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ABSTRACT

This Ohio Integrated Technical and Academic Competency (ITAC) profile provides the professional or occupational competencies deemed essential for a graduate to perform proficiently in carpentry when he or she graduates from the specialization work force development program in industrial and engineering systems. The profile includes competency lists that are the result of research and review of existing competency profile lists and includes input from industry, labor, professional organizations, professional and industrial representation, and national standards for a specific industry or profession. The profile includes an overview of carpentry as a profession, including job duties and skills, and a list of competencies and subcompetencies. The following competency areas are listed: (1) carpentry orientation and safety; (2) basic carpentry procedures; (3) layout work; (4) footings, grade beams, foundation walls, and forms; (5) floor framing; (6) wall framing; (7) ceiling and roof framing; (8) roofing; (9) exterior finish; (10) installing fire and draftstopping in compliance with code; (11) insulation; (12) interior finish; (13) stairs; and (14) specialized carpentry applications. (KC)

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Acknowledgements

Overview

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Introduction to the Specialization ITAC

Revised 2001

The Ohio Integrated Technical and Academic Competency (ITAC) profiles are developed under the auspices of the Ohio Department of Education and the Ohio State Board of Education. They provide a broad-based educational response to Ohio's need for a skilled workforce. Each Specialization ITAC represents a profile of the professional or occupational competencies deemed essential for a graduate to perform proficiently when he or she graduates from the specialization workforce development programs in Business and Marketing, Industrial and Engineering Systems, Health Occupations, or Family and Consumer Sciences. The Specialization ITAC profile, in conjunction with the competencies identified in the Foundation and Clusters ITACs, provide a career pathway that can lead to employment or further education.

Process and Intent

The integrated competency lists are the result of all encompassing research and review of existing competency profile lists and includes input from industry, labor, professional organizations, professional and industrial representation, and national standards for a specific industry/profession. Representatives from a broad cross-section of Ohio professional organizations, businesses/professions, industry, and labor played a critical role in identifying current and future knowledge and skills for the industry, and defining the vision and scope of the profession/industry. The instructional methods and teaching strategies are the responsibility of the local school system and/or instructor.

Curriculum Applications Using the ITAC Competency Profiles

Each profile includes a comprehensive listing of occupational skill competencies that reflect the job opportunities and skills that are required to work in a specific profession/career pathway. Critical academic, employability and information technology skills have been integrated throughout the list to support the technical skills. These competency profiles will be used as the basis for curriculum development in Ohio's secondary, adult, and post-secondary programs. The specialization competency profiles are organized so that they can be clustered or grouped in a modular approach. Individual curriculum specialists can use the competencies profiles to develop instructional programs based on local needs as determined in conjunction with their local advisory committees. i.e., the specialization cluster academy approach. Final assessments will be designed to accompany each profile list and to accommodate student evaluation by modules.

Career Pathways | FasTrak ITACs

Acknowledgements
Ohio Department of Education
Career, Technical and Adult Education
2001 Revision

Carpentry

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Overview

Carpentry

Carpentry is a profession for those who like to work with their hands and often outside. A good carpenter is required to be a serious and conscientious worker who pays close attention to detail. It is necessary to be able to plan and organize work and carry out tasks with little or no supervision. Problem-solving skills are also very important since there may not be anyone to turn to for help in calculating and figuring. Interpersonal skills are also of major importance along good writing and oral communication skills. It may be necessary to explain in writing what a job requires as well as estimate the costs involved and the materials required.

Carpenters work mainly with wood though they also use other materials such as plywood, drywall, plaster or tiles. They may design and cut building components, or they may be required to install prefabricated structures such as window frames, doors or shelves. Carpenters work for a variety of clients from both the residential and commercial/industrial sectors. They can be self- employed or can work for construction sub-contractors, working as either union or non-union labor.

A carpenter's job often starts with drawings or instructions that define the scope of a specific project. It may be necessary to build foundations, install floor beams and subflooring as well as erect walls and roofing systems. Carpenters also need to know how to build stairways, wall partitions, or install and trim prefabricated fixtures in kitchens and bathrooms.

A carpenter may also be required to apply drywall, plaster or insulation materials to both ceilings and walls. On occasion, it may be necessary to install parquet flooring or tiles. Some of the tasks may not be directly related to actual construction work. For example, you may occasionally erect a scaffolding, or do minor concrete work.

A carpenter may specialize to work in either the residential or the commercial/industrial sector. In fact, many carpenter skills are transferable so that it is as easy to work on a private residence or building, as well as a large commercial establishment.

Though the tools for basic carpentry tasks haven't changed much in the past two decades, new materials and construction techniques have transformed carpentry profession. Today's emphasis on energy efficiency requires knowledge of airflow management and insulation techniques. The use of new materials in the construction field, such as Formica, preserved wood products and particle boards, also requires additional skills.

One must be physically fit to be a successful carpenter. Much of what is expected requires physical effort. Carpentry work is intellectually demanding since it requires foresight, concentration, mathematical skills, and an ability to understand plans and blueprints. It may be necessary to arrange for subcontractors to deal with building tasks such as heating and electrical wire work. A carpenter may need to prepare cost estimates for clients or employers and, when necessary, written progress reports.

Carpenters take pride in the quality of their craftsmanship and very often enjoy the opportunity to work in a variety of tasks and to actually see the result of their labor.

15.00.00.0 Carpentry

15.01.00.0 Carpentry Orientation and Safety

15.01.01.0 Outline the scope of a profession in carpentry

15.01.01.01 Survey history and progress of carpentry craft
15.01.01.02 Identify stages of progress within carpentry trade
15.01.01.03 Identify responsibilities of a person in construction industry
15.01.01.04 State personal characteristics of a committed professional

15.01.02.0 Identify employment opportunities and training for carpentry

15.01.02.01 Identify education and training required to work in the carpentry profession
15.01.02.02 Identify professional growth opportunities in the carpentry profession
15.01.02.03 Describe techniques, processes, and procedures a typical carpentry employee would perform
15.01.02.04 Identify professional and/or trade associations related to the carpentry profession
15.01.02.05 Demonstrate quality control/quality workmanship

15.01.03.0 Protect workers from ergonomic injuries

15.01.03.01 Identify work habits that ensure healthy ergonomic practices
15.01.03.02 Identify repetitive motion activities that might cause injury
15.01.03.03 Maintain posture to prevent injuries e.g., in learning laboratory, on a job site, at a computer
15.01.03.04 Lift/transport objects and materials in accordance with established safe practices

15.01.04.0 Use personal safety equipment in accordance with current Occupational Safety and Health Administration (OSHA) standards

15.01.04.01 Identify resources for Occupational Safety and Health Administration (OSHA) standards as they relate to the carpentry profession [Encourage OSHA and CPR certification]
15.01.04.02 Practice OSHA standards concerning use of personal safety equipment in carpentry
15.01.04.03 Identify consequences of disregarding safety rules
15.01.04.04 Wear personal protective equipment, safety gear, or clothing appropriate for given jobs (i.e., hard-toed shoes, hard hat, eye protection, hearing protection, respiratory protection, hand protection)
15.01.04.05 Wear job-appropriate clothing
15.01.04.06 Avoid loose-fitting, unbuttoned, or frayed clothing
15.01.04.07 Secure long hair and dangling jewelry
15.01.04.08 Identify location of first-aid kit
15.01.04.09 Demonstrate basic first aid procedures
15.01.04.10 Identify procedures for responding to a medical emergency
15.01.04.11 Demonstrate knowledge of appropriate actions to take in response to given emergencies

15.01.05.0 Use fire equipment

15.01.05.01 Identify potential fire hazards in carpentry industry
15.01.05.02 Conduct routine inspections of fire equipment
15.01.05.03 Demonstrate established procedures for the use of fire extinguishers

15.01.06.0 Follow established procedures for handling, storage, and disposal of hazardous materials

15.01.06.01 Follow manufacturer's recommendations for safe use of chemical products
15.01.06.02 Identify location of material safety data sheets (MSDSs)
15.01.06.03 Interpret/follow MSDS information for each hazardous material
15.01.06.04 Follow procedures specified by each MSDS
15.01.06.05 Recognize product labeling color codes
15.01.06.06 Interpret product labeling
15.01.06.07 Dispose of hazardous materials in accordance with Environmental Protection Agency (EPA) standards

15.01.07.0 Follow established procedures for the use, handling, and storage of tools, materials, and equipment

15.01.07.01 Handle all tools according to manufacturer's specifications/instructional manual regarding safe use
15.01.07.02 Identify stationary power tools and hand tools commonly used by carpenters and their uses
15.01.07.03 Identify potential hazards related to the use of hand tools
15.01.07.04 Demonstrate safety procedures established for the use of hand tools
15.01.07.05 Disable power in dangerous situations disconnecting main power source/lockout/tagout procedures
15.01.07.06 Demonstrate established procedures for lifting and transporting large or heavy objects
15.01.07.07 Use power tools and machinery in accordance with established operating procedures and safety
15.01.07.08 Conduct routine inspections of hand tools and power equipment
15.01.07.09 Maintain hand tools
15.01.07.10 Maintain an orderly, clean work area
15.01.07.11 Maintain power equipment
15.01.07.12 Use stationary power tools in a safe appropriate manner

15.01.08.0 Demonstrate Basic Scaffolding Procedures

15.01.08.01 Identify types of scaffolding and assembly procedures
15.01.08.02 Tie knots

15.02.00.0 Basic Carpentry Procedures

15.02.01.0 Acquire basic hand tools and tool kit

15.02.01.01 Identify commonly used tools
15.02.01.02 Identify different brands and quality ranges of tools
15.02.01.03 Review tool maintenance and warranty information

15.02.02.0 Utilize construction materials to optimum efficiency

15.02.02.01 Identify types of building materials
15.02.02.02 Perform drilling procedures
15.02.02.03 Fasten materials using staples, nails, screws, and adhesives in accordance with manufacturer's specifications and building codes
15.02.02.04 Explain terms commonly used in construction materials
15.02.02.05 State uses of various types of construction materials
15.02.02.06 Describe proper method of caring for lumber and building materials at job site
15.02.02.07 Estimate quantities of building materials using industry-standards methods

15.02.03.0 Use engineered products/systems (e.g. joist systems, trusses, microlam beams)

15.02.03.01 Follow manufacturer's instructions for installation
15.02.03.02 Identify applications for engineered products and systems

15.03.00.0 Layout Work

15.03.01.0 Interpret construction drawings

15.03.01.01 Identify types of drawings and specifications
15.03.01.02 Identify common scales used in construction drawings
15.03.01.03 Determine actual measurements based on given scale
15.03.01.04 Identify information concerning construction features and their relationship using sections and details
15.03.01.05 Interpret symbols
15.03.01.06 Identify general construction information not clearly indicated by the dimensions using schedules
15.03.01.07 Identify how the work will be performed, materials and finishes to be used, and worker responsibilities using building specifications
15.03.01.08 Interpret site plans
15.03.01.09 Follow code compliant construction

15.03.02.0 Demonstrate layout and measuring procedures

15.03.02.01 Demonstrate accurate fundamentals in squaring techniques
15.03.02.02 Demonstrate accurate plumb and leveling techniques
15.03.02.03 Demonstrate basic use for manual and electronic layout equipment (e.g., transit, laser level, builder's level)
15.03.02.04 Install batter boards
15.03.02.05 Square building corners
15.03.02.06 Locate building corners

15.04.00.0 Footings, Grade Beams, Foundation Walls, and Forms

15.04.01.0 Construct footings and foundations

15.04.01.01 Determine type of wall forms to use
15.04.01.02 Erect/brace forms
15.04.01.03 Install bulkheads
15.04.01.04 Construct boxes for specified openings
15.04.01.05 Layout and install anchor bolts in concrete
15.04.01.06 Install expansion and contraction joints in concrete walls
15.04.01.07 Install keyways for footings and foundations
15.04.01.08 Strip forms

15.04.02.0 Construct all-weather wood foundations

15.04.02.01 Prepare footing trenches
15.04.02.02 Install gravel pads
15.04.02.03 Install footing plates
15.04.02.04 Lay out foundation walls
15.04.02.05 Construct foundation walls
15.04.02.06 Erect foundation walls
15.04.02.07 Caulk plywood joints
15.04.02.08 Install polyethylene film moisture barriers

15.04.03.0 Construct forms for slabs and paving

15.04.03.01 Determine job requirements
15.04.03.02 Level base material
15.04.03.03 Lay out forms
15.04.03.04 Erect forms
15.04.03.05 Install reinforcing material
15.04.03.06 Pour concrete floor
15.04.03.07 Strip forms

15.04.04.0 Construct foundations, grade beams and forms

15.04.04.01 Construct stud and sheathing wall forms
15.04.04.02 Erect/brace plywood panel wall forms
15.04.04.03 Erect/brace manufactured wall forms
15.04.04.04 Construct stair forms
15.04.04.05 Construct boxes for specified openings
15.04.04.06 Install reinforcing steel
15.04.04.07 Install beam pockets
15.04.04.08 Install bulkheads
15.04.04.09 Install expansion and contraction joints in concrete walls
15.04.04.10 Install keyways for footings and foundations
15.04.04.11 Coat/water seal foundations

15.05.00.0 Floor Framing

15.05.01.0 Construct sills

15.05.01.01 Determine job requirements
15.05.01.02 Select needed materials
15.05.01.03 Install termite shields
15.05.01.04 Clean tops of walls
15.05.01.05 Install sill sealer
15.05.01.06 Cut sills to finished lengths
15.05.01.07 Install sills

15.05.02.0 Erect girders, beams, and columns

15.05.02.01 Install columns
15.05.02.02 Install temporary braces
15.05.02.03 Construct wood girders
15.05.02.04 Install girders or beams

15.05.03.0 Install floor joist systems

15.05.03.01 Determine job requirements
15.05.03.02 Lay out floor joists
15.05.03.03 Cut floor joists to finished lengths
15.05.03.04 Install joist headers and trimmers
15.05.03.05 Install box sills (band board)
15.05.03.06 Frame floor openings
15.05.03.07 Install necessary blocking for engineered joist systems

15.05.04.0 Install bridging

15.05.04.01 Determine job requirements
15.05.04.02 Lay out bridging
15.05.04.03 Cut bridging to finished lengths
15.05.04.04 Install cross bridging
15.05.04.05 Install solid bridging
15.05.04.06 Install metal bridging

15.05.05.0 Install subflooring

15.05.05.01 Determine job requirements
15.05.05.02 Align floor sheathing
15.05.05.03 Fasten floor sheathing to joists
15.05.05.04 Trim excess around openings

15.06.00.0 Wall Framing

15.06.01.0 Lay out walls and rough openings

15.06.01.01 Determine job requirements
15.06.01.02 Locate partitions
15.06.01.03 Determine stud layout
15.06.01.04 Strike wall lines
15.06.01.05 Mark rough openings
15.06.01.06 Describe correct procedure for assembling and erecting an exterior wall
15.06.01.07 Describe wall-framing techniques used in masonry construction
15.06.01.08 Explain use of metal studs in wall framing

15.06.02.0 Frame walls and rough openings

15.06.02.01 Select materials
15.06.02.02 Cut wall-framing components (e.g., corner posts, T-posts, doorframes, window frames, headers, cripples and jacks)
15.06.02.03 Install wall-framing components
15.06.02.04 Plumb partitions
15.06.02.05 Plumb walls
15.06.02.06 Brace exterior walls
15.06.02.07 Install wind bracing
15.06.02.08 Install exterior wall sheathing and house wrap

15.06.03.0 Frame metal wall partitions

15.06.03.01 Determine job requirements
15.06.03.02 Cut wall-framing components (e.g., corner posts, T-posts, door frames, window frames, headers, cripples and jacks)
15.06.03.03 Lay out metal track
15.06.03.04 Cut metal track
15.06.03.05 Install metal track
15.06.03.06 Install studs
15.06.03.07 Install blocking
15.06.03.08 Lay out bracing
15.06.03.09 Cut bracing
15.06.03.10 Install bracing

15.07.00.0 Ceiling and Roof Framing

15.07.01.0 Construct ceiling framing

15.07.01.01 Determine framing member requirements
15.07.01.02 Select materials
15.07.01.03 Determine needed length of ceiling joists
15.07.01.04 Lay out ceiling joists
15.07.01.05 Cut ceiling joists
15.07.01.06 Install ceiling joists
15.07.01.07 Install bracing
15.07.01.08 Apply acoustical finishes

15.07.02.0 Construct gable roof framing

15.07.02.01 Determine framing member requirements
15.07.02.02 Select materials
15.07.02.03 Lay out top plates
15.07.02.04 Cut top plates
15.07.02.05 Install top plates
15.07.02.06 Lay out ridge boards
15.07.02.07 Cut ridge boards
15.07.02.08 Install ridge boards
15.07.02.09 Determine needed length of common rafters
15.07.02.10 Lay out common rafters
15.07.02.11 Cut common rafters
15.07.02.12 Install common rafters
15.07.02.13 Install rafter support at ridge board and plate
15.07.02.14 Cut/install bracing in gable and support

15.07.03.0 Construct hip/valley roof framing

15.07.03.01 Determine framing member requirements
15.07.03.02 Select materials
15.07.03.03 Lay out hip rafters
15.07.03.04 Cut hip rafters
15.07.03.05 Install hip rafters
15.07.03.06 Lay out valley rafters
15.07.03.07 Cut valley rafters
15.07.03.08 Install valley rafters
15.07.03.09 Lay out jack rafters
15.07.03.10 Cut jack rafters
15.07.03.11 Install jack rafters

15.07.04.0 Install finish framing components

15.07.04.01 Lay out gable-end studs and outlookers
15.07.04.02 Cut gable-end studs and outlookers
15.07.04.03 Install gable-end studs and outlookers
15.07.04.04 Frame roof openings
15.07.04.05 Frame dormers
15.07.04.06 Frame chimney saddles
15.07.04.07 Install roof sheathing

15.07.05.0 Install prefabricated roof trusses in accordance with truss information and manufacturer's guide

15.07.05.01 Lay out top plates for truss placement
15.07.05.02 Lay out story poles
15.07.05.03 Install story poles
15.07.05.04 Align/install trusses
15.07.05.05 Install with approved metal fastening devices
15.07.05.06 Install bracing
15.07.05.07 Install sheathing

15.08.00.0 Roofing

15.08.01.0 Install drip edges, eaves flashing, and vents per manufacturer's instructions and code

15.08.01.01 Determine job requirements
15.08.01.02 Install drip edges on eaves and rakes
15.08.01.03 Install miscellaneous metal flashing
15.08.01.04 Install ice and water shields
15.08.01.05 Install roof vents
15.08.01.06 Install ridge vents

15.08.02.0 Install fiberglass or asphalt shingles and caps

15.08.02.01 Determine installation method
15.08.02.02 Determine scaffolding or roof jack requirements
15.08.02.03 Erect fall protection according to OSHA standards
15.08.02.04 Install valley material
15.08.02.05 Install felt paper
15.08.02.06 Install starter strip
15.08.02.07 Install first course of shingles
15.08.02.08 Install roof jacks
15.08.02.09 Install succeeding courses of shingles
15.08.02.10 Install hip and ridge caps

15.08.03.0 Install wood shingles and shakes

15.08.03.01 Determine installation method
15.08.03.02 Determine scaffolding or roof jack requirements
15.08.03.03 Erect fall protection according to OSHA standards
15.08.03.04 Install underlayment
15.08.03.05 Install valleys
15.08.03.06 Install starter course
15.08.03.07 Establish location and alignment of shingles by striking a chalk line or attaching a temporary straightedge
15.08.03.08 Install succeeding courses of shingles
15.08.03.09 Install shingles around flashing and vents
15.08.03.10 Install ridge cap shingles

15.09.00.0 Exterior Finish

15.09.01.0 Install exterior doors, windows, and hardware

15.09.01.01 Confirm size of rough openings for windows and doors
15.09.01.02 Confirm door swing
15.09.01.03 Install exterior door and window units plumb and square in openings
15.09.01.04 Install door and window hardware
15.09.01.05 Install weather stripping
15.09.01.06 Apply caulking and sealant
15.09.01.07 Use metal brake for bending coil stock

15.09.02.0 Install fascia, soffits, frieze board, and moldings

15.09.02.01 Identify fascia and soffits appropriate for given situation
15.09.02.02 Install fascia and soffits with proper blocking appropriate for the job
15.09.02.03 Identify moldings and frieze board
15.09.02.04 Cut moldings and frieze board
15.09.02.05 Install moldings and frieze board
15.09.02.06 Case exterior openings

15.09.03.0 Install exterior siding/covering

15.09.03.01 Lay out starter course
15.09.03.02 Level starter course
15.09.03.03 Lay out story pole
15.09.03.04 Install starter corners and moldings
15.09.03.05 Install siding/covering per manufacturer's specifications

15.09.04.0 Install exterior trim accessories

15.09.04.01 Lay out gutters and downspouts
15.09.04.02 Cut gutters and downspouts
15.09.04.03 Install gutters and downspouts
15.09.04.04 Install louvers and shutters
15.09.04.05 Install posts and railing
15.09.04.06 Install decorative moldings and specialty panels

15.10.00.0 Install fire and draft stopping in compliance with code

15.10.01.0 Install fire stopping
15.10.01.01 Identify/locate types of fire stopping
15.10.01.02 Apply fire stopping materials

15.10.02.0 Install draft stopping
15.10.02.01 Identify/locate types of draft stopping
15.10.02.02 Apply draft-stopping materials

15.11.00.0 Insulation

15.11.01.0 Ventilate attics and crawl spaces
15.11.01.01 Determine job requirements
15.11.01.02 Install vents
15.11.01.03 Install baffles for ventilation

15.11.02.0 Install thermal insulation and vapor barriers
15.11.02.01 Determine required R-value for location
15.11.02.02 Determine R-value for different materials
15.11.02.03 Select materials and fasteners
15.11.02.04 Install insulation according to OSHA standards
15.11.02.05 Insulate foundation walls
15.11.02.06 Install inner vapor barriers
15.11.02.07 Seal air infiltration areas (e.g., electrical openings, utility entrances)

15.12.00.0 Interior Finish

15.12.01.0 Install gypsum wallboard
15.12.01.01 Determine job requirements
15.12.01.02 Measure gypsum wallboard
15.12.01.03 Cut gypsum wallboard
15.12.01.04 Fasten wallboard
15.12.01.05 Install corner bead
15.12.01.06 Finish wallboard, i.e., tape, fill depressions, sand and coat

15.12.02.0 Install suspended ceilings
15.12.02.01 Determine job requirements
15.12.02.02 Lay out/level ceiling line
15.12.02.03 Install edge moldings
15.12.02.04 Hang wires
15.12.02.05 Cut grid systems (e.g., T-grid, concealed grid)
15.12.02.06 Install grid systems
15.12.02.07 Install ceiling panels

15.12.03.0 Install finish flooring
15.12.03.01 Determine job requirements
15.12.03.02 Prepare subfloor
15.12.03.03 Install building paper over subfloor
15.12.03.04 Cut underlayment
15.12.03.05 Install underlayment
15.12.03.06 Lay out centerline
15.12.03.07 Determine requirements for wood flooring
15.12.03.08 Install specified flooring (e.g., floor tiles, strip flooring, plank flooring, tongue and groove flooring, or prefinished flooring blocks, ceramic, vinyl sheetgoods, vinyl covered tile)

15.12.04.0 Install interior doors
15.12.04.01 Determine job requirements
15.12.04.02 Verify door schedule
15.12.04.03 Install frames
15.12.04.04 Hang doors
15.12.04.05 Install doorstops and casings
15.12.04.06 Install hardware (e.g., cylinder, mortise, hinges, dead bolt)
15.12.04.07 Trim interior doors
15.12.04.08 Install specified door units (e.g., prehung [split jamb], double-hung, folding [accordion], sliding, bi-fold, pocket)
15.12.04.09 Install thresholds

15.12.05.0 Install window trim
15.12.05.01 Cut/install stools and sills
15.12.05.02 Install jamb extensions
15.12.05.03 Install side and head casings
15.12.05.04 Install mullions
15.12.05.05 Install aprons

15.12.06.0 Install baseboards and moldings
15.12.06.01 Determine job requirements
15.12.06.02 Cut baseboards and shoe molds
15.12.06.03 Install baseboards and shoe molds
15.12.06.04 Cut crown moldings
15.12.06.05 Install crown moldings
15.12.06.06 Cut chair rails
15.12.06.07 Install chair rails

15.12.07.0 Install cabinets
15.12.07.01 Determine job requirements
15.12.07.02 Verify that the cabinets received match the requirements
15.12.07.03 Check squareness and plumb of walls
15.12.07.04 Check level of floor
15.12.07.05 Mark studs for wall units
15.12.07.06 Mark backrail to match stud location
15.12.07.07 Drill backrail
15.12.07.08 Set base cabinets in location
15.12.07.09 Plumb/shim cabinets
15.12.07.10 Verify appropriate blocking for cabinet support
15.12.07.11 Attach cabinets to walls
15.12.07.12 Fasten sections together
15.12.07.13 Install recessed medicine cabinets

15.12.08.0 Install storage devices
15.12.08.01 Determine job requirements
15.12.08.02 Install shelving
15.12.08.03 Install closet accessories
15.12.08.04 Construct built-in cabinets

15.13.00.0 Stairs

15.13.01.0 Construct rough and finished stairs
15.13.01.01 Determine total rise
15.13.01.02 Determine number of risers
15.13.01.03 Determine total run
15.13.01.04 Determine unit rise
15.13.01.05 Determine unit run
15.13.01.06 Lay out stair story pole
15.13.01.07 Lay out stringers (i.e., carriages, horses)
15.13.01.08 Cut stringers
15.13.01.09 Install stringers
15.13.01.10 Lay out temporary treads and risers
15.13.01.11 Cut temporary treads and risers
15.13.01.12 Install temporary treads and risers
15.13.01.13 Layout and install circular or geometric stairs
15.13.01.14 Construct stair forms for concrete applications
15.13.01.15 Construct open riser/utility stairs

15.13.02.0 Install finish stair trim components
15.13.02.01 Lay out skirt boards
15.13.02.02 Cut skirt boards
15.13.02.03 Install skirt boards
15.13.02.04 Lay out treads and risers
15.13.02.05 Cut treads and risers
15.13.02.06 Install treads and risers
15.13.02.07 Lay out handrails, balusters, moldings, newels, and volutes
15.13.02.08 Cut handrails, balusters, moldings, newels, and volutes
15.13.02.09 Install handrails, balusters, moldings, newels, and volutes
15.13.02.10 Install prefabricated stairs
15.13.02.11 Install disappearing stair units

15.14.00.0 Specialized Carpentry Applications

15.14.01.0 Install window and door replacements
15.14.01.01 Determine type and size of units needed
15.14.01.02 Remove existing units
15.14.01.03 Adjust rough openings
15.14.01.04 Position/attach units
15.14.01.05 Insulate units
15.14.01.06 Seal around units
15.14.01.07 Cut stops
15.14.01.08 Position stops
15.14.01.09 Attach stops
15.14.01.10 Install skylights

15.14.02.0 Install storm windows and doors
15.14.02.01 Determine job requirements
15.14.02.02 Select storm window and door units needed
15.14.02.03 Position/attach storm windows
15.14.02.04 Position/attach storm door units
15.14.02.05 Install garage door and power units
15.14.02.06 Select garage door units
15.14.02.07 Construct garage doorframes
15.14.02.08 Position garage door units
15.14.02.09 Attach garage door units
15.14.02.10 Install garage door power units

15.14.03.0 Install countertops
15.14.03.01 Determine job requirements
15.14.03.02 Check base cabinets for level
15.14.03.03 Level loose cabinets
15.14.03.04 Cut particle and base underlayment material
15.14.03.05 Secure underlayment to base cabinets
15.14.03.06 Cut ledgers
15.14.03.07 Secure ledgers to edge top
15.14.03.08 Precut laminate material
15.14.03.09 Apply mastic
15.14.03.10 Place drying strips
15.14.03.11 Align laminate on drying strips
15.14.03.12 Remove drying strips
15.14.03.13 Trim edges
15.14.03.14 Dress edges

15.14.04.0 Install storage devices
15.14.04.01 Determine job requirements
15.14.04.02 Install shelving
15.14.04.03 Install closet accessories
15.14.04.04 Construct built-in cabinets

15.14.05.0 Install porches and decks
15.14.05.01 Determine job requirements
15.14.05.02 Contact underground protective service (UPS)
15.14.05.03 Lay out deck perimeters
15.14.05.04 Set posts
15.14.05.05 Plumb/brace posts
15.14.05.06 Tamp in or cement posts
15.14.05.07 Cut frame materials
15.14.05.08 Position/attach frame materials
15.14.05.09 Cut deck materials
15.14.05.10 Position/attach deck materials

15.14.06.0 Construct protective enclosures
15.14.06.01 Determine job requirements
15.14.06.02 Construct winterization covers
15.14.06.03 Install dust and dirt drops
15.14.06.04 Construct pedestrian walkways

15.14.07.0 Perform welding and cutting operations
15.14.07.01 Wear personal safety equipment according to OSHA standards
15.14.07.02 Determine welding requirements
15.14.07.03 Use welding equipment
15.14.07.04 Use oxyacetylene cutting torch

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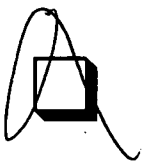

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