# IDAHO RESIDENTIAL CONSTRUCTION PROGRAM STANDARDS

2016

## CONTENT STANDARD 1: TRADE SKILLS AND HABITS

### Performance Standard 1.1: Employment Opportunities

1.1.1 Identify the requirements for a job/job description.
1.1.2 Investigate educational opportunities.
1.1.3 Investigate occupational opportunities.
1.1.4 Locate resources for finding employment.
1.1.5 Confer with prospective employers.
1.1.6 Identify job trends.
1.1.7 Research geographic locations.

### Performance Standard 1.2: Building Codes

1.2.1 Identify terms associated with building codes.
1.2.2 Interpret sections of the building codes.
1.2.3 Discuss the importance of complying with building code requirements.

### Performance Standard 1.3: OSHA Standards

1.3.1 Define the purpose of OSHA.
1.3.2 Describe the inspection process by OSHA.
1.3.3 Describe the record keeping requirements for OSHA compliance.
1.3.4 List safety and health hazards that OSHA may inspect for in a shop or on a job site.
1.3.5 List OSHA safe working procedures that apply to building trades work assignments.
1.3.6 Complete the OSHA 10 Training.

## CONTENT STANDARD 2: BUILDING MATERIALS AND ENERGY CONSERVATION STRATEGIES

### Performance Standard 2.1: Lumber

2.1.1 Define terms associated with lumber.
2.1.2 Select characteristics to consider in using lumber.
2.1.3 Identify common defects in lumber.
2.1.4 Select from a list standard lumber grades.
2.1.5 Write actual sizes for given nominal sizes of lumber.

### Performance Standard 2.2: Plywood

2.2.1 Identify letters designating veneers used in plywood.
2.2.2 Distinguish between standard interior and exterior plywood grades.

### Performance Standard 2.3: Millwork

2.3.1 Select from a list solid softwoods and hardwoods used in millwork.
2.3.2 Select from a list types of woods used for trim and moldings.
2.3.3 Identify types of trim and moldings.

### Performance Standard 2.4: Energy-saving Construction

2.4.1 Discuss the importance of conserving energy to the owners/occupants of a building and to the nation and the world.
2.4.2 Describe techniques used in solar construction.
2.4.3 Explain advantages and disadvantages of solar construction.
2.4.4 Discuss advanced framing techniques.
2.4.5 Explain the importance of r-factor in building construction.
2.4.6 List benefits of using insulation in a structure.
2.4.7 Explain the functions of various types of insulation.
2.4.8 Name general classifications of insulation materials.
2.4.9 List areas where insulation should be used in construction.
2.4.10 List factors that determine the amount of insulation needed.
2.4.11 Interpret sections of state and local codes pertaining to energy efficiency.

## CONTENT STANDARD 3: MATH AND MEASUREMENT SKILLS

### Performance Standard 3.1: Basic Math

3.1.1 Identify terms associated with basic math.
3.1.2 Identify symbols used in math problems.

### Performance Standard 3.2: Mathematical Operations Using Whole Numbers.

3.2.1 Label the place values of a whole number.
3.2.2 Add, subtract, multiply, and divide whole numbers.

### Performance Standard 3.3: Fractions, Decimals and Percentages

3.3.1 Distinguish among types of fractions.
3.3.2 Reduce fractions to lowest terms.
3.3.3 Convert mixed numbers to improper fractions.
3.3.4 Convert improper fractions to mixed numbers.
3.3.5 Add, subtract, multiply, and divide fractions.
3.3.6 Label the place values of a decimal number.
3.3.7 Add, subtract, multiply, and divide decimal numbers.
3.3.8 Convert decimal fractions to common fractions.
3.3.9 Convert common fractions to decimal numbers and percentages.
3.3.10 Identify decimal and fractional equivalents.
3.3.11 Convert percentages to fractions and decimal numbers.
3.3.12 Solve percentage problems.
3.3.13 Solve basic ratio and proportion problems.

### Performance Standard 3.4: Basic Geometry

3.4.1 Identify terms used in geometry.
3.4.2 Identify geometric figures.
3.4.3 Convert units of measure.
3.4.4 Calculate the area of geometric figures.

3.4.5 Calculate the volume of solid figures.
3.4.6 Estimate cubic yards.

### Performance Standard 3.5: Measuring Operations

3.5.1 Identify terms associated with measuring.
3.5.2 Identify basic measuring tools used by carpenters.
3.5.3 Convert fractional inches to hundredths of a foot.
3.5.4 Identify graduations on an engineer's rule.
3.5.5 Read an engineer's rule to the nearest hundredth of a foot.
3.5.6 Describe measuring methods used to square lines.
3.5.7 Read measurements on architect's and engineer's rules.
3.5.8 Read measurements on tapes.
3.5.9 Demonstrate the ability to use basic measuring tools and the 3-4-5 method to lay out the perimeter of a building.

## CONTENT STANDARD 4: BLUEPRINT READING AND DRAWING SKILLS

### Performance Standard 4.1: Blueprint Reading Skills

4.1.1 Identify types of drawings usually included in a set of plans.
4.1.2 List information found on types of drawings in a set of plans.
4.1.3 Identify lines in the alphabet of lines.
4.1.4 Identify selected symbols commonly used on plans.
4.1.5 Identify selected abbreviations commonly used on plans.
4.1.6 Match architects conventions to their correct representations.
4.1.7 Explain the purpose of written specifications.
4.1.8 Use an architect's scale.
4.1.9 Use an engineer's scale.
4.1.10 Use a metric scale.
4.1.11 Interpret a finish schedule.

## CONTENT STANDARD 5: USE AND MAINTENANCE OF HAND AND POWER TOOLS

### Performance Standard 5.1: Common Carpentry Hand Tools

5.1.1 Explain the care and safe use of hand tools.
5.1.2 Identify and match carpentry hand tools to their correct uses.
5.1.3 Demonstrate proper care and safe use of carpentry hand tools.

### Performance Standard 5.2: Power Tools

5.2.1 Identify terms associated with power tools.
5.2.2 Explain the general safety rules pertaining to power tools.
5.2.3 Explain how to maintain power tools properly.
5.2.4 Explain the safe operation for portable and stationary power tools.
5.2.5 Explain rules for the safe use of pneumatic fasteners.
5.2.6 Identify the parts of a powder-actuated tool.

5.2.7 Select from a list appropriate uses of powder-actuated tools.
5.2.8 Match saw blades to their correct uses.
5.2.9 Complete a safety test for specific tools.
5.2.10 Perform rip and miter cut-off operations.
5.2.11 Drill and bore holes.

## CONTENT STANDARD 6: SITE PREPARATION, CONCRETE FORMS AND FORMING

### Performance Standard 6.1: Leveling Instruments

6.1.1 Identify terms associated with leveling instruments.
6.1.2 List uses of a builder's level.
6.1.3 Identify types of levels.
6.1.4 Identify parts of a builder's level.
6.1.5 Explain the use of a transit.
6.1.6 Explain and/or demonstrate the proper care of leveling instruments.
6.1.7 Identify parts of a leveling rod.
6.1.8 Set up and adjust leveling instruments.
6.1.9 Use leveling instruments to check elevations, measure angles, and read angles.
6.1.10 Establish elevation reference points from benchmark.
6.1.11 Locate and square corners.
6.1.12 Set grade stakes.
6.1.13 Correctly mark a story pole.
6.1.14 Install batter boards.
6.1.15 Establish grade using leveling instruments.

### Performance Standard 6.2: Concrete Footings and Foundations

6.2.1 Identify terms associated with concrete foundations.
6.2.2 Describe the composition of concrete and factors affecting its strength, durability, and workability.
6.2.3 Understand the types of admixtures used in concrete and their functions.
6.2.4 List the advantages and disadvantages of using vibrators in concrete.
6.2.5 Label parts of a concrete foundation.
6.2.6 Identify types of concrete footings and foundations.
6.2.7 Explain the uses of concrete footings and foundations.
6.2.8 Discuss the design of footings and foundations.
6.2.9 Arrange in order steps involved when constructing concrete foundations.
6.2.10 Interpret sections of the state and local codes that pertain to concrete construction.
6.2.11 Calculate the cubic yards of concrete needed to pour a structure.

### Performance Standard 6.3: Reinforcing Material

6.3.1 Name types of reinforcing material used in concrete.
6.3.2 Match common rebar numbers to their correct diameter sizes.
6.3.3 Select from a list common sizes of welded wire fabric.

### Performance Standard 6.4: Concrete Forms, Associated Hardware, and Materials

6.4.1 Match to their correct definitions terms associated with forming.
6.4.2 Explain the purpose of forms.
6.4.3 Name various types of forms.

## CONTENT STANDARD 7: FRAMING

### Performance Standard 7.1: Floors and Sills

7.1.1 Identify terms associated with frame floors and sills.
7.1.2 Identify floor and sill framing and support members.
7.1.3 Name methods used to fasten sills and sill insulation to the foundation.
7.1.4 Select from a list types of beams/girders.
7.1.5 Describe the types of floor joists.
7.1.6 Identify the types of bridging.
7.1.7 Describe the types of subflooring/decking materials.
7.1.8 List purposes of subflooring.
7.1.9 Identify fasteners used in floor framing and their correct uses.
7.1.10 Use a span table to determine sizes of beams, girders and joists.
7.1.11 Discuss common methods used to attach subfloor/decking to structures.
7.1.12 Estimate the amount of material needed to frame a floor assembly.
7.1.13 Interpret state and local building code sections pertaining to floors, sills, walls and ceilings.

### Performance Standard 7.2: Floors and Sill Installation

7.2.1 Demonstrate the ability to lay out a floor system.
7.2.2 Demonstrate the ability to install bridging.
7.2.3 Demonstrate the ability to install joists for a cantilever floor.
7.2.4 Demonstrate the ability to install subfloor/decking materials.
7.2.5 Demonstrate the ability to install a single floor system using tongue and groove material.

### Performance Standard 7.3: Wall and Partition Members

7.3.1 Identify and describe the function of the wall framing members.
7.3.2 Identify methods used to construct outside corners of wall frames.
7.3.3 Identify common methods used to construct partition T's.
7.3.4 Discuss types of headers.
7.3.5 Calculate rough opening (R.O.) dimensions for doors.
7.3.6 Calculate the length of trimmers for window and door openings.
7.3.7 Calculate the length of headers for rough openings.
7.3.8 Select from a list construction details that should be added during wall framing.
7.3.9 List methods used to brace walls.
7.3.10 Select from a list of nails most often used in framing.
7.3.11 Discuss ADA compliance considerations in framing.
7.3.12 Calculate the amount of materials required for wall and partition framing.

## Performance Standard 7.4: Frame a Single-story Structure

7.4.1 Demonstrate the ability to lay out a wall and partition locations on a floor.
7.4.2 Cut studs, trimmers, cripples, and headers to length.
7.4.3 Assemble corners, T's, and headers.
7.4.4 Construct wall sections for a single-story structure.
7.4.5 Erect and brace wall sections for a single-story structure.
7.4.6 Layout and install ceiling joists.

## Performance Standard 7.5: Metal Framing Systems

7.5.1 Name components of metal stud systems.
7.5.2 Identify fasteners used for metal stud construction.
7.5.3 Identify tools and equipment used in metal stud construction.
7.5.4 List areas where metal stud systems are used.
7.5.5 List advantages and disadvantages of metal stud systems.

## Performance Standard 7.6: Types of Finish Flooring

7.6.1 Identify finish flooring materials.
7.6.2 Identify different types of underlayment.

## Performance Standard 7.7: Finish Flooring Installation

7.7.1 Estimate the number of 4'x 8' sheets of underlayment needed to floor a room.
7.7.2 Estimate the needed quantity of finish flooring materials.
7.7.3 Demonstrate the ability to install underlayment.
7.7.4 Demonstrate the ability to install various types of flooring.

# CONTENT STANDARD 8: ROOF CONSTRUCTION TECHNIQUES

## Performance Standard 8.1: Roof Framing Members

8.1.1 Identify terms associated with roof framing.
8.1.2 Identify the different types of roof styles.
8.1.3 Identify roof framing members.
8.1.4 Label roof framing units.
8.1.5 Identify parts of a rafter.
8.1.6 Calculate the length of a common rafter.
8.1.7 Calculate the number of roof vents needed.

## Performance Standard 8.2: Construct a Roof

8.2.1 Estimate material needed to frame a roof.
8.2.2 Lay out rafter locations on top plate and ridge board.
8.2.3 Lay out, cut, and erect rafters for gable roofs.
8.2.4 Apply roof sheathing.
8.2.5 Erect trusses by hand and or light crane.

## Performance Standard 8.3: Cornices and Gable Ends

8.3.1 Identify cornices and gable ends.
8.3.2 Label types of cornice designs.
8.3.3 Identify parts of a box cornice.
8.3.4 Identify parts of a boxed rake section.
8.3.5 Identify types of cornice moldings.
8.3.6 Label types of tail-rafter cuts.
8.3.7 Select from a list materials used for soffits.
8.3.8 Select from a list hardware and fasteners used on or with cornices.
8.3.9 Estimate material needed for cornices and gable ends.
8.3.10 Demonstrate the ability to build a horizontal box cornice.
8.3.11 Demonstrate the ability to apply siding to a gable end.

## Performance Standard 8.4: Roofing Materials

8.4.1 Identify roofing materials.
8.4.2 Discuss safety rules pertaining to roofing.
8.4.3 Identify minimum slope requirements to their specific roofing applications.
8.4.4 Interpret sections of state and local codes that pertain to roofs and roofing.
8.4.5 Discuss procedures for applying roofing materials.

## Performance Standard 8.5: Roofing and Flashing Installation

8.5.1 Demonstrate the ability to apply underlayment.
8.5.2 Demonstrate the ability to apply flashing.
8.5.3 Select from a list types of materials used for flashing.
8.5.4 Select from a list procedures for applying starter course of shingles.
8.5.5 Describe procedures for applying shingles with cutouts that break joint in half.
8.5.6 Arrange, in order, steps for installing flashing at open-valley locations.
8.5.7 Estimate roofing materials needed for a roof.
8.5.8 Demonstrate the ability to apply various roofing material.

# CONTENT STANDARD 9: INTERIOR STAIRCASE CONSTRUCTION

## Performance Standard 9.1: Staircases

9.1.1 Identify terms associated with staircases.
9.1.2 Identify parts of a staircase.
9.1.3 Identify basic types of stairs.
9.1.4 List factors that must be considered when building a staircase.
9.1.5 Explain rules for unit rise and unit run of stair stringers.
9.1.6 Label methods used to secure stringers.
9.1.7 Discuss requirements of state and local codes that pertain to stairs.

## Performance Standard 9.2: Staircase Construction

9.2.1 Calculate number and size of risers and treads for a stair of given dimensions.

9.2.2 Estimate materials for stairs.
9.2.3 Construct a staircase.

### Performance Standard 9.3: Handrails and Railings

9.3.1 Identify terms associated with handrails and railings.
9.3.2 List factors that must be considered when selecting handrails and railings.
9.3.3 Discuss requirements of state and local codes that pertain to handrails and railings.
9.3.4 Estimate materials needed for a handrail or railing.
9.3.5 Determine the correct fasteners to use with handrails and railings.

## CONTENT STANDARD 10: SHEATHING, SIDING, AND EXTERIOR BUILDING MATERIALS

### Performance Standard 10.1: Wall Sheathing and Siding

10.1.1 Identify terms associated with exterior walls and trim.
10.1.2 Name types of wall sheathing.
10.1.3 Identify styles of siding.
10.1.4 Identify joint details for plywood siding.
10.1.5 Identify types of exterior moldings and trims.
10.1.6 List recommendations for waterproofing exterior walls.
10.1.7 List advantages and disadvantages of various types of siding.

### Performance Standard 10.2: Wall Sheathing and Siding Installation

10.2.1 Estimate amounts of siding.
10.2.2 Estimate sheathing and siding for a house with a hip roof.
10.2.3 Install sheathing.
10.2.4 Install siding.

## CONTENT STANDARD 11: WINDOWS, EXTERIOR AND INTERIOR DOORS, AND ASSOCIATED TRIM

### Performance Standard 11.1: Windows

11.1.1 Identify terms associated with windows and accessories.
11.1.2 Name types/styles of windows.
11.1.3 Select from a list types of materials used to construct windows.
11.1.4 Identify parts of a window installation.
11.1.5 Select from a list types of materials used for window panes.
11.1.6 Discuss U-factor.
11.1.7 Discuss information a carpenter should know when installing windows.

### Performance Standard 11.2: Window Unit Installation

11.2.1 List the steps for a good window installation.
11.2.2 Demonstrate the ability to install various window units.

### Performance Standard 11.3: Prehung Exterior Door Installation

11.3.1 Identify terms associated with exterior doors.
11.3.2 Identify types of entry doors.

11.3.3 List advantages and disadvantages of patio doors.
11.3.4 Identify parts of an exterior door installation.
11.3.5 List materials used in door construction.
11.3.6 Name materials used for exterior door sills.
11.3.7 Select from a list standard sizes of exterior doors.
11.3.8 Explain the numbering system for doors.
11.3.9 Determine finish clearances and dimensions for hanging doors.
11.3.10 Identify door swing (hand).
11.3.11 Identify hardware used with exterior doors.
11.3.12 List types of thresholds used with entrance doors.
11.3.13 Demonstrate the ability to install a metal threshold on a concrete floor.
11.3.14 Demonstrate the ability to install an exterior prehung door unit.
11.3.15 Demonstrate the ability to install entry door frame, casing, door and lock.
11.3.16 Demonstrate the ability to install weatherstripping.
11.3.17 Demonstrate the ability to install door frame and inside jambs for an overhead garage door.

## Performance Standard 11.4: Interior Door Installation

11.4.1 Identify the terms associated with interior doors and trim.
11.4.2 Identify the general types of interior door construction.
11.4.3 Identify types of interior doors.
11.4.4 Identify parts of an interior door unit.
11.4.5 Select from a list standard sizes of interior doors and jambs.
11.4.6 Identify hand of a door.
11.4.7 Select finish clearances and dimensions for hanging doors.
11.4.8 Identify hardware used with interior doors.
11.4.9 Identify types of interior trim.
11.4.10 Estimate material needed to trim a door.

## Performance Standard 11.5: Door Units, Locks and Trim

11.5.1 Demonstrate the ability to install an interior door frame, hang door, lock and trim.
11.5.2 Demonstrate the ability to install a pre-hung door unit.
11.5.3 Demonstrate the ability to install a bifold/bypass door unit.
11.5.4 Demonstrate the ability to install a pocket door unit.

## Performance Standard 11.6: Insulation and Vapor Barriers

11.6.1 Identify terms associated with insulation.
11.6.2 Explain the functions of insulation.
11.6.3 Discuss R-values.
11.6.4 List types of insulation commonly used in residential construction.
11.6.5 Discuss the classifications of insulation materials.
11.6.6 List areas where insulation should be used in residential construction.

11.6.7 List factors that determine the amount of insulation needed for walls, ceilings, and floors.
11.6.8 Name types of materials used for vapor barriers.

### Performance Standard 11.7: Insulation and Vapor Barrier Installation

11.7.1 Estimate the packages of insulation needed to insulate a structure.
11.7.2 Demonstrate the ability to install vapor barrier and insulation.

### Performance Standard 11.8: Drywall

11.8.1 Identify terms associated with drywall.
11.8.2 Name types of drywall.
11.8.3 Select from a list standard sizes of drywall.
11.8.4 Identify standard edge shapes of drywall.
11.8.5 Explain the benefits of using drywall.
11.8.6 Describe types of base or construction where drywall is used.
11.8.7 Identify hardware and fasteners used with drywall.
11.8.8 Select from a list types of finishes that may be applied to drywall.

### Performance Standard 11.9: Drywall Installation

11.9.1 Estimate materials needed to drywall a structure.
11.9.2 Install drywall.
11.9.3 Finish drywall joints and depressions.

## CONTENT STANDARDS 12: CABINETS AND SPECIAL BUILT-INS

### Performance Standard 12.1: Parts of a Cabinet

12.1.1 Identify terms associated with cabinet installation and special built-ins.
12.1.2 Name types of cabinets.
12.1.3 Identify parts of a cabinet.
12.1.4 Name the standard sizes of base and top cabinets.
12.1.5 Discuss types of material used on countertops.

### Performance Standard 12.2: Cabinet and Shelves Installation

12.2.1 Install a factory-built cabinet.
12.2.2 Install shelves in a closet.

## CONTENT STANDARD 13: JOB COORDINATION

### Performance Standard 13.1: Coordinate with Other Trades

13.1.1 Select from a list of activities that may affect the work of subcontractors.
13.1.2 Identify structural problems that may be caused by other trades.
13.1.3 Discuss the importance of correctly orienting knockouts on prefabricated materials.
13.1.4 Explain the importance of placing large fixtures before framing is completed.
13.1.5 Explain the importance of nailing directly over studs when doubling top plates.
13.1.6 Explain why carpenters need to know basic wiring and plumbing practices, especially when remodeling.

## Performance Standard 13.2: Inspection and Code Requirements

13.2.1 Explain the purpose of Building Codes.
13.2.2 Discuss the importance of knowing state and local codes and ordinances.
13.2.3 Match activities on a job schedule with required inspections.
13.2.4 Identify required building permits.
13.2.5 Determine the average lead-time required to get an inspector on site.