CAAI-Unit-Plan-4B- Barrier Free Design- ARCHITECTURAL and URBAN DESIGN CONSIDERATIONS

Content Area: **CTE**
Course(s): **CA Interior Design**
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Unit Overview

This section deals with the design requirements of vertical and horizontal access in both new and existing constructions.

Each unit is composed of the following:

1) Problem identification: This part defines problems encountered by the disabled in the built-up environment owing to the absence or improper application of a certain measure or provision.

2) Planning principle: This part defines the target group, the general goal and the need for a certain measure.

3) Design considerations: This part deals with the technical and architectural aspects of implementing certain measures with regard to general and particular application characteristics, criteria, minimum dimensions and measurements, materials, etc.

Students will learn to design a barrier-free path for the safety and independence of disabled people, especially the sightless. This section deals with the design requirements of open spaces, recreational areas and pedestrian routes. It introduces solutions to the principal problems in the design of an accessible outdoor environment.

Enduring Understandings

Students will implement the lessons below into a design project every marking period:

1. RAMPS
2. ELEVATORS
3. PLATFORM LIFTS
4. STAIRS
5. RAILINGS AND HANDRAILS
6. ENTRANCES
7. VESTIBULES
8. DOORS

9. CORRIDORS
10. REST ROOMS

Students will also be able to implement the lessons below into a design project:

1. OBSTRUCTION free design
2. SIGNAGE
3. STREET FURNITURE
4. PATHWAYS
5. CURB RAMPS
6. PEDESTRIAN CROSSINGS
7. PARKING

Essential Questions

Is there a complementary ramped route next to stairs or steps?

Do steeper ramps comply with requirements?

Are ramps with the correct rise or more protected on both sides?

Is the width of the ramp at correct?

Is the surface of ramps non-slip?

Is the ramp surface clear of obstructions?

Is the location of the ramp clearly identifiable

Is the minimum width of the stairs correct?

Is an intermediate handrail installed for stairs when needed?

Do stairs have flush or rounded nosing?

Do treads have a non-slip surface?

Is the location of the stairs clearly identifiable?

Are safety guards or railings installed around all hazardous areas and raised platforms?

Are handrails continuous throughout the full length of ramps and stairs?

Are handrails continuous throughout the landing of ramps and stairs except when interrupted by doorways?

Are the primary entrances to buildings accessible?

Is the approach to the entrance free of stairs and steps?

Is the accessible entrance clearly identifiable?

Are the entrance landing dimensions sufficient?

Can entrance doors operate independently?

Is there enough space to maneuver between two sets of doors?

Is the minimum clear width of interior doors adequate?

Do door handles have a shape that is easy to grasp with one hand?

Does the corridor width allow maneuvering through doors located along its length?

Are water-closets, bidets, showers and sinks mounted at the right heights?

Are grab bars installed in water closets, bath tubs and showers?

Can all obstacles within the path of travel be easily identified by a person with partial sight?

Are all overhanging obstructions mounted at a minimum height of 2.00 m (1.95 m)?

Can all protruding objects within the path of travel be detected by a sightless person with a cane?

Are accessible spaces identified by the international symbol of accessibility?

Are there directional signs indicating the location of accessible facilities?

Are signs clear, simple and easy to read?

Are maps, information panels and wall-mounted signs placed at a height between 0.90 m and 1.80 m.?

Is the color of signs clearly distinguishable?

Is the surface of the sign processed so as to prevent glare?

Is the sign supplement by a text in embossed letters or in Braille available next to information signs?

Is the lettering size proportional to the reading distance?

Does the location of street furniture obstruct the free passage of pedestrians?

Are resting facilities provided at regular intervals?

Is there an adjoining space for a wheelchair next to benches and public seats?

Are public seats between the right height?
Are the tops of tables the right height ?
Are knee spaces at accessible tables adequate?

Are water fountain spouts mounted at an approximate height ?

Is the pathway clear of obstructions?

Is the path of travel free of steps or stairs?

s the path of travel easy to detect?

Is the surface, level, smooth and non-slip?

Does the pathway have a different color and texture than the adjacent surfaces?

Are the edges of raised pathways protected?
Are there barriers separating the pathway from planting areas, pools and other landscape features?

Are curb ramps provided to overcome differences in level between the road surface and pathway level at:
* Pedestrian crossings?
* Drop-off zones?
* Accessible parking spaces?
* Building entrances?

Are curb ramps located at each corner of each street intersection?

Is every curb ramp faced by another curb ramp on the opposite side of the street?

Is the road surface even and slip-resistant at pedestrian crossings?

Do traffic islands have street-level pathways cut through them?

Standards/Indicators/Student Learning Objectives (SLOs)

ARCH.9-12.9.4.12.B.(1).1	Demonstrate communication skills and strategies that are used to work effectively with potential clients and others.
ARCH.9-12.9.4.12.B.(1).2	Employ appropriate representational media to communicate concepts and design.
ARCH.9-12.9.4.12.B.(1).3	Integrate structural, environmental, safety, building envelope, and building service systems in the design of buildings and structures.
ARCH.9-12.9.4.12.B.(1).4	Review traditional project phases and various roles within them to plan for and implement phases within a project.
ARCH.9-12.9.4.12.B.(1).5	Evaluate and select suitable environmental impact practices to enhance project acceptance and quality.
ARCH.9-12.9.4.12.B.(1).6	Appreciate the diversity of needs, values, and social patterns in project design to appropriately meet client needs.
ARCH.9-12.9.4.12.B.(2).6	Describe testing and inspection procedures used to ensure successful completion of construction projects.
ARCH.9-12.9.4.12.B.(2).7	Assess the purpose for scheduling as it relates to successful completion of construction projects.

Lesson Titles

1. Accessibility- Housing Modifications for People with Special Needs
2. Circulation and Proportion
3. Consideration for Individual Spaces
4. Defining Space
5. Standard Clearance Spaces

Career Readiness, Life Literacies, & Key Skills

WRK.K-12.P.1	Act as a responsible and contributing community members and employee.
WRK.K-12.P.3	Consider the environmental, social and economic impacts of decisions.
WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
WRK.K-12.P.6	Model integrity, ethical leadership and effective management.
WRK.K-12.P.7	Plan education and career paths aligned to personal goals.
WRK.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
WRK.K-12.P.9	Work productively in teams while using cultural/global competence.

Inter-Disciplinary Connections

- Applied **Mathematics**
- **Arts** Related to Product "Form"
- **Historical** References & Perspectives
- Technical **Literacy**
- Applied **Sciences**

0x	Connections to Equations.
0x	During high school, students begin to formalize their geometry experiences from elementary and middle school, using more precise definitions and developing careful proofs. Later in college some students develop Euclidean and other geometries carefully from a small set of axioms.
0x	In real world problems, the answers are usually not numbers but quantities: numbers with units, which involves measurement. In their work in measurement up through Grade 8, students primarily measure commonly used attributes such as length, area, and volume. In high school, students encounter a wider variety of units in modeling, e.g., acceleration, currency conversions, derived quantities such as person-hours and heating degree days, social science rates such as per-capita income, and rates in everyday life such as points scored per game or batting averages. They also encounter novel situations in which they themselves must conceive the attributes of interest. For example, to find a good measure of overall highway safety, they might propose measures such as fatalities per year, fatalities per year per driver, or fatalities per vehicle-mile traveled. Such a conceptual process is sometimes called quantification. Quantification is important for science, as when surface area suddenly “stands out” as an important variable in evaporation. Quantification is also important for companies, which must conceptualize relevant attributes and create or choose suitable measures for them.
0xLA.9-	Analyze in detail a series of events described in a text; draw connections between the events, to

10.RH.9-10.3	determine whether earlier events caused later ones or simply preceded them.
LA.9-0x10.RH.9-10.9	Compare and contrast treatments of the same topic, or of various perspectives, in several primary and secondary sources; analyze how they relate in terms of themes and significant historical concepts.
LA.9-0x10.RST.9-10.5	Analyze the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).

SCI.HS	Engineering Design
SCI.HS-ETS1-4	Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.
SCI.HS-ETS1-1	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
SCI.HS-ETS1-3	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
TECH.8.2.12.D.CS1	Apply the design process.
TECH.8.2.12.D.CS2	Use and maintain technological products and systems.
TECH.8.2.12.E.2	Analyze the relationships between internal and external computer components.
	Connections to Equations.
	The concepts of congruence, similarity, and symmetry can be understood from the perspective of geometric transformation. Fundamental are the rigid motions: translations, rotations, reflections, and combinations of these, all of which are here assumed to preserve distance and angles (and therefore shapes generally). Reflections and rotations each explain a particular type of symmetry, and the symmetries of an object offer insight into its attributes—as when the reflective symmetry of an isosceles triangle assures that its base angles are congruent.

Anticipatory Set

Possibilities of short activities that will focus the student's attention before the actual lesson begins:

1. **Vocabulary connections-** terms and definitions in a short game of "Trash-ketball"
2. **Challenge**- Offer students sketching task and let them try to solve it as a group then present it to the class.
3. **Challenge**- Offer a volunteer student a CAD task and let him/ her solve it on the board.
4. **Use manipulatives or models**

- **Description:** Teacher will use physical models to prepare students to learn a specific concept or better highlight the critical attributes of new concepts. Teacher will use a variety of models of two or three-dimensional shapes.

1. **Show & Tell**: Use a prop from an article students are about to read related to industry. Examples: Professional drawings - Architectural, Interior Design, Engineering.
2. **Use a visual**- Teacher will use visual aides to encourage students to better connect to new concepts. Examples: Real drawings used in industry- Architectural, Interior Design, Engineering. The teacher will tell students that they have thirty seconds to remember everything they can about the drawing. After the thirty seconds, the teacher will remove the drawings and ask students to recall all they can

about them. The teacher will solicit ideas and use this to introduce distinguishing between main idea and supporting details.

Instructional Strategies, Learning Activities, and Levels of Blooms/DOK

Direct Instruction

- **Possibilities include**
  - Structured Overview
  - Lecture
  - Explicit Teaching
  - Drill & Practice
  - Compare & Contrast
  - Didactic Questions
  - Demonstrations
  - Guided & Shared - reading, listening, viewing, thinking

Interactive Instruction

- **Possibilities include**
  - Debates
  - Role Playing
  - Panels
  - Brainstorming
  - Peer Partner Learning
  - Discussion
  - Laboratory Groups
  - Think, Pair, Share
  - Cooperative Learning Groups
  - Jigsaw
  - Problem Solving
  - Structured Controversy
  - Tutorial Groups
  - Interviewing
  - Conferencing

Indirect Instruction

- **Possibilities include**
  - Problem Solving
  - Case Studies
  - Reading for Meaning
  - Inquiry
  - Reflective Discussion
  - Writing to Inform

- Concept Formation
- Concept Mapping
- Concept Attainment
- Cloze Procedure

Independent Study

- **Possibilities include**
  - Essays
  - Computer Assisted Instruction
  - Journals
  - Learning Logs
  - Reports
  - Learning Activity Packages
  - Correspondence Lessons
  - Learning Contracts
  - Homework
  - Research Projects
  - Assigned Questions
  - Learning Centers

Experiential Learning

- **Possibilities include**
  - Field Trips
  - Narratives
  - Conducting Experiments
  - Simulations
  - Games
  - Storytelling
  - Focused Imaging
  - Field Observations
  - Role-playing
  - Model Building
  - Surveys

Instructional Skills

- **Possibilities include**
  - Explaining
  - Demonstrating
  - Questioning
  - Questioning Technique
  - Wait Time
  - Levels of Questions

Modifications

At Risk Modifications

The possible list of modifications/accommodations identified for Special Education students can be utilized for At-Risk students. Teachers should utilize ongoing methods to provide instruction, assess student needs, and utilize modifications specific to the needs of individual students. In addition, the following may be considered:

- Additional time for assignments .
- Adjusted assignment timelines .
- Agenda book and checklists .
- Answers to be dictated .
- Assistance in maintaining uncluttered space .
- Books on tape .
- Concrete examples .
- Extra visual and verbal cues and prompts .
- Follow a routine/schedule .
- Graphic organizers .
- Have students restate information .
- No penalty for spelling errors or sloppy handwriting .
- Peer or scribe note-taking .
- Personalized examples .
- Preferential seating .
- Provision of notes or outlines .
- Reduction of distractions .
- Review of directions .
- Review sessions .
- Space for movement or breaks .
- Support auditory presentations with visuals .
- Teach time management skills .
- Use of a study carrel .
- Use of mnemonics .
- Varied reinforcement procedures .
- Work in progress check .

ELL Modifications

-
  - Choice of test format (multiple-choice, essay, true-false)
  - Continue practicing vocabulary
  - Provide study guides prior to tests
  - Read directions to the student
  - Read test passages aloud (for comprehension assessment)
  - Vary test formats

IEP & 504 Modifications

*All teachers of students with special needs must review each student's IEP. Teachers must then select the appropriate modifications and/or accommodations necessary to enable the student to appropriately progress in the general curriculum.

Possible Modifications/Accommodations: (See listed items below):

- Allow for redos/retakes .
- Assign fewer problems at one time (e.g., assign only odds or evens) .
- Differentiated center-based small group instruction .
- Extra time on assessments .
- Highlight key directions .
- If a manipulative is used during instruction, allow its use on a test .
- Opportunities for cooperative partner work .
- Provide reteach pages if necessary .
- Provide several ways to solve a problem if possible .
- Provide visual aids and anchor charts .
- Test in alternative site .
- Tiered lessons and assignments .
- Use of a graphic organizer .
- Use of concrete materials and objects (manipulatives) .
- Use of word processor .

G&T Modifications

- Higher learners are allowed to briefly examine the upcoming content so they can start formulating thoughts in their minds, focus and examine the upcoming content.

- Encourage higher learners to take a pre-test so they can demonstrate prior knowledge and mastery of the upcoming content.
- Eliminate practice and instructional time for higher learners who demonstrate they have mastered lesson concepts.
- Let higher learners pursue independent more advanced projects.
- Allow higher learners to work on more advanced activities during the time other students are learning through direct instruction.
- Teach higher learners to keep a detailed portfolio of the drawings and class work.
- Create opportunities for collaboration by making higher learners team leaders.
- Engage in small discussion sessions to offer higher learner the opportunity to process knowledge on a deeper level.

Formative Assessment

-
  - Alternate assignments/enrichment assignments
  - Enrichment projects
  - Extension activities
  - Higher-level cooperative learning activities
  - Pairing direct instruction with coaching to promote self-directed learning
  - Provide higher-order questioning and discussion opportunities
  - Provide texts at a higher reading level
  - Tiered assignments
  - Tiered centers

Summative Assessment

- Quiz, Test, MP Assessments about the specified lesson: **Planning for Individual Spaces- Barrier Free Design**

- Final examination (a truly summative assessment) about the specified lesson.
- Projects (project phases submitted at various completion points could be formatively assessed) about the specified lesson.
- Portfolio that include all class assignments.
- Student evaluation of the lesson (teaching effectiveness).
- Instructor self-evaluation about the current lesson
- By Rubric shown below.

Interior Design Rubric

Presentation Board and Design

Performance Task	0	2	4	6	
Presentation Board	Board is incomplete	Board is partially complete but is missing key elements; no labels	Board is complete and has all of the required elements and with necessary neatness	Board is exceptional. It is done with impeccable neatness and creativity. Attention is paid to detail and contains all required elements.	
Scaled Room Floor plan	Did not appear to use any scale	scale used, but not ¼"	¼" scale used, but inconsistently	¼" scale consistently used	
Room Dimensions	No room dimensions labeled	Some room dimensions labeled, but sloppy	Some room dimensions labeled	All room dimensions labeled	
Furniture Arrangement	No furniture arrangement shown	Poorly arranged, both form and function	Good form OR function, not both	Well-arranged for form and function	
Samples	No samples provided	Some samples, not all provided	Some well-chosen, but not well coordinated	Well-chosen and coordinated	
Principles/Elements of Design	Principles/elements of design not applied	Principles/elements applied only minimally	Most principles/elements of design applied	Principles/elements of design applied consistently	
Overall Effectiveness	Lacking in visual appeal	Minimal visual appeal	Some visual appeal	Great visual appeal, very effective	
Professionalism	No organization	Somewhat organized, but elements poorly mounted, some grammar mistakes	Organized and some elements mounted properly	Very organized, all elements mounted properly, proper grammar, no misspellings	

ORAL PRESENTATION					
Performance Task	**0**	**1**	**2**	**3**	
Organization/Delivery	Presentation is not done or speaks briefly and does not cover components of project	Presentation covers some topic elements	Presentation covers all topic elements but with minimal information	Presentation covers all relevant information with a seamless and logical delivery	
Knowledge of Subject Matter	Little or no evidence of knowledge	Minimal evidence of knowledge	Knowledge of subject matter is evident but not shared in presentation	Knowledge of subject matter is evident and incorporated throughout the presentation	
Rationale of Design Decisions Explained	No rationale of design decisions explained	Design decisions are somewhat explained	Design decisions are	Design decisions are	

		but show little understanding of Clients' needs and style	explained thoroughly and show complete understanding of Clients' needs and style	explained fully and reflect thorough understanding of Clients' needs and style.	
Use of Display Boards during Presentation	Display boards are not used during presentation	Display boards used to limit amount of speaking time	Display boards used minimally during presentation	Display boards used effectively throughout presentation	
Voice-Pitch, Tempo, Volume	No voice qualities are used effectively	Voice quality is adequate	Voice is good but could be improved	Voice quality is outstanding and pleasing to listen to	
Body Language/Clothing Choice	Body language shows nervousness and unease/inappropriate clothing	Body language shows minimal amount of nervousness/clothing is appropriate	Body language is good and clothing is professional	Body language and clothing choice both enhance the presentation	
Grammar/Word Usage/Pronunciation	Extensive (more than 5) grammatical and pronunciation errors	Some (3-5) grammatical and pronunciation errors	Few (1-2) grammatical and pronunciation errors	Presentation has no grammatical or pronunciation errors	

Resources & Materials

- Residential Housing and Interiors, 4th Edition b**y:** Clois E. Kicklighter, Ed. D. and Joan C. Kicklighter
- Housing and Interior Design By: Evelyn L. Lewis, Ed.D., Carolyn Turner Smith, Ph.D
- Interior Design By : Stephanie Clemons
- Glencoe Mechanical Drawing: Board and CAD Techniques, Student Edition: 1st (First) Edition by Glencoe McGraw-Hill
- Basic Technical Drawing by Spencer, Dygon, Novak Glencoe McGraw-Hill
- Exploring Drafting, Instructor's Manual Instructor's Manual, 10th Edition by John R. Walker (Author), Bernard D. Mathis

Technology Materials and Standards

Specific technology resources include:

- Autodesk REVIT- Software
- Google SketchUp Software
- AutoCAD Architecture Software
- Smart boards
- Computers

- Chrome Books
- 3D printer
- Large format Printer (plotter)

9.3.12.AR-PRT.2	Demonstrate the production of various print, multimedia or digital media products.
9.3.12.AR-PRT.3	Perform finishing and distribution operations related to the printing process.
9.3.12.AR-TEL.3	Demonstrate decision making, problem-solving techniques and communication skills when providing services for customers.
9.3.12.AR-VIS.2	Analyze how the application of visual arts elements and principles of design communicate and express ideas.
9.3.12.AR-VIS.3	Analyze and create two and three-dimensional visual art forms using various media.

Computer Science and Design Thinking Standards

CS.9-12.8.1.12.CS.2	Model interactions between application software, system software, and hardware.
CS.9-12.8.1.12.CS.3	Compare the functions of application software, system software, and hardware.
CS.9-12.CS	Computing Systems
	Successful troubleshooting of complex problems involves multiple approaches including research, analysis, reflection, interaction with peers, and drawing on past experiences.
	A computing system involves interaction among the user, hardware, application software, and system software.