HVAC – CENTRAL PLANT DESIGN & DRAFTING PER ASHRAE & SMACNA

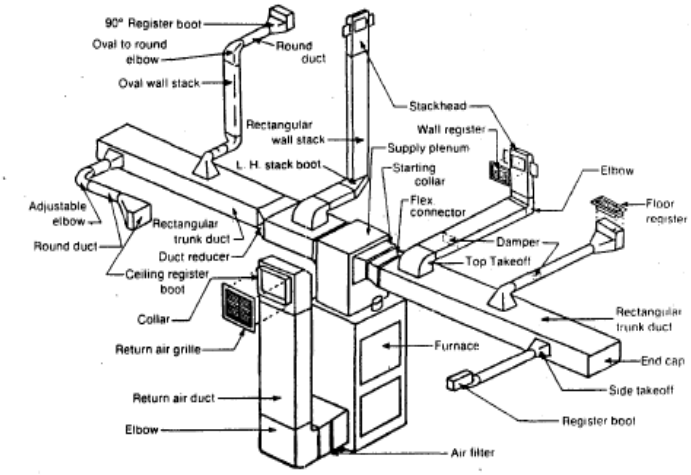
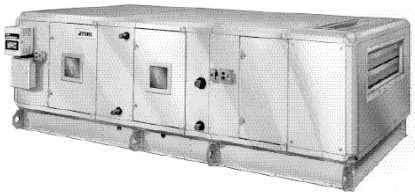


Fig. 5. Composite duct system



OVERVIEW – HVAC System Design & Drafting

This is a fast-paced program designed to present all major topics relative to the design and operation of Heating, ventilating, and air-conditioning (HVAC) systems. The program duration is 1 month Full time Instruction including concept theory, problem solving, system design, CAD drafting and exposure to HVAC Software's like Elite Package & ComfortAir etc.

WHAT YOU SHOULD BRING

Course participants should bring an open mind, a thirst for knowledge, a scientific calculator, sketch pad, pen and long book.

Description

This certificate program introduces the full range of HVAC topics from the definition of HVAC to heating/cooling load calculation to HVAC system selection to air distribution system design to chilled water system design to piping , pump and valve sizing to component sizing to, finally, overall control of HVAC systems. Each topic is presented so as to demonstrate the "real world" impact of design decisions on resulting system performance. Numerous examples of actual designs are presented. (See the "Course Outline" section for details of topics.)

What You Will Learn

Learn how HVAC systems "work," how to design for good performance and how to investigate and evaluate systems when they don't work properly. You will get a full overview of HVAC topics relative to comfort air-conditioning and learn enough to perform design, installation, maintenance and analysis of HVAC systems.

WHO SHOULD ATTEND

- Mechanical/Electrical/Consulting Engineers and Students
- Technicians
- Draftsmen

Training Features

- Faculty with a decade of Gulf Experience & HVAC/MEP certified Engineer from Saudi Aramco KSA.
- Excellent Material Provided (HVAC Manual, Design Charts, Demo Software CD's, Drawings & Design of Multi Story High Rise Buildings)
- Industry Leading Software's Used in Training.
- Design Demonstration of Sky Rise Buildings (Multi Story / Towers)
- Individual Attention & Placement Guidance.
- Hundreds of Students placed in India, Middle East and USA.

Institute of Piping Engineering & Building Services

HVAC DESIGN & DRAFTING PER ASHRAE

Heating systems

Introduction to Wet Indirect Heating, Gas Boilers, Boiler Efficiency, Combined Heat and Power, Pumps, Heat Emitters, Domestic Hot Water Systems, Controls, Valves, Feed and Expansion, Indirect and Direct Air Heating Systems, Heaters, Direct Water Heating Systems, Heat Pumps, Radiators,

Heat Loss Calculations.

Sources of Heat Loss, Heat Loss calculations and Air quantity calculation.

VENTILATION

Introduction, Domestic Ventilation, Ventilation of Commercial Buildings, Fans, Heat Recovery, Mechanical Ventilation Systems and Design for Commercial, Residential and Kitchens.

AIR CONDITIONING

Introduction, Cooling, Absorption Chilling & Vapour Compression, Local Comfort Cooling Systems (Window, Split, Packaged, Fan Coil Units), Centralized Air Conditioning Systems, AHU-Filtration, AHU-Cooling Coil, AHU-Heating Coil, Humidification and Humidifiers, Dehumidification, Diffusers, Ducting, Dampers, Delivery Systems (Single Zone System, Constant Volume, Variable Air Volume), Evaporators, Compressors, Expansion Valves, Condensers, Cooling Towers

Psychometrics

Basic definitions, basic psychometrics. The psychometric chart, with examples. Moist air mixtures. Sensible heat ratios.

AIR DISTRIBUTION SYSTEMS

Components of Air Distribution Systems (Alternate Duct Materials, Major Ductwork Components, Outlets and Returns), Duct Systems (Extended Plenum Systems, Radial Systems, Reducing Trunk System, Gravity Systems, Return Air Systems), Designing Total HVAC System (Heating and Cooling Requirements, Selecting HVAC Equipment, Designing the Air Distribution System), Duct Sizing (Velocity Method, Equal Friction Method, Static Regain Method).

Duct Material Calculations – GI sheet, Elbow Design and Accessories.

Ducted air velocities, frictional losses, noise, balancing the system, leakage. Examples using a duct sizing chart and Ductulator. Duct Testing and Sealing

Room Air Distribution

Terminology, temperature differentials for various outlet terminals, location of terminals, types of air outlet, terminal air flow, selection of terminals and location of return air grilles.

Fans

Types, selection and application of fans. Fan laws and examples.

P.T.O

Cooling and Heating Load Estimations (Peak and Partial Loads)

Factors affecting load estimations (internal, external, solar, shading etc). Design conditions. Fresh air requirements. Building Survey & Orientation, Building Materials, U-factor Calculations, Temperature Differences, Examples of load estimations using E- 20 work sheet to work out Load, Air quantity and properties of conditioned air. (ADP, CFM, Mixed Air Temperature Calculations)

Cooling Loads – Sun gain thru glass windows & door, Solar gain thru Roof & Walls, Partition gain, Internal Loads – People, Lights, Electrical Applications, Heat gain thru ducts, Heat gain thru Bypass air / Ventilation air / Infiltration air.

HYDRONIC SYSTEMS–CHILLED WATER SYSTEMS/PIPING DESIGN

Introduction, Secondary Refrigerant Systems, Types of Chillers, Chilled Water Air Washers, Pumps, Piping sizing and frictional losses, Design, Chiller Selection and hydronic system design, piping Valves.

Refrigerants

Classification & Details, Refrigerant Pressure Testing, Leak Detection, Quantity Calculations, Refrigerant Pipe Sizing.

Equipment Selection

AHU, FCU, Package Units, ACCU, Chiller Packages, Water Cooled Condenser, Air Cooled Condenser, Cooling Tower, DX Chiller, Flooded Chiller, Refrigerant Coil, Water Coil , Pumps, Fans, Valves and other System Accessories

PROJECT

Load Calculations, Duct Design, Design calculations, Equipment Selection (Chiller, Evaporator, Condenser, Compressor, Fan, Valves, Piping, Cooling Tower, and Pumps), Pipe Design & Valves.

HVAC Systems Maintenance Complete Overview and Bill of Quantity

Drafting of Duct Layouts, Piping Layouts, Riser Diagrams, Sections, Machine Layouts, and Schematics etc.

Software's: **CHVAC & RHVAC – From EliteSoft, Duct Sizer & Pipe Sizer from McQuay, HAP (Hourly Analysis Program) & Block Load from CARRIER.**

The training programs can also be arranged on-site, customized for your organization. For more details, please call us at 0091-9885946711.

For Information on Other Training Programs/Courses, please call us at 0091-9885946711 or visit our website: **www.ipebs.in**