ID 40
Residential Design

Universal Design
Universal Design

- The average American population is aging.
  - 13% of Americans are over 65.
- Addressing the needs of this new demographic is one of the fastest growing trends in the design/build industry.
- During the next decade, Universal Design will transform:
  - Real estate
  - Design/build approaches
  - Construction standards
Varied Approaches:

● A simple definition means “finding opportunities for helping every client live better”…
  ▼ Designing for the needs of the elderly.
  ▼ Providing friendlier environments for children.

● Universal Design addresses the concept of “aging in place”.
  ▼ To acknowledge that we will all having changing needs throughout our lives.

Design Challenge: Consider the needs of everyone in the home. Examine the variety of ways each person will use the space.
Universal Design Principles:

- The goal of Universal Design is to allow people to live better in their personal environments.
- Universal Design removes the social stigma associated with physical impairment and aging.
  - There is a wealth of attractive, ADA-compliant home products available today.
  - Most design solutions are not expensive.
- There are seven basic principles of Universal Design.
Principle One: EQUITABLE USE

- The design of the building/space should make it equally usable by everyone.
  - ▼ Provide the same identical means of use for all users wherever possible.
  - ▼ Avoid segregating or stigmatizing any users.
  - ▼ Provide the same level of privacy, security and safety to all users.
  - ▼ Create a design appealing to all users.
Principle Two: FLEXIBLE USE

- The design accommodates a wide range of individual preferences and abilities:
  - Provide flexibility so the space can be usable in an unanticipated manner.
  - Accommodate both left and right handed access/use.
  - Provide adaptability to the client’s pace.
  - Help increase the client’s accuracy and precision.
Principle Three: INTUITIVE USE

- Everyone in the building/space should understand the purpose of each design feature and how to use it.
  - Regardless of the client’s experience, knowledge, language skills, and/or current concentration level.
  - Eliminate unnecessary complexity.
  - Usage should be consistent with the expectations and intuition of all users.
Principle Four: PERCEPTIBLE INFORMATION

- The building/space communicates all necessary information to the client, regardless of their sensory abilities.
  - Present a variety of communication modes (written, pictorial, tactile, verbal).
  - Provide contrast between essential information and its surroundings.
  - Maximize legibility of essential information.
Principle Five: TOLERANCE FOR ERROR

- Eliminate, isolate, or shield any design features that could prove hazardous through accidental or unintended actions.
  - Provide warning features as clients approach hazardous areas.
  - Provide fail safe features.
Principle Six:
LOW PHYSICAL EFFORT

- Provide design features that require little or no physical force to use.
  - ▼ Allow the client to maintain a neutral body position.
  - ▼ Minimize repetitive actions.
  - ▼ Minimize sustained physical effort.
  - ▼ Provide a smooth travel surface with minimal slope.
Principle Seven: Adequate Space for Approach and Use.

- Appropriate size and space is provided for approach, reach, manipulation, and use regardless of body size, posture, or mobility.
  - Provide clear lines of sight for both seated and/or standing users.
  - Accommodate variations in hand and grip size.
  - Make reach to all design features comfortable for all users.
  - Provide a clear path of travel.
Basic Considerations:

- Observe the client’s lifestyle:
  - Notice physical abilities as well as limitations.
- Place yourself in the client’s place and envision activities that will allow feelings of independence.
  - Foster a positive tone for the environment.
- Question the client about what works best.
  - Investigate alternatives.
  - Educate clients about usability and accessibility.
- Use as many motorized, remote-controlled, motion detector products as possible.
Basic Considerations:

- Look beyond industry standards.
  - Standards/codes should be viewed as minimum requirements and not rote applications.

- Look beyond the ordinary.
  - Keep searching for hidden opportunities, new products.

- Understand that clients need environments that they can use.
  - Pay special attention to kitchen and bath designs.
Basic Considerations:

- Plan closets directly above each other in multi-story houses.
  - These areas could house an elevator or chair-lift if needed at a later date.
- Design step-less entries, wide doorways, and large doors to accommodate wheelchair usage.
- Build platforms around bathtubs to provide easier access.
- All bathroom walls should have blocking to support grab bars.
General Space Planning:

- Doorways must have a 32” minimum “clear width” opening.
  ▼ Do not specify a door narrower than 2’-10”.
- Include extra space next to the latch side of the door.
  ▼ A seated person remains clear of the door swing.
  ▼ This area should be 18” to 24” wide and 48” to 60” deep.
- Hallway widths must be a minimum of 3’-6” wide.
  ▼ This provides room for the 90 degree turning radius of the wheelchair.
Emergency Egress:

Always design emergency egress windows in the main bedroom areas.

▼ These will become emergency exits in case of fire, etc.
▼ For a seated person to use this exit, the window must be:
  - 18” minimum to 24” maximum a.f.f.
  - At least 30” wide.

This allows safety personnel to reach in and assist the disabled person during the emergency...
General Kitchen Planning:

- We will cover Kitchen and Bath design later in the semester.
- Here are a few basic considerations to help you pre-plan your design.
- **REMEMBER:** Your design goal is to help your client maintain a high quality of life and to keep living as independently as possible.
Kitchen Planning:

- Consider proxemics in your design.
  - In a wheelchair, the maximum reachable height is 54”.
  - The maximum horizontal reach is 44”.
- Countertops should be no higher than 30” to 34”.
  - NKBA recommends a countertop height between 28” to 38” a.f.f.
- Always provide some standard height counters to accommodate all the cooks in the home.
- Motor-driven, adjustable counters are available.
  - This may be a smart investment for sink and cooktop areas with multiple users.
Kitchen Planning:

- Consider the “working triangle” in the kitchen.
  
  ▼ The imaginary line from the center of the sink, to the center of the cooktop and refrigerator.
  
  ▼ Each “leg” should be 4’ to 9’ long.
  
  ▼ The sum of the “legs” should be no less than 12’ and no greater than 26’.

- Traffic patterns should never intersect any portion of the working triangle.
Kitchen Island:

- If an island will include an eating area, there should be 65” of clearance from the counter edge to the next wall/obstruction.
  - This allows traffic to pass behind the diner.
- Allow 36” of clearance between counters and any island area.
  - Where 2 pathways intersect, allow 42” to accommodate the wheelchair turning radius.
Microwave Placement:

- Consider microwave placement in relation to all users.
  - Typical installation heights vary from 24” to 48” a.f.f.

- A seated user may need a location lower than 24”.
  - Ideally located +/- 6” from the seated user’s elbow height.

Refer to the articles in your hand-outs to research additional interesting solutions to Universal kitchen and bath needs.
Final “Food for Thought”...

- Consider the type of wheelchair your client uses.
  - Review the many different styles and sizes available.
  - Your client may use more than one type.
  - Research the dimensions of your client’s specific model and tailor your design approach.

- Review the table of “Safety and Security Problems” you have been given.
  - Foster ways to avoid hazards for your client.

- Revisit these materials throughout your design process.