Basic Blueprint Reading

Introduction to Print Reading

Objectives:

- Describe the basic format for conveying technical information in a drawing
- Identify and interpret the various drawing views used in technical drawings
- Understand how information is organized in notes and title blocks
- Interpret the different line types used in drawings
- Understand the concept of the drawing scale and how it affects information shown in the drawing

Print-Reading Symbols and Abbreviations

Objectives:

- Interpret the most common abbreviations used on drawings
- Understand and interpret the various symbols and notations used on drawings for electrical, architectural, mechanical, and other types of applications
- Recognize how symbols are used to show standard materials, parts, and assemblies
- Interpret thread specifications
- Understand some common symbols used in machining prints
- Recognize common symbols found on hydraulic and pneumatic prints

Dimensioning and Tolerancing

Objectives:

- Know the international standards and conventions that apply to drawings
- Understand how different numbering systems were developed and how they're applied to prints and drawings
- Understand dimensions and tolerances on drawings that describe geometries of parts and assemblies
- Recognize and interpret common symbols and nomenclature used in geometric dimensioning and tolerancing (GD&T)
- Understand how GD&T uses symbols to explain and describe the designer's intent, and eliminate misinterpretation of the print

Print Reading Applications

Objectives:

- Understand standard drawing formats that give information about part titles, part numbers, dimensional standards, revisions, and materials
- Explain how various components shown on prints are connected or related to each other
- Obtain important information from a drawing about quantities, materials, assembly processes, or dimensions
- Visualize the three-dimensional parts and assemblies represented by two-dimensional drawings

Building Drawings

Objectives:

- Identify the various kinds of building drawings
- Compare elevations, plans, and sections
- Match the symbols used on drawings with the various building materials they stand for
- Interpret the explanations and abbreviations used on building drawings
- Read steel and concrete structural drawings

Electrical Drawings and Circuits

Objectives:

- Identify electrical construction drawings, schematics, and wiring diagrams
- Interpret various electrical symbols
- Read standard abbreviations used in electrical diagrams
- Tell if a diagram is a block diagram, a schematic diagram, or a wiring diagram
- Compare closed circuits, open circuits, grounded circuits, and short circuits

Electronic Drawings

Objectives:

- Identify and interpret the various electronics symbols used on drawings
- Identify and interpret the various types of drawings used in the electronics field

Hydraulic and Pneumatic Drawings

Objectives:

- Identify and interpret graphic symbols for lines, flows, and reservoir
- Identify and interpret pump and valve symbols
- Identify and interpret fluid circuit and air circuit components
- Identify and interpret graphical, circuit, cutaway, pictorial, and combined diagrams

Piping: Drawings, Materials, and Parts

Objectives:

- Define the term ‘’piping drawings”
- Recognize on sight plans, elevations, and sectional views
- Identify a view by its placement on a drawing
- List what working drawings include
- Evaluate whether or not a freehand sketch serves its intended purpose
- Interpret the standard symbols and abbreviations used on piping drawings and diagrams
- “Read” the color coding on piping in industrial and power plants
- Interpret dimensions marked on piping drawings

- Define piping plans, diagrams, plot plans, general arrangements, and details, and state the use of each
- List the various materials used for pipe and give the characteristics of pipe of each material
- Classify pipe by material, construction, end condition, strength, and size
- Recognize the various types of valves and identify their use and construction
- List and identify various kinds of pipe hangers and supports and other piping accessories

Welding Symbols

Objectives:

- Identify by name the welding processes commonly used in plant maintenance work
- Name the best welding processes for a given welding job
- Identify by sight the basic joint and groove designs used in welding
- Identify by sight the basic types of welds, and describe their uses
- Interpret the weld symbols most often found in the drawings used in plant maintenance work

Sheet Metal Basics

Objectives:

- Identify sheet metal of known material and thickness by gage and weight
- Figure allowances for bends, circumferences, seams, locks, and edges
- Know when and where to cut relief radii
- Catalog and identify by sight the various seams, locks, and edges
- Name and describe the major tools and machines used in sheet metal working
- Explain how large fittings can be constructed
- List the characteristics of PVC and PVF sheet and laminates

Sketching

Objectives:

- Use the right techniques for sketching straight and curved lines, and circles and arcs
- Make, with practice, multiview sketches of simple objects that accurately show all the details of the objects
- Dimension sketches of simple machine parts with enough detail that parts can be made
- Draw, with practice, realistic picturelike sketches of objects that have simple rectangular and circular shapes

Elements of Print Reading, Part 1

Objectives:

- Given a drawing, interpret the dimensions and notes
- Differentiate between perspective, isometric, orthographic, and working drawings
- Identify the classifications of fits and the use of tolerances and their method of application
- Shown a scale for a drawing, be able to convert the sizes
- Identify the symbols used to indicate surface finishes

Elements of Print Reading, Part 2

Objectives:

- Distinguish between simplified and section drawings
- Interpret the symbols used in section drawings
- Given a drawing, identify the different components and interpret dimensions and notes
- Calculate the taper on a given workpiece
- Point out the differences between the types of rivet symbols used on a working drawing
- Choose the proper information on a drawing to calculate a dimension that is not indicated

Reading Shop Prints, Part 1

Objectives:

- Properly interpret working drawings (including dimensions and tolerances)
- Interpret symbols, notes, and specification
- Identify material requirements
- Interpret drawings to determine the proper procedure to make the part

Reading Shop Prints, Part 2

Objectives:

- Read and properly interpret various shop prints
- Interpret and use cam prints
- Interpret and use gear prints
- Read and understand an assembly drawing and bill of materials
- Read simple sheet metal drawings

Reading Electrical Schematic Diagrams

Objectives:

- Identify standard electrical symbols and describe their meaning
- Describe the parts of a schematic diagram
- Explain the flow of electrical current through circuit devices
- Describe and identify electrical drawings, block diagrams, wiring diagrams, and electrical schematic diagrams
- Interpret switch status and describe a switching circuit's operating behavior
- Trace wiring diagrams for motor controls
- Identify a ladder diagram and describe its function

Electrical Blueprint Reading

Objectives:

- Explain how blueprints are prepared
- Talk about the relationship of electrical blueprints to the architectural drawings and drawings of other trades
- Read and understand the information presented on blueprints

- Identify the different methods of presenting information on blueprints
- Interpret the common symbols used on electrical blueprints
- List the common abbreviations used on electrical blueprints
- Trace a wiring diagram and understand it