SM TECHNO

Training Services

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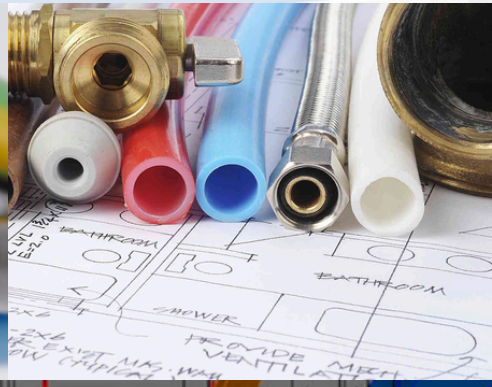
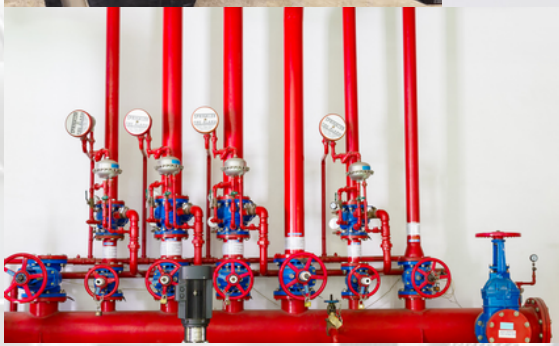
MSME: UDYAM-TS-02-0113747

SM Techno MEP Training Services is an ISO 9001: 2008 certified organization, providing a world class leading technical training in Mechanical, Electrical & Civil engineering disciplines to meet the requirements of skilled professionals in the field of Building Industry.




Providing Career - Focused Training Programs

Training Mode: Video, Live Online & Classroom

- HVAC
- FIRE FIGHTING
- ELECTRICAL
- REVIT MEP
- PLUMBING
- REVIT ARCHITECTURE

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Training Services

HVAC COURSE

COURSE STANDARDS

ASHRAE

Carrier

AUTODESK

SMACNA

SOFTWARES

- Carrier HAP
- ASHRAE Climatic Data
- ASHRAE Psychrometry
- Autodesk Design Review
- AutoCAD 2D
- Zamil E-selector Machine Selection
- Diakin VRV
- McQuay Duct Sizer
- McQuay Pipe Sizer
- Beta Program
- ASHRAE Duct Fittings
- Pump Excel Program
- Fan static Pressure Excel Program
- Air Terminal Selection Software
- BOQ Excel Program

PROJECTS

- Villa Type A
- Sample Project (Load Calculation)
- School Project (HAP)
- Studio Project (Machine selection)
- Tower Project (Estimation)
- Hotel Project (Ducting & Piping)

HIGHLIGHTS

- Live online Training
- Classroom Training
- Video Courses
- Gulf experience faculty
- Digital classroom
- Basic to advance level
- Concept based training
- Software calculation
- Interactive sessions
- Updated syllabus
- Motivation

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HVAC
DESIGNING, DARFTING, ESTIMATION & INSTALLATION
SYLLABUS

- **MODULE - 01**

  HVAC Designing (Video or Live Online Mode) - 60+ Hours

  PART 1 - HVAC Basics
  PART 2 - Manual Load Calculation
  PART 3 - Carrier HAP
  PART 4 - HVAC Air System
  PART 5 - HVAC Chilled Water System

Free Complimentary Modules

- **MODULE - 02 - 16+ Hours (Video Mode Only)**
  AutoCAD+HVAC Drafting
- **MODULE - 03 - 10+ Hours (Video Mode Only)**
  HVAC Estimation
- **MODULE - 04 5+ Hours (Video Mode Only)**
  HVAC Installation

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MODULE - 01
HVAC DESIGNING

PART 01
DESIGN BASICS

Chapter 1

Introduction to MEP

- Difference between MEP & HVAC
- HVAC abbreviation
- Definition of air conditioning
- HVAC application
- Standard societies
- ASHRAE, ISHRAE, SMACNA..

Chapter 2

How HVAC project executes

- Types of drawing
- Overview of HVAC design
- Roles & responsibilities of design engineers
- Overview of HVAC installation
- Roles and responsibilities of installation engineers

Chapter 3

Physics Used in HVAC

- Heat
- British thermal unit
- Modes of heat transfer
- Unit of refrigeration
- Temperature & temperature scales
- Enthalpy
- Sensible and latent heat
- Vapour compression refrigeration cycle
- Unit
- System of units
- Conversions

Chapter 4

Psychometric

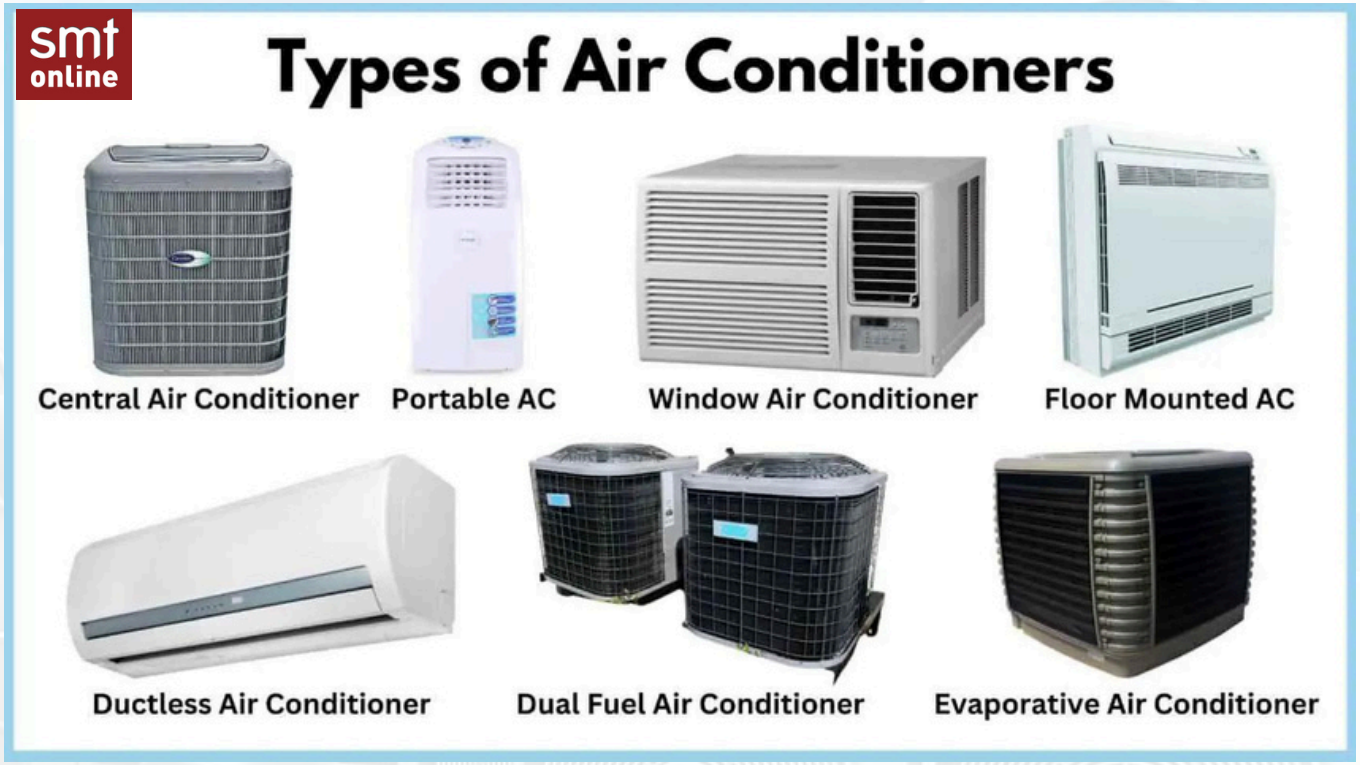
- Introduction
- Properties of air
- Dry bulb temperature
- Wet bulb temperature
- Dew point temperature
- Relative humidity
- Humidity ratio
- Manual psychometric chart
- Psychometric software
- Psychometric analysis
- Humidification
- De-humidification
- Sensible heat ratio
- By pass factor
- Contact factor

Chapter 5

Air conditioning system

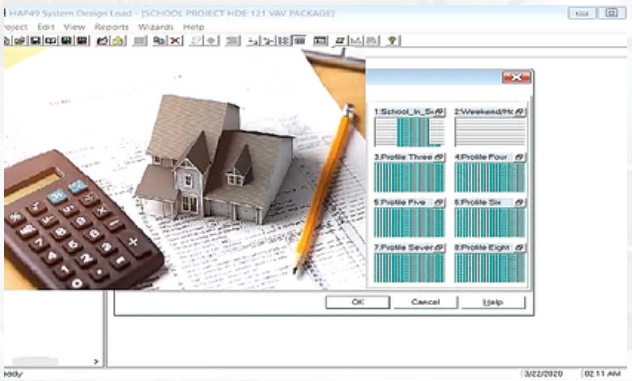
- Direct expansion system
- Window air conditioning
- Split air conditioning
- High wall
- Cassette air conditioning
- Floor stand
- Cube air conditioning
- Ductable split air conditioning
- Package air conditioning
- Chilled water system
- Air cooled chiller
- Water cooled chiller

- VRF/VRV system
- Radiant cooling
- Chilled beams
- District cooling system
- Air system
- FCU (fan coil unit)
- AHU (air handling unit)
- HRU (heat recovery unit)
- CAV system
- VAV system
- Desert cooler
- Air curtain



HVAC DESIGNING

PART 02
MANUAL LOAD CALCULATION (UPDATED)



Chapter 6

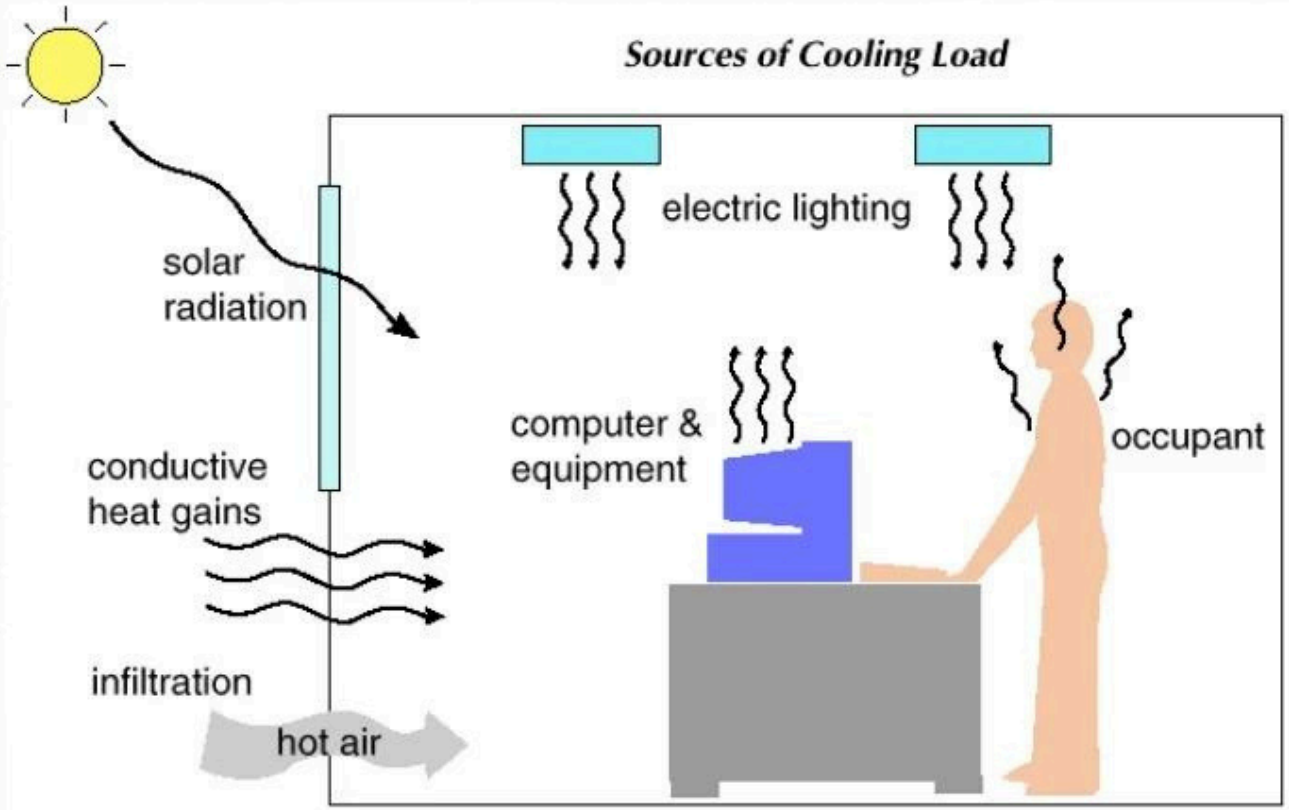
Building survey

- Introduction
- Types of architecture drawing
- Psychometric conditions
- Latitude
- Longitude
- Orientation of building
- Elevation of city
- Levels (section heights)
- Construction materials
- Terminology of building structure
- Surrounding conditions
- Windows
- Doors
- People
- Lighting
- Appliances
- Thermal storage
- Location air conditioning machine
- Available spaces
- Power services
- Water services
- Applications
- Drain location

Chapter 7

Manual load calculations

- Cooling load calculation
- Heating load calculation
- Sources of heat
- Project data extraction
- Sample project (Updated)
- Input file
- Finding u-values
- Manual load calculation
- E-20 chart calculation
- E-20 excel calculation



HVAC DESIGNING

PART 03
SOFTWARE (HAP) LOAD CALCULATION (UPDATED)

HAP 5.1 - Hourly Analysis Program

Sample project (Updated)

Sample Project+School project

Optional project for practice

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Chapter 7.1

Software load calculation

- Introduction to HAP
- Ventilation standards
- Sample Project
- School project
- HAP general settings
- Project sequence
- Input weather data
- Creating Library
- Creating spaces
- All Air conditioning system
- Creating System
- Generating report
- Archive and Retrieve HAP project Data
- HAP Additional Topics
- HAP Project Analysis
- Ventilation in HAP

Chapter 8

Machine selection

- Factor effecting machine selection
- Window air conditioning
- Split air conditioning
- Ductable air conditioning
- Package air conditioning
- VRV/VRF
- Chiller
- Air cooled selection
- Water cooled selection
- Ahu selection
- Software Selection

HVAC DESIGNING

PART 04
HVAC AIR SYSTEM (UPDATED)

Chapter 9

HVAC Air System

- Introduction to Ducting
- Continuity Equation
- SMACNA Standard
- Classification of Duct
- Duct Material
- Flexible Duct
- Duct Gauging
- Duct Fitting
- Duct Accessories
- Fire Damper
- Types of Duct Plenum

Chapter 10

Duct Design

- Key Objectives of Duct Design
- Duct design process overview
- Duct Velocity
- Types of Duct System Layout
- Duct Aspect Ratio

Chapter 11

Duct Sizing Methods

- Equal Friction Method
- Static Regain Method
- Velocity Reduction Method
- Constant Velocity Method
- Duct Design Using the Continuity Equation
- Examples
- Duct Branch Design
- Plenum Box Sizing

Chapter 12

Air Distribution & Terminal

- Function of Air Terminals
- Occupied Zone
- Good Air Distribution
- Air Patterns
- Types of Air Terminals
- Air Terminal Selection
- Example Calculation
- Catalogue Selection
- Diffuser Selection
- Grill Selection
- Steps for HVAC Air-Side Planning

Chapter 13

Exhaust System

- Toilet Exhaust System
- Steps for Designing Toilet Exhaust System
- Sample Project
- Car Parking Exhaust System
- Why Ventilate Enclosed Car Parks
- Key Codes & Standards
- Ventilation Strategies & System Types
- Determining Exhaust Airflow (Detailed Methods)
- Sample Project
- Kitchen Exhaust System
- Design Steps
- Sample Project

Chapter 14

Stair Case Pressurization

- Introduction to Staircase Pressurization
- Codes & Standards
- System Components
- Calculation & Sizing
- Sample Project

Chapter 15

Fan Selection

- Introduction to Fans in HVAC Systems
- Types of fan
- Fan laws
- Fan performance characteristics
- Fan selection requirements
- Loss coefficient
- ASHRAE Duct Fitting Database software
- Air volume in CFM
- ESP Calculation
- Fan selection manual
- Fan selection with Excel Program

HVAC DESIGNING

PART 05
HVAC WATER SYSTEM (UPDATED

Chapter 16

Introduction

- Types of pipe
- Pipe material
- Pipe class
- Classification of pipe
- Types of pipe arrangements
- Direct return systems
- Reversed return system
- Pipe Designing
- Pipe designing method
- Velocity method
- Velocity + fraction combine method
- Manual pipe designing
- Software pipe designing
- Project

Chapter 17

Fitting & Accessories

- Pipe fitting
- Pipe accessories
- PICV
- Pump hookup
- Chiller hookup
- Ahu hook up
- Valves selection

Chapter 18

Pump Selection

- Introduction
- Classification of pumps
- Pump laws
- Pump Curves
- Types of pump Primary pump
- Secondary pump
- Tertiary pump
- Head loss
- Pump selection manual
- Pump selection with Excel Program

Chapter 19

Other Equipment Selection

- Cooling Tower Selection
- Make up Water Tank Selection
- Expansion Tank Sizing
- • Air Separator selection

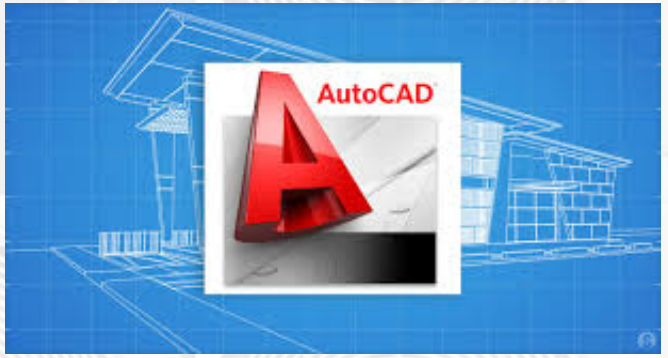
MODULE - 02
HVAC DRAFTING

PART 01: AUTOCAD

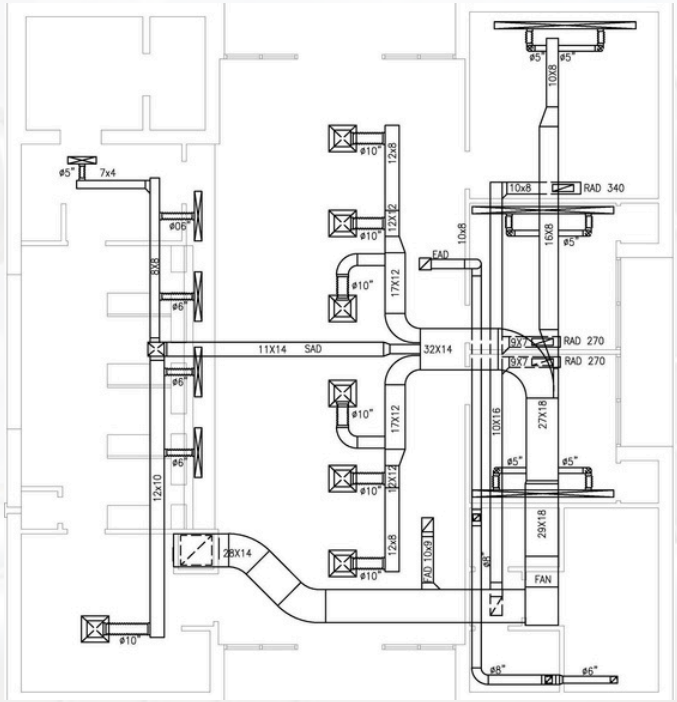
AUTOCAD

- Introduction to AutoCAD
- What is What on CAD Screen
- Autocad Coordinate System
- Angle Measurement System
- Drawing Setup
- Line Command-Absolute and Relative Method
- Polar and Direct Distance Method
- Function Keys Part 1
- Function Keys Part 2
- PolyLine
- Construction Line
- Circle
- Rectangle
- Ellipse
- Polygon
- Point
- Smooth PolyLine and Revision Clouds
- Selection Methods
- Copy and Move
- Rotate and Offset
- Mirror, Scale, Block and Explode
- Stretch, Break and Join
- Fillet and Chamfer

- Lengthen and Reverse
- Trim and Extend
- Rectangular and Polar Array
- Divide, Measure and Align
- Inquiry Commands- Measure Tools
- Zoom Commands
- Creating Isometric Drawing
- Central Line and Drawing Properties
- Object Properties
- Dimensioning in AutoCAD
- Dimension Command
- Dimension Style
- Single line and Multiline Text
- Creating Layers
- Layouts
- Printing & Ploting
- External Refrence
- Basic Exercises
- Advance Exercises

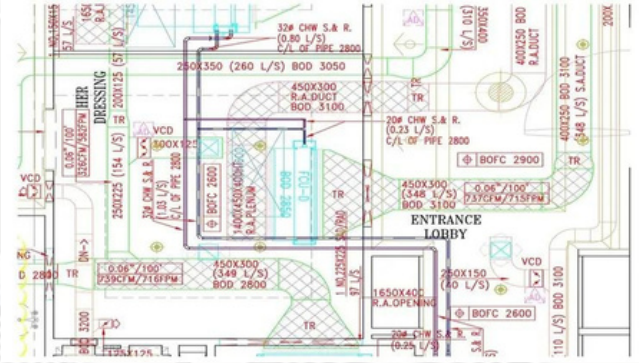


PART 02
HVAC DRAFTING



- How A Drafting Project Executes
- Legends and Abbreviations
- Types of Layouts
- Architectural layout
- Structural layout
- Electrical layout
- Mechanical layout
- HVAC layout
- Firefighting layout
- Type of False Ceiling
- Creating Layers
- Air Terminals (SAD, RAD, SCD, RCD)
- Duct Fittings
- Reducers
- trouser piece
- Elbow
- Mouth piece
- Canvas cloth
- Flexible ducts etc.
- Conversion of Civil Multicolor Drawing to Single Color
- X-Ref File, Scaling of a Drawing
- Single Line Drawing in Ducting
- Placement of Indoor Unit

- Placement of Air Terminals
- Single line ducting
- Accessories (VAV, VCD, FD, Sand trap Lower ETC)
- Double Line Drawing in Ducting
- Placement of Indoor Unit
- Placement of Air Terminals
- Double line ducting
- Accessories placement
- Insulation
- Acoustic insulation
- Thermal Insulation
- Single Line Piping
- Rooting of piping
- Sizing (using chart and pipe sizer)
- Valves fitting
- Double Line Piping
- Conversion of single line piping to double line pipe
- Pipe fitting
- Elbow
- Tee
- Reducer
- Labeling
- SECTION
- Section for a particular complicated area
- Printing and plotting techniques



MODULE 3
HVAC ESTIMATION

Introduction to Estimation

- Departments in Estimation
- Tender Department
- Job in Hand Department

Tree Diagram for Estimation

- Units & Conversions
- Length
- Area
- Tonnage

Legends & Abbreviation

- General Abbreviation
- HVAC Abbreviation
- Ducting Abbreviation
- Air Terminal Abbreviation
- Accessories Abbreviation
- Letter of Intend (LOI)

Equipments

- Air Side Equipments
- Water Side Equipments
- Refrigerant Side Equipment's

Air Side Extraction

- Supply Duct
- Return Duct
- Flexible Duct
- Fresh Air Duct
- Kitchen exhaust Duct
- Smoke exhaust Duct
- Toilet exhaust Duct

Water Side Extraction

- Chillers
- Pumps
- Chilled Water Supply piping
- Chilled Water Return piping

Step to Start the Services

- Document extraction
- Division of Services
- Division 21
- Division 22
- Division 23
- Division 26

Ducting Side

- Supply Air Duct
- Return Air Duct
- Flexible Duct
- Fresh Air Duct
- Kitchen exhaust Duct
- Smoke exhaust Duct
- Toilet exhaust Duct

Piping Side

- Chillers
- Pumps
- Chilled Water Supply piping
- Chilled Water Return piping

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MODULE 4
HVAC INSTALLATION

Chapter 1

INTRODUCTION

- Responsibilities of Site Engineer
- How to Read Shop Drawing

Chapter 2

INSTALLATION

- Sequence of Operation
- Chiller Installation
- AHU Installation
- FCU Installation
- Duct Installation
- Fan Installation
- Pipe Installation
- Pump Installation

Chapter 3

INSULATING

- Duct Insulation
- Pipe Insulation

ADDITIONAL NOTES

For Self-Study (Complimentary)

- Tab Work
- Maintenance
- Filters
- Installation Safety
- HVAC Sales

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WEBSITE

LOCATION

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INSTAGRAM