Links

Program Links
MCCTE-FSU
States' Career Clusters
OCTE Website

46.0000 - Construction Trades (2010)*

Technical Standards

I. MI Technical Standards

A. Industry-Wide Health & Safety Standards.

1. Complete OSHA 10 hour (teachers must be OSHA outreach certified)
2. Examine Material Safety Data Sheets (MSDS) and follow the procedures as necessary
3. Describe personal safety at any type of construction site
4. Recognize and mitigate safety hazards including hazardous materials, environmental hazards and accident conditions at any type of construction site
5. Describe procedures for the Renovation, Repair, and Painting--Lead Safe Work practices

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B. Construction Equipment and Tools.

1. Use and maintain common hand tools in the construction industry
2. Use and maintain common portable power tools in the construction industry
3. Use and maintain common stationary power tools used in the construction industry
4. Identify technology tools in the construction industry

C. Building & Construction Design.

1. Demonstrate knowledge of the design of construction projects
2. Interpret Blueprints/Drawings/Specifications used in construction projects
3. Describe methods used for site planning in construction projects

D. Material Resources for Construction Activities.

1. Identification common materials used in the construction industry
2. Handle, install, position, move, store, and secure materials properly

E. Regulations & Quality Assurance.

1. Identify and comply with governmental regulations, local and state building codes, contract provisions, and construction standards
2. Describe methods used to manage liability on a construction site
3. Describe quality assurance methods used to complete construction projects
4. Describe environmental impact mitigation

F. Construction of Heavy/Highway & Civil Structures.

1. Demonstrate knowledge of heavy/highway and civil materials and methods in the construction of different types of projects.
2. Demonstrate knowledge of road construction components to perform road marking and road pavement operations
3. Demonstrate knowledge of bridge components and how to construct different types of bridges
4. Demonstrate knowledge of materials, methods, and techniques in the construction of tunnels, canals, dams, railroads, pipelines, mass-transit facilities, golf courses, and wetlands

G. Site Preparation for Heavy/Highway & Civil Structures.

1. Describe procedures to carry out grubbing methods (e.g., removal of trees, stumps, plants, and rocks)
2. Identify methods used to perform grading procedures (e.g., altering land surfaces by cutting, filling, and/or smoothing to meet a designated form and function)
3. Define methods used to undertake soil remediation procedures (e.g., protecting and restoring the soil's structure)
4. Describe types and properties of soil
5. Identify underground piping materials and fittings and carry out joining methods for underground pipe
6. Describe methods to install box culverts and catch basins
7. Describe methods to install underground pipe
8. Understand the different colors used for utility marking
9. Know and apply the rules for digging around various utilities
10. Know the procedures to follow if a utility (gas, power, water, etc.) line is hit during digging
11. Describe a variety of earthmoving methods including stripping top soil; excavation; transportation of construction materials; placing and backfilling; watering, mixing, spreading, and leveling of materials; and compaction
12. Describe soil stabilization methods

H. Heavy Equipment Operations.

1. Understand the use of rigid frame trucks: dump trucks, asphalt distribution trucks, broom trucks, transit-mix trucks, fuel/lubrication trucks, maintenance trucks, water trucks
2. Describe the use the correct type and size of equipment such as: compaction equipment, loaders, backhoe loaders, scrapers, bulldozers, excavators, telescoping excavators, motor graders, skid steer loaders
3. Understand the uses of different types of construction cranes and forklifts

I. Materials & Installation Used in Heavy/Civil Projects.

1. Demonstrate knowledge of concrete properties when performing methods of mixing, curing, and finishing
2. Describe installation of structural steel in the construction of bridges, roads, and utilities
3. Describe methods to assemble, install, and maintain pipes to carry liquids, steam, compressed air, gases, and fluids needed for processing, manufacturing, heating, and cooling
4. Describe operation of concrete paving equipment, including pavers, slip-form pavers, and texture/curing machines

J. Residential Construction.

1. Apply knowledge of specific materials and methods for construction of home components including foundation, walls, roofing, staircases, and flooring (e.g., carpet, tile, stone installation, etc.).
2. Understand the distinctions between nonresidential (i.e., stores, offices, factories, etc.) and residential structures (i.e., houses, townhouses, etc.) in terms of building codes, structure formation, building design, materials, etc.
3. Understand the terms associated with building science
4. Describe methods to prepare site for residential construction projects
5. Understand the sequencing of events for constructing residential buildings
6. Correctly build or install essential home components including, but not limited to foundations, walls, roofs, staircases, flooring, carpets, fixtures, and cabinetry

K. Specialty Skills in Residential Construction.

1. Understand roles and responsibilities of various craftspeople
2. Describe methods used to facilitate smooth workflow by recognizing relationships between trades/professions

L. Business Fundamentals.

1. Apply knowledge of business and management principles involved in residential construction.
2. Describe common contracts and budgets used in construction projects
3. Identify permits and licenses required during residential construction projects
4. Analyze blueprints and other documentation to prepare time, cost, materials, and labor estimates

M. Green Building Practices.

1. Describe construction trends related to green building practices
2. Describe methods to select sites for green building practices
3. Perform home energy audits to determine the energy efficiency of a structure
4. Describe methods to minimize construction waste and demolition debris

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Foundation Standards

I. ACADEMIC FOUNDATIONS: Achieve additional academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within a career cluster.

- A. Perform math operations such as estimating and distributing materials and supplies to complete jobsite/workplace tasks.
- B. Apply principles of physics as they relate to worksite/jobsite situations to work with materials and load applications.

II. COMMUNICATIONS: Use oral and written communication skills in creating, expressing and interpreting information and ideas including technical terminology and information.

- A. Use vocabulary and visual cues commonly used in design and construction to be successful in workplace/jobsite communications.

PROBLEM-SOLVING AND CRITICAL THINKING: Solve problems using critical thinking skills (analyze, synthesize, and evaluate) independently and in teams. Solve problems using creativity and innovation.

III.

- A. Create and implement project plans considering available resources and requirements of a project/problem to accomplish realistic planning in design and construction situations.
- B. Evaluate and adjust design and construction project plans and schedules to respond to unexpected events and conditions.

IV. INFORMATION TECHNOLOGY APPLICATIONS: Use information technology tools specific to the career cluster to access, manage, integrate, and create information.

V. SYSTEMS: Understand roles within teams, work units, departments, organizations, inter-

organizational systems, and the larger environment. Identify how key organizational systems affect organizational performance and the quality of products and services. Understand global context of industries and careers.

A. Comply with regulations and applicable codes to establish a legal and safe workplace/jobsite.
B. Examine how the roles and responsibilities among trades/professions work in relationship to complete a project/job.
C. Examine all factors effecting the project and the planning process.
D. Understand and manage union-management relationships and contracts to create a cooperative work environment.

VI. SAFETY, HEALTH AND ENVIRONMENTAL: Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. Follow organizational policies and procedures and contribute to continuous improvement in performance and compliance.

A. Assess and control the types and sources of workplace hazards to ensure a safe workplace and jobsite.

VII. LEADERSHIP AND TEAMWORK: Use leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.

A. Establish specific goals to manage project assignments in a timely manner.

VIII. ETHICS AND LEGAL RESPONSIBILITIES: Know and understand the importance of professional ethics and legal responsibilities.

A. Recognize legal and ethical relationships between employees and employers to establish workplace/jobsite rules, regulations and guidelines in a design and/or construction setting.
B. Read regulations and contracts to ensure ethical and safety elements are observed.
C. Use ethical and legal standards to avoid conflicts of interest in a design and/or construction setting.

IX. EMPLOYABILITY AND CAREER DEVELOPMENT: Know and understand the importance of employability skills. Explore, plan, and effectively manage careers. Know and understand the importance of entrepreneurship skills.

A. Explain written organizational policies, rules and procedures common in design and construction settings to help employees perform their jobs.
B. Recognize the responsibilities and personal characteristics to develop individual goals for professionalism.

X. TECHNICAL SKILLS: Use the technical knowledge and skills required to pursue the targeted careers for all pathways in the career cluster, including knowledge of design, operation, and maintenance of technological systems critical to the career cluster.

A. Read, interpret, and use technical drawings, documents, and specifications to plan a project.
B. Use and maintain appropriate tools, machinery, equipment, and resources to accomplish project goals.

Employment Standards