DRAFTER (STRUCTURAL)

APPENDIX A

O*NET CODE 17-3011.01

This training outline is a minimum standard for Work Processes and Related Instruction. Changes in technology and regulations may result in the need for additional on-the-job or classroom training.

WORK PROCESSES

Approximate Hours

A. Tools, Equipment and Work Aids **300**

1. CAD: using and caring for computer-aided drafting terminal, keyboard, mouse and/or stylus
2. Understanding and using sketches, rough drawings, tracing paper, pictorial drawings
3. Understanding and using handbooks, charts, technical specifications, catalogs, building codes, building manuals, reference library materials, CAD manuals and tutorials
4. Using and caring for plotters, printers, Mylar
5. Documenting procedures; maintaining files; setting up project directories

B. Reading Structural Blueprints **200**

1. Reading standard blueprints
2. Reading orthographic projections
3. Reading isometric projections
4. Reading geometric constructions
5. Reading auxiliary views
6. Reading sectional views
7. Demonstrating an understanding of dimensioning procedures

C. Drafting Basics **1,500**

Producing drawings using traditional board drafting and CAD systems:

1. Sketching freehand, preliminary, and final
2. CAD

3. Determining sequence of work and method of presentation, in conjunction with supervisor or project team
4. Interpreting rough sketches, notes and engineering specifications
5. Drafting detail drawings of architectural designs and plans for buildings
6. Drawing plans to scale
7. Changing drawings using CAD systems
8. Sketching pictorial views

D. Making Calculations **500**

1. Understanding and using metric system
2. Compiling dimensions
3. Checking dimensions and materials to be used, assigning numbers to materials list
4. Calculating weights, volumes, and stress factors
5. Using reference materials such as engineering handbooks, product catalogs, tables, etc.
6. Calculating related materials needed, projecting amount required, preparing materials schedule. (at option of sponsor *)
7. Determining scale

E. Construction Detailing **800**

The following tasks are performed using CAD programs:

1. Drawing wall sections
2. Drawing roof detail
3. Drawing standard framing detail
4. Drawing sheet metal detail
5. Drawing electrical layouts and sections
6. Drawing heating and air conditioning layout and sections
7. Drawing plumbing layouts and sections

F. Drafting Simple Architectural Drawings Manually **300**

1. Drawing masonry
2. Drawing structural framing
3. Drawing landscaping

G. Drafting Commercial and Public Structure Plans, using CAD **2,500**

1. Reviewing preliminary considerations, commercial building codes, Americans with Disabilities Act (ADA) accessibility guidelines/codes
2. Drawing plot plans
3. Drawing basement plans
4. Drawing roof plans
5. Drawing floor plans
6. Drawing elevations
7. Drawing machinery placement layout plans (at option of sponsor *)
8. Drawing architectural renderings (at option of sponsor*)
9. Checking plot surveys for commercial and public projects
10. Developing office designs, specifications and layouts. (at option of sponsor*)
11. Incorporating graphic design (for example: Text/Pictures/CAD) (at option of sponsor*)

H. Drafting Alterations **400**

1. Sketching in the field and taking measurements
2. Surveying existing conditions in conjunction with structural engineer
3. Planning alterations scheduling/sequencing as a part of a team
4. Gathering information for specifications, using customer input (at option of sponsor*)

I. Writing Specifications **100**

1. Using commercial catalogs
2. Using building code manuals
3. Using builder’s manuals

J. Quality Assurance Checking **100**

1. Inspecting finished drawings
2. Checking drawings for content
3. Checking for accuracy
4. Checking symbols and conventions
5. Checking specifications

6. Checking shop drawings

K. Inspecting Field Sites **300**

1. Surveying sites under construction
2. Inspecting materials for conformity with plans and specs (at option of sponsor*)
3. Inspecting structures during progressive stages of completion
4. Record keeping and taking photos
5. Inspecting completed structures (at option of sponsor*)

L. Drawing Structural Steel **500**

1. Shaped:
   a. Channel – I Beam
   b. Angle iron, etc.
2. Roof trusses
3. Plate Girders
4. Columns
5. Assemblies of above

M. Drawing Structural Details **500**

1. Concrete, keyed expansion, isolation, rebar/ mesh
2. Steel construction

Approximate Total Hours **8,000**

* If optional components are not selected, the time should be devoted to further mastery of the required Work Processes.

Apprenticeship work processes are applicable only to training curricula for apprentices in approved programs. Apprenticeship work processes have no impact on classification determinations under Article 8 or 9 of the Labor Law. For guidance regarding classification for purpose of Article 8 or 9 of the Labor Law, please refer to https://dol.ny.gov/public-work-and-prevailing-wage

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APPENDIX B

RELATED INSTRUCTION

Safety & Health

1. Fundamentals – Fire, Electrical, Right-to-Know (Hazardous Communications), OSHA, Emergency Procedures
2. Trade Safety
3. Drafting Room: VDT Precautions, Ergonomic Furnishings/Work Aids
4. First Aid (minimum 6.5 hours every 3 years)
5. Sexual Harassment Prevention Training – must comply with Section 201-g of the Labor Law

Blueprint Fundamentals

1. Reading and Interpreting Structural Blueprints
2. Blueprint Production
3. Drawing and Sketching
4. Lettering and Tracing
5. Orthographic Projection
6. Geometric Constructions
7. Sectional Views and Auxiliary Views
8. Dimensioning Procedures
9. Fasteners and Hardware

Computer Aided Drafting (CAD)

1. Introduction to (CAD)
   Drawing Set Up Commands and Data Entry Methods
2. Developing the Shape and Drawing Description
3. Developing Dimension and Scale Description
4. CAD Mechanical Detailing
5. File Management
6. Editing Commands
7. Construction Commands and Object Modification
8. Exclusive Features
9. Advanced CAD Tasks

Mathematics

1. Fundamentals
2. Algebra
3. Geometric Construction
4. Trigonometry
5. Calculus Basics
6. Metric System
7. Estimating and Specifications
8. Trade Applications
9. Calculating Reduced Scales
10. Calculating Weights
11. Calculating Tolerances
12. Calculating Stress Factors

Trade Theory and Science

1. Tools, Machines and Equipment
2. Terminology
3. Drafting Department Practice and Operation
4. Handbooks, Catalogs and Reference Material
5. Work Sequencing
6. Detailing, Welding Symbol
7. Layout and Assembly Drawings, Working Drawings
8. Introduction to Design, Design Research and Testing
9. Visualizing Multiple Perspective Drawings
10. Conceptualizing Inside Complex Processes
11. Principles of Architectural and Structural Drafting
12. Fundamental Principles of Engineering
13. Structural Construction Materials and their Properties
14. Geometric Dimensioning and Tolerancing

Other Workplace Skills

1. Communications: Management, Customer, Engineering, Team Members
2. Problem Solving
3. Group Team Problem Solving

4. American with Disabilities Act Overview

Other Related Courses as Necessary or Required by Sponsor

A Minimum of 144 Hours of Related Instruction is Required for Each Apprentice for Each Year.

Appendix B topics are approved by New York State Education Department.