



Table of Contents

The majority of the content below covers the topics for the PA, PPD, and PDD exams. However, the content of these three exams goes beyond what is covered in these lectures. I will continue to add more content to cover all the technical subjects eventually.

0.0 How To...

0.1- How To Read Questions - (Published by 06/04/2022)

0.2- How to Asses Spatial and Functional Relationships -
(Published by 05/23/2024)

0.3- How to Calculate Slopes - (Published by 07/17/2024)

0.4 - How to Study for the PA Exam - (Published by 04/23/2025)

0.5 - How to Study for the PPD Exam - (Published by 04/24/2025)

0.6 - How to Study for the PDD Exam - (Published by 04/29/2025)

0.6 - How to Study for the PCM+PJM+CE Exam - (Published by
05/15/2025)

1.0 Structures

1.1 Loads & Forces

(Published by 03/25/2022)

Dead & Live Loads, Forces

Laws of Equilibrium

Moment

1.1A - Sample Questions (Equilibrium & Moment)

1.1B - Sample Questions Continued (Equilibrium & Moment)

1.1C - Axial Stress & Sample Questions



1.2 Shear & Moment Diagrams

(Published by 03/25/2022)

1.2A - Deformation & Hooke's Law

Stress & Strain
Elasticity & Plasticity
Stress/Strain Diagram

1.2B - Modulus of Elasticity

Ductility & Brittleness
Tension & Compression
Shear & Bending

1.2C - Shear & Moment Diagrams

Sample Questions (Shear & Moment Diagrams)

1.3 Structural Systems & Earthquake Design

1.3A - Published by 04/07/2022

Structural Systems
Shear Wall, Moment Frame, and Braced Frame
Tributary Area

1.3B - Published by 05/06/2022

Earthquakes
Inertial Forces and Acceleration
Period & Resonance
Damping
Ductility, Stiffness & Strength
Building System Design Considerations
Re-Entrant Corners
Structural Irregularities
Soft & Weak Story

1.3C - Published by 05/17/2022

Impacts of Earthquakes on Site Assessment
Non-Structural Design Elements Under Seismic Loads

1.4 - Published by 11/11/2022

Overturning Moment
Safety Factor

1.5 - Published by 08/22/2025

Basics of Wind
Wind Loads on Buildings
Sliding, Uplifting & Overturning
Designing for Wind

2.0 Environment & Sustainability

2.1A - Published by 6/9/2022

What is Sustainability
Sustainable Design Objectives
Global Warming & Greenhouse Effect
Renewable Energy Sources
Geothermal Energy Systems
Wind Turbines

2.1B - Published 6/11/2022

The Basics
Embodied Energy
Heat, Sensible Heat, Latent Heat
Heat Flow
Thermal Resistance
R-Value, K-Value, U-Value, C-Value
Thermal Comfort
Psychometric Chart

2.2A - Published by 07/31/2022

Climate
Microclimate
Climate Regions of the US
General Design Strategies for Cold & Hot Climates

2.2B-Pt.1 - Published by 09/26/2022

Altitude /Azimuth Angles
Latitude
Reading Sun-Path Diagrams

2.2B-Pt.2 - Published by 10/04/2022

Daylighting Strategies
Thermal Properties of Windows
Surface Films and Low-E Coating
Window Design Strategies for Better Daylighting
Skylight Design Strategies for Better Daylighting

2.2C - Published by 12/03/2022

Passive Heating Systems

- Direct Gain
- Indirect Gain (Trombe Wall)
- Isolated Gain (Sun Space)
- Thermosiphoning

2.3 - Published by 01/03/2023

Shading

2.4 - Published by 01/28/2023

Passive Cooling

- How Does Air Flow?
- Natural Ventilation
- Stack Effects, Bernoulli Effect, Venturi Tube)
- High-Mass Cooling (Roof Ponds)
- Night Flushing
- Evaporative Cooling

3.0 Mechanical Systems

3.1 - Published by 6/29/2023

- Active Climate Control
- How to Select the HVAC System
- Thermal Zoning
- HVAC System Components
- Boilers
- Furnaces
- Refrigeration Cycle
- Heat Pumps

3.2 - Published by 7/21/2023

Air Delivery

- Fans
- Air Handling Units
- Designing Ductwork

Water Delivery

- Pumps, Pipes
- Water Delivery Devices

Indoor Air Quality

- Dedicated Outdoor Air System (DOAS)
- Heat Recovery Ventilators (HRVs)
- Energy Recovery Ventilators (ERV)

3.3 - Published by 8/03/2023

- Small Buildings / Large Buildings
- Local Systems / Central Systems
- Small Building HVAC System Scenarios

3.4 - Published by 10/07/2023

- Large Buildings HVAC System Scenarios

3.5 - Published by 10/16/2023

- Mechanical Systems Bonus Quiz

4.0 Site Analysis

4.1 - Published by 12/01/2023

- Zoning
- FAR / Setback /Building Footprint/ Total Buildable Area Calculations
- Easement / Right of Way
- Variance
- Planned Urban Development

4.2 - Published by 12/08/2024

- Site Analysis & Design (Analyzing the Site and Placement of Buildings)

5.0 Water & Plumbing

5.1 - Published by 10/08/2024

- The Water Cycle
 - Rainwater Harvesting
 - Stormwater Management Strategies
1. Infiltration and Absorption-Based Strategies
 - Permeable Pavements or Ground Covers.
 - Rain Gardens (Bioretention Basins)
 - Bioswales
 - Vegetated Swales
 - Green Roofs
 - Infiltration Trenches & Infiltration Basins
 - Filter Strip
 - Sand Filters
 2. Retention and Detention-Based Strategies
 - Retention Basins (Ponds)

- Detention Basins (Ponds)
- Constructed Wetlands

5.2-Pt.1 - Published by 11/12/2024

- Water Supply
 - Public Water Supply
 - Private Water Supply and Water Wells (Dug, Drilled, Driven...Wells Compared)
- Water Distribution
 - Upfeed & Downfeed Water Distribution
- Pipes & Controls
 - Plastic Pipe Types
 - Galvanized Steel Pipes
 - Valve Types

5.2-Pt.2 - Published by 1/21/2025

- Plumbing Fixtures
 - Toilet Types
 - Toilet Bowl and Flush Types
 - Compost Toilets
- Hot Water
 - Water Heater Types
 - Solar Water Heating

5.3 - Published by 05/19/2025

- Sanitary Drainage
 - Components of the DWV Systems (Vent Stack vs. Stack Vent)
 - Traps & Siphonage
 - Grease Traps
- Waste Piping
 - Pipe Materials
 - Pipe Connections