ARCHITECTURAL DRAFTING AND DESIGN STANDARDS

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INTRODUCTION

The standards in this document are designed to clearly state what the student should know and be able to do upon completion of an advanced high school Architectural Drafting and Design program. These standards are designed for a three-credit course sequence that prepares the student for a technical assessment directly aligned to the standards.

The Architectural Drafting and Design Standards Writing Team determined that any statewide skill standards for Architectural Drafting and Design programs must follow, as closely as possible, nationally-recognized standards. Many resources were considered and evaluated including ASME, ISO, and AIA standards. The standards were industry validated through the coordination of industry representatives and the Office of Career, Technical, and Adult Education at the Nevada Department of Education.

These exit-level standards are designed for the student to complete all standards through their completion of a program of study. These standards are intended to guide curriculum objectives for a program of study.

The standards are organized as follows:

Content Standards are general statements that identify major areas of knowledge, understanding, and the skills students are expected to learn in key subject and career areas by the end of the program.

Performance Standards follow each content standard. Performance standards identify the more specific components of each content standard and define the expected abilities of students within each content standard.

Performance Indicators are very specific criteria statements for determining whether a student meets the performance standard. Performance indicators may also be used as learning outcomes, which teachers can identify as they plan their program learning objectives.

The crosswalk and alignment section of the document shows where the performance indicators support the English Language Arts and Math Common Core State Standards, and the Nevada State Science Standards. Where correlation with an academic standard exists, students in the Architectural Drafting and Design program perform learning activities that support, either directly or indirectly, achievement of one or more Common Core State Standards.

All students are encouraged to participate in the career and technical student organization (CTSO) that relates to their program area. CTSOs are co-curricular national associations that directly enforce learning in the CTE classroom through curriculum resources, competitive events, and leadership development. CTSOs provide students the ability to apply academic and technical knowledge, develop communication and teamwork skills, and cultivate leadership skills to ensure college and career readiness.

The Employability Skills for Career Readiness identify the “soft skills” needed to be successful in all careers, and must be taught as an integrated component of all CTE course sequences. These standards are available in a separate document.

CONTENT STANDARD 1.0 : APPLY FUNDAMENTAL DRAFTING SKILLS	
PERFORMANCE STANDARD 1.1 : CREATE GEOMETRIC CONSTRUCTIONS	
1.1.1	Define geometric terms and recognize various geometric shapes by name
1.1.2	Use lines, circles, and arcs to construct regular and irregular geometric shapes
1.1.3	Construct angles, to include acute, obtuse, and right angles
1.1.4	Divide lines and bisect angles and arcs
1.1.5	Construct tangent, concentric, and perpendicular geometric relationships
1.1.6	Calculate area, perimeter, and volume of geometric shapes to include circle, square, rectangle, and triangle
PERFORMANCE STANDARD 1.2 : DEMONSTRATE MEASURING AND SCALING TECHNIQUES	
1.2.1	Justify the scaling of objects
1.2.2	Determine appropriate engineering and metric scales
1.2.3	Measure and calculate object size, area, and volume
1.2.4	Construct drawings utilizing metric and customary (i.e., SAE, Imperial) measurement systems
1.2.5	Transcribe drawings accurately using ratios and proportions
1.2.6	Determine and apply the equivalence between fractions and decimals
1.2.7	Convert between customary (i.e., SAE, Imperial) and metric systems
PERFORMANCE STANDARD 1.3 : DEMONSTRATE CONVENTIONAL DRAFTING PRACTICES	
1.3.1	Identify and select appropriate drafting media
1.3.2	Complete title blocks
1.3.3	Utilize appropriate drawing composition and layout
1.3.4	Identify and utilize industry standard object properties (i.e., line weight, line type)
1.3.5	Produce drawings from sketches
1.3.6	Apply symbols to industry standards (i.e., ASME, ANSI)
1.3.7	Apply appropriate annotations to drawings
1.3.8	Produce lettering to specific standards

PERFORMANCE STANDARD 1.4 : CREATE MULTI-VIEW DRAWINGS USING ORTHOGRAPHIC PROJECTION	
1.4.1	Determine the principle view of an object
1.4.2	Project from an existing view to create additional views
1.4.3	Identify, create, and arrange the six standard views (using properties of similarities of right angles)
1.4.4	Identify, create, and arrange sectional views
1.4.5	Identify, create, and arrange primary auxiliary views
1.4.6	Apply appropriate measurement units
PERFORMANCE STANDARD 1.5 : APPLY DIMENSIONS AND ANNOTATIONS	
1.5.1	Differentiate appropriate dimension standards (i.e., ANSI, ISO)
1.5.2	Arrange dimensions and annotations using appropriate standards (i.e., ANSI, ISO)
1.5.3	Use various dimensioning styles (i.e., aligned, unidirectional, polar, ordinate, datum)
1.5.4	Construct bill of materials or schedule
1.5.5	Identify and transcribe tolerancing dimensioning
1.5.6	Identify and transcribe thread designations
PERFORMANCE STANDARD 1.6 : CREATE PICTORIAL DRAWINGS	
1.6.1	Create oblique drawings
1.6.2	Create isometric drawings
1.6.3	Create perspective drawings
PERFORMANCE STANDARD 1.7 : DEMONSTRATE SKETCHING TECHNIQUES	
1.7.1	Develop design ideas using freehand sketching
1.7.2	Create pictorial and multi-view sketches
1.7.3	Create rough, refined, and presentation sketches
1.7.4	Prepare field sketches
1.7.5	Produce drawings from sketches
1.7.6	Utilize hand lettering techniques
1.7.7	Utilize the alphabet of lines (i.e., styles and weights)

CONTENT STANDARD 2.0 : APPLY FUNDAMENTAL CADD SKILLS

PERFORMANCE STANDARD 2.1 : UTILIZE BASIC COMPUTER AND IT SKILLS

2.1.1	Use computer hardware and input/output devices to solve design drafting problems
2.1.2	Apply basic commands of an operating system and software
2.1.3	Apply file and disk management techniques
2.1.4	Import and export data files using various formats
2.1.5	Access and use a network to transfer files
2.1.6	Demonstrate the use of various storage media
2.1.7	Demonstrate basic troubleshooting skills related to fundamental hardware and software problems
2.1.8	Evaluate electronic media to acquire information to complete drafting problems (i.e., internet, books, PowerPoint)
2.1.9	Demonstrate personal safety (i.e., electrical and mechanical hazards)
2.1.10	Interpret and utilize acceptable use policies (i.e., network and lab agreements)

PERFORMANCE STANDARD 2.2 : SET UP A DRAWING ENVIRONMENT

2.2.1	Select appropriate existing title blocks
2.2.2	Set drafting settings (i.e., grid, snap, and modes)
2.2.3	Determine and apply scaling factors
2.2.4	Assign line weights, line types, and colors
2.2.5	Utilize template files
2.2.6	Utilize sheets/layouts for plotting/printing
2.2.7	Scale sheets/layout views for plotting/printing

PERFORMANCE STANDARD 2.3 : UTILIZE THE CARTESIAN COORDINATE SYSTEM TO CREATE GEOMETRIC SHAPES AND OBJECTS

2.3.1	Describe and utilize the Cartesian Coordinate System to create geometric shapes and objects (x, y, z)
2.3.2	Calculate input coordinates
2.3.3	Manipulate coordinate systems (i.e., absolute, relative, and polar)
2.3.4	Utilize appropriate coordinate entry methods

PERFORMANCE STANDARD 2.4 : CREATE AND MODIFY OBJECTS UTILIZING CADD COMMANDS

2.4.1	Utilize multiple entry methods to invoke CADD commands (i.e., hot keys, icons, and menus)
2.4.2	Utilize geometric relationships to ensure accuracy (i.e., endpoint, midpoint, and center)
2.4.3	Create and modify objects using CADD commands
2.4.4	Assign property styles to objects
2.4.5	Access and integrate help resources to solve problems

PERFORMANCE STANDARD 2.5 : CREATE AND MODIFY ANNOTATIONS	
2.5.1	Define, create, and modify industry standards text styles
2.5.2	Arrange text based on industry standards
2.5.3	Create and modify dimension styles
2.5.4	Arrange dimensions based on industry standards (may include dual dimensioning)
2.5.5	Use industry standard symbols to annotate drawings
2.5.6	Construct bill of materials or schedules
2.5.7	Import/export data from other programs
PERFORMANCE STANDARD 2.6 : UTILIZE BASIC OUTPUT METHODS	
2.6.1	Recognize plot/print areas for assigned plotter/printer
2.6.2	Utilize plot preview function
2.6.3	Plot drawings to proper scale
2.6.4	Plot drawings to various output media (i.e., paper or electronic)

CONTENT STANDARD 3.0 : DEMONSTRATE ADVANCED CADD SKILLS AND TECHNIQUES	
PERFORMANCE STANDARD 3.1 : UTILIZE TEMPLATES, SYMBOLS, AND LIBRARIES	
3.1.1	Describe the use of symbols
3.1.2	Create and save symbols
3.1.3	Utilize symbols
3.1.4	Edit symbols
3.1.5	Assign symbol properties (i.e., attributes, parameters, constraints)
3.1.6	Edit symbol properties
3.1.7	Create and utilize symbol libraries
3.1.8	Create template files
PERFORMANCE STANDARD 3.2 : DEVELOP AND DISPLAY THREE-DIMENSIONAL MODELS	
3.2.1	Interpret and define the right-hand rule for the x, y, and z-axes
3.2.2	Develop three-dimensional models (i.e., wireframe, surface, solid, or parametric)
3.2.3	Manipulate the x-y plane in three-dimensional space
3.2.4	Display three-dimensional objects from various viewpoints
3.2.5	Edit the shape and configuration of solid models
3.2.6	Analyze a solid model for its physical properties
3.2.7	Display objects as shaded or hidden lines removed
3.2.8	Apply surface textures and materials to models
3.2.9	Create shaded and rendered presentation drawings
3.2.10	Create working drawings from three-dimensional models
PERFORMANCE STANDARD 3.3 : UTILIZE ADVANCED OUTPUT METHODS	
3.3.1	Plot/print to appropriate industry standards
3.3.2	Develop object property schemes
3.3.3	Create and apply industry standard title blocks
3.3.4	Reference external files
3.3.5	Transmit files electronically
3.3.6	Create multi-view layouts from solid models
3.3.7	Create shaded and rendered presentation drawings

CONTENT STANDARD 4.0: APPLY ARCHITECTURAL DRAFTING AND DESIGN	
PERFORMANCE STANDARD 4.1 : IDENTIFY ARCHITECTURAL DRAFTING RELATED TO ARCHITECTURAL DESIGN	
4.1.1	Identify and describe different architectural styles
4.1.2	Identify construction terminology and materials
4.1.3	Identify architectural symbols
4.1.4	Identify architectural design and planning concepts
4.1.5	List and describe drawings necessary for a building permit
4.1.6	Interpret construction-related drawings
PERFORMANCE STANDARD 4.2 : PREPARE ARCHITECTURAL DRAFTING RELATED TO DESIGN CRITERIA	
4.2.1	Prepare preliminary design sketches (to calculate area, volume, square footage, etc.)
4.2.2	Prepare a floor plan from an existing plan
4.2.3	Apply architectural design concepts to floor plans
4.2.4	Apply industry standards, codes, and regulations to architectural designs
4.2.5	Use mathematical formulas to support proper application of building codes
4.2.6	Arrange appropriate architectural symbols
PERFORMANCE STANDARD 4.3 : CREATE ARCHITECTURAL DRAFTING VIEWS AND DETAILS RELATED TO DESIGN CRITERIA	
4.3.1	Create an exterior elevation from an existing floor plan
4.3.2	Create interior elevations (i.e., kitchen, bathroom)
4.3.3	Create a roof plan utilizing pitch/slope calculations according to appropriate building codes
4.3.4	Create building sections and details from an existing floor plan
4.3.5	Prepare and draft schedules (i.e., window, door, room)
PERFORMANCE STANDARD 4.4 : DEFINE AND APPLY CIVIL SITE DRAFTING CONCEPTS RELATED TO CIVIL ENGINEERING	
4.4.1	Define civil engineering and identify geographic data (i.e., coordinate points, lines, symbols)
4.4.2	Interpret civil engineering-related drawings
4.4.3	Create a site plan utilizing pitch/slope calculations according to code requirements

CROSSWALK AND ALIGNMENTS OF ARCHITECTURAL DRAFTING AND DESIGN STANDARDS AND THE COMMON CORE STATE STANDARDS AND THE NEVADA SCIENCE STANDARDS

CROSSWALK

The crosswalk of the Architectural Drafting and Design Standards shows links to the Common Core State Standards, and identifies the performance indicators in which the learning objectives in the Architectural Drafting and Design program support academic learning. The performance indicators are grouped according to their content standard, and are crosswalked to the English Language Arts and Math Common Core State Standards, and Nevada State Science Standards.

ALIGNMENTS

In addition to correlation with the Common Core Math Standards, many performance indicators support the Common Core Mathematical Practices. The following table illustrates the alignment of the Architectural Drafting and Design Standards Performance Indicators and the Common Core Mathematical Practices. This alignment identifies the performance indicators in which the learning objectives in the Architectural Drafting and Design program support academic learning.

CROSSWALK OF ARCHITECTURAL DRAFTING AND DESIGN STANDARDS AND THE COMMON CORE STATE STANDARDS

CONTENT STANDARD 1.0: APPLY FUNDAMENTAL DRAFTING SKILLS

Performance Indicators	Common Core State Standards and Nevada Science Standards
1.1.1	**Math: Geometry – Congruence** G-CO.1 Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
1.1.2	**Math: Geometry – Circles** G-C.3 Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle. **Math: Geometry – Congruence** G-CO.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). G-CO.13 Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.
1.1.3	**Math: Geometry – Congruence** G-CO.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).
1.1.4	**Math: Geometry – Congruence** G-CO.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).
1.1.5	**Math: Geometry – Circles** G-C.4 Construct a tangent line from a point outside a given circle to the circle. **Math: Geometry – Congruence** G-CO.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).
1.1.6	**Math: Geometry – Similarity, Right Triangles, and Trigonometry** G-SRT.9 Derive the formula A = 1/2 ab sin© for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side. G-SRT.11 Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces). **Math: Geometry – Geometric Measurement and Dimension** G-GMD.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
1.2.1	**Math: Number & Quantity – Quantities** N-Q.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

1.2.2	**Math: Number & Quantity – Quantities** N-Q.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. N-Q.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
1.2.4	**Math: Geometry – Congruence** G-CO.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).
1.3.4	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
1.3.6	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
1.3.7	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
1.4.2	**Math: Geometry - Congruence** G-CO.5 Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another. **Math: Geometry - Geometric Measurement and Dimension** G-GMD.4 Identify the shapes of two-dimensional cross-sections of three dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.
1.4.4	**Math: Geometry - Congruence** G-CO.5 Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another. **Math: Geometry - Geometric Measurement and Dimension** G-GMD.4 Identify the shapes of two-dimensional cross-sections of three dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.
1.4.6	**Math: Number & Quantity - Quantities** N-Q.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
1.5.1	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
1.5.4	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.2a Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.

1.5.5	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
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CONTENT STANDARD 2.0: APPLY FUNDAMENTAL CADD SKILLS

Performance Indicators	Common Core State Standards and Nevada Science Standards
2.1.8	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem
2.1.10	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.2 Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
2.2.3	**Math: Number & Quantity - Quantities** N-Q.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
2.2.7	**Math: Number & Quantity - Quantities** N-Q.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
2.3.1	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.2d Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the toic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.
2.4.5	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem
2.5.1	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
2.5.5	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
2.5.6	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.2a Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
2.6.3	**Math: Number & Quantity - Quantities** N-Q.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

CONTENT STANDARD 3.0: DEMONSTRATE ADVANCED CADD SKILLS AND TECHNIQUES

Performance Indicators	Common Core State Standards and Nevada Science Standards
3.1.1	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
3.1.3	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
3.2.1	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
3.2.2	**Math: Geometry- Modeling with Geometry** G-MG.1 Use geometric shapes, their measures, and their properties to describe objects.
3.2.3	**Math: Geometry - Congruence** G-CO.5 Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.
3.2.4	**Math: Geometry - Congruence** G-CO.5 Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another. G-CO.6 Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent. **Math: Geometry - Geometric Measurement and Dimension** G-GMD.4 Identify the shapes of two-dimensional cross-sections of three dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.
3.2.5	**Math: Geometry - Congruence** G-CO.5 Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another. G-CO.6 Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent. **Math: Geometry - Geometric Measurement and Dimension** G-GMD.4 Identify the shapes of two-dimensional cross-sections of three dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects. **Math: Geometry- Modeling with Geometry** G-MG.3 Apply geometric methods to solve design problems.

3.2.6	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
3.3.3	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.2a Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.

CONTENT STANDARD 4.0: APPLY ARCHITECTURAL DRAFTING AND DESIGN

Performance Indicators	Common Core State Standards and Nevada Science Standards
4.1.1	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. **English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
4.1.2	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
4.1.3	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
4.1.5	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
4.1.6	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
4.2.1	**Math: Geometry – Geometric Measurement and Dimension** G-GMD.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
4.2.4	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
4.2.5	**Math: Geometry – Geometric Measurement and Dimension** G-GMD.3 Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
4.3.5	**English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.2a Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
4.4.1	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
4.4.2	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

ALIGNMENT OF ARCHITECTURAL DRAFTING AND DESIGN STANDARDS AND THE COMMON CORE MATHEMATICAL PRACTICES

Common Core Mathematical Practices	Architectural Drafting and Design Performance Indicators
1. Make sense of problems and persevere in solving them.	1.7.1, 1.7.3 2.1.1
2. Reason abstractly and quantitatively.	1.2.2; 1.6.1, 1.6.2, 1.6.3; 1.7.2, 1.7.4 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.1.5, 3.1.6, 3.1.7; 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7; 3.3.6, 3.3.7 4.1.1, 4.1.2, 4.1.3, 4.1.4; 4.2.3; 4.3.3; 4.4.1, 4.4.3
3. Construct viable arguments and critique the reasoning of others.	1.2.1 4.2.5; 4.4.3
4. Model with mathematics.	1.1.6; 1.2.3 3.2.2, 3.2.9, 3.2.10
5. Use appropriate tools strategically.	1.1.2, 1.1.3, 1.1.5; 1.2.3, 1.2.4; 1.3.1, 1.3.3; 1.5.6; 1.7.6, 1.7.7 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, 2.1.6, 2.1.7, 2.1.8, 2.1.10; 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5, 2.2.6, 2.2.7; 2.4.1, 2.4.2, 2.4.3; 2.4.4, 2.4.5; 2.5.1, 2.5.2, 2.5.5, 2.5.6, 2.5.7; 2.6.1, 2.6.2, 2.6.4 3.1.8; 3.2.8, 3.2.10; 3.3.1, 3.3.3, 3.3.4, 3.3.5 4.1.3, 4.1.5, 4.1.6; 4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.2.6; 4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5; 4.4.2
6. Attend to precision.	1.2.2, 1.2.5, 1.2.7; 1.3.4, 1.3.5, 1.3.6, 1.3.7, 1.3.8; 1.4.6; 1.5.1, 1.5.2, 1.5.3, 1.5.4, 1.5.5; 1.7.5 2.3.4; 2.4.2; 2.5.3, 2.5.4, 2.5.5, 2.5.6; 2.6.3 3.3.1, 3.3.3
7. Look for and make use of structure.	1.1.1, 1.1.4; 1.2.6; 1.4.1, 1.4.2, 1.4.3, 1.4.4, 1.4.5 2.3.1, 2.3.3 3.3.2
8. Look for and express regularity in repeated reasoning.	1.2.6; 1.3.2 2.3.2