Appendix A:
Core Competencies

Architecture and Construction Core

The following Cluster (Foundation) Knowledge and Skill statements apply to all careers in the Architecture and Construction Cluster.

ACADEMIC FOUNDATIONS

Perform math operations such as estimating and distributing materials and supplies to complete jobsite/workplace tasks.
Use basic math functions to complete jobsite/workplace tasks.
Identify whole numbers, decimals, fractions, complex numbers, and polynomials.
Apply basic arithmetic add, subtract, multiply, and divide operations.
Apply relational (equal, not equal, greater than, less then, etc.) and logical operators in a logical expression.
Use geometric formulas to determine areas and volumes of various structures.
Calculate areas and volumes of structures.
Estimate materials and supplies needed.
Use appropriate formulas to determine percentages /decimals.
Calculate percentages/decimals.
Use percentages/decimals to perform measurement tasks.
Use appropriate formulas to determine ratios, fractions, and proportion measures.
Calculate ratios, fractions, and proportion measures.
Use ratios, fractions, and proportion measures to perform measurement tasks.
Use appropriate formulas to determine measurements of dimensions, spaces, and structures.
Measure dimensions, spaces, and structures using U.S. Standard unit.
Measure dimensions, spaces, and structures using Metric units.
Use dimensions, spaces, and structures calculations to estimate materials and supplies needed.
Conceptualize a three-dimensional form from a two-dimensional drawing to visualize proposed work.
Build Create three-dimensional form models.
Apply principles of physics as they relate to worksite/jobsite situations to work with materials and load applications.
Apply basic concepts of statics and loads to planning.
Use the basic concepts of static and load calculations for rigging and moving loads.
Identify the physical properties present when using common construction materials in order to use the materials safely, effectively and efficiently.
Use the basic concepts of physics when working with common construction materials.

COMMUNICATIONS
Use vocabulary and visual cues commonly used in design and construction to be successful in workplace/jobsite communications.
Match vocabulary and visual cues to workplace/jobsite situations.
Use correct terminology to convey verbal and visual.
Utilize vocabulary and visual cues in context of design and construction situations.
Confirm understanding of verbal and visual instructions.
Ask questions concerning details of instructions.
Perform assignments as requested.
Perform assignments as requested.

PROBLEM-SOLVING AND CRITICAL THINKING
CREATE AND IMPLEMENT PROJECT PLANS CONSIDERING AVAILABLE RESOURCES AND REQUIREMENTS OF A PROJECT/PROBLEM TO ACCOMPLISH REALISTIC PLANNING IN DESIGN AND CONSTRUCTION SITUATIONS.
Plan, organize, schedule, and manage a project/job to optimize workflow and outcome.
Report results of the project/job.
Manage the schedule of a project/job.
Identify timeline required to complete a project/job..
Evaluate efficiency and effectiveness of a project/job.
Estimate resources/materials required for a specific project or problem.
Estimate correct amount of required resources/materials.
Create a budget.
Use available resources/materials effectively while completing a project or resolving a problem with a project plan.
Evaluate waste of resources/materials.
Evaluate necessity for additional resources/materials.
Determine alternative solutions for a specific project/problem.
Evaluate feasibility of alternative suggestions.
Implement appropriate alternatives.
EVALUATE AND ADJUST DESIGN AND CONSTRUCTION PROJECT PLANS AND SCHEDULES TO RESPOND TO UNEXPECTED EVENTS AND CONDITIONS.
Incorporate potential job disruptions into planning time lines.
Identify potential events and conditions that disrupt the completion of a job.
Solve situational problems involved with unexpected events and conditions.
Adjust project plans and schedules when presented with unexpected information.
Modify existing plans to reflect an unexpected change.
Modify existing schedules to reflect an unexpected change.
Modify existing budget to reflect unexpected change.
Identify and assess critical situations as they arise to resolve issues.
Evaluate potential solutions and determine best solution.
Appraise critical situations and implement appropriate response.
Generate a project update that tracks changes necessitated by unexpected events and conditions.
Present an oral and/or written status report on the project.

INFORMATION TECHNOLOGY APPLICATIONS

No additional statements in this topic beyond those found in the Essential Knowledge and Skills Chart.

SYSTEMS

COMPLY WITH REGULATIONS AND APPLICABLE CODES TO ESTABLISH A LEGAL AND SAFE WORKPLACE/JOBSITE.

Identify governmental regulations and national, state, and/or local building codes that apply to a given workplace/jobsite.

- Follow governmental regulations and building codes.
- Follow jurisdictional regulations and building codes.
- Use information given in regulations and codes correctly.
- Pass job inspections and comply with regulations at all times.
- Pass required substance abuse screening.

Evaluate workplace/jobsite activities for compliance with governmental and other applicable safety regulations such as EPA and OSHA.

- Read and discuss information on OSHA, EPA, and other safety regulations.
- Pass safety inspections and comply with regulations at all times.

Use MSDS (Material Safety Data Sheets) information for the management, use, and disposal of materials.

- Obtain, understand, and follow MSDS (Material Safety Data Sheets) information
- Use materials safely.

Identify workplace/jobsite environmental hazards of a given situation.

- Follow safe practices relating to environmental hazards.

EXAMINE ALL FACTORS EFFECTING THE PROJECT AND THE PLANNING PROCESS.

Understand social, environmental, and political factors that affect the project.

- Label all systems on a set of construction documents.
- Discuss the interrelationship of the systems in the built environment.
- Use the concept of “Critical Path Method” (CPM) and/or similar, sequential methods so that work progresses efficiently.

Understand the context of the projects.

- Follow safe practices relating to environmental hazards.

UNDERSTAND AND MANAGE UNION-MANAGEMENT RELATIONSHIPS AND CONTRACTS TO CREATE A COOPERATIVE WORK ENVIRONMENT.

Analyze a proposed contract in terms of both the company’s and the union’s position in labor contract negotiations.

- Document how quality improves profitability.
- Discuss the interrelationship of the systems in the built environment.

Assess a situation for compliance with terms of a contract.

SAFETY, HEALTH, AND ENVIRONMENTAL
Assess and control the types and sources of workplace hazards to ensure a safe workplace and jobsite.
Follow governmental regulations and building codes.
Follow jurisdictional regulations and building codes.
Use information given in regulations and codes correctly.
Pass job inspections and comply with regulations at all times.
Pass required substance abuse screening.
LEADERSHIP AND TEAMWORK
ESTABLISH SPECIFIC GOALS TO MANAGE PROJECT ASSIGNMENTS IN A TIMELY MANNER.
Establish project goals that assist in meeting project specifications and deadlines.
Define and describe project goals.
Identify and list key project activities.
Identify and report activity deadlines.
Organize work teams that effectively manage assignments.
Determine and list assignments by activity and personnel.
Complete assignments.
Monitor and write a report on progress of the project.
Evaluate completed project according to customer requirements.

ETHICS AND LEGAL RESPONSIBILITIES

Recognize legal and ethical relationships between employees and employers to establish workplace/jobsite rules, regulations, and guidelines in a design and/or construction setting.
Access appropriate resources to identify the roles, rights, and responsibilities of an employee and an employer.
Practice workplace/jobsite conduct incorporating employee and employer roles, rights, and responsibilities.
Examine insurance documentation to determine liability issues associated with a job.
Describe liability issues as needed.
Comply with employer policies, procedures, and job-specific agreements, such as sexual harassment avoidance and substance abuse control, to prevent ethical and legal problems.
Comply with employer policies and procedures.
Comply with project labor agreements.
Read regulations and contracts to ensure ethical and safety elements are observed.
Study regulations and codes to identify those applicable to the local area.
Locate and implement regulations and codes applicable to tasks and projects.
Comply with local, state and Federal codes.
Explain the various aspects of service contracts to ensure compliance.
Evaluate and follow service contracts.
Recognize the relationships among and responsibilities of various parties to a contract.
Fulfill contractual roles and responsibilities.
Monitor relationships with other parties.
Recognize the definition of specialized words or phrases to fully understand documents and contracts.
Use industry jargon or terminology appropriately.
Use industry acronyms correctly.
Use words with multiple meanings correctly in context.
Use ethical and legal standards to avoid conflicts of interest in a design and/or construction setting.
Identify conflicts of interest relating to a job or project to prevent ethical or legal problems.
Resolve issues relating to any potential conflicts of interest.

EMPLOYABILITY AND CAREER DEVELOPMENT
EXPLAIN WRITTEN ORGANIZATIONAL POLICIES, RULES, AND PROCEDURES COMMON IN DESIGN AND CONSTRUCTION SETTINGS TO HELP EMPLOYEES PERFORM THEIR JOBS.
Locate appropriate information on organizational policies in handbooks and manuals.
Identify the contents of various organizational publications.
Select the appropriate document(s) as reference for the situation.
Discuss how specific organizational policies and rules influence a specific work situation..
Locate and identify specific organizational policy, rule or procedure to assist with a given situation.
Explain specific organizational policy, rule or procedure to improve a given situation.
RECOGNIZE THE RESPONSIBILITIES AND PERSONAL CHARACTERISTICS TO DEVELOP INDIVIDUAL GOALS FOR PROFESSIONALISM.
Identify appropriate responsibilities and personal characteristics by researching workplace/jobsite information.
Practice the responsibilities and characteristics of a professional craftsperson.
Identify all critical/important functions.
Document customer satisfaction.
Present a professional image in the workplace/jobsite.
Maintain appropriate professional memberships.
Follow rules, regulations, and guidelines.

TECHNICAL SKILLS
Read, interpret, and use technical drawings, documents, and specifications to plan a project.
Interpret drawings used in project planning.
Recognize elements and symbols of blueprints and drawings.
Describe written standards and specifications that apply.
Interpret and explain standards and specifications.
Recognize how specifications and standards are arranged for proper access.
Use specifications and standards.
Apply specifications and standards appropriately.
Use architect's plan, manufacturer's illustrations and other materials to communicate specific data and visualize proposed work.
Sketch/draw/illustrate concepts and ideas.
Draw or sketch plan/layout to be completed.
Use proper measurements to determine layout.
Use and maintain appropriate tools, machinery, equipment, and resources to accomplish project goals.
Select tools, machinery, equipment, and resources that match requirements of the job.
Operate tools, machinery, and equipment in a safe manner.
Properly maintain and care for tools, machines, and equipment.
Safely use tools, machines, and equipment productively and efficiently in alignment with industry standards.
Identify sources of information concerning state-of-the-art tools, equipment, materials, technologies and methodologies.
Read current periodicals, industry publications, and manufacturer's catalogs.
Use state-of-the-art tools, equipment, materials, technologies, and methodologies.
Demonstrate use of tools, machinery, equipment, and other resources commonly used in design and construction.

Construction Pathway

The following knowledge and skill statements apply to all careers in the Construction Pathway. The statements are organized within five topics.

SYSTEMS

Understand contractual relationships with all parties involved in the building process to ensure successful build of a project.

Create a sustainable and accountable partnership between stakeholders.

Establish/implement reporting relationships among stakeholders.

Determine priorities of all parties involved.

Design and implement submittal approval procedures to ensure effective flow of information in construction process.

Identify the components necessary for developing submittal approval procedures system.

Employ procedures that complete submittal approval process related to shop drawings.

Employ procedures that complete submittal approval process related to state and local permits.

Understand risk management and use a variety of strategies and tactics to maintain, increase or decrease risk.

Evaluate the tolerability of the inherent risk exposure in a given situation.

Provide solutions to unaddressed problems that pose great risk to a project.

Identify the most appropriate team member to manage risk in a given situation.

Understand construction subcontracts and manage working relationships on a project.

Identify the components of a subcontract.

Explain the function of each component of a subcontract.

Assess the relevance of subcontract terms in a given situation.

Understand and apply project turnover procedures to successfully manage construction projects.

Identify the components of project turnover procedures.

Explain the function of each component of project turnover procedures.

Explain the use of project turnover procedures for a given situation.

Build in accordance with contracts to meet budget and schedule.

Recognize and understand the contract documents and related activities in respect to a specific project.

Apply the components of the document as they relate to a given project.

Identify activities such as coordination meetings, project schedules, meeting deadlines, resolving disputes, change orders, etc. for use in a given project.

Understand and implement testing and inspection procedures to ensure successful completion of the project.

List testing and inspection procedures related to specific areas.

Interpret guides designed for testing and inspection purposes in specific areas.

Understand purpose for scheduling as it relates to successful completion of the project.

Develop a schedule for a specific project.

Explain rationale for a specific scheduling procedure.

Understand and apply closeout procedures to effectively complete a project.

Identify the components of closeout procedures.

SAFETY, HEALTH, AND ENVIRONMENTAL
Create and apply a jobsite safety program to ensure safe practices and procedures.
Determine procedures for a jobsite safety program.
Explain the importance of workers being OSHA certified.
Recognize and employ universal construction signs and symbols to function safely in the workplace.
Identify universal signs and symbols such as colors, flags, stakes, and hand signals that apply to construction workplace situations.
Explain functions of signs and symbols.
Work safely using signs and symbols.
Inspect all signs and symbols for safe and proper use.
Use proper signs and signals for the work area.
Respond appropriately to signs and signals.
Select the most appropriate sign or symbol for use in a workplace situation.
Understand and apply procedures for jobsite security to prevent liability.
Explain the need for jobsite security to prevent liability.
Design and implement jobsite security procedures.
Create and apply a jobsite environmental program.
Explain the need for an environmental program that include recycling, site clean-up, and safe disposal in accordance with MSDS.
List the steps to establish an environmental program.
LEADERSHIP AND TEAMWORK
Manage relationships with internal and external parties to successfully complete construction projects.
Describe strategies used to promote collaboration, trust, and clear communication among contractors, suppliers, clients, and others on a jobsite.
Plan and organize project meetings.
LEGAL RESPONSIBILITIES AND ETHICS
Establish specific goals to manage project assignments in a timely manner.
Understand proper changeover procedures for successful completion of the project.
Establish process for changeover procedures.
Explain the need for specific changeover procedures.

TECHNICAL SKILLS
EXAMINE BUILDING SYSTEMS AND COMPONENTS TO EVALUATE THEIR USEFULNESS TO A PROJECT.
Identify building systems needed to complete a construction project.
List all building systems involved in a project.
Describe the purpose of each system.
List all components of the involved building system.
Describe the function of each component.
Identify components of building systems needed to complete a construction project. Incorporate appropriate building systems into a construction project.
Incorporate appropriate building systems into a construction project.
UTILIZE CRAFT SKILLS TO MEET OR EXCEED CUSTOMER EXPECTATIONS.
Develop and utilize good craft skills.