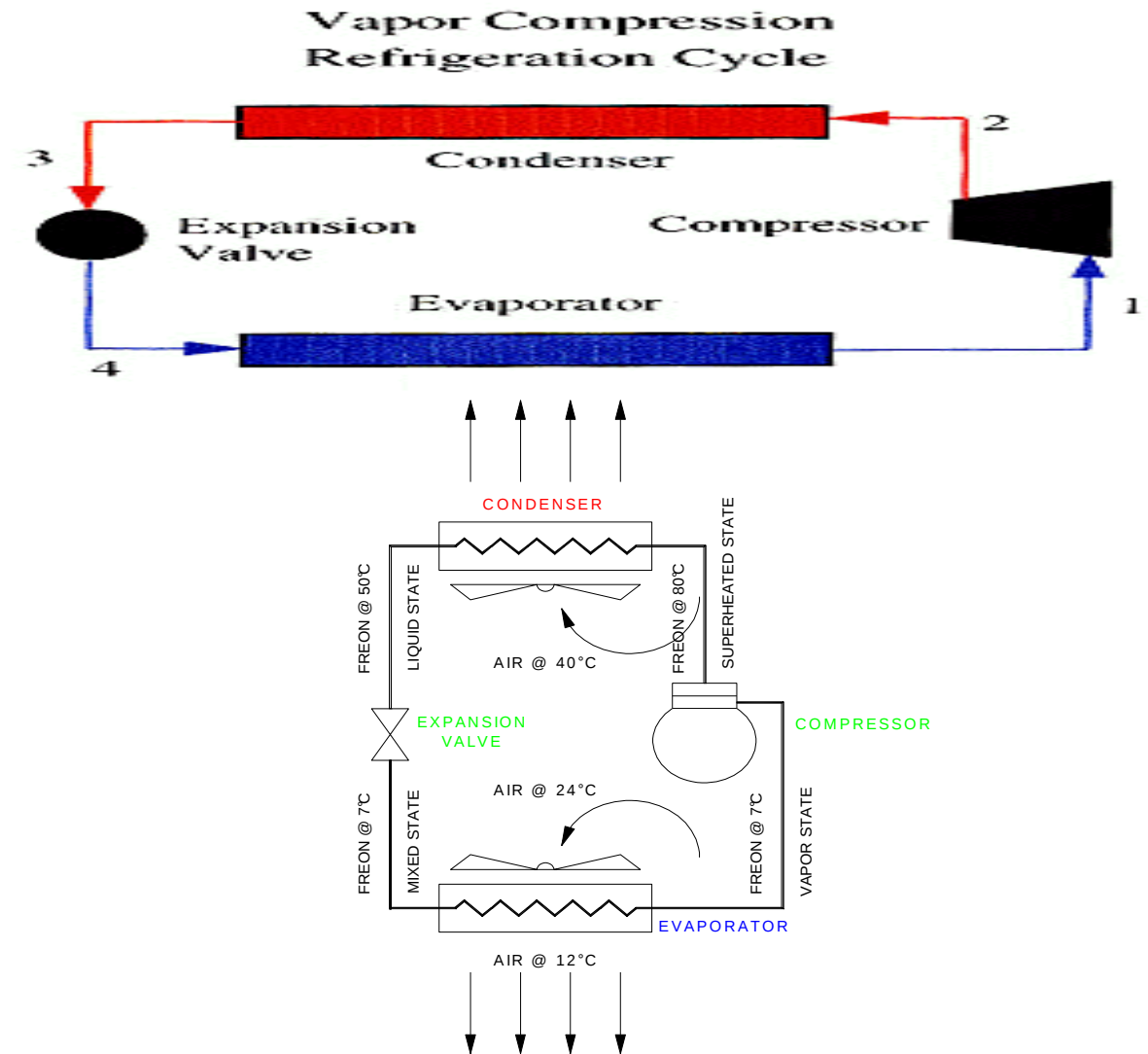
1. Location
2. Electrical data
3. Load feeding type
4. Termination type
5. Operation mode



HVAC

Physical concept:

In order to complete the loop of the refrigerant, it is evaporated in the evaporator, then compressed to the condenser thus raising its pressure and temperature to about 50°C, then condensed to liquid in the condenser, and at last its pressure is decreased back to that of the evaporator by means of the expansion valve as per the drawing:



1-DX System:



Applicable for Low rise buildings

1-1 Split units

ON/OFF



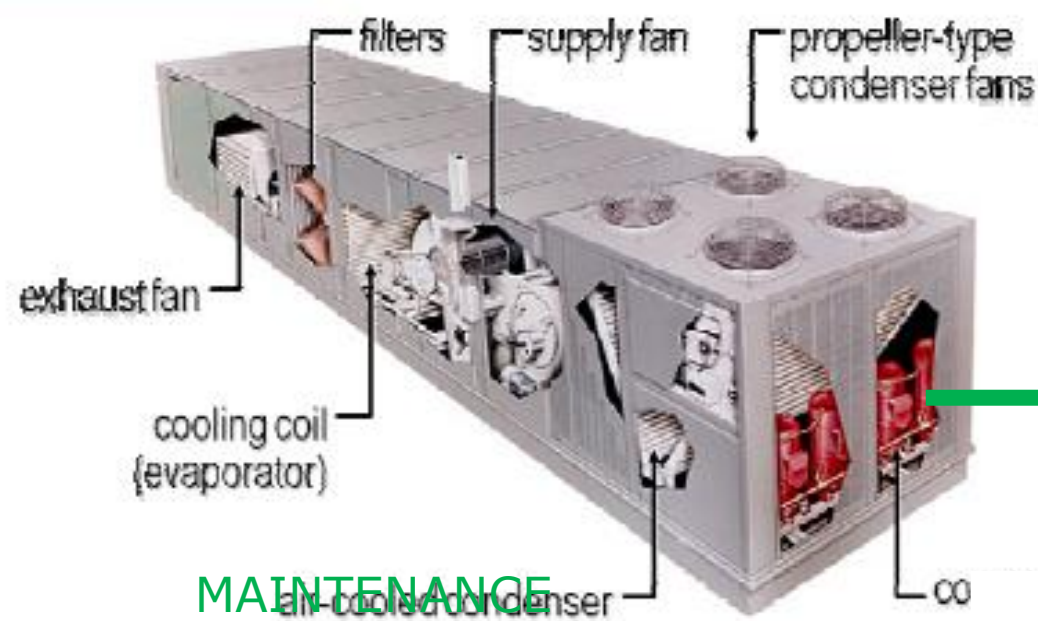
CIRCUIT BREAKER
PROTECTION



DISCONNECT SWITCH
MAINTENANCE

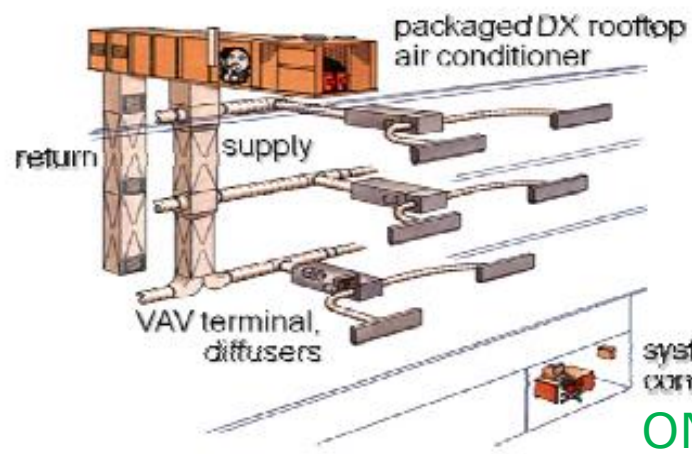
SPECIAL REQUIRES: emergency feeding required in
ups rooms and data center

1-2 Package Units



PROTECTION
FOR VAV

MCC /CP



ON/OFF

MDB SMDB



switch

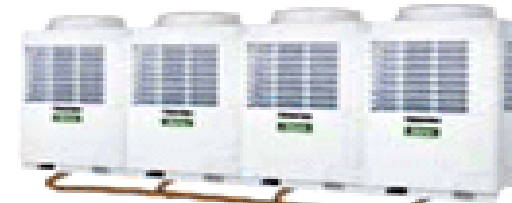


1-3 Variable Refrigerant Flow(VRF)

PROTECTION



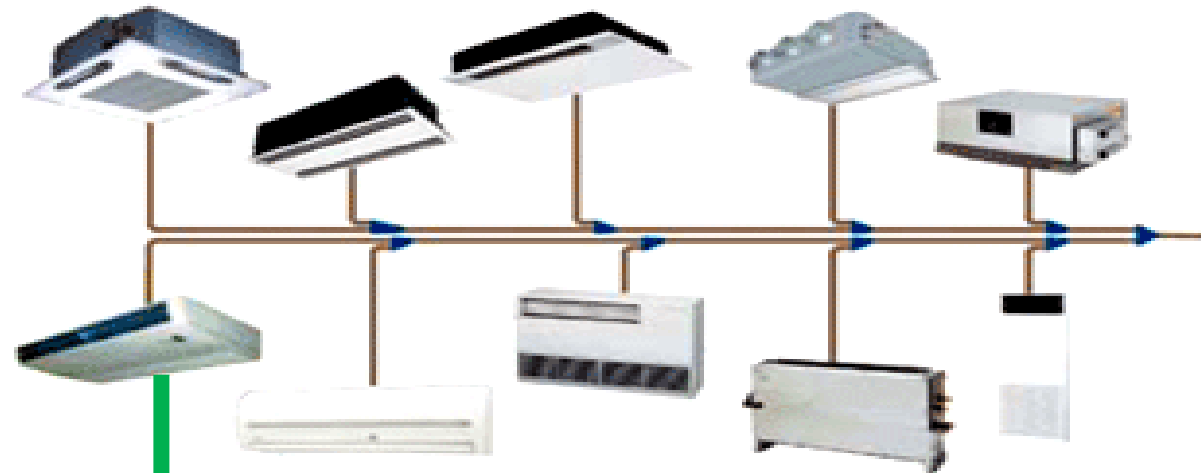
TOSHIBA
VRF R410A



MCC /CP



MAINTENANCE



MDB SMDB

Disconnect Switch



2-Chilled Water System:

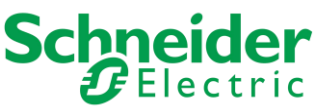
Water used for cooling as it keep its temperature for long distance,
there are two types for electric driven chillers:

1-Electric driven:

- A. Air cooled
- B. Water cooled

2-Absorption chillers(Gas Driven)

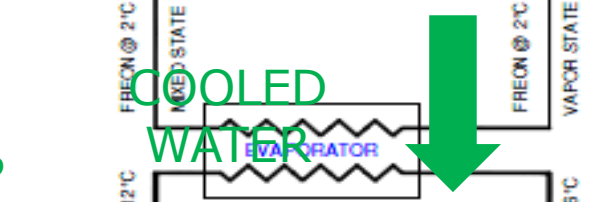
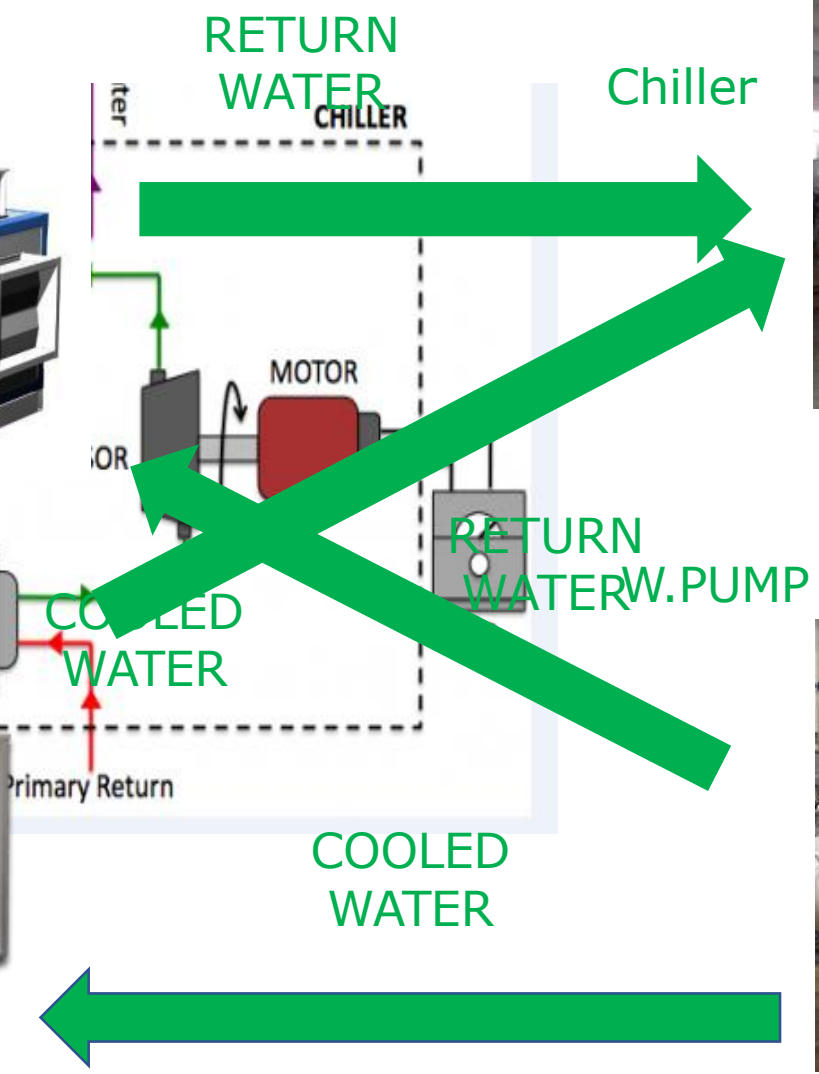
Air cooled chillers



AHU
FOR LARGE SPACES



FCU
FOR SMALL SPACES



B-Water cooled chillers

AHU
FOR LARGE SPACES



RETURN
WATER

Chiller

RETURN

COOLED
WATER

W.PUMP

COOLED
WATER

FCU
FOR SMALL SPACES



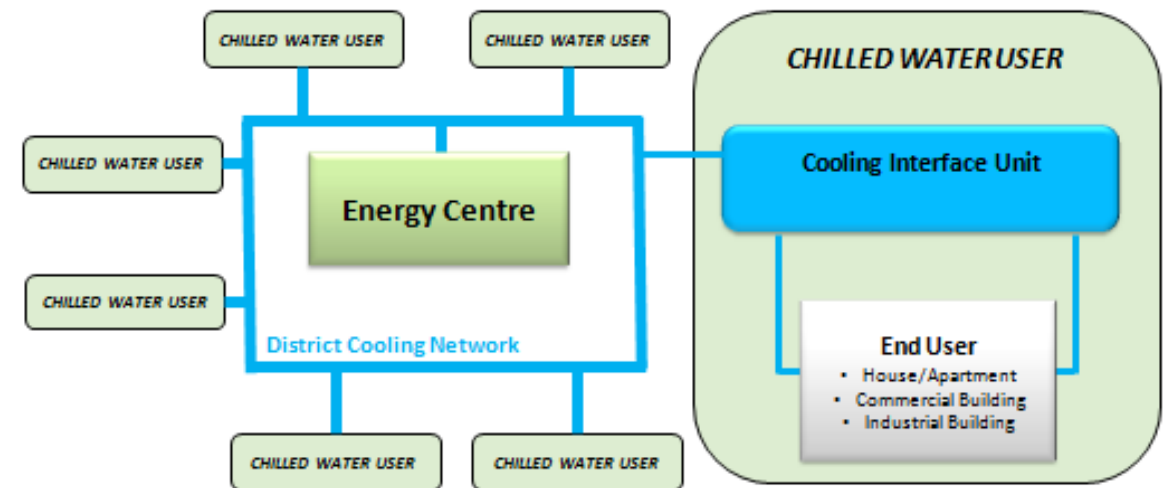
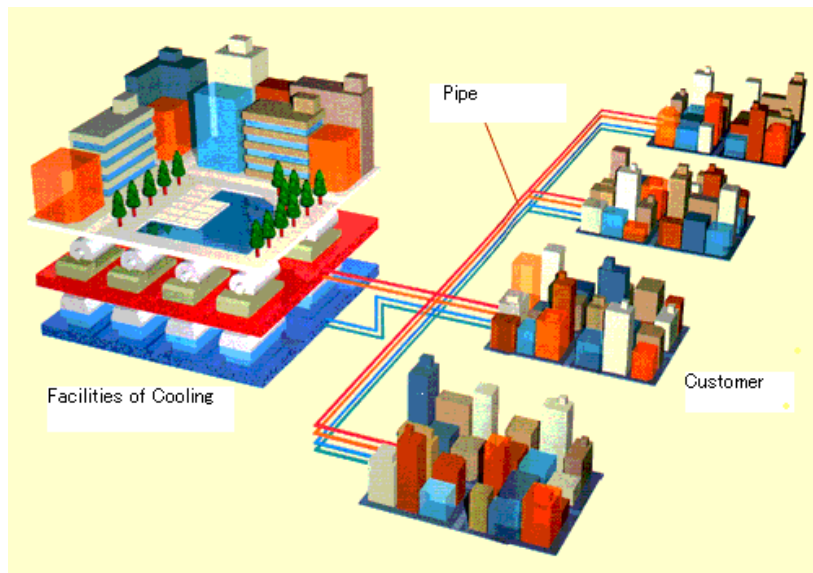
COOLED
WATER





C-District Cooling:

- This is a system used in Mega infrastructure projects to feed multiple users depending on diversity between them
- The optimum feasibility could be achieved by using a Water cooled system together with Absorption system
- Dedicated electrical substations would be used in this application & MV feeding could be used for some cases



MV FEEDING

TR (MV/MV)



Medium Voltage
Switchgear



Schneider
Electric

-MV MCC
-SOFT STARTER



MV CHILLER



LV FEEDING



MDB



-LV MCC
-SOFT STARTER



LV PUMPS



LV CHILLER

Mechanical Ventilation

Concept:

A building ventilation system that uses powered fans or blowers to provide fresh air to rooms when the natural forces of air pressure are not enough to circulate air through a building.

Mechanical ventilation is used to control indoor air quality, excess humidity, odors, and contaminants can often be controlled via dilution or replacement with outside air. However, in humid climates specialized ventilation systems can remove excess moisture from the air.

A-Basement Ventilation:

1. Jet Fans

2. Duct work using: Fresh Air Fans- Exhaust fans

DISCONNECT SWITCH
MAINTENANCE

MCC /CP

High power

MDB



DISCONNECT SWITCH
MAINTENANCE

ON/OFF

Low power

DB
SMDB



B-Kitchen Ventilation:

1. Individual small fans
2. Central ducted roof top fans
3. Hood for smoke extraction above ovens



C-Toilet Ventilation:

1. Individual small fans
2. Central ducted roof top fans



Wall Exhaust



Celling Exhaust fan



Air grill



Central Exhaust fan



Electrical feeding:

MDB

DISCONNECT SWITCH
MAINTENANCE



MCC /CP



Roof top fan



ON/OFF



CIRCUIT BREAKER
PROTECTION



socket



Junction box

ON/OFF



Ceiling or Wall
Exhaust fan

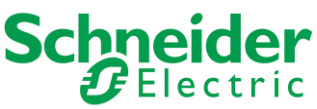


Fire Scenario

Concept:

- A building is divided into a number of smoke zones, each zone is separated from others by partitions, floors, and doors that can be closed to inhibit smoke movement.
- Exhaust air of smoked zone : allow for 6 air changes/hr through centralized exhaust fans & controlled fire damper for ducts as per fire zones configuration.
- In the event of a fire, pressure difference and airflows produced by mechanical fans(use same concept)limit the spread of smoke from the zone where fire is initiated to the other zones.
- All escaping routes {Lift lobby & Stairs} should be pressurized to facilitate the evacuation safely
- NFPA (National Fire Protection Association)is the reference for design.

Electrical feeding:



Smoke Fan



Pressurized Fan



CP

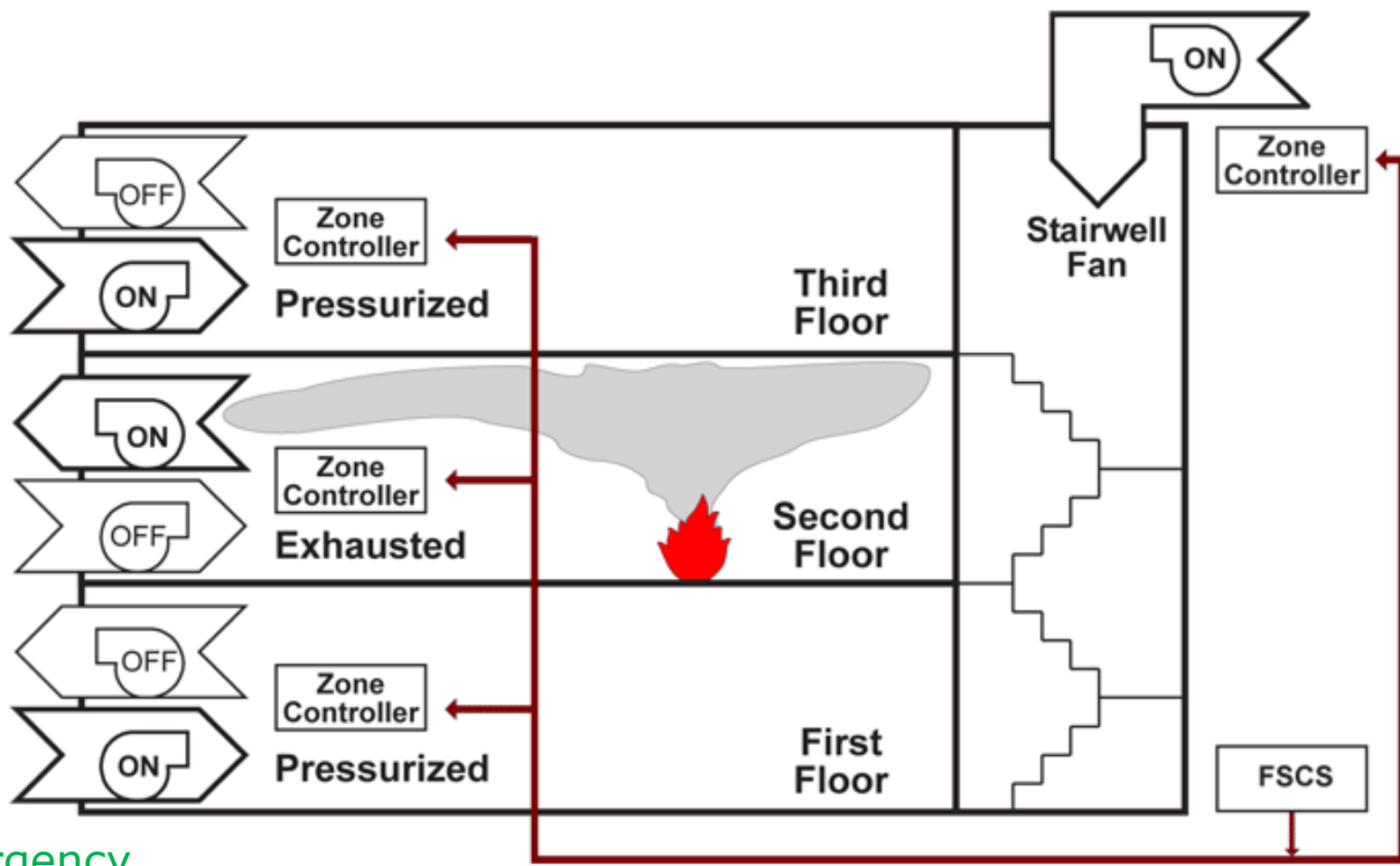


CP



Emergency feeding

Emergency feeding

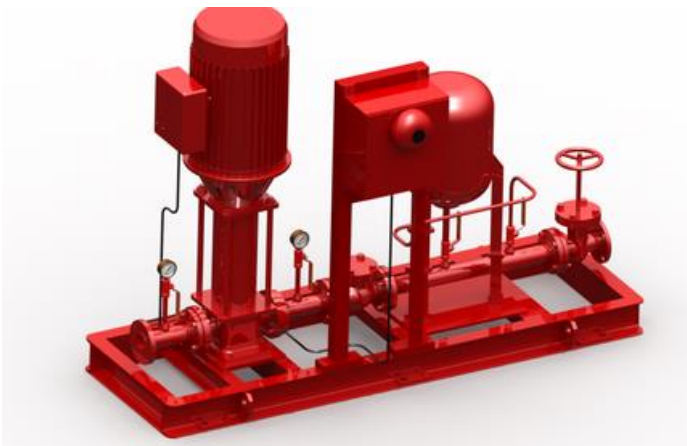


FIRE FIGHTING

Water System

System Configuration:

- Primary pump (operation)
- Secondary pump (stand by)
- Jockey pump



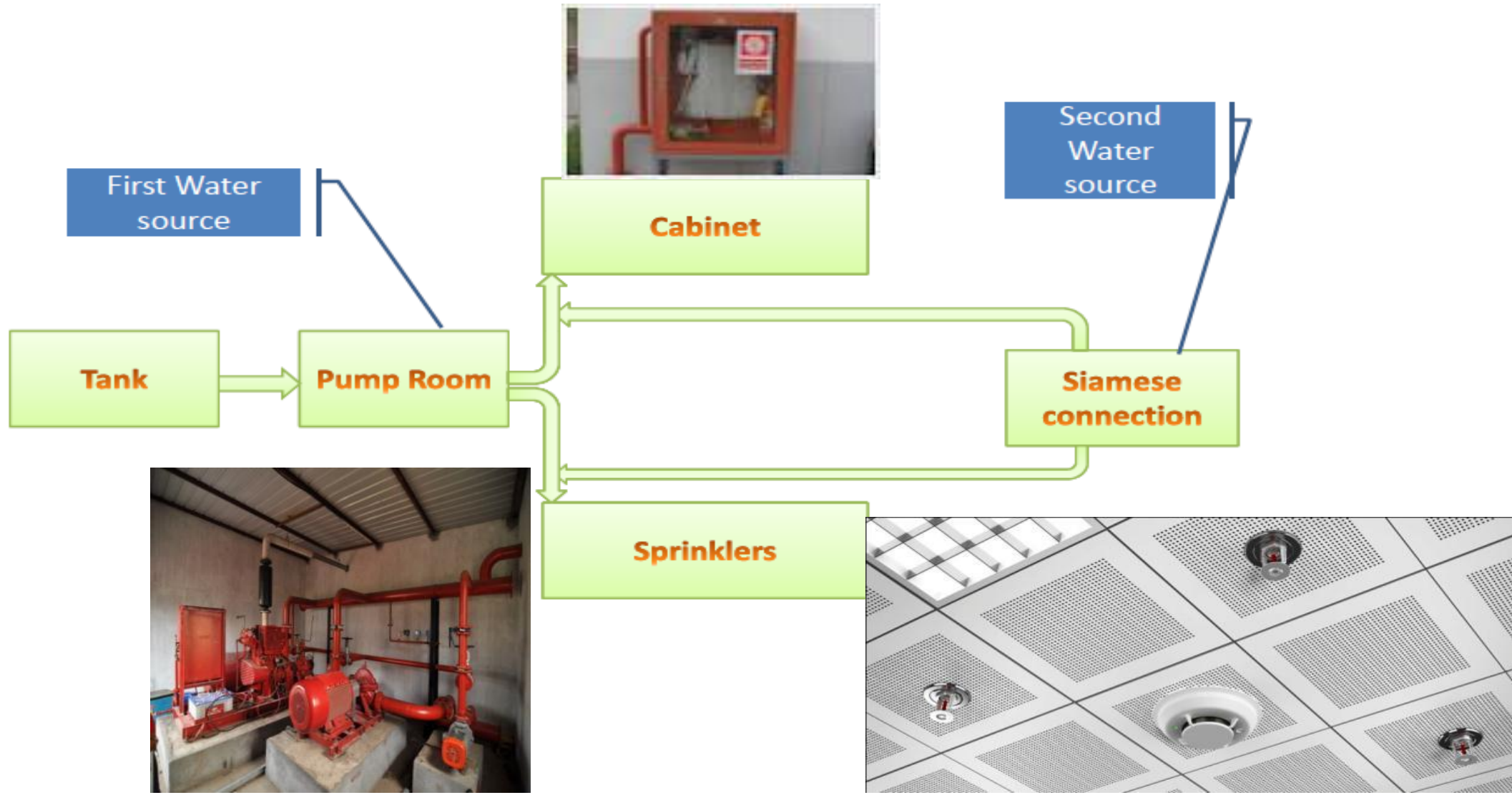
jockey fire pump



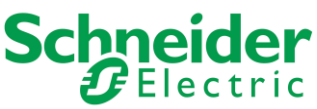
Diesel fire pump



Electric fire pump



Electrical feeding:



Primary pump (electrical)+Secondary pump (Diesel)+Jockey pump



Diesel fire pump



TR



GEN



Electric fire pump



jockey fire pump



EMDB
ESMDB

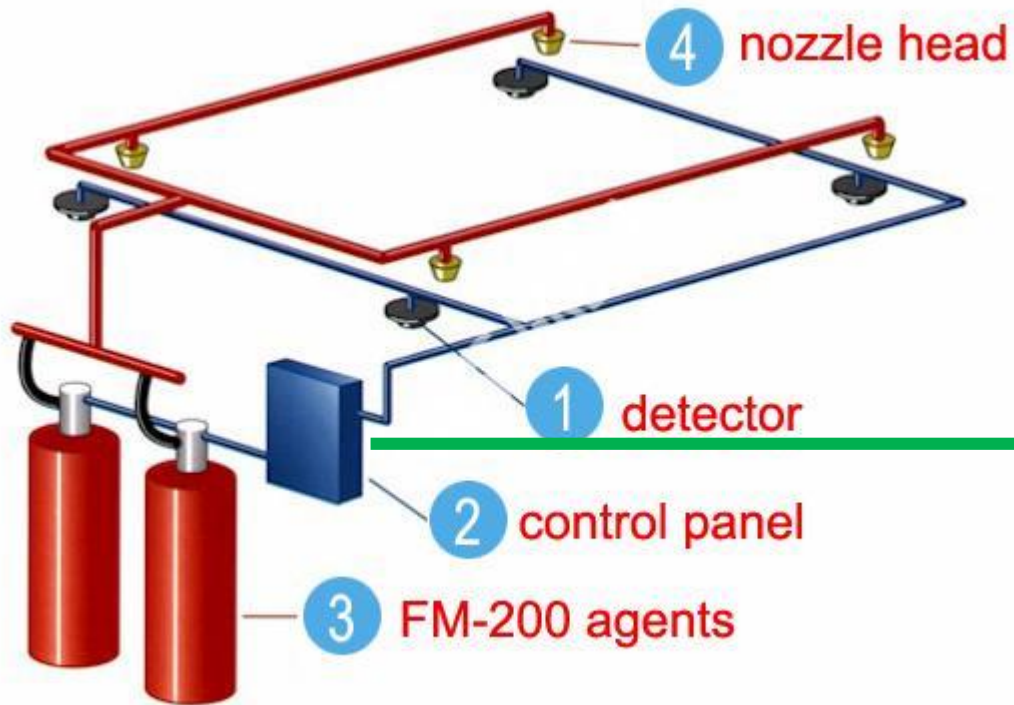
Notes:



1. Magnetic release only C.B used for connect between transformer feeding or generator feeding and fire pump controller and it must be sized to trip magnetic only in case of reaching locked rotor current for fire pump
2. A fire pump controller or fire pump power transfer switch , where provided, shall not be used as a junction box to supply other equipment, including a pressure maintenance Jockey pump(s) (NFPA20 (9.7))
3. Transfer of Power. Transfer of power to the fire pump controller between the normal supply and one alternate supply shall take place within the pump room. (NFPA20 (9.6.4))
4. The generator fuel supply capacity shall be sufficient to provide 8 hours of fire pump operation at 100 percent of the rated pump capacity in addition to the supply required for other demands. (NFPA20 (9.6.2.3))
5. No ground fault interruption means shall be installed in any fire pump control or power circuit. (NFPA20 (9.1.8.1))
6. No arc fault interruption means shall be installed in any fire pump control or power circuit. (NFPA20 (9.1.8.2))
7. In case of using Diesel fire pump emergency power source must be provided for battery charger

Gas System

Used in Electric & Low current rooms to
avoid destroying Sensitive equipment



CIRCUIT
BREAKER
PROTECTION

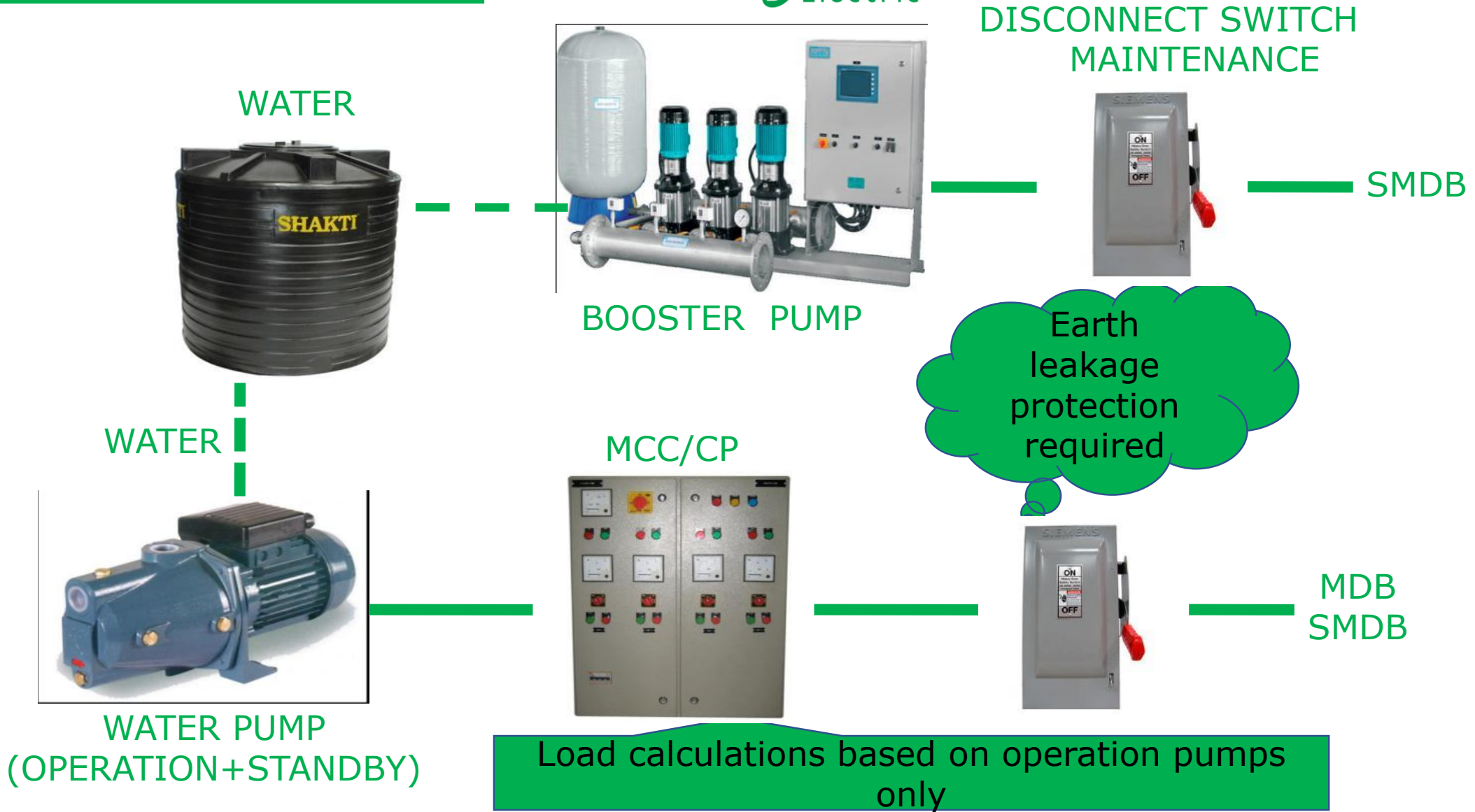
EDB
ESMDB



Junction Box

PLUMBING

Domestic Water



Hot Water:



Water heater



DISCONNECT SWITCH
MAINTENANCE



CIRCUIT BREAKER
PROTECTION

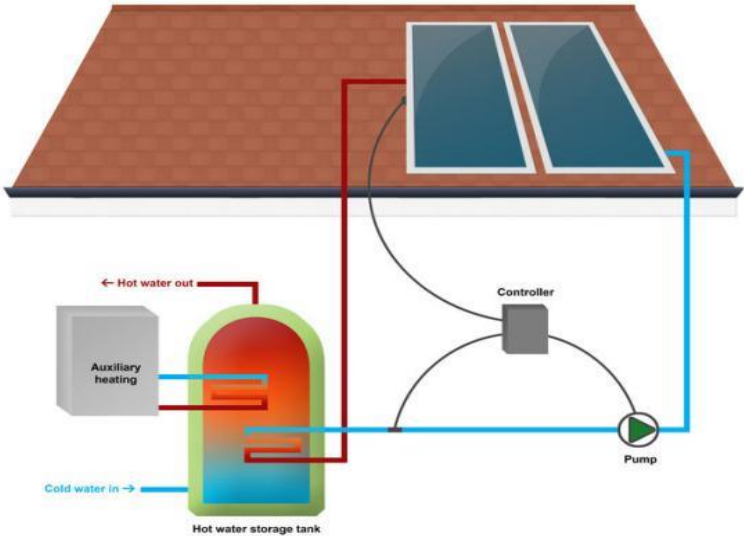


DB



MDB
SMDB

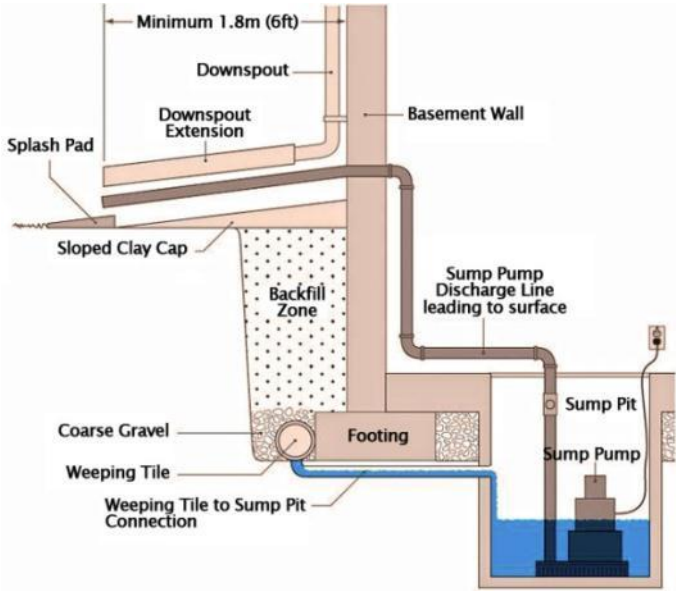
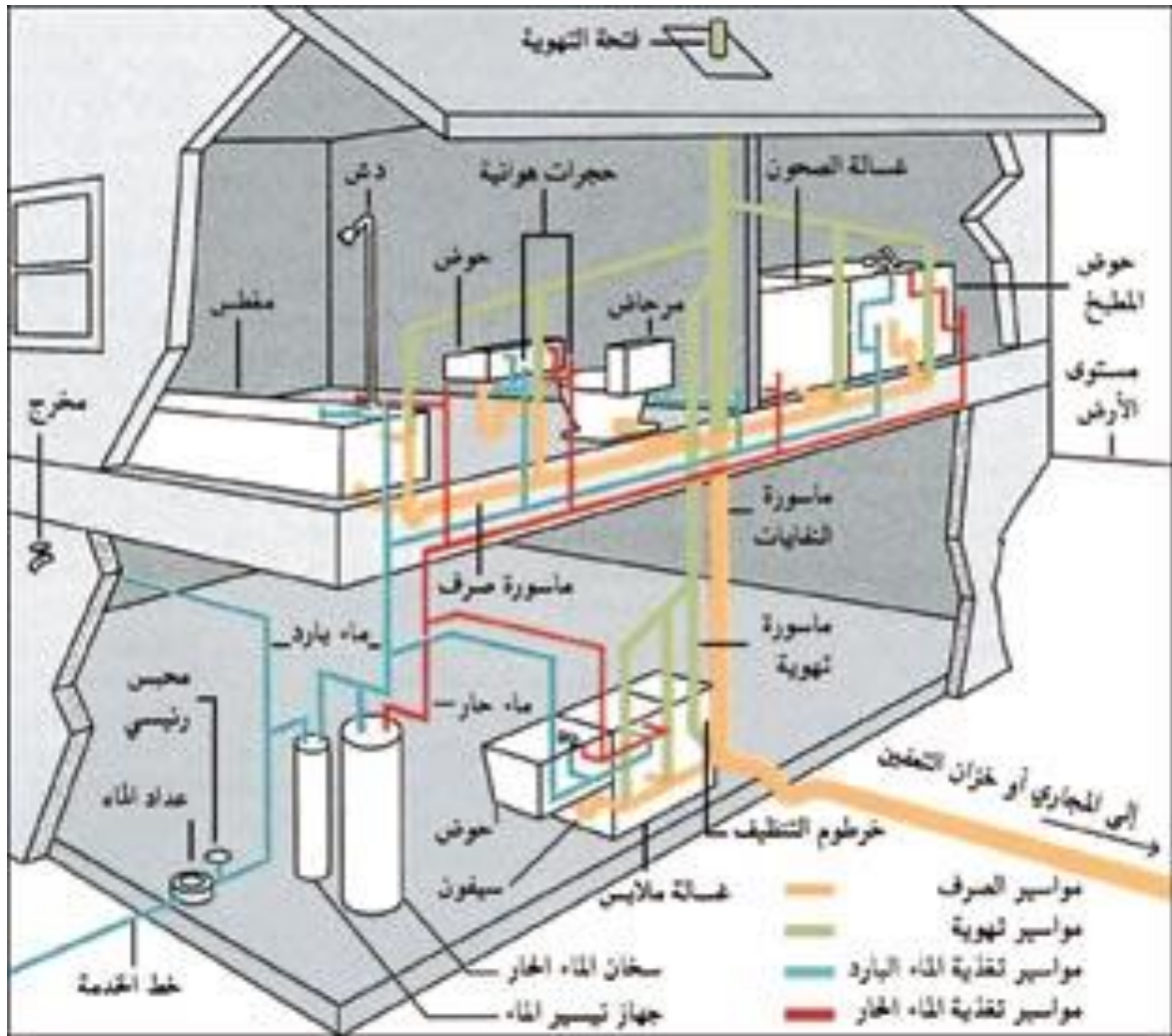
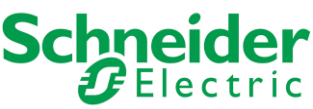
- Central:
- 1. Solar energy
 - 2. Electrical
 - 3. Gas



MCC/CP



Drainage



INDSUTRIAL
SOCKET



Emergency
feeding
must be
provided

EMDB
ESMDB

SUMP CP



Irrigation



Earth leakage
protection
required

MDB
SMDB



CP



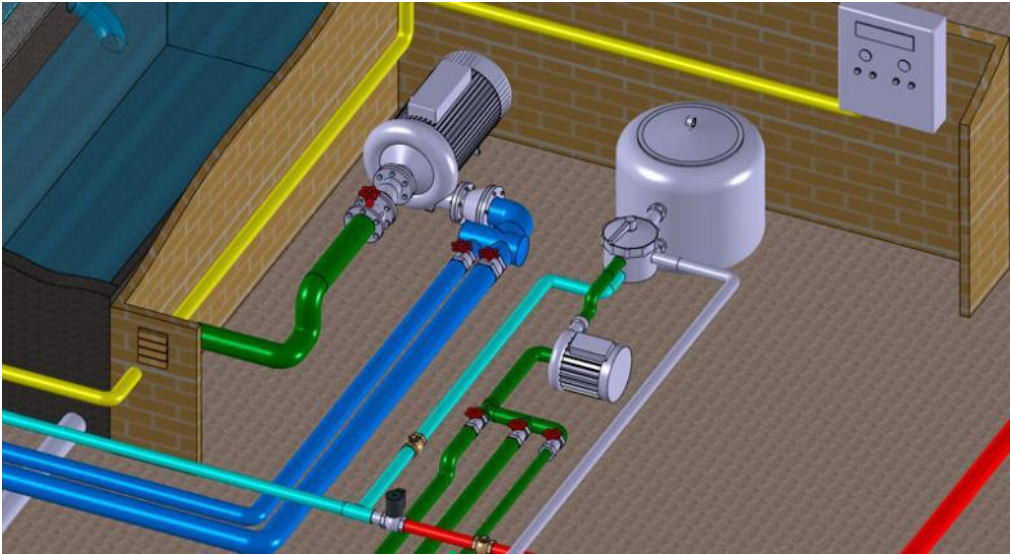
WATER



IRRIGATION WATER PUMP

Water Features

MDB
SMDB

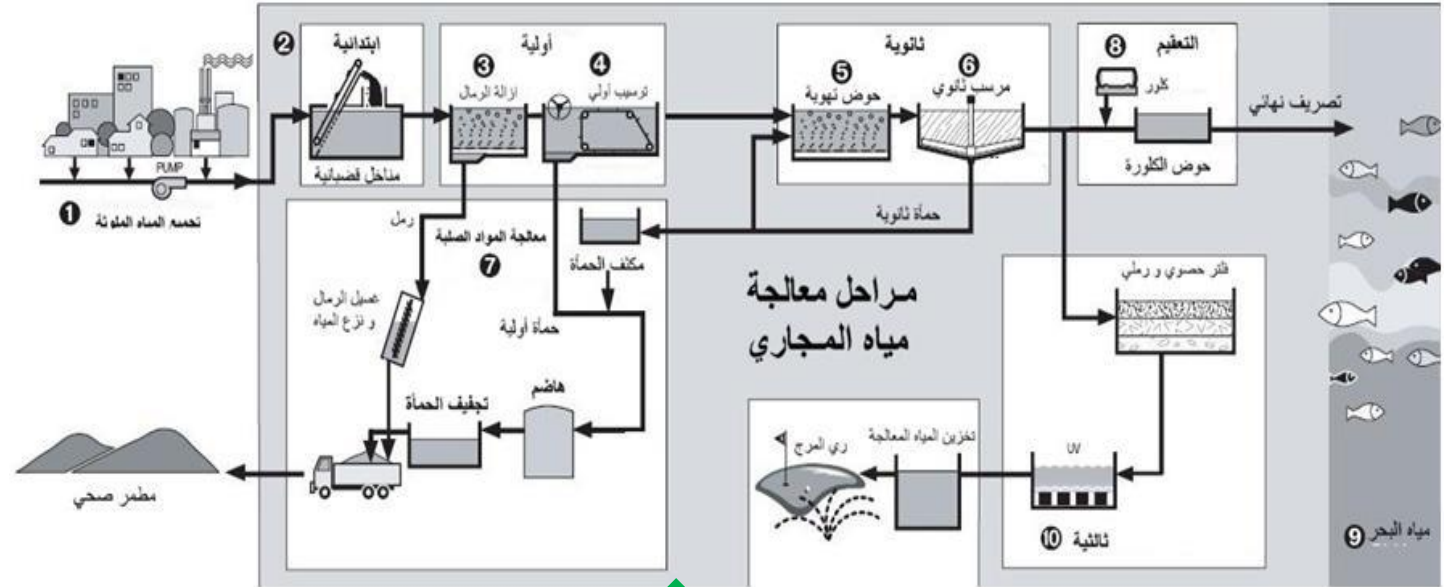


PUMP ROOM



Earth leakage protection required

Sewage Treatment Plant (STP)



RMU



TR (MV/LV)



MDB



LOW CURRENT

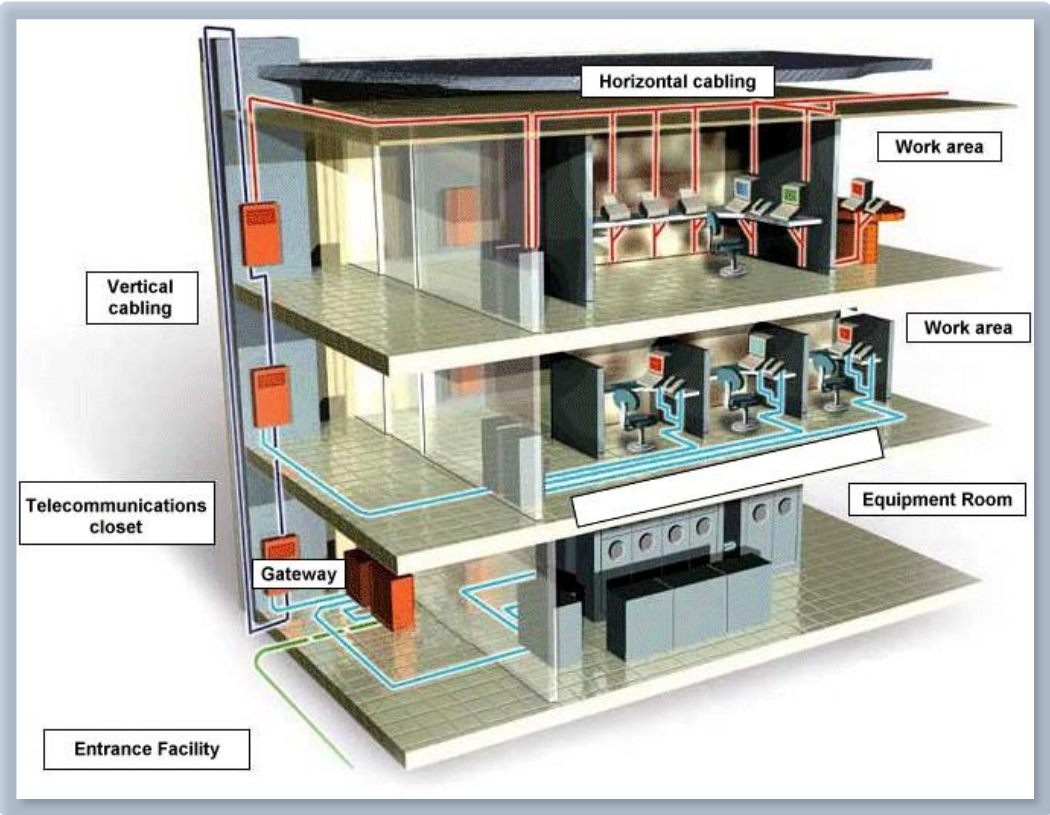
Structure Cabling



IT Rack



Industrial Power Socket



Data Outlet



Socket



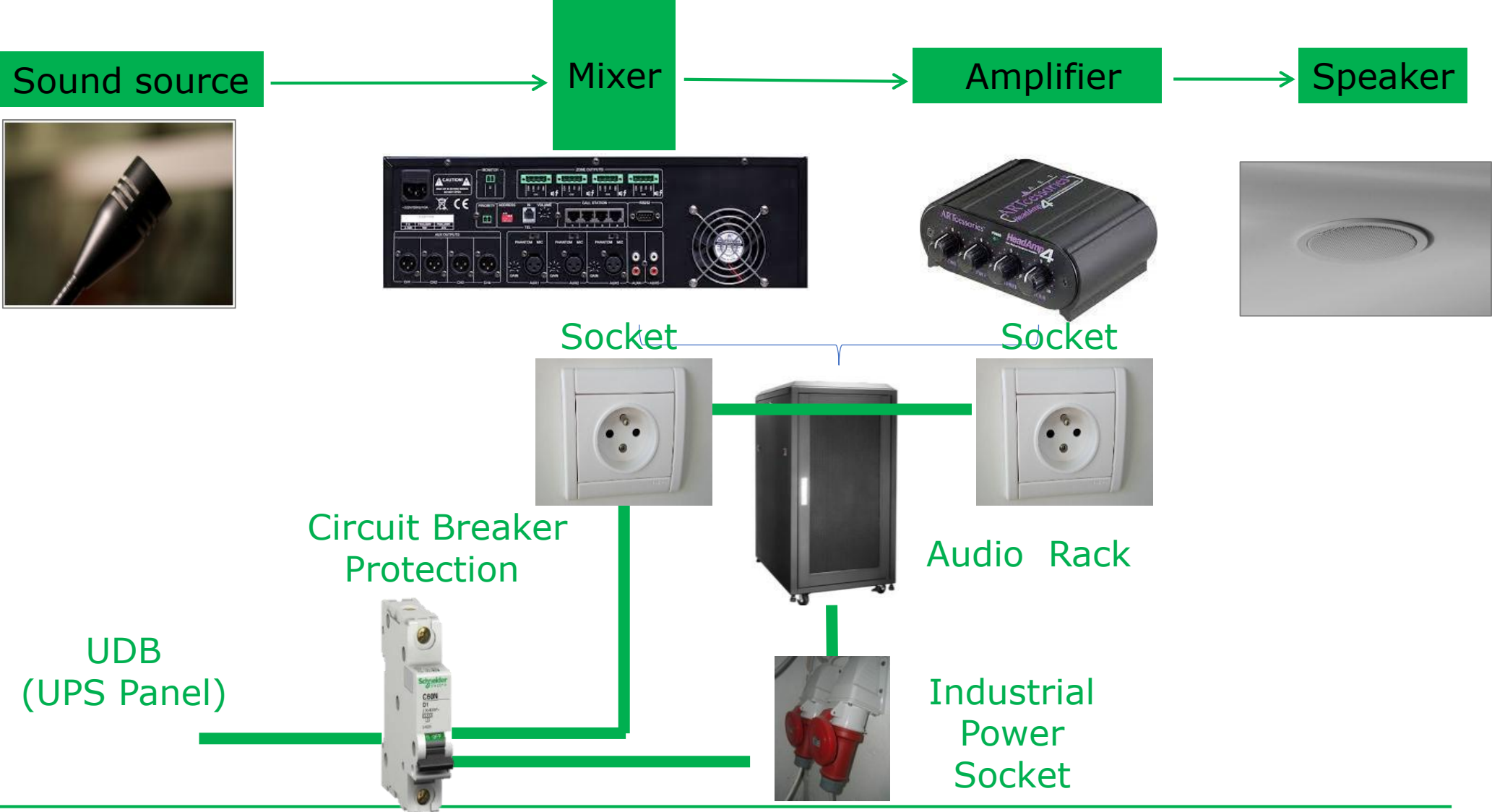
UDB (UPS Panel)



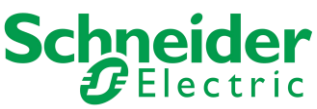
Circuit Breaker Protection



Public Address



Audio Visual



Fire Alarm

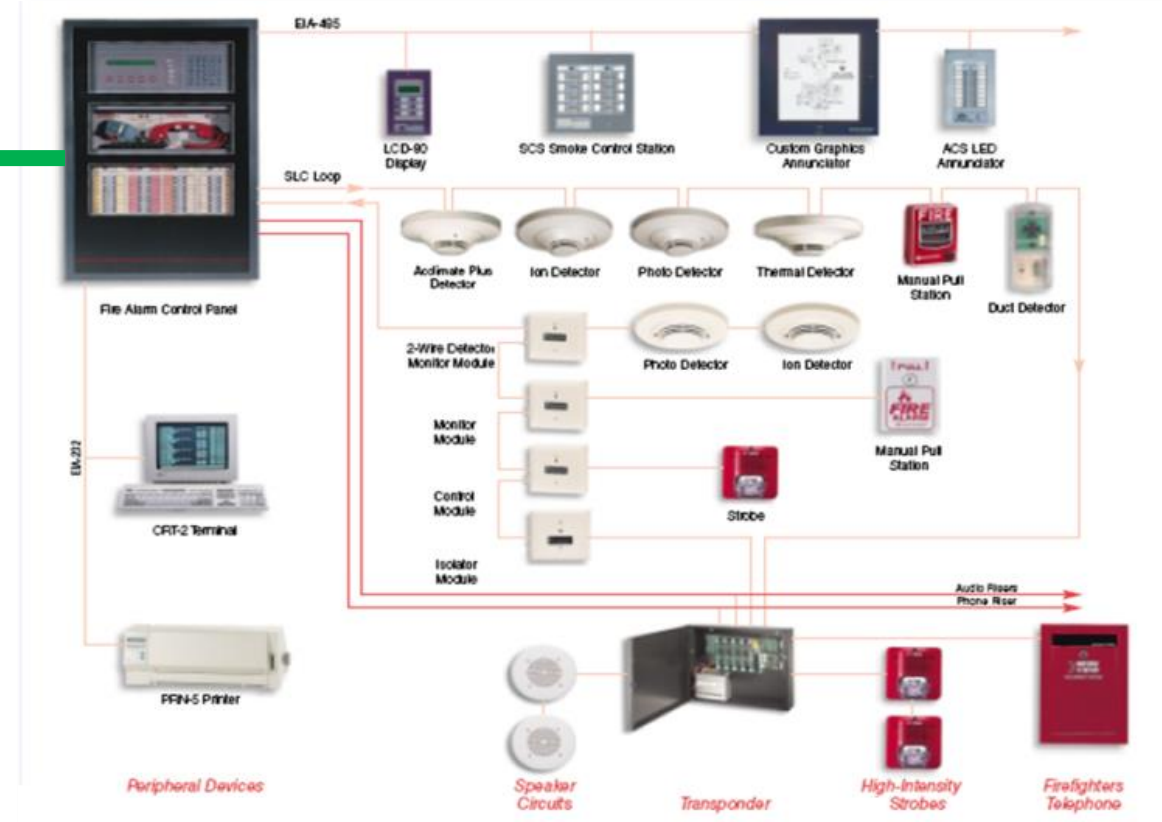
Junction box



Circuit Breaker
Protection



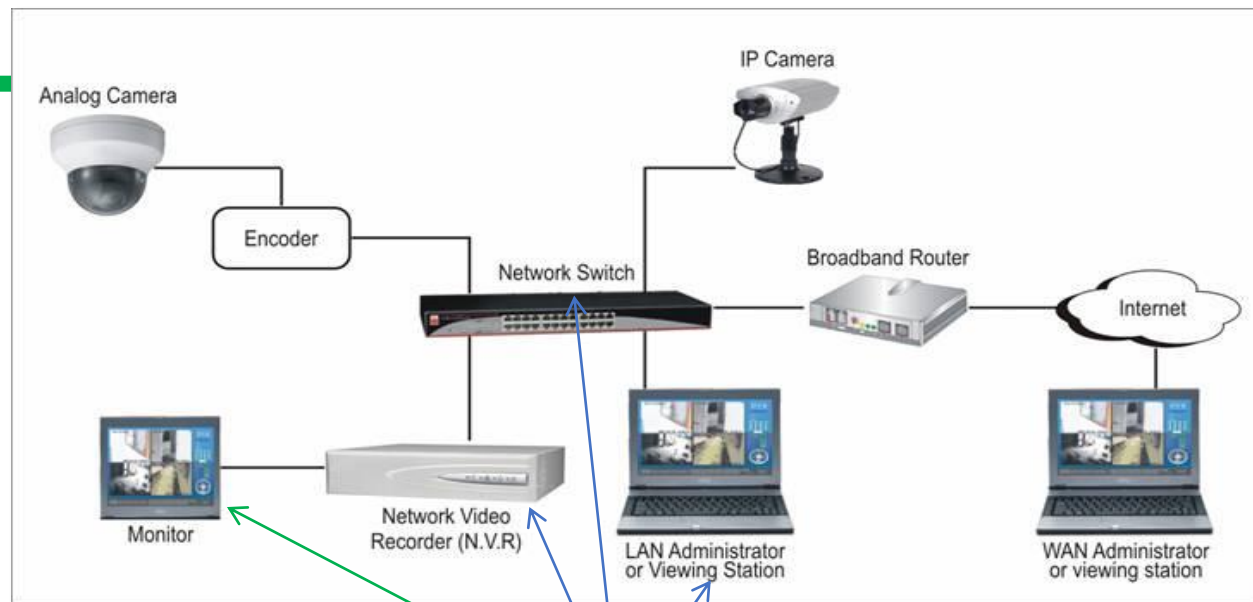
UDB
(UPS Panel)



Junction box

Circuit Breaker
Protection

UDB
(UPS Panel)



Socket



Access Control

Socket



Junction
box



Circuit Breaker
Protection



UDB
(UPS
Panel)

