

Mathematic Standards Matrix
CONSTRUCTION TECHNOLOGIES
October 22, 2008

CONSTRUCTION TECHNOLOGIES Standards/Measurement Criteria		MATH STANDARDS
		Strand #, Concept #, Grade Level Performance Objective # (<i>College Work Readiness Level Standards are italicized</i>)
STANDARD 1.0- LAY OUT BUILDING LINES		
1.1	Demonstrate the use and care of precision measuring instruments	Strand 5: Structure and Logic, Concept 1: Algorithms and Algorithmic Thinking, High School Level PO 2: Analyze algorithms for validity and equivalence recognizing the purpose of the algorithm.
1.2	Establish building lines	Strand 1: Number and Operations, Concept 1: Number Sense, High School Level PO 3: Express that the distance between two numbers is the absolute value of their difference. Strand 5: Structure and Logic, Concept 2: Logic, Reasoning, Problem Solving and Proof, High School Level PO 1: Analyze a problem situation, determine the question(s) to be answered, organize given information, determine how to represent the problem, and identify implicit and explicit assumptions that have been made. PO 2: Solve problems by formulating one or more strategies, applying the strategies, verifying the solution(s), and communicating the reasoning used to obtain the solution(s). PO 5: Summarize and communicate mathematical ideas using formal and informal reasoning.
1.3	Use a builder's level or transit and differential leveling procedures to determine site and building elevations	Strand 1: Number and Operations, Concept 1: Number Sense, High School Level PO 3: Express that the distance between two numbers is the absolute value of their difference. Strand 5: Structure and Logic, Concept 2: Logic, Reasoning, Problem Solving and Proof, High School Level PO 1: Analyze a problem situation, determine the question(s) to be answered, organize given information, determine how to represent the problem, and identify implicit and explicit assumptions that have been made. PO 2: Solve problems by formulating one or more strategies, applying the strategies, verifying the solution(s), and communicating the reasoning used to obtain the solution(s). PO 5: Summarize and communicate mathematical ideas using formal and informal reasoning.
1.4	Record site layout data and information in field notes using accepted practices	Strand 2: Data Analysis, Probability, and Discrete Mathematics, Concept 1: Data Analysis (Statistics), High School Level PO 2: Organize collected data into an appropriate graphical representation with or without technology.

Mathematic Standards Matrix
CONSTRUCTION TECHNOLOGIES
October 22, 2008

CONSTRUCTION TECHNOLOGIES Standards/Measurement Criteria		MATH STANDARDS
		Strand #, Concept #, Grade Level Performance Objective # (<i>College Work Readiness Level Standards are italicized</i>)
STANDARD 2.0 - PERFORM CONCRETE/MASONRY WORK		
2.1	Prepare and pour a footing	Strand 4: Geometry and Measurement, Concept 1: Geometric Properties, High School Level PO 10: Solve problems using right triangles, including special triangles. Strand 4: Geometry and Measurement, Concept 4: Measurement, High School Level PO 5: Calculate the surface area and volume of 3-dimensional figures and solve for missing measures.
2.2	Construct a foundation wall or pier	Strand 4: Geometry and Measurement, Concept 1: Geometric Properties, High School Level PO 10: Solve problems using right triangles, including special triangles. Strand 4: Geometry and Measurement, Concept 4: Measurement, High School Level PO 5: Calculate the surface area and volume of 3-dimensional figures and solve for missing measures.
2.3	Lay brick/block to specification	See Note
2.4	Cut brick and block accurately	See Note
2.5	Demonstrate the process of depositing, spreading, consolidating, and striking off concrete in a form	See Note
2.6	Construct concrete formwork	Strand 4: Geometry and Measurement, Concept 1: Geometric Properties, High School Level PO 10: Solve problems using right triangles, including special triangles. Strand 4: Geometry and Measurement, Concept 4: Measurement, High School Level PO 5: Calculate the surface area and volume of 3-dimensional figures and solve for missing measures.
2.7	Estimate the material needed for concrete/masonry work	Strand 4: Geometry and Measurement, Concept 4: Measurement, High School Level PO 5: Calculate the surface area and volume of 3-dimensional figures and solve for missing measures. Strand 5: Structure and Logic, Concept 2: Logic, Reasoning, Problem Solving and Proof, High School Level PO 1: Analyze a problem situation, determine the question(s) to be answered, organize given information, determine how to represent the problem, and identify implicit and explicit assumptions that have been made. PO 2: Solve problems by formulating one or more strategies, applying the strategies, verifying the solution(s), and communicating the reasoning used to obtain the solution(s). PO 3: Evaluate a solution for reasonableness and interpret the meaning of the solution in the context of the original problem.

NOTE: Additional math performance objectives may be embedded within this measurement criterion but they were not identified by the team of experts during the analysis process.
 The local district may include additional math performance objectives as appropriate.

Mathematic Standards Matrix
CONSTRUCTION TECHNOLOGIES
October 22, 2008

CONSTRUCTION TECHNOLOGIES Standards/Measurement Criteria		MATH STANDARDS
		Strand #, Concept #, Grade Level Performance Objective # (<i>College Work Readiness Level Standards are italicized</i>)
STANDARD 3.0 - LAY OUT AND INSTALL FLOOR SYSTEMS		
3.1	Install sill plate(s)	Strand 4: Geometry and Measurement, Concept 1: Geometric Properties, High School Level PO 10: Solve problems using right triangles, including special triangles.
3.2	Set posts	See Note
3.3	Construct or place girders/beams	See Note
3.4	Match selected fasteners used in floor framing to their correct uses	See Note
3.5	Estimate the amount of material needed to frame a floor assembly	Strand 4: Geometry and Measurement, Concept 4: Measurement, High School Level PO 5: Calculate the surface area and volume of 3-dimensional figures and solve for missing measures. Strand 5: Structure and Logic, Concept 2: Logic, Reasoning, Problem Solving and Proof, High School Level PO 1: Analyze a problem situation, determine the question(s) to be answered, organize given information, determine how to represent the problem, and identify implicit and explicit assumptions that have been made. PO 2: Solve problems by formulating one or more strategies, applying the strategies, verifying the solution(s), and communicating the reasoning used to obtain the solution(s). PO 3: Evaluate a solution for reasonableness and interpret the meaning of the solution in the context of the original problem.
3.6	Lay out and construct floor assembly	Strand 4: Geometry and Measurement, Concept 1: Geometric Properties, High School Level PO 10: Solve problems using right triangles, including special triangles.
3.7	Install joists for a cantilever floor	See Note
3.8	Install a subfloor using butt-joint plywood/OSB panels	See Note

NOTE: Additional math performance objectives may be embedded within this measurement criterion but they were not identified by the team of experts during the analysis process.
The local district may include additional math performance objectives as appropriate.

Mathematic Standards Matrix
CONSTRUCTION TECHNOLOGIES
October 22, 2008

CONSTRUCTION TECHNOLOGIES Standards/Measurement Criteria		MATH STANDARDS
		Strand #, Concept #, Grade Level Performance Objective # (<i>College Work Readiness Level Standards are italicized</i>)
STANDARD 4.0- DEMONSTRATE WALL AND CEILING FRAMING		
4.1	Lay out wall lines including plates, corner posts, door and window openings, partition Ts, bracing and plan for installation of fire stops	Strand 4: Geometry and Measurement, Concept 1: Geometric Properties, High School Level PO 10: Solve problems using right triangles, including special triangles.
4.2	Assemble wood stud walls	See Note
4.3	Assemble metal stud walls	See Note
4.4	Lay out, assemble, erect, and brace exterior walls for a frame building	Strand 4: Geometry and Measurement, Concept 1: Geometric Properties, High School Level PO 10: Solve problems using right triangles, including special triangles.
4.5	Cut and install ceiling joists on a wood frame building	See Note
4.6	Estimate the materials required to frame walls and ceilings	Strand 4: Geometry and Measurement, Concept 4: Measurement, High School Level PO 5: Calculate the surface area and volume of 3-dimensional figures and solve for missing measures. Strand 5: Structure and Logic, Concept 2: Logic, Reasoning, Problem Solving and Proof, High School Level PO 1: Analyze a problem situation, determine the question(s) to be answered, organize given information, determine how to represent the problem, and identify implicit and explicit assumptions that have been made. PO 2: Solve problems by formulating one or more strategies, applying the strategies, verifying the solution(s), and communicating the reasoning used to obtain the solution(s). PO 3: Evaluate a solution for reasonableness and interpret the meaning of the solution in the context of the original problem.

NOTE: Additional math performance objectives may be embedded within this measurement criterion but they were not identified by the team of experts during the analysis process.
The local district may include additional math performance objectives as appropriate.

Mathematic Standards Matrix
CONSTRUCTION TECHNOLOGIES
October 22, 2008

CONSTRUCTION TECHNOLOGIES Standards/Measurement Criteria		MATH STANDARDS
		Strand #, Concept #, Grade Level Performance Objective # (<i>College Work Readiness Level Standards are italicized</i>)
STANDARD 5.0 - FRAME AND FINISH A ROOF		
5.1	Construct conventional roof and/or set truss systems	Strand 3: Patterns, Algebra, and Functions, Concept 3: Algebraic Representations, High School Level PO 2: Solve formulas for specified variables. Strand 3: Patterns, Algebra, and Functions, Concept 4: Analysis of Change, High School Level PO 2: Solve problems involving rate of change.
5.2	Install roof sheathing and coverings	See Note
5.3	Frame a roof opening	See Note
5.4	Demonstrate the techniques for installing a variety of types of roofing materials	See Note
5.5	Estimate the materials used in framing and sheathing a roof	Strand 4: Geometry and Measurement, Concept 4: Measurement, High School Level PO 5: Calculate the surface area and volume of 3-dimensional figures and solve for missing measures. Strand 5: Structure and Logic, Concept 2: Logic, Reasoning, Problem Solving and Proof, High School Level PO 1: Analyze a problem situation, determine the question(s) to be answered, organize given information, determine how to represent the problem, and identify implicit and explicit assumptions that have been made. PO 2: Solve problems by formulating one or more strategies, applying the strategies, verifying the solution(s), and communicating the reasoning used to obtain the solution(s). PO 3: Evaluate a solution for reasonableness and interpret the meaning of the solution in the context of the original problem.
STANDARD 6.0 - IDENTIFY THERMAL AND MOISTURE PROTECTION		
6.1	Install insulation material	See Note
6.2	Install vapor barrier	See Note
6.3	Identify types and use of thermal insulation	See Note

NOTE: Additional math performance objectives may be embedded within this measurement criterion but they were not identified by the team of experts during the analysis process.
 The local district may include additional math performance objectives as appropriate.

Mathematic Standards Matrix
CONSTRUCTION TECHNOLOGIES
October 22, 2008

CONSTRUCTION TECHNOLOGIES Standards/Measurement Criteria		MATH STANDARDS
		Strand #, Concept #, Grade Level <i>Performance Objective # (College Work Readiness Level Standards are italicized)</i>
STANDARD 7.0 - APPLY EXTERIOR FINISHES		
7.1	Identify and/or install frieze boards or soffit	See Note
7.2	Install exterior moldings and trim	See Note
7.3	Install various types of siding	See Note
7.4	Apply correct installation to eliminate water intrusion	See Note
7.5	Install exterior stucco finish	See Note
STANDARD 8.0 - INSTALL DOORS AND WINDOWS		
8.1	Install door systems	See Note
8.2	Install door hardware	Strand 3: Patterns, Algebra, and Functions, Concept 4: Analysis of Change, High School Level PO 2: Solve problems involving rate of change. Strand 4: Geometry and Measurement, Concept 1: Geometric Properties, High School Level PO 10: Solve problems using right triangles, including special triangles.
8.3	Install window systems	Strand 3: Patterns, Algebra, and Functions, Concept 4: Analysis of Change, High School Level PO 2: Solve problems involving rate of change.

NOTE: Additional math performance objectives may be embedded within this measurement criterion but they were not identified by the team of experts during the analysis process.
The local district may include additional math performance objectives as appropriate.

Mathematic Standards Matrix
CONSTRUCTION TECHNOLOGIES
October 22, 2008

CONSTRUCTION TECHNOLOGIES Standards/Measurement Criteria		MATH STANDARDS
		Strand #, Concept #, Grade Level Performance Objective # (<i>College Work Readiness Level Standards are italicized</i>)
STANDARD 9.0 - INSTALL INTERIOR TRIM AND STAIRS		
9.1	Install baseboards and casings	See Note
9.2	Lay out and cut stringers	Strand 3: Patterns, Algebra, and Functions, Concept 4: Analysis of Change, High School Level PO 2: Solve problems involving rate of change. Strand 4: Geometry and Measurement, Concept 1: Geometric Properties, High School Level PO 10: Solve problems using right triangles, including special triangles.
9.3	Determine the number and sizes of risers and treads required for a stairway	Strand 3: Patterns, Algebra, and Functions, Concept 4: Analysis of Change, High School Level PO 2: Solve problems involving rate of change.
9.4	Build a small stair unit	See Note
9.5	Lay out a skirt board	See Note
STANDARD 10.0 - ASSEMBLE PIPING, WASTE AND VENT DISTRIBUTION SYSTEMS		
10.1	Assemble a soil, waste and vent system	Strand 3: Patterns, Algebra, and Functions, Concept 4: Analysis of Change, High School Level PO 2: Solve problems involving rate of change.
10.2	Assemble a water distribution system	See Note
10.3	Install plumbing fixtures or equipment	See Note
10.4	Demonstrate the ability to properly measure, cut, and join plastic and copper piping	See Note
10.5	Identify the major components of a drainage system; describe their functions and how they malfunction	See Note

NOTE: Additional math performance objectives may be embedded within this measurement criterion but they were not identified by the team of experts during the analysis process.
The local district may include additional math performance objectives as appropriate.

Mathematic Standards Matrix
CONSTRUCTION TECHNOLOGIES
October 22, 2008

CONSTRUCTION TECHNOLOGIES Standards/Measurement Criteria		MATH STANDARDS
		Strand #, Concept #, Grade Level Performance Objective # (<i>College Work Readiness Level Standards are italicized</i>)
STANDARD 11.0 - INSTALL ELECTRICAL COMPONENT/SYSTEM(S)		
11.1	Identify electrical service entrance requirements	Strand 4: Geometry and Measurement, Concept 4: Measurement, High School Level PO 1: Use dimensional analysis to keep track of units of measure when converting.
11.2	Rough in switch boxes and outlet boxes	See Note
11.3	Rough in feeder and circuit	Strand 2: Data Analysis, Probability, and Discrete Mathematics, Concept 4: Vertex-Edge Graphs, High School Level PO 1: Solve network problems using graphs and matrices.
11.4	Install low voltage systems	See Note
11.5	Trim out electrical devices and appliances	See Note
11.6	Install lighting fixture(s) and ceiling fans	See Note
STANDARD 12.0 - INSTALL INTERIOR WALL AND CEILING FINISH		
12.1	Identify type and use of drywall	See Note
12.2	Demonstrate the proper techniques for cutting drywall	See Note
12.3	Fasten drywall to ceiling and walls	See Note
12.4	Apply mud, use tape appropriately and install corner bead	See Note
12.5	Demonstrate technique for paint application	See Note

NOTE: Additional math performance objectives may be embedded within this measurement criterion but they were not identified by the team of experts during the analysis process.
The local district may include additional math performance objectives as appropriate.