

# Structural Detailer Training

## Web-Based Course

### Overview

Dowco's Structural Detailer Training course covers approximately 300 hours of web-based instruction. It allows you to train in steel detailing at your own pace over the Internet. Within one year, spending only six hours of training each week, you will meet the criteria of an entry-level steel detailer.

### Requirements

A computer with a high-speed Internet connection. Detailing or drawing software is not required.

### Prerequisites

There are no prerequisites for the detailing course, nor do you need any detailing or steel industry experience. However, prior experience in the steel industry will help you understand many of the fundamentals and mathematics concepts more easily and more quickly.

### Goals and Outcomes

At the end of this course, you will:

- ✓ Have a comprehensive understanding and knowledge of detailing fundamentals
- ✓ Be confident working with detailing drawings and process documents
- ✓ Know the fundamentals around detailing columns, beams, connections and trusses
- ✓ Have the theoretical knowledge of a detailer with years of experience
- ✓ Take the knowledge you have acquired to the detailing shop and be more confident and comfortable addressing detailing issues.
- ✓ Be familiar with tables in the *AISC Steel Construction Manual* and know how to use them

### Certificates

A certificate of completion is awarded to you when you successfully complete the online component of the course.

### Texts and Fees

The student will be required to purchase the following texts from the AISC:

1. *Detailing for Steel Construction*, Third Edition ("Text")
2. *AISC Steel Construction Manual*, Fifteenth Edition ("Manual")

### Course Components

- Detailing Fundamentals                      217 modules with 79 tests and 17 comprehensive exams
- Related Mathematics                        62 modules with 44 tests
- Video Lessons                                51 stand-alone videos with 23 tests

### Detailing Fundamentals

The program guides you through the modules step-by-step and does not allow you to continue until you have mastered the previous material. The *Detailing for Steel Construction* textbook provided is used as a reference guide.

### Related Mathematics

The math component will help you understand some of the issues that designers and engineers deal with. The course also explains the difference between ASD (Allowable Stress Design) and LRFD (Load and Resistance Factor Design) and demonstrates how each method is used in calculations. The student is required to reference the Steel Construction Manual and use the tables to answer many of the questions.

## Videos

Streaming videos cover the many characteristics of steel fabrication, shapes structure and erection.

## Drawing Examples

A series of drawings with animations are presented the student to demonstrate how drawings are dimensioned.

## Testing

Tests are given regular intervals, throughout the course to make sure that you have mastered the material. Tests cover all the material using multiple-choice, true/false, and matching type questions. Test results are given immediately. You can review the tests, contact the instructor via email, or chat online to other students.

You must score at least 65% on related math questions before you are allowed to advance to the next section. The course will guide you through this process.

## Course Outline

### Lessons for Reference

This section of the course prepares you to work through the main course chapters. They include basics such as the difference between ASD and LRFD, a primer on geometry, and walk the student through specification, erection, and shop detail drawings. Concepts of grid systems, elevations, centerlines, running dimensions and clearances are covered. Specific examples of how these principles apply to beams and columns are demonstrated and the relationship between the many dimensions is verified.

### Chapter 1: Introduction to Structural Steel Detailing

An overview is provided of the structural steel design and construction process, common references, structural materials fabrication and erection. ASD and LRFD calculation methods are explained and demonstrated. Structural shapes are reviewed and methods for calculating weights of different steel members such as beams, plates, and HSS are presented.

### Chapter 2: Contract Documents and the Detailing Process

This chapter gives summary and definition of the information needed on design drawings and the typical steps involved in the detailing process. Related mathematics looks at forces in trusses, walls and floor slabs; Column schedules and load tables; and steel joists, their span length, connection and load tables.

### Chapter 3: Common Connection Details

Common connection details showing various framing configurations and the force transfer mechanisms that occur in each, with illustrations of the common connection details that are used in each case are covered in this chapter, specifically

- Fasteners
- Forces in bolts and welds
- Common bolted shear connections
- Common welded shear connections
- Selecting connections
- Column splices
- Truss connections

Related mathematics covers how to calculate bolt length, shear and tensile strength, and flange thickness. It reviews double-angle, shear end-plate and all-bolted seated connections. Calculations on the minimum and maximum sizes of welds are demonstrated. Truss working points and the center-of-gravity on angles are also covered.

## Chapter 4: Basic Detailing Conventions

This chapter on basic detailing conventions covers the definition of detailing conventions that are in universal use. Over the years, innovation, trial and error, common logic and a desire to improve shop and erection drawings have combined to evolve the standard practices and conventions we use today. Some of the conventions covered are:

- Materials identification
- Piece marking
- Advance bills of materials
- Shop bills of materials
- Clearance requirements
- Tolerances
- Sheet numbers
- Erection marks
- Right and left hand details
- Welding processes
- Economy of welds
- Painting
- Galvanizing

Related mathematics reinforces drawing details and goes through some specific examples on channels, columns and column splices.

## Chapter 5: Project Set-up and Control

This chapter discusses how to set-up and control a project and defines detailing conventions that are project specific. Some of the project processes covered includes:

- Pre-construction conference
- Project-specific connections
- Coordination with other trades
- Advance bills for columns, trusses and beams
- A sample detailing kick-off meeting agenda

Related mathematics reviews the process of ordering in multiples.

## Chapter 6: Erection Drawings

This chapter explains how to prepare erection drawings. The chapter covers special instructions for the following:

- Mill (Industrial) and Tier Buildings
- Methods for giving field instructions for bolting and welding
- Locating marks
- Temporary structures
- Review of erection aids
- Matchmarking

A geometry primer is covered in the related mathematics section.

## Chapter 7: Shop Drawings and Bills of Materials

This is a key chapter of the course. Guidance for the preparation of shop drawings and bills of materials is covered as they relate to anchor rod placement, columns, beams and girders, trusses, bracing systems, roof and wall framing, clearances for bolting, welding and field work.

## Chapter 8: Detailing Quality Control and Assurance

The last chapter covers quality control and assurance procedures that are commonly used to prepare and maintain shop and erection drawings. Checking, back-checking, approval of drawings, fit check and maintenance of records are reviewed.