ARCHITECTURAL DESIGN STANDARDS

This document was prepared by:

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VISION

All Nevadans ready for success in the 21st century

MISSION

To improve student achievement and educator effectiveness by ensuring opportunities, facilitating learning, and promoting excellence

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ACKNOWLEDGEMENTS

The development of Nevada career and technical standards and assessments is a collaborative effort sponsored by the Office of Career Readiness, Adult Learning & Education Options at the Department of Education and the Career and Technical Education Consortium of States. The Department of Education relies on teachers and industry representatives who have the technical expertise and teaching experience to develop standards and performance indicators that truly measure student skill attainment. Most important, however, is recognition of the time, expertise and great diligence provided by the writing team members in developing the career and technical standards for Architectural Design.

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BUSINESS AND INDUSTRY VALIDATION

All CTE standards developed through the Nevada Department of Education are validated by business and industry through one or more of the following processes: (1) the standards are developed by a team consisting of business and industry representatives; or (2) a separate review panel was coordinated with industry experts to ensure the standards include the proper content; or (3) the adoption of nationally-recognized standards endorsed by business and industry.

The Architectural Design standards were validated through a complete review by an industry panel.

PROJECT COORDINATOR

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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 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.

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 Nevada Academic Content Standards in Science (based on the Next Generation Science Standards) and the English Language Arts and Mathematics (based on the Common Core State Standards). Where correlation with an academic content standard exists, students in the Architectural Design program perform learning activities that support, either directly or indirectly, achievement of the academic content standards that are listed.

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.

The **Standards Reference Code** is only used to identify or align performance indicators listed in the standards to daily lesson plans, curriculum documents, or national standards.

Program Name	Standards Reference Code
Architectural Design	ARCH

Example: ARCH.2.3.4

Standards	Content Standard	Performance Standard	Performance Indicator
Architectural Design	2	3	4

CONTENT STANDARD 1.0 : APPLY FUNDAMENTAL ARCHITECTURAL SKILLS	
PERFORMANCE STANDARD 1.1 : DEMONSTRATE PRINT READING PRACTICES	
1.1.1	Interpret basic elements of an architectural drawing (e.g., title block information, dimensions, annotations, line types, and schedules)
1.1.2	Identify industry standard architectural symbols
1.1.3	Describe various types of drawing views (i.e., plan, elevation, section, detail, and pictorial)
1.1.4	Identify drawing sheet classifications (e.g., architectural, civil, electrical, landscape, and mechanical)
PERFORMANCE STANDARD 1.2 : UTILIZE MATHEMATICAL OPERATIONS AND MEASURING TECHNIQUES	
1.2.1	Identify industry standard units of measure
1.2.2	Determine appropriate architectural and engineering scales
1.2.3	Convert between customary (i.e., SAE and Imperial) and metric units
1.2.4	Determine and apply the equivalence between fractions and decimals
1.2.5	Measure and calculate distance, object size, area, and volume
PERFORMANCE STANDARD 1.3 : DEMONSTRATE SKETCHING TECHNIQUES	
1.3.1	Prepare sketches using appropriate scale and proportions
1.3.2	Create sketches using appropriate architectural symbols
1.3.3	Utilize the alphabet of lines (i.e., styles and weights)
1.3.4	Annotate sketches legibly using an appropriate architectural lettering style
PERFORMANCE STANDARD 1.4: DEMONSTRATE SPATIAL REASONING	
1.4.1	Define spatial reasoning
1.4.2	Identify spatial reasoning techniques (e.g., mapping, rotating, matching, patterning, and counting)
1.4.3	Relate spatial analysis techniques to architecture (e.g., circulation and space planning)
1.4.4	Utilize spatial reasoning techniques to solve design problems

CONTENT STANDARD 2.0 : ANALYZE ARCHITECTURAL PROFESSIONAL PRACTICES	
PERFORMANCE STANDARD 2.1 : RESEARCH THE HISTORY OF ARCHITECTURE	
2.1.1	Research and compare various architectural styles and designs used throughout history
2.1.2	Explain how historical innovations have impacted today's society
2.1.3	Describe the significance of major architects and their historical influence on the built environment
PERFORMANCE STANDARD 2.2 : INVESTIGATE CAREER OPPORTUNITIES	
2.2.1	Identify the primary duties and attributes of an architect
2.2.2	Explain the traditional path for becoming an architect
2.2.3	Discuss various architectural career opportunities (e.g., draftsman, designer, project manager, architect, landscape architect, and interior designer)
2.2.4	Differentiate between the relationships of all stakeholders involved in a construction project
PERFORMANCE STANDARD 2.3 : ANALYZE PROFESSIONAL ETHICAL PRACTICES	
2.3.1	Analyze current professional code of ethics
2.3.2	Analyze ethical architectural issues
2.3.3	Describe how ethics influence the architectural design process

CONTENT STANDARD 3.0 : APPLY DESIGN CONCEPTS	
PERFORMANCE STANDARD 3.1 : UTILIZE ELEMENTS OF DESIGN	
3.1.1	Identify the elements of design (e.g., line, shape, space, form, texture, value, and color)
3.1.2	Demonstrate the elements of design through various drawing techniques
PERFORMANCE STANDARD 3.2 : UTILIZE PRINCIPLES OF DESIGN	
3.2.1	Identify the principles of design (e.g., balance, contrast, rhythm, repetition, movement, harmony, emphasis, unity, proportion, and variety)
3.2.2	Demonstrate the principles of design through various drawing techniques
PERFORMANCE STANDARD 3.3 : APPLY THE DESIGN PROCESS	
3.3.1	Define the design process
3.3.2	Identify the different types of design processes
3.3.3	Describe the activities that occur during each phase of the design process
3.3.4	Apply the steps of the architectural design process to solve a variety of design problems

CONTENT STANDARD 4.0 : UTILIZE DIGITAL DRAFTING TECHNIQUES	
PERFORMANCE STANDARD 4.1 : UTILIZE BASIC COMPUTER AND IT SKILLS	
4.1.1	Identify and define the various digital drafting and modeling options (e.g., CADD/BIM)
4.1.2	Use computer hardware and input/output devices to solve drafting problems
4.1.3	Apply file and disk management techniques
4.1.4	Import and export data files using various formats
4.1.5	Access and use a network to transfer files
4.1.6	Demonstrate the use of various storage media
4.1.7	Demonstrate basic troubleshooting skills related to fundamental hardware and software problems
4.1.8	Utilize resources to complete drafting problems
4.1.9	Demonstrate personal safety (i.e., electrical and mechanical hazards)
4.1.10	Interpret and utilize acceptable use policies (i.e., network and lab agreements)
PERFORMANCE STANDARD 4.2 : UTILIZE THE CARTESIAN COORDINATE SYSTEM	
4.2.1	Describe and utilize the Cartesian Coordinate System to create geometric shapes and objects
4.2.2	Interpret and define the right-hand rule for the x, y, and z-axes
4.2.3	Calculate input coordinates
4.2.4	Utilize appropriate coordinate entry methods (i.e., absolute, relative, and polar)
PERFORMANCE STANDARD 4.3 : CREATE GEOMETRIC CONSTRUCTIONS	
4.3.1	Define geometric terms and recognize various geometric shapes by name
4.3.2	Use lines, circles, and arcs to construct regular and irregular geometric shapes
4.3.3	Construct angles, to include acute, obtuse, and right angles
4.3.4	Divide lines and bisect angles and arcs
4.3.5	Construct tangent, concentric, and perpendicular geometric relationships
4.3.6	Calculate area, perimeter, and volume of geometric shapes to include circle, square, rectangle, and triangle
PERFORMANCE STANDARD 4.4 : CREATE AND MODIFY DRAWINGS AND MODELS	
4.4.1	Utilize templates
4.4.2	Set drafting and modeling settings (e.g., grid, snap, and modes)
4.4.3	Utilize multiple entry methods to invoke CADD/BIM commands (e.g., hot keys, icons, and menus)
4.4.4	Utilize geometric relationships to ensure accuracy (e.g., endpoint, midpoint, and center)
4.4.5	Create and modify objects using CADD/BIM commands
4.4.6	Assign properties to objects (e.g., line weight, line types, scale factors, and colors)
4.4.7	Produce drawings from sketches

PERFORMANCE STANDARD 4.5 : CREATE DRAWINGS USING ORTHOGRAPHIC PROJECTION	
4.5.1	Determine the principle view of an object
4.5.2	Project from an existing view to create additional views
4.5.3	Identify, create, and arrange the six standard views (using properties of similarities of right angles)
4.5.4	Identify, create, and arrange sectional views
4.5.5	Identify, create, and arrange primary auxiliary views
4.5.6	Apply appropriate measurement units
PERFORMANCE STANDARD 4.6 : UTILIZE SYMBOLS AND LIBRARIES	
4.6.1	Describe the use of symbols
4.6.2	Utilize and edit symbols
4.6.3	Create and save symbols
4.6.4	Assign symbol properties (e.g., attributes, parameters, and constraints)
4.6.5	Create and utilize symbol libraries
PERFORMANCE STANDARD 4.7 : APPLY DIMENSIONS AND ANNOTATIONS	
4.7.1	Differentiate between appropriate dimension standards (i.e., ANSI and ISO)
4.7.2	Define, create, and modify industry standard text styles
4.7.3	Define, create, and modify industry standard dimension styles
4.7.4	Place dimensions and annotations using appropriate standards (i.e., ANSI and ISO)
4.7.5	Use various dimensioning styles (e.g., aligned, unidirectional, baseline, and datum)
PERFORMANCE STANDARD 4.8 : CREATE PICTORIAL DRAWINGS	
4.8.1	Create oblique drawings
4.8.2	Create isometric drawings
4.8.3	Create perspective drawings
PERFORMANCE STANDARD 4.9 : PREPARE ARCHITECTURAL CONSTRUCTION DRAWINGS	
4.9.1	Transcribe a floor plan from an existing plan
4.9.2	Transcribe a site plan from an existing plan using geographic data (e.g., GIS, maps, and aerials)
4.9.3	Draw an exterior elevation utilizing an existing plan
4.9.4	Draw a roof plan utilizing an existing plan
4.9.5	Draw interior elevations utilizing an existing plan
4.9.6	Draw building sections and details utilizing an existing plan
4.9.7	Draw an electrical plan utilizing an existing plan
4.9.8	Prepare and draft schedules (e.g., window, door, and room)

PERFORMANCE STANDARD 4.10 : UTILIZE OUTPUT METHODS	
4.10.1	Identify and select appropriate drafting media
4.10.2	Utilize sheets/layouts for plotting/printing
4.10.3	Scale sheets/layout views for plotting/printing
4.10.4	Select and utilize appropriate title blocks
4.10.5	Recognize plot/print areas for assigned plotter/printer
4.10.6	Utilize plot preview function
4.10.7	Plot drawings to proper scale
4.10.8	Plot drawings to various output media (i.e., paper and electronic)
4.10.9	Reference external files
4.10.10	Transmit files electronically

CONTENT STANDARD 5.0 : APPLY ARCHITECTURAL DESIGN SKILLS	
PERFORMANCE STANDARD 5.1 : UTILIZE BUILDING DESIGN CONCEPTS	
5.1.1	Compare and contrast residential and commercial building practices
5.1.2	Describe the different design considerations (e.g., orientation, solar, climate, and view)
5.1.3	Utilize the design process (e.g., problems, constraints, and solutions)
5.1.4	Prepare preliminary design sketches
5.1.5	List and describe drawings necessary for a building permit
5.1.6	Research the importance of construction specifications
5.1.7	Create a set of plans per local building permit requirements
5.1.8	Review and revise plans throughout the process to ensure the design objective has been met
PERFORMANCE STANDARD 5.2 : IDENTIFY BUILDING MATERIALS	
5.2.1	Identify the materials used in building construction
5.2.2	Differentiate between the various types of material properties and their applications
5.2.3	Discuss the environmental impact of material usage
5.2.4	Explain how construction is affected by the availability, quality, and quantity of resources
PERFORMANCE STANDARD 5.3 : UTILIZE BUILDING CODES AND REGULATIONS	
5.3.1	Identify various building codes and regulations (e.g., ICC, IBC, IRC, ADA, and NEC)
5.3.2	Research types of codes and regulations required for building construction
5.3.3	Explain the purpose of building codes and regulations
5.3.4	Describe how building codes and regulations affect the design process
5.3.5	Apply building codes and regulations in a design problem
5.3.6	Use mathematical formulas to support proper application of building codes (e.g., tables and schedules)
PERFORMANCE STANDARD 5.4 : INVESTIGATE GREEN BUILDING STRATEGIES	
5.4.1	Identify agencies and their roles in regulating sustainable practices and building efficiency (e.g., USGBC and LEED)
5.4.2	Examine national, state, and local energy and efficiency policies
5.4.3	Describe how social, environmental, and financial constraints influence the design process
5.4.4	Describe the impact of construction on the environment
5.4.5	Identify the design practices that can lessen adverse impacts on the environment
5.4.6	Research sustainable design practices
5.4.7	Summarize techniques for energy efficient construction
5.4.8	Diagram the lifecycle of a building

CONTENT STANDARD 6.0 : APPLY PRESENTATION SKILLS	
PERFORMANCE STANDARD 6.1 : CREATE AND MAINTAIN A PERSONAL PORTFOLIO	
6.1.1	Research the various types of personal portfolios
6.1.2	Explain the purpose of creating personal portfolios (e.g., educational and occupational)
6.1.3	Develop and maintain an architectural portfolio that includes physical and digital works
6.1.4	Describe how portfolios are dynamic and require maintenance
PERFORMANCE STANDARD 6.2 : DEVELOP MODELS AND GRAPHICS	
6.2.1	Develop architectural models (e.g., physical and digital)
6.2.2	Display architectural models from various viewpoints
6.2.3	Apply surface textures and materials to models
6.2.4	Create shaded and rendered presentation drawings
6.2.5	Prepare models and graphics to validate a design solution
PERFORMANCE STANDARD 6.3 : UTILIZE PRESENTATION SKILLS	
6.3.1	Utilize architectural terminology in presentations
6.3.2	Prepare design ideas for presentation
6.3.3	Perform a visual and verbal presentation utilizing physical and digital work
PERFORMANCE STANDARD 6.4 : UTILIZE THE CRITIQUING PROCESS	
6.4.1	Conduct peer and self-evaluations
6.4.2	Understand the elements of the critique process, including a respect for peer work and the ability to give and receive dispassionate criticism

CROSSWALKS AND ALIGNMENTS OF ARCHITECTURAL DESIGN STANDARDS AND THE NEVADA ACADEMIC CONTENT STANDARDS AND THE COMMON CAREER TECHNICAL CORE STANDARDS

CROSSWALKS (ACADEMIC STANDARDS)

The crosswalk of the Architectural Design Standards shows links to the Nevada Academic Content Standards in Science (based on the Next Generation Science Standards – Disciplinary Core Ideas Arrangement) and the English Language Arts and Mathematics (based on the Common Core State Standards). The crosswalk identifies the performance indicators in which the learning objectives in the Architectural Design program support academic learning. The performance indicators are grouped according to their content standard and are crosswalked to the Nevada Academic Content Standards in Science, English Language Arts, and Mathematics.

ALIGNMENTS (MATHEMATICAL PRACTICES)

In addition to correlation with the Nevada Academic Content Standards for Mathematics, many performance indicators support the Mathematical Practices. The following table illustrates the alignment of the Architectural Design Standards Performance Indicators and the Mathematical Practices. This alignment identifies the performance indicators in which the learning objectives in the Architectural Design program support academic learning.

CROSSWALKS (COMMON CAREER TECHNICAL CORE)

The crosswalk of the Architectural Design Standards shows links to the Common Career Technical Core. The crosswalk identifies the performance indicators in which the learning objectives in the Architectural Design program support the Common Career Technical Core. The Common Career Technical Core defines what students should know and be able to do after completing instruction in a program of study. The Architectural Design Standards are crosswalked to the Architecture & Construction Career Cluster™ and the Design/Pre-Construction Career Pathway.

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CROSSWALK OF ARCHITECTURAL DESIGN STANDARDS AND THE NEVADA ACADEMIC CONTENT STANDARDS

CONTENT STANDARD 1.0: APPLY FUNDAMENTAL ARCHITECTURAL SKILLS

Performance Indicators	Nevada Academic Content Standards
1.1.2	**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.
1.1.3	**English Language Arts: Speaking and Listening Standards** SL.11-12.1a Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well reasoned exchange of ideas.
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.
1.2.5	**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.

CONTENT STANDARD 2.0: ANALYZE ARCHITECTURAL PROFESSIONAL PRACTICES

Performance Indicators	Nevada Academic Content Standards
2.1.1	**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. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
2.1.2	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. **English Language Arts: Speaking and Listening Standards** SL.11-12.1a Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well reasoned exchange of ideas.
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2.3.1	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
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CONTENT STANDARD 3.0: APPLY DESIGN CONCEPTS

Performance Indicators	Nevada Academic Content Standards
3.3.3	**English Language Arts: Speaking and Listening Standards** SL.11-12.1a Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well reasoned exchange of ideas.
3.3.4	**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.

CONTENT STANDARD 4.0: UTILIZE DIGITAL DRAFTING TECHNIQUES

Performance Indicators	Nevada Academic Content Standards
4.1.10	**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.
4.2.1	**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.11-12.2d 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.
4.3.1	**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.
4.3.2	**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.
4.3.3	**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.).
4.3.4	**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.).
4.3.5	**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.).

4.3.6	**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.
4.5.2	**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.
4.5.4	**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.
4.5.6	**Math: Number & Quantity - Quantities** N-Q.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
4.6.1	**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.
4.6.2	**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. **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.
4.9.8	**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.
4.10.3	**Math: Number & Quantity - Quantities** N-Q.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

CONTENT STANDARD 5.0: APPLY ARCHITECTURAL DESIGN SKILLS

Performance Indicators	Nevada Academic Content Standards
5.1.1	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
5.1.2	**English Language Arts: Speaking and Listening Standards** SL.11-12.1a Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well reasoned exchange of ideas.
5.1.3	**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.
5.1.6	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
5.2.2	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
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5.3.2	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
5.3.3	**English Language Arts: Speaking and Listening Standards** SL.11-12.1a Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well reasoned exchange of ideas.
5.3.4	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
5.4.2	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
5.4.3	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. **English Language Arts: Speaking and Listening Standards** SL.11-12.1a Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well reasoned exchange of ideas.
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5.4.6	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
5.4.7	**English Language Arts: Reading Standards for Literacy in Science and Technical Subjects** RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.

CONTENT STANDARD 6.0: APPLY PRESENTATION SKILLS

Performance Indicators	Nevada Academic Content Standards
6.1.1	**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. **English Language Arts: Writing Standards for Literacy in Science and Technical Subjects** WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
6.1.2	**English Language Arts: Speaking and Listening Standards** SL.11-12.1a Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well reasoned exchange of ideas.
6.1.4	**English Language Arts: Speaking and Listening Standards** SL.11-12.1a Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well reasoned exchange of ideas.
6.3.1	**English Language Arts: Speaking and Listening Standards** SL.11-12.6 Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.
6.3.3	**English Language Arts: Speaking and Listening Standards** SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. SL.11-12.6 Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.
6.4.1	**English Language Arts: Speaking and Listening Standards** SL.11-12.3 Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.
6.4.2	**English Language Arts: Speaking and Listening Standards** SL.11-12.1b Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed. SL.11-12.1d Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. SL.11-12.3 Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.

ALIGNMENT OF ARCHITECTURAL DESIGN STANDARDS AND THE MATHEMATICAL PRACTICES

Mathematical Practices	Architectural Design Performance Indicators
1. Make sense of problems and persevere in solving them.	1.2.5 4.1.2
2. Reason abstractly and quantitatively.	1.2.5; 1.3.2 4.2.2; 4.6.1 - 4.6.5; 4.8.1 - 4.8.3
3. Construct viable arguments and critique the reasoning of others.	5.1.3; 5.3.6 6.4.1, 6.4.2
4. Model with mathematics.	1.4.4 4.3.6
5. Use appropriate tools strategically.	1.2.2, 1.2.5 4.3.2, 4.3.3, 4.3.5, 4.3.6; 4.4.1 - 4.4.7; 4.9.1 - 4.9.8; 4.10.3, 4.10.7 4.10.8, 4.10.9, 4.10.10
6. Attend to precision.	1.2.3, 1.2.4, 1.2.5 4.3.6; 4.4.2, 4.4.4 - 4.4.7; 4.7.1; 4.10.3, 4.10.7
7. Look for and make use of structure.	1.4.4 4.2.1; 4.3.1, 4.3.4 5.1.3
8. Look for and express regularity in repeated reasoning.	1.2.4; 1.4.4 4.2.3 5.1.3

CROSSWALKS OF ARCHITECTURAL DESIGN STANDARDS AND THE COMMON CAREER TECHNICAL CORE

Architecture & Construction Career Cluster™ (AC)	Performance Indicators
1. Use vocabulary, symbols and formulas common to architecture and construction.	6.2.5; 6.3.2, 6.3.3
2. Use architecture and construction skills to create and manage a project.	6.2.5
3. Comply with regulations and applicable codes to establish and manage a legal and safe workplace.	ESCR 1.1.1 - 1.3.4
4. Evaluate the nature and scope of the Architecture & Construction Career Cluster™ and the role of architecture and construction in society and the economy.	2.1.1, 2.1.2, 2.1.3
5. Describe the roles, responsibilities and relationships found in the architecture and construction trades and professions, including labor/management relationships.	2.2.1, 2.2.3, 2.2.4
6. Read, interpret and use technical drawings, documents and specifications to plan a project.	1.1.1 - 1.1.4 5.1.4 - 5.1.8
7. Describe career opportunities and means to achieve those opportunities in each of the Architecture & Construction Career Pathways.	2.2.2, 2.2.3

Design/Pre-construction Career Pathway (AC-DES)	Performance Indicators
1. Justify design solutions through the use of research documentation and analysis of data.	5.3.5; 5.4.5
2. Use effective communication skills and strategies (listening, speaking, reading, writing and graphic communications) to work with clients and colleagues.	5.1.8 6.2.5; 6.3.2, 6.3.3; 6.4.1
3. Describe the requirements of the integral systems that impact the design of buildings.	3.3.4 5.1.2; 5.2.4; 5.3.4; 5.4.3
4. Apply building codes, laws and rules in the project design.	5.3.1 - 5.3.6; 5.4.1
5. Identify the diversity of needs, values and social patterns in project design, including accessibility standards.	5.3.1
6. Apply the techniques and skills of modern drafting, design, engineering and construction to projects.	3.1.1 - 3.3.4 4.1.1 - 4.10.10
7. Employ appropriate representational media to communicate concepts and project design.	6.2.5; 6.3.1 - 6.3.3
8. Apply standards, applications and restrictions pertaining to the selection and use of construction materials, components and assemblies in the project design.	5.2.1 - 5.2.4