

Renovation and Design of Industrial Buildings

A to Z Guide to Steel Building Design

Introduction

Civil engineers working in a variety of sectors, including as oil and gas, power plants, water treatment plants, and industrial factory projects, are required to complete this training course on Industrial Building Designs and Renovation. Attendees will leave this session with a deeper understanding of foundations, advanced structural analysis and design, and fundamental concepts of building rehabilitation.

Sample illustrations of actual structures will be provided in this training course to help designers comprehend design techniques and apply them to various building kinds. Examples of various systems, such space frames, will be given, ranging from the standard two-dimensional beams and frames to the three-dimensional multi-storey frames. This course will cover building inspection and assessment techniques, look at the reasons behind structural degradation, and

This training session on Course N Carry will emphasize:

- Deciding on an appropriate structural system and getting the overall plan ready
- Using loads and load combinations in accordance with ASCE, UBC, and IBC
- Industrial building analysis and design
- Techniques for Investigating Structures
- Techniques for Renovating Structures
- Supplies Needed for Repairing Steel and Concrete Structures

Objectives

Upon completion of this training program, you will be able to:

- Choose the geometry, structural system, and layout that make the most sense.
- To compute applied loads and load combinations, use the American codes.
- Applying loads in accordance with ASCE, IBC, and UBC to structural models
- Examine and design industrial steel and concrete structures in accordance with AISC [ASD / LRFD].
- How to look into and evaluate the state of industrial buildings
- Choose the best remodelling techniques.

Training Methodology

A range of tried-and-true adult learning strategies will be employed in this Concrete Structure Designing for Industrial Projects training course to guarantee optimal acquisition, retention, and understanding of the material covered. Every day sessions will involve a lot of interaction and participation; pictures and videos will be utilized as examples.

Organizational impacts

- Learn which structural systems are commonly employed in buildings intended for industrial usage.
- Examine the difficulties involved in utilizing different crane technologies in commercial structures.
- Examine several design examples that show workable solutions for several aspects of the design for both new building and refurbishment.
- Examine typical concrete, metal building systems, or structural steel foundation types for gable rigid frame buildings.
- Learn how to construct the foundations of process equipment, which is commonly located in industrial structures.
- Concrete anchoring and embedding
- Find out how to make beams and frames more capable of supporting loads.

Personal Impact

Participant will comprehend the following:

- The usual real-world difficulties in industrial building design
- The blueprint for new building, which includes standard framing methods, crane runway beam designs, and crane support designs
- Anchoring and embedment, as well as foundations for equipment and building structures
- Rehabilitating and fortifying industrial structures
- Wind, seismic retrofit, vertical loads, and foundation strengthening
- The problems of building enlargement and building envelope restoration

Who should attend?

This course is intended for civil engineers and experts involved in building analysis, design, and/or rehabilitation who work in the oil and gas, power, and water treatment industries, as well as industrial companies.

Though a wide spectrum of professions can benefit from this Course N Carry training course, the following will be especially noted:

- Engineers by Design
- Engineer consultants
- Engineers for Contractors

- Companies that Provide Engineering Services
- Engineers in Construction

Course Outline

Day 1

An Overview of American Codes and the Creation of Economical Geometry Computing Loads and Combinations of Loads

- An Overview of American Codes and Their Application
- Establishing a Structural Plan
- Design Standards
- Details of the Dead Load/Live Load and subsequent loads
- Seismic loads, sources, standards, methods for calculating seismic loads, load-resisting systems, design methodology, and requirements for detailing
- Definition of wind loads, variables influencing them, methods and standards for calculating wind loads, load-resisting systems, a basic understanding of how wind moves around structures and buildings, as well as how to get the design parameters and data needed to calculate wind loads
- Combinations of loads [ASD/LRFD]

Day 2

Steel Industrial Building Design

- Steel Frame Pipe Rack Design
- Girt and Side Girt Purlins
- Girders for Cranes
- Systems of Bracing
- Baseplates and Anchor Fasteners

Day 3

Concrete Industrial Building Design

- Design of Concrete Slabs
- Concrete Beam Design for Torsion and Shear
- Concrete Column Design
- Concrete Stair Design

- Deep and Shallow Foundations

- Foundation Design for Vibrating Equipment
- Tanks Foundation Design
- Earth-Retaining/Liquid Structures

Day 4

Building Assessment

- Techniques for Examining and Assessing Industrial Buildings
- Criteria for Visual Inspection
- Infrared and ultrasonic
- Types of Concrete Cracks
- Corrosion Events
- Choosing the Materials for Repair
- Techniques for Defence
- Protective Cathodic

Day 5

Techniques for Renovation of Industrial Buildings

- Motives for Using CFRP for Structure Strengthening in Industrial Building Renovation
- Building Extension
- Main Frame Reinforcement for Vertical Loads
- Steel Structure
- Metal Structures
- Concrete
- Seismic and Wind Retrofit
- Strengthening of the Foundation
- Remodelling of Grade Slabs
- Installing New Equipment in Pre-existing Structures
- Fortifying Anchors and Integration