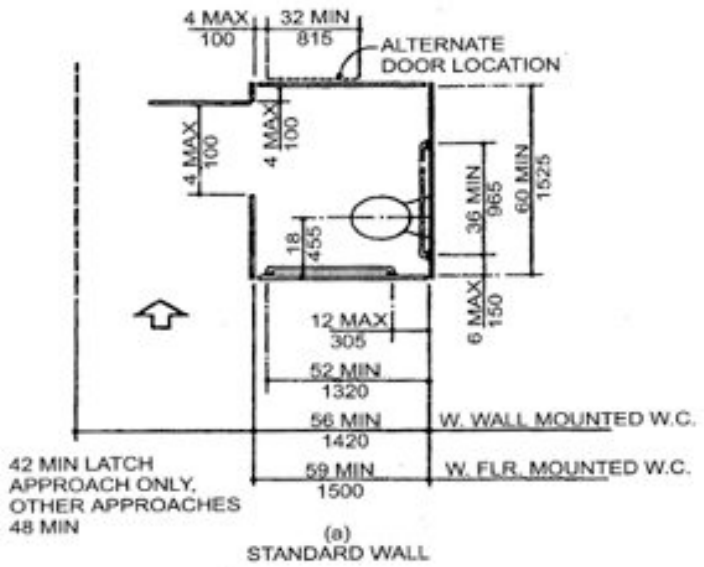
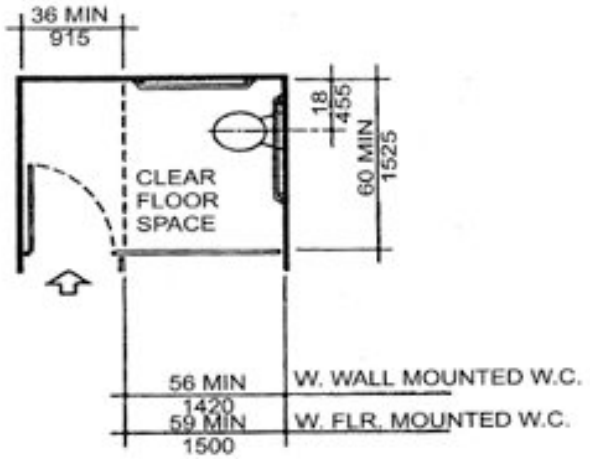
How architects see accessibility: code compliance



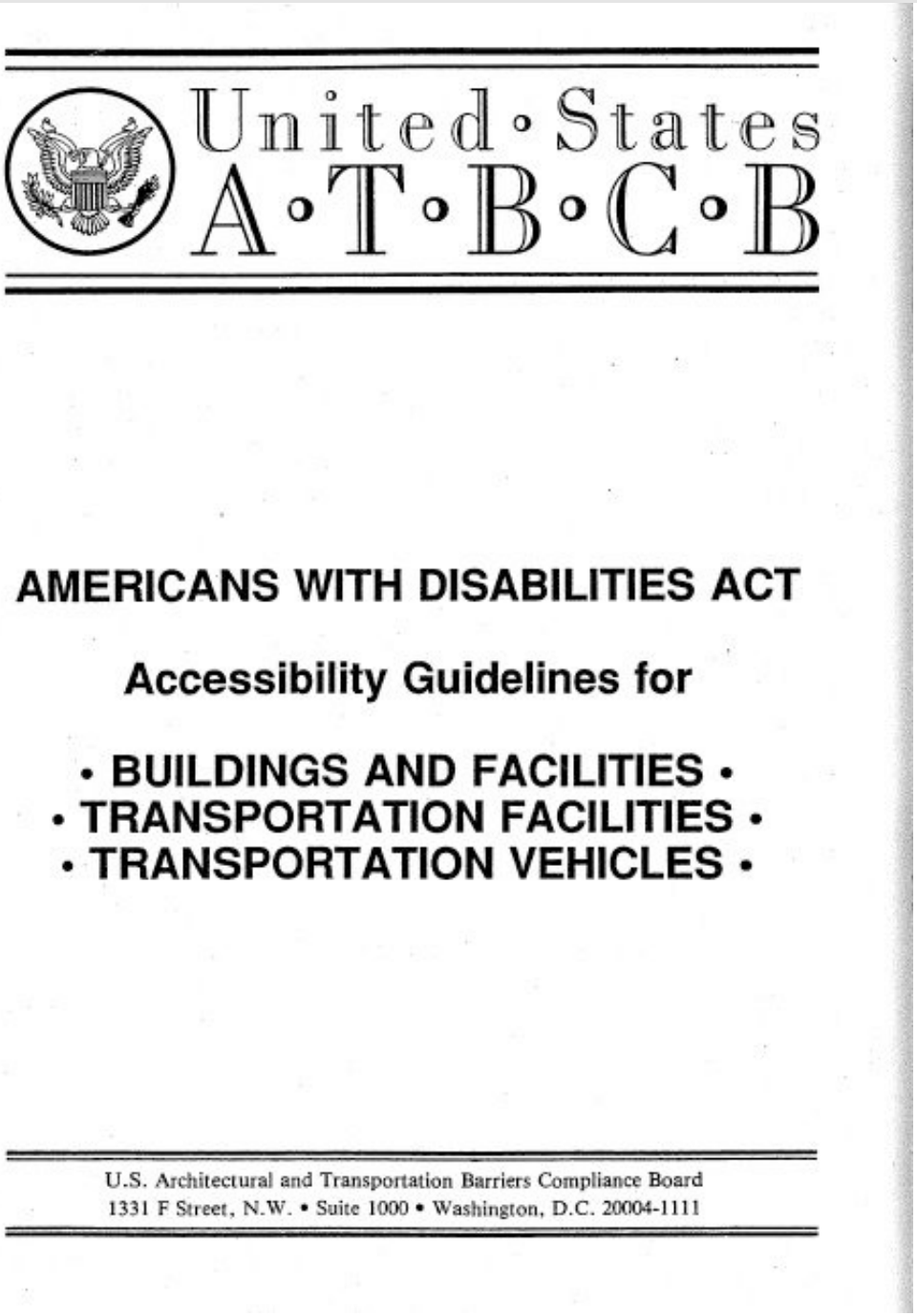
(a)
STANDARD WALL



(a-1)
STANDARD STALL (END OF ROW)

ADAAG FIGURE 30
TOILET STALLS

How owners see accessibility: ADA standards



United States
A·T·B·C·B

AMERICANS WITH DISABILITIES ACT

Accessibility Guidelines for

• BUILDINGS AND FACILITIES •
• TRANSPORTATION FACILITIES •
• TRANSPORTATION VEHICLES •

U.S. Architectural and Transportation Barriers Compliance Board
1331 F Street, N.W. • Suite 1000 • Washington, D.C. 20004-1111

How architects see accessibility: minimum = maximum

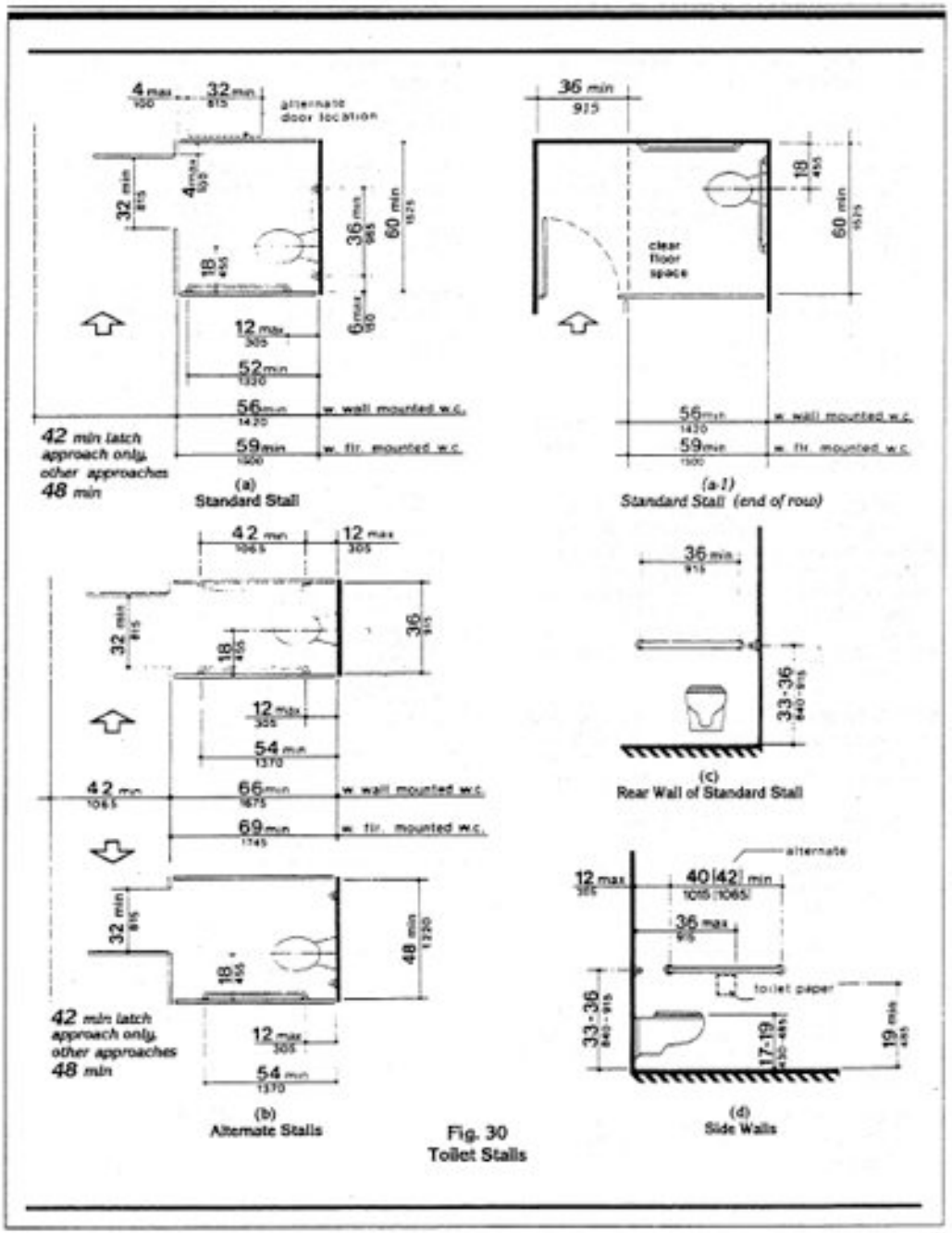
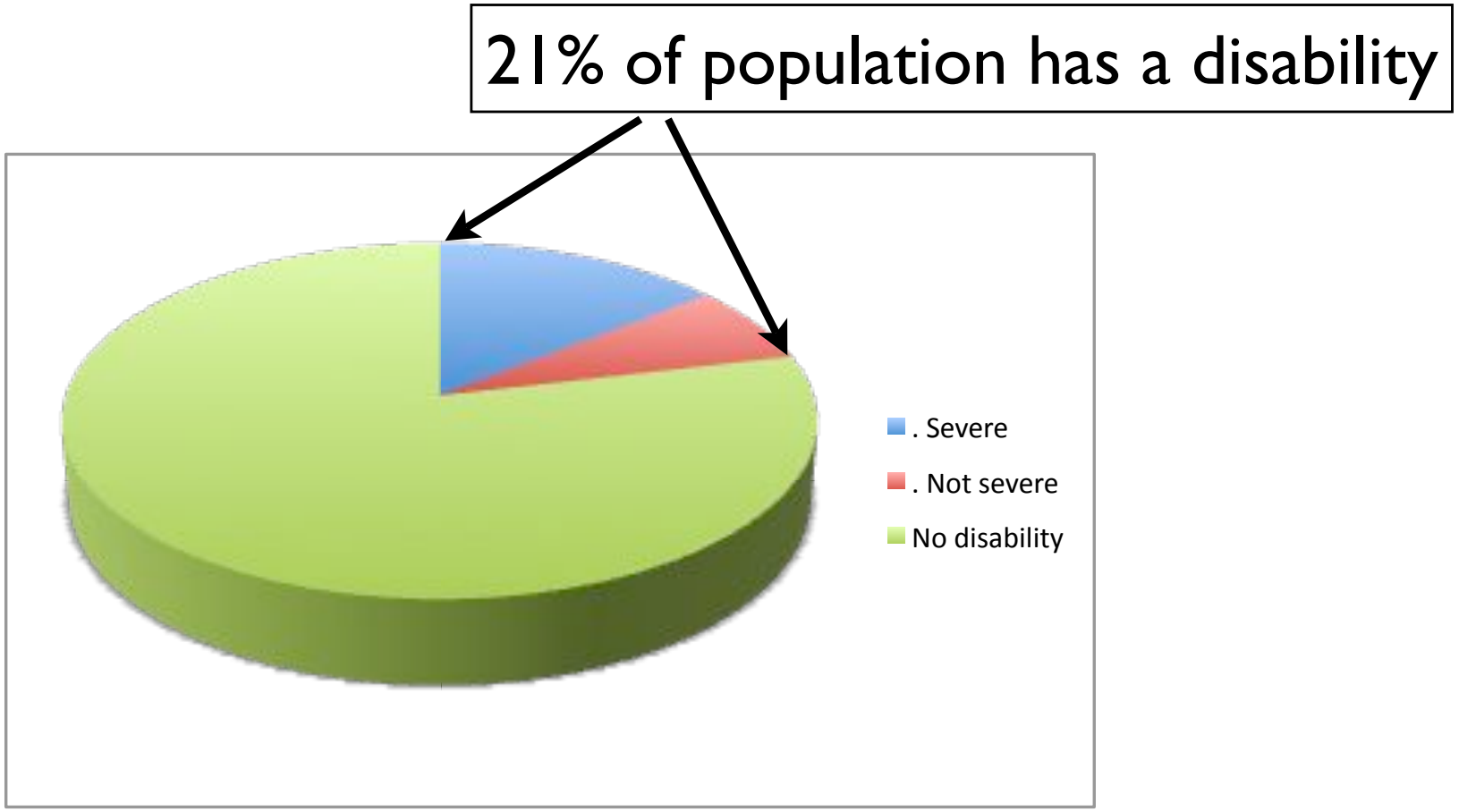


Fig. 30
Toilet Stalls

How the community sees accessibility

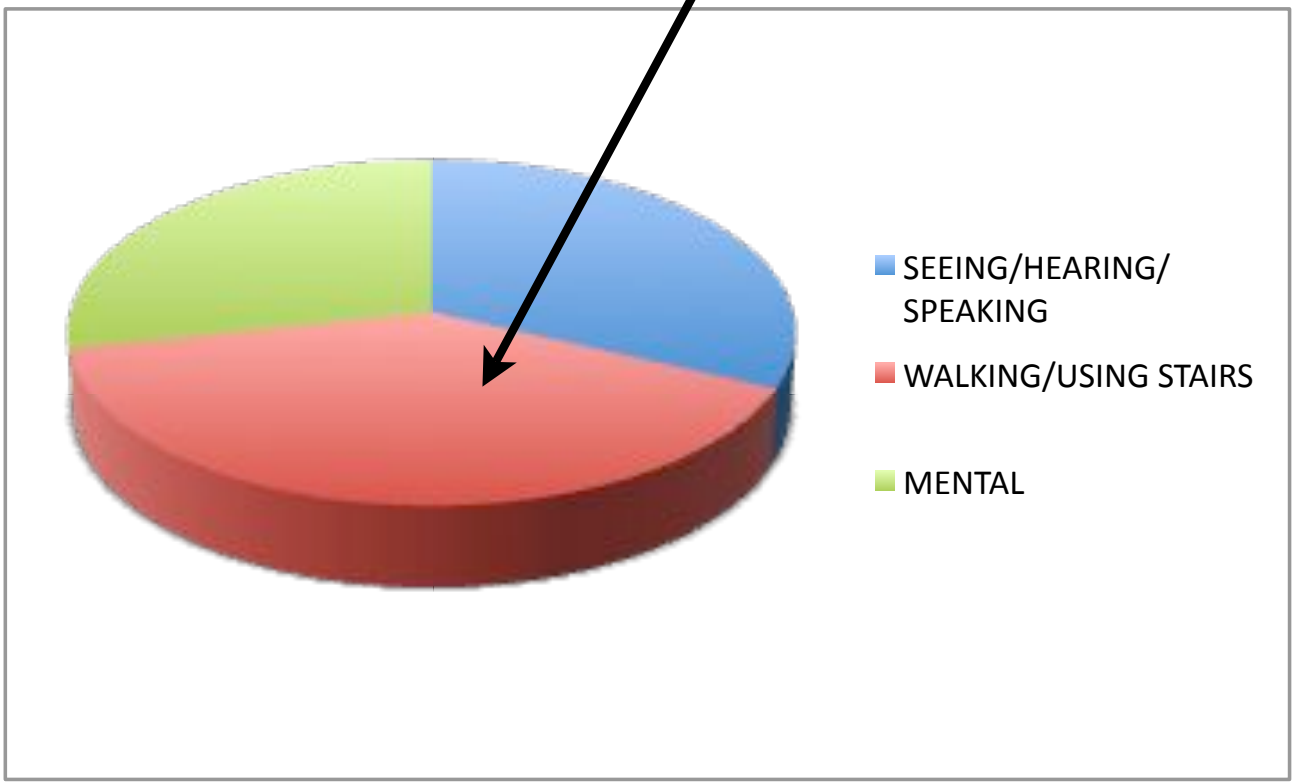
How the community sees accessibility

Statistics: percentages of US population with a disability (2005)



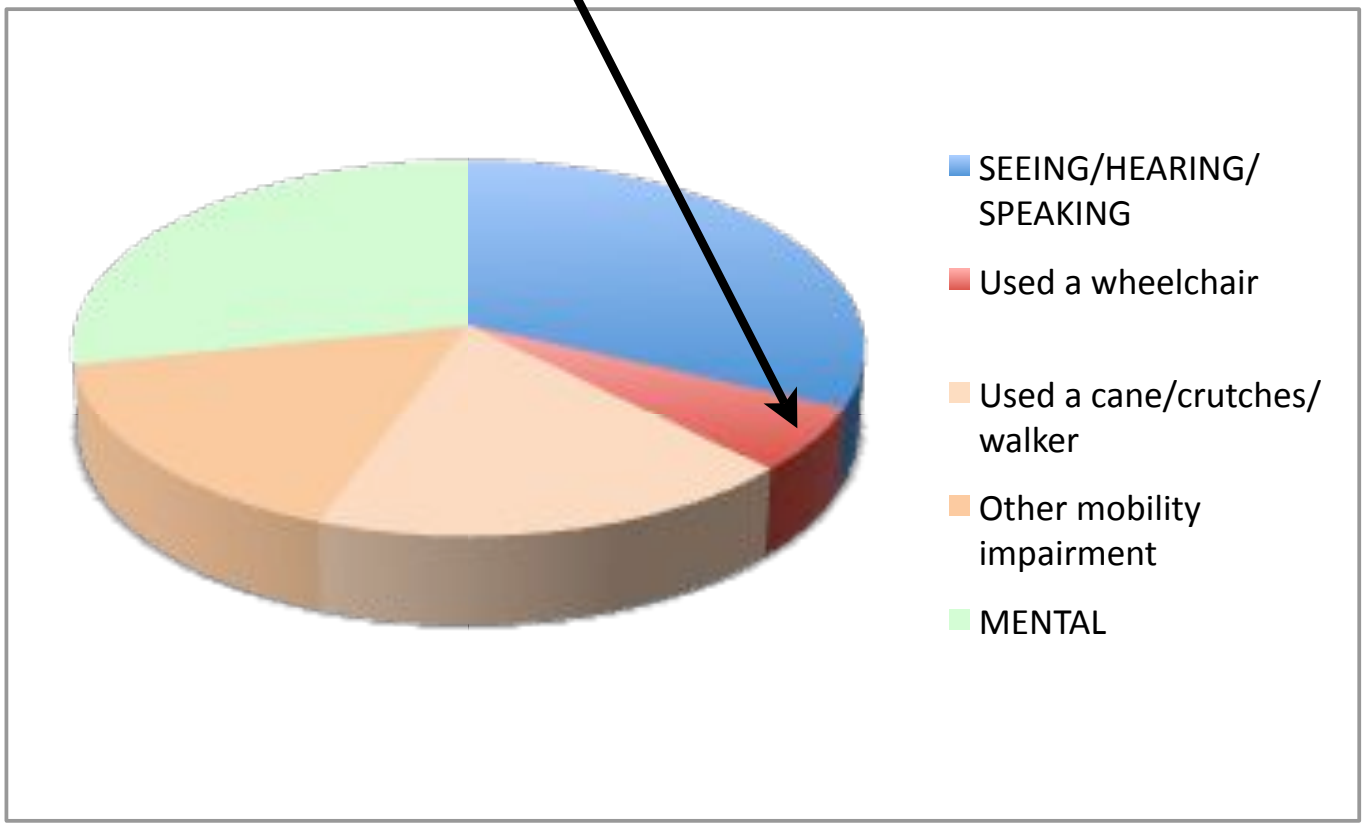
Statistics: disability type by percentage (2005)

less than 10% of population has mobility impairments



Statistics: disability type by percentage & mobility aid (2005)

less than 2% of population uses a wheelchair



Universal Design: Where we are coming from

1920s-1950s: no access...front door or rear

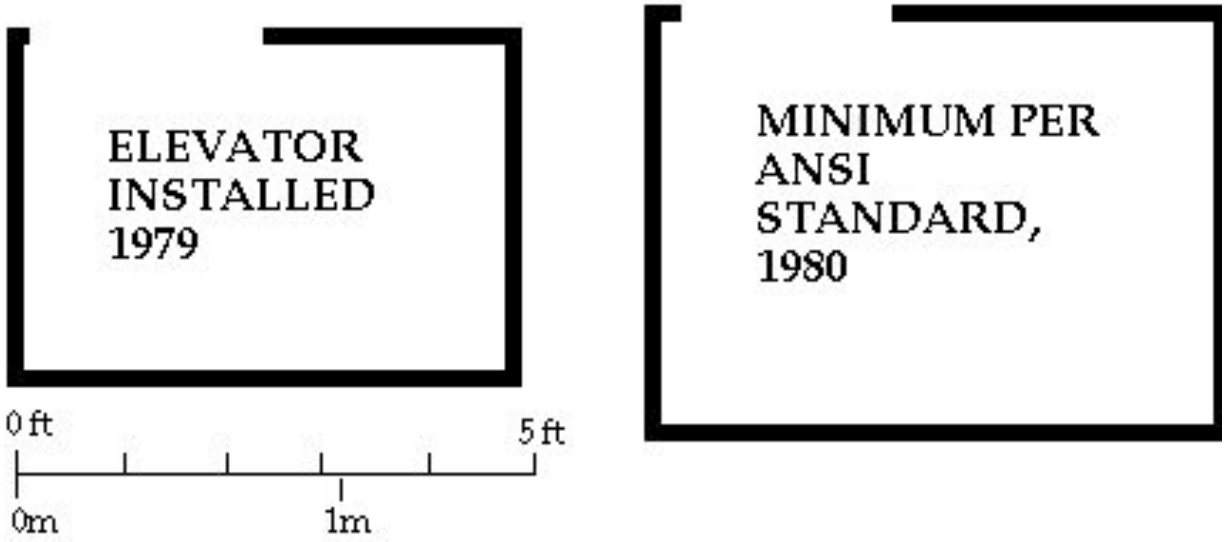
A brief history of accessible schools

1960s: some feeble...and dangerous...attempts

A brief history of accessible schools

1970s Rehabilitation Act: response and ineffectiveness

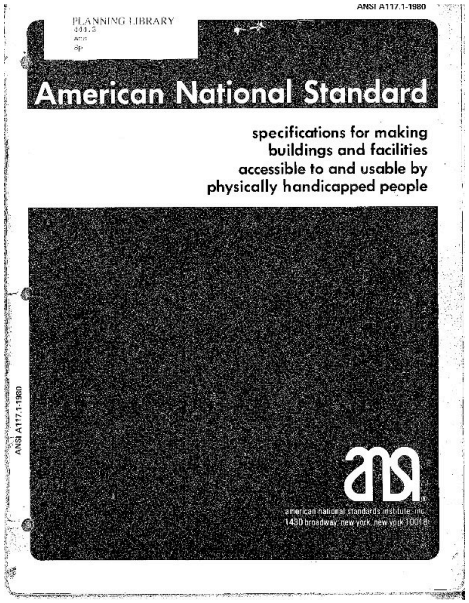
A brief history of accessible schools



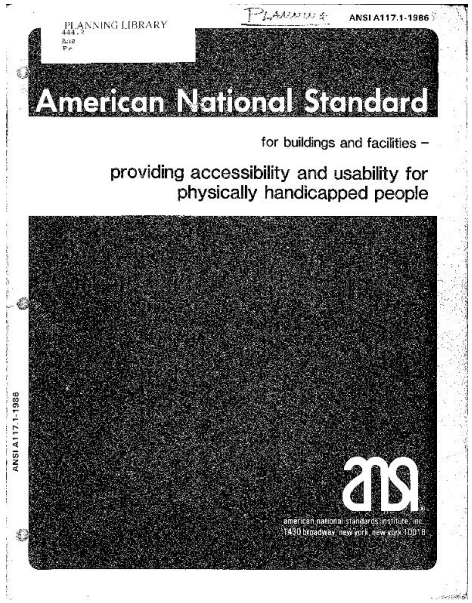
1980s: change happens!

The ever-changing landscape of Federal accessibility standards

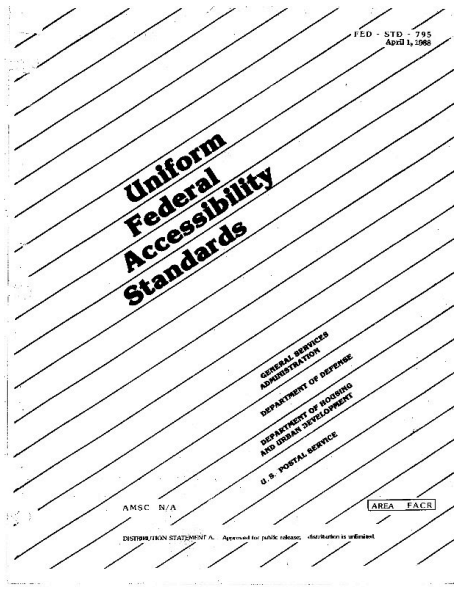
1977



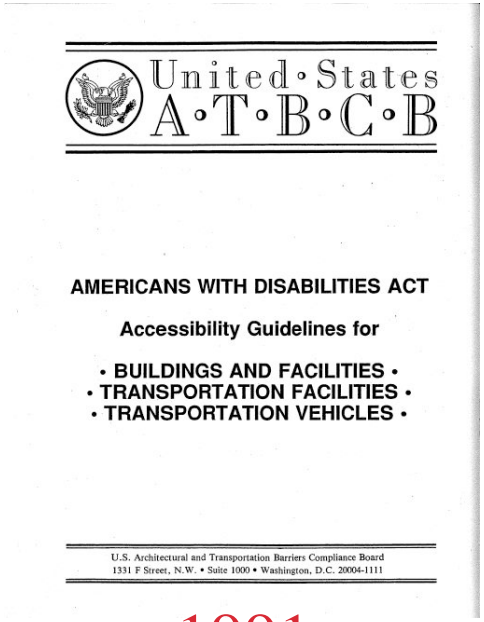
1980



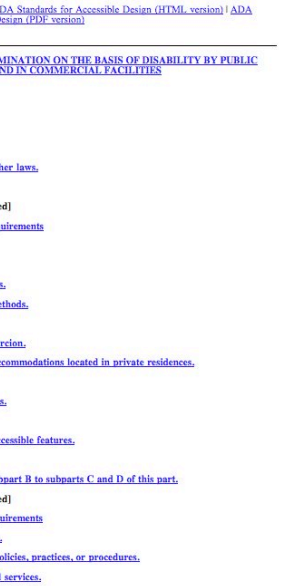
1986



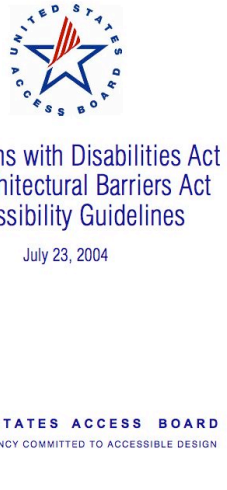
1988



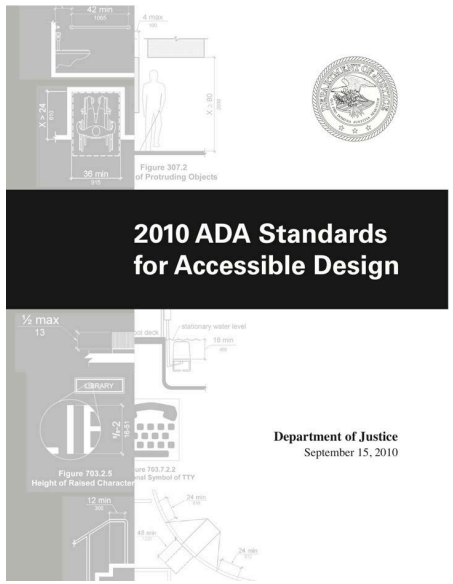
1991



1992



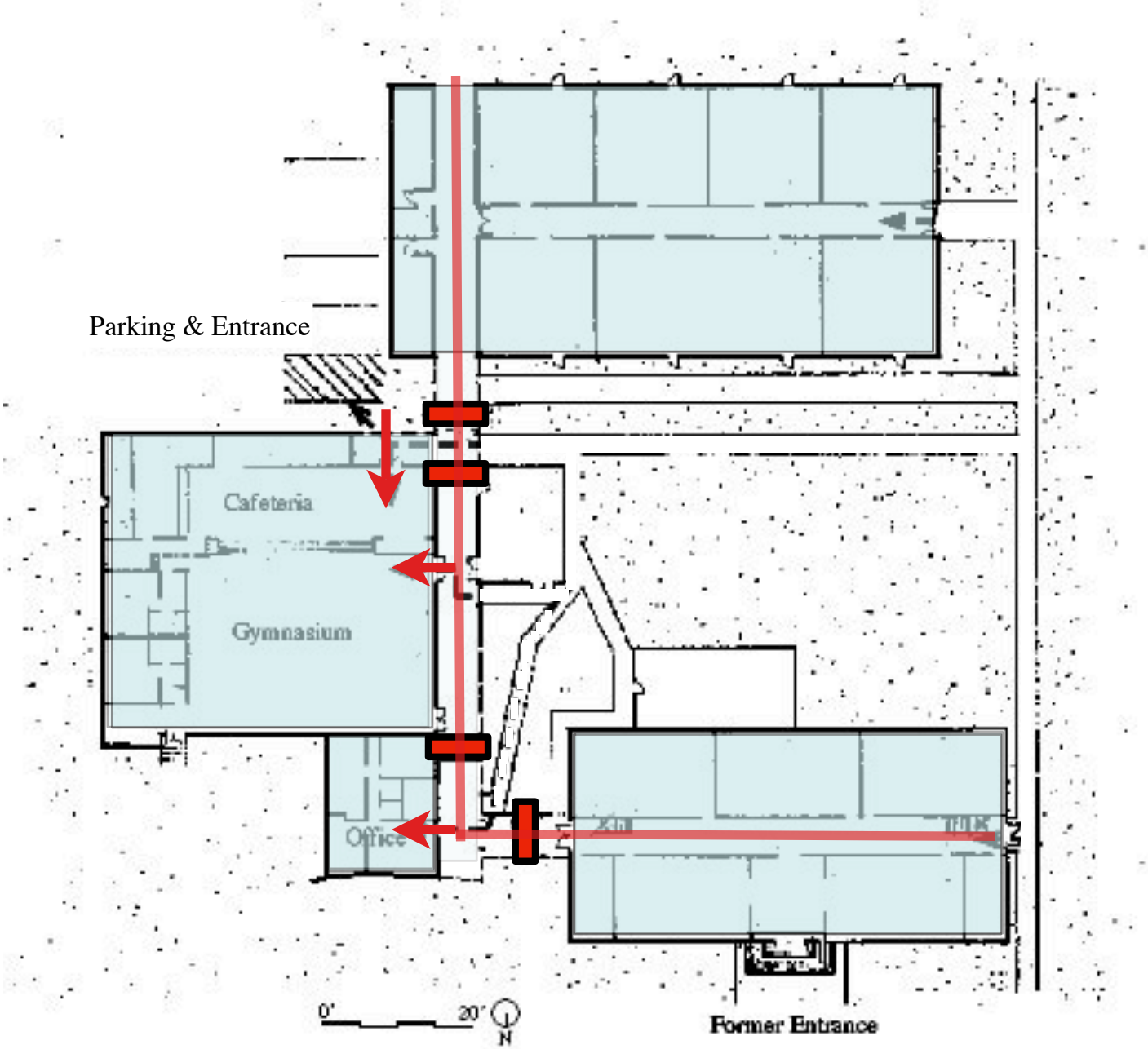
2004*



2010

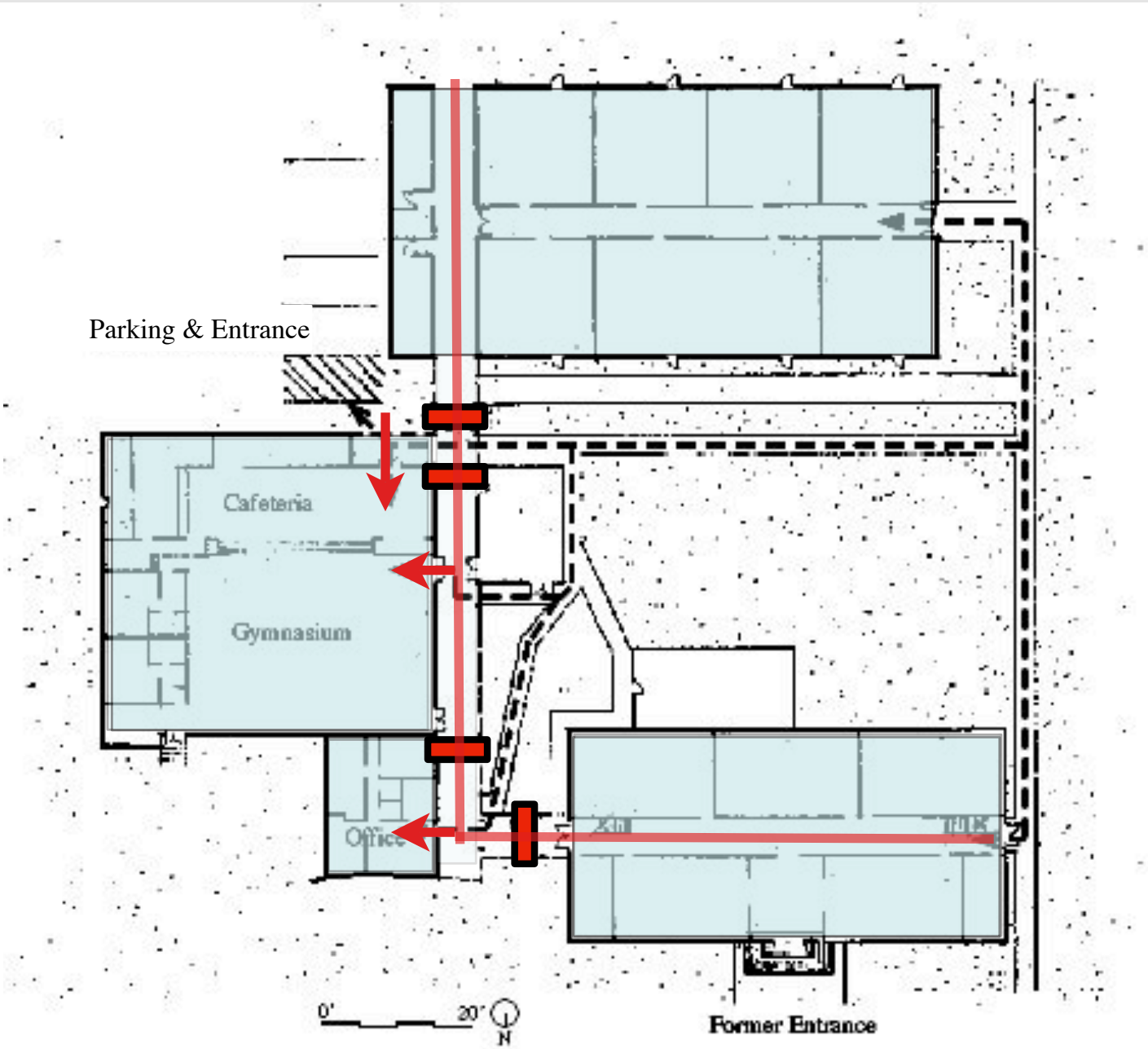
The ever-changing landscape of Federal accessibility standards

A brief history of accessible schools



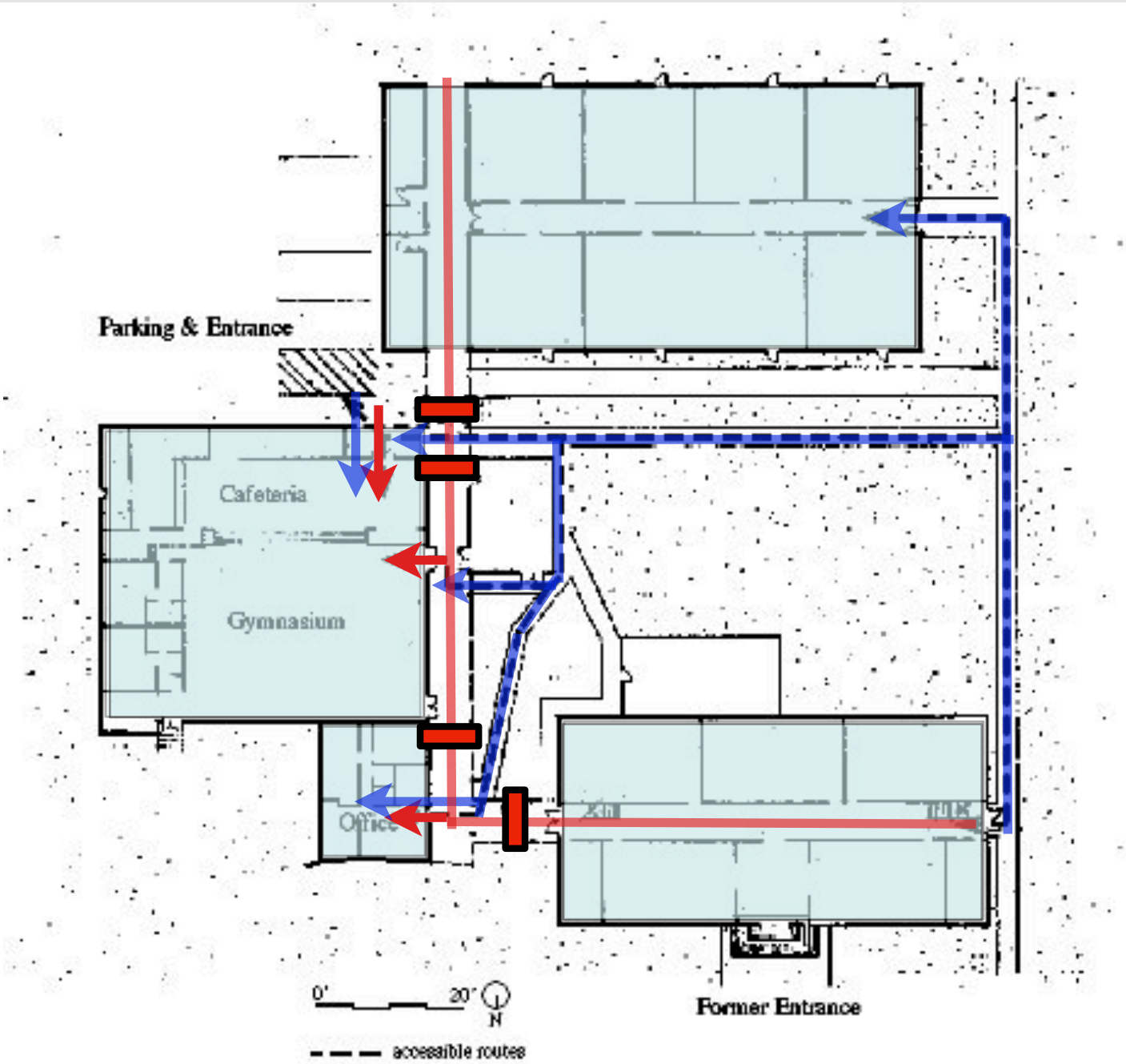
1980s: effective standards

A brief history of accessible schools



1980s: effective standards, implementation challenges

A brief history of accessible schools



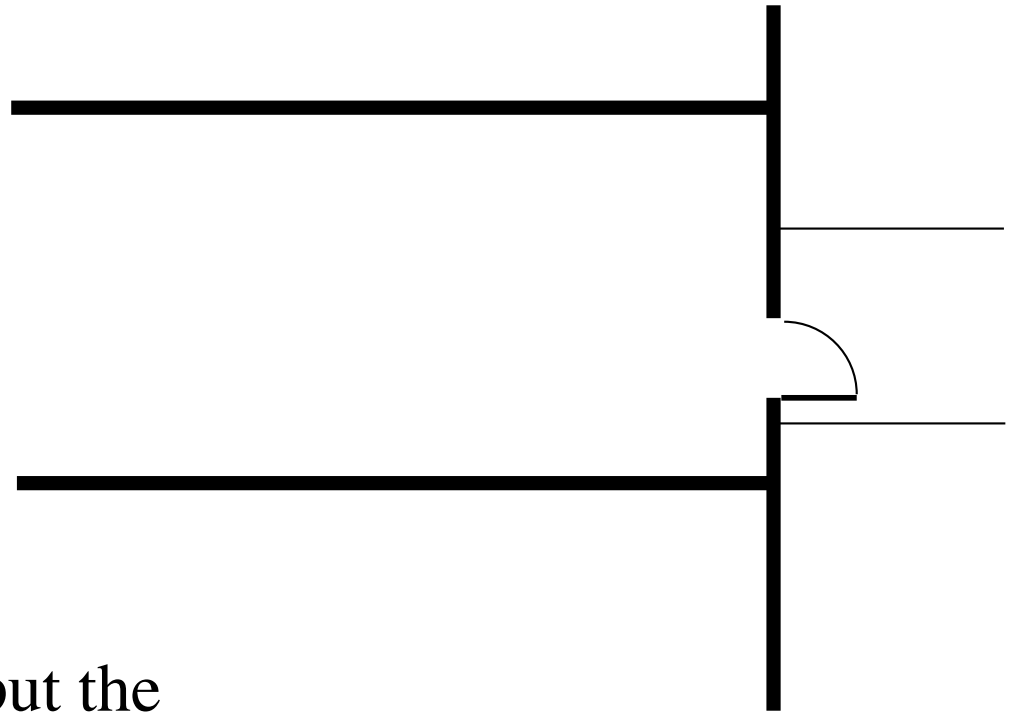
1980s: effective standards: **but does this work?**

A brief history of accessible schools

1995 to present: accessible design, but mimimum becomes maximum

Universal Design: the challenge of social isolation

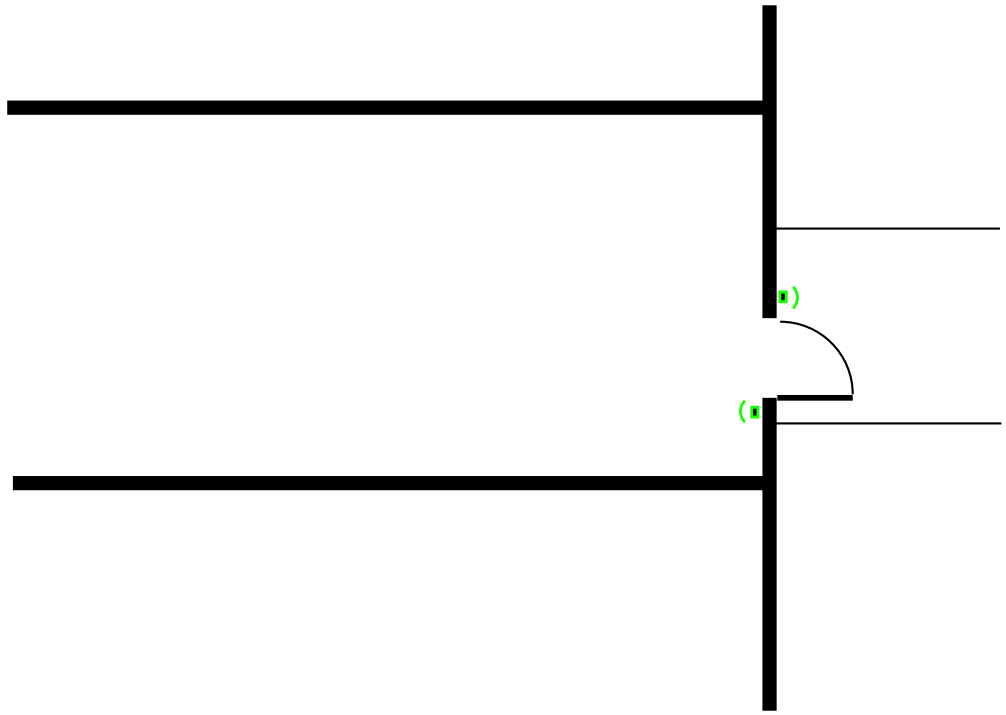
Universal Design: whole population



Where to put the
door actuator buttons?

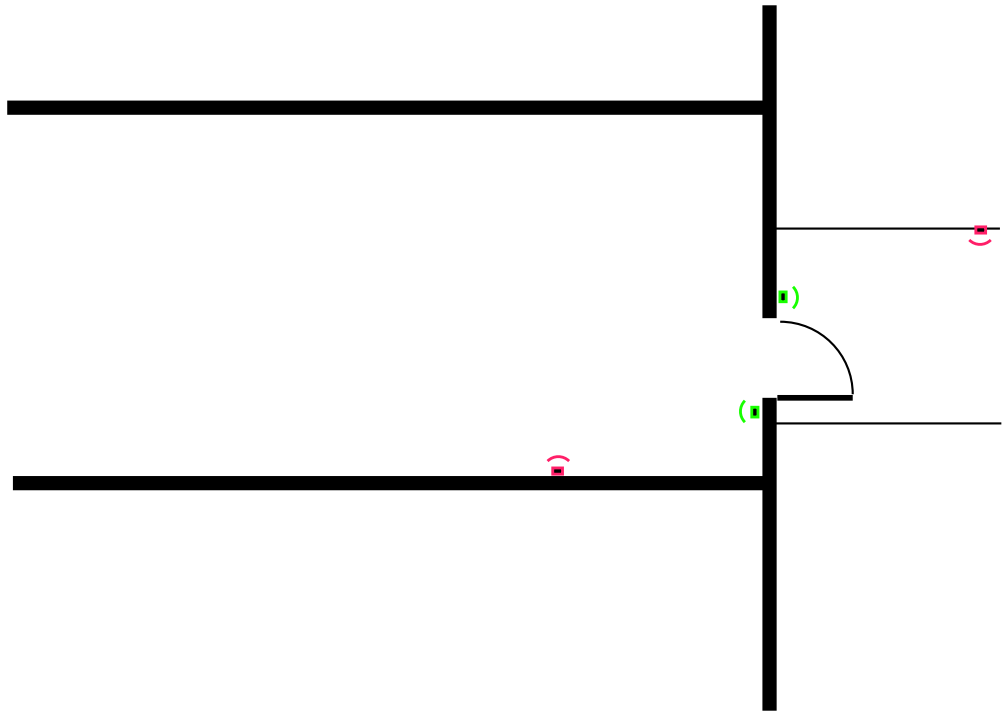
Where next? Going beyond the standards...

Universal Design: whole population



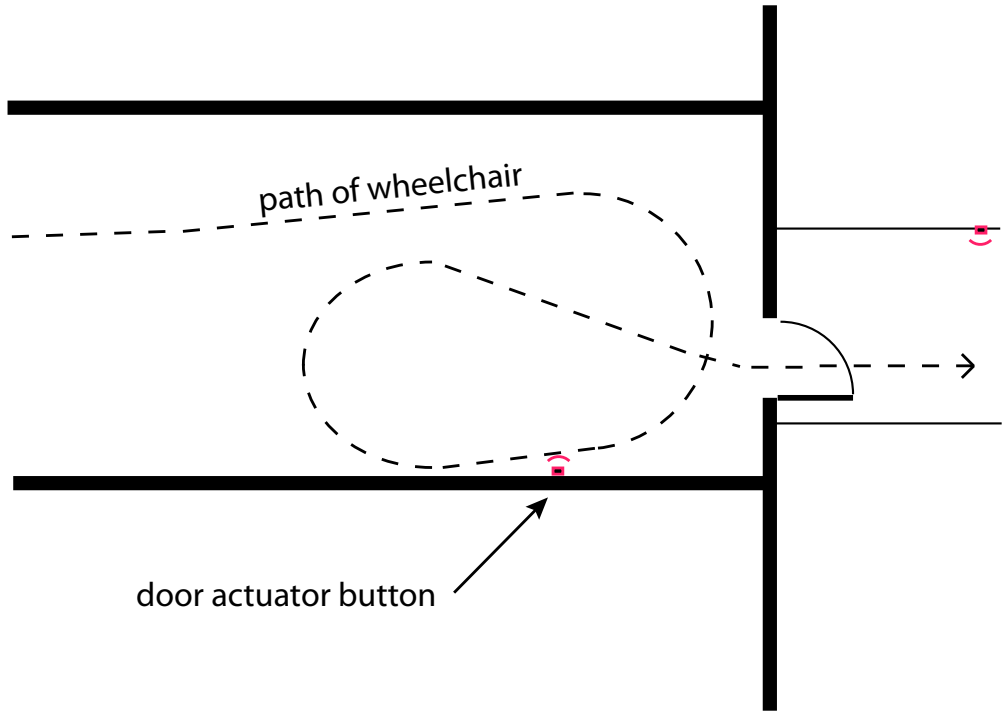
Where next? Going beyond the standards...

Universal Design: whole population



Where next? Going beyond the standards...

Universal Design: whole population



Where next? Going beyond the standards...

Seven Principles of Universal Design

1. Equitable Use:

The design is useful and marketable to people with diverse abilities.

2. Flexibility in Use:

The design accommodates a wide range of individual preferences and abilities.

3. Simple and Intuitive:

Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

4. Perceptible Information:

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

5. Tolerance for Error:

The design minimizes hazards and the adverse consequences of accidental or unintended actions.

6. Low Physical Effort:

The design can be used efficiently and comfortably and with a minimum of fatigue.

7. Size and Space for Approach and Use:

Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

(from http://www.design.ncsu.edu/cud/univ_design/princ_overview.htm and other sources)

These don't always apply well in design fields. Perhaps follow them up...

Universal Design: Four Questions to Test a Design

- **Is it universal?**
  - Is it designed for a wide range of abilities and needs?
- **Is it effective?**
  - Does it actually work for the specific needs?
  - Has it been tested or at least reviewed by representatives of a wide range of users?
  - Is it supported by research, design standards, or other sources?
- **Is it welcoming?**
  - Does it feel natural and comfortable for all users?
  - Does it discriminate unnecessarily on the basis of ability?
  - Does it give the impression of disability-based discrimination?
- **Will the design solution be durable over time?**
  - Can it accommodate change through flexibility, adaptability, or adjustability?

Compliance: ADA requirements for controls (1992)

4.27.1 **General.** Controls and operating mechanisms required to be accessible by 4.1 shall comply with 4.27.

4.27.2 **Clear Floor Space**. Clear floor space complying with 4.2.4 that allows a forward or a parallel approach by a person using a wheelchair shall be provided at controls, dispensers, receptacles, and other operable equipment.

4.27.3* **Height**. The highest operable part of controls, dispensers, receptacles, and other operable equipment shall be placed within at least one of the reach ranges specified in 4.2.5 and 4.2.6. Electrical and communications system receptacles on walls shall be mounted no less than 15 in (380 mm) above the floor.
EXCEPTION: These requirements do not apply where the use of special equipment dictates otherwise or where electrical and communications systems receptacles are not normally intended for use by building occupants.

4.27.4 **Operation.** Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2 N).

Compliance: ADA requirements for controls (2010)

309 Operable Parts 309.1 General. *Operable parts* shall comply with 309.
309.2 Clear Floor Space. A clear floor or ground *space* complying with 305 shall be provided. **309.3 Height.** *Operable parts* shall be placed within one or more of the reach ranges specified in 308.
309.4 Operation. *Operable parts* shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate *operable parts* shall be 5 pounds (22.2 N) maximum.
EXCEPTION: Gas pump nozzles shall not be required to provide *operable parts* that have an activating force of 5 pounds (22.2 N) maximum.

Universal Design: The closed fist test for controls

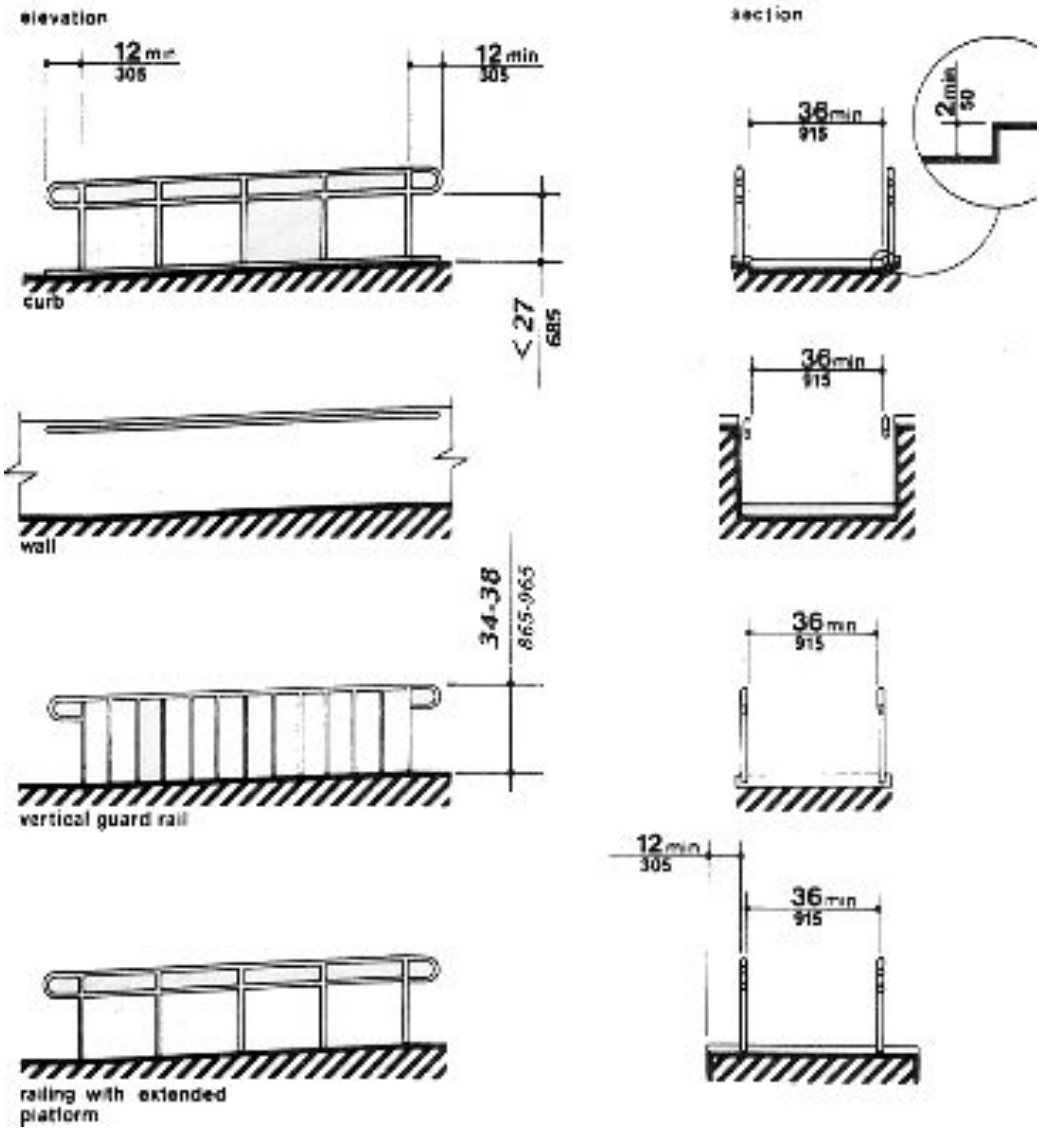
Pattern:

Can the control be operated with a closed fist?

Many standard plumbing, electrical, and hardware controls can be. However, others can't, in particular door knobs, thumb latch locks, faucets that require grip, and so forth.

Compliance: ramps

The standard uninspired solution to grade differences is to pick a ramp from the building code or from the ADA Standards. The results are seldom beautiful and sometimes don't work well for almost anyone. And if you try to build it at the maximum slope (1:12), it will almost invariably end up too steep.



Universal Design: Site Mobility Patterns

Integrated Path

Make sure that accessible routes are a meaningful main route used by all.

Low Slopes / Short Ramps

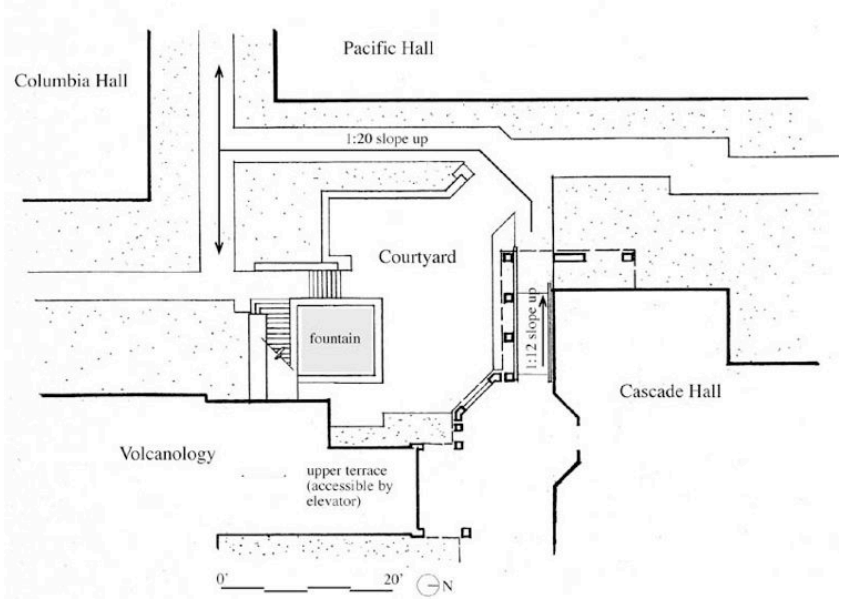
Keep slopes at 5 percent or less except for short ramps (up to 12 - 15 feet long)

Shortest Path

Make accessible routes a direct and as short as possible (within the context of Low Slopes / Short Ramps). This suggests integrating grade changes into the direction of desired travel and avoiding back-and-forth ramps. [add UHCC examples]

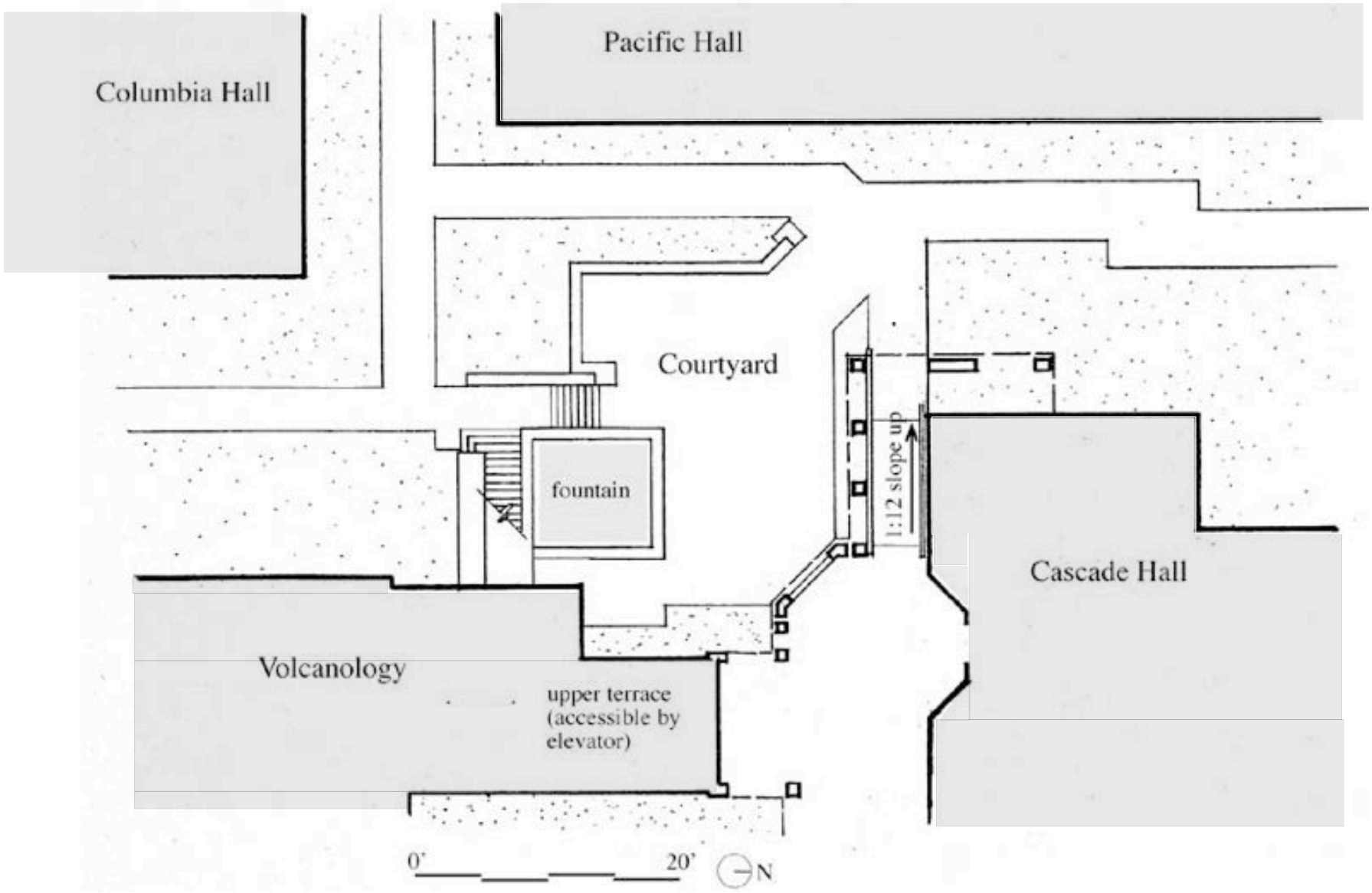
Easy Climbs

Total vertical ascents of more than about four feet can be very tiring for many people. Avoid them or provide alternative means (such as an elevator).

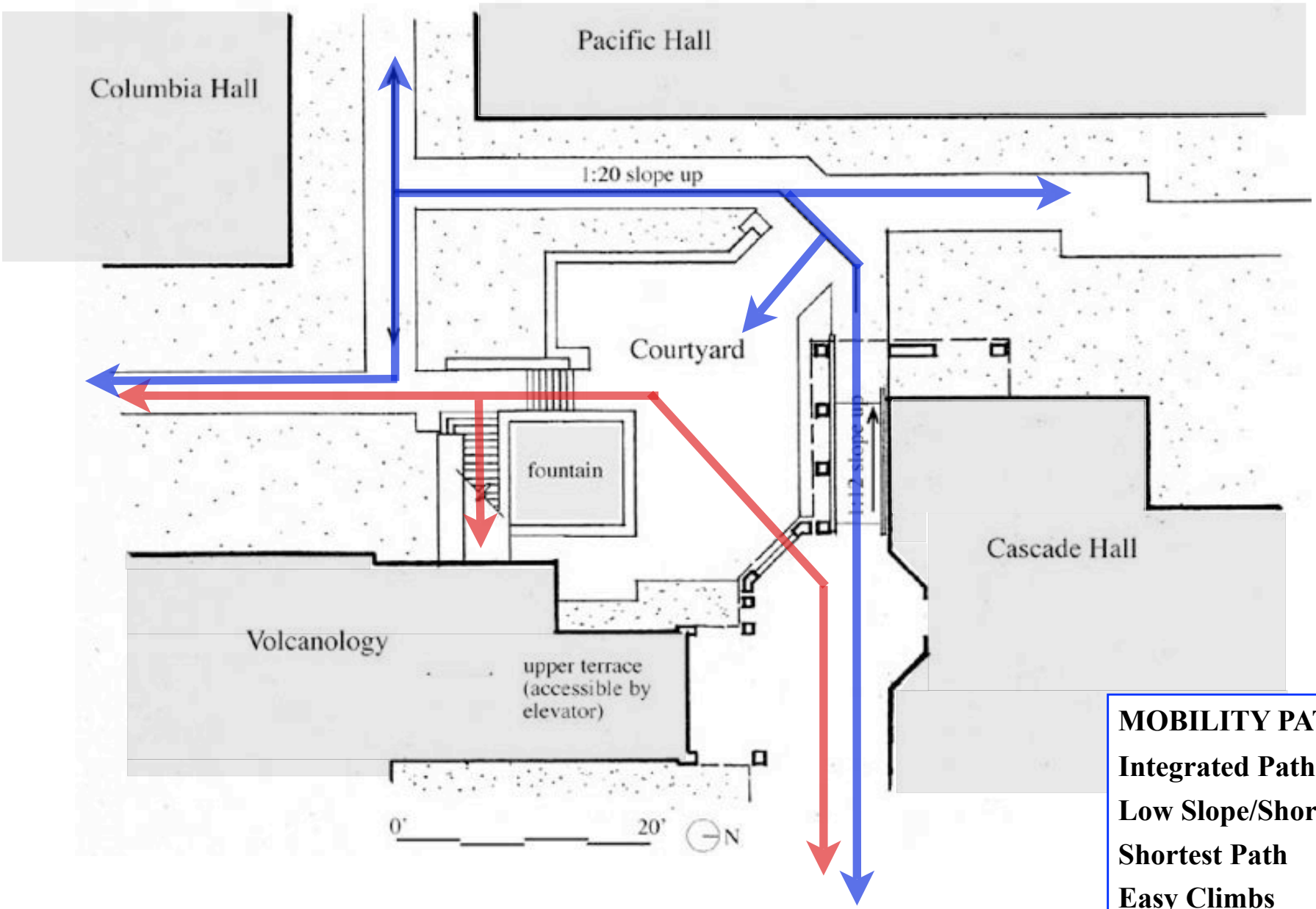


Universal Design Case: Mobility, Cascade Courtyard

Universal Design Case: Mobility, Cascade Courtyard



Universal Design Case: Mobility, Cascade Courtyard



MOBILITY PATTERNS

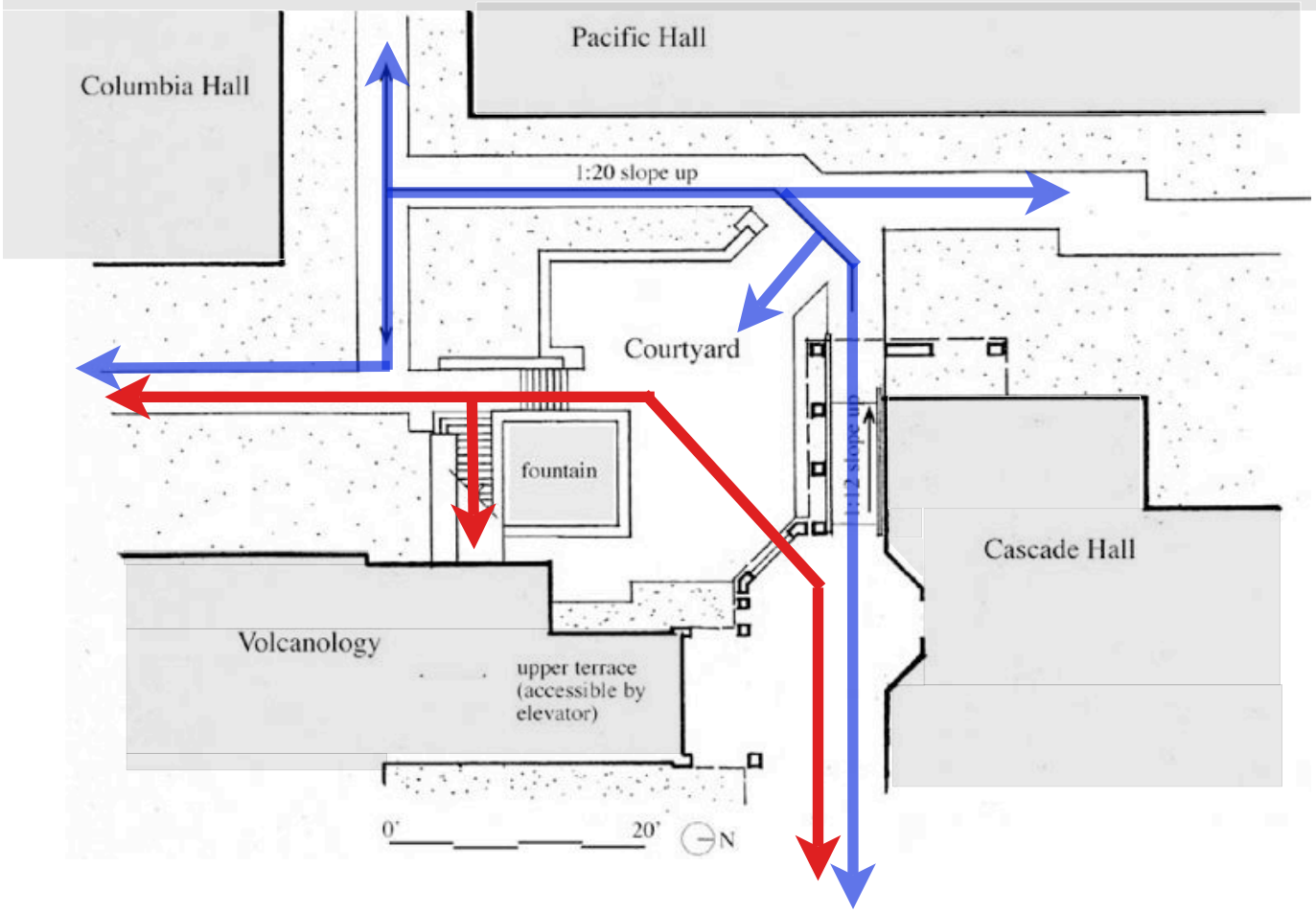
Integrated Path

Low Slope/Short Ramps

Shortest Path

Easy Climbs

Universal Design Case: Mobility, Cascade Courtyard



MOBILITY PATTERNS

Integrated Path

Low Slope/Short Ramps

Shortest Path

Easy Climbs

Universal?	**Welcoming?**	**Effective?**	**Durable?**
Is it universal? Is it designed for a wide range of abilities and needs?	Is it welcoming? Does it feel natural and comfortable for all users? Does it discriminate unnecessarily on the basis of ability? Does it give the impression of disability-based discrimination?	Is it effective? Does it actually work for the specific needs? Has it been tested or reviewed by representatives of a wide range of users? Is it supported by research, design standards, or other sources?	Will the design solution be durable over time? Can it accommodate change through flexibility, adaptability, or adjustability?

Universal Design Case: Mobility, Erb Memorial Union Amphitheatre

MOBILITY PATTERNS

Integrated Path

Low Slope/Short Ramps

Shortest Path

Easy Climbs

Is it possible to use 5% slopes to create walks that connect levels without making people loop back and forth?

Universal Design Case: Mobility, Erb Memorial Union Amphitheatre

Is it possible to use 5% slopes to create walks that connect levels without making people loop back and forth?

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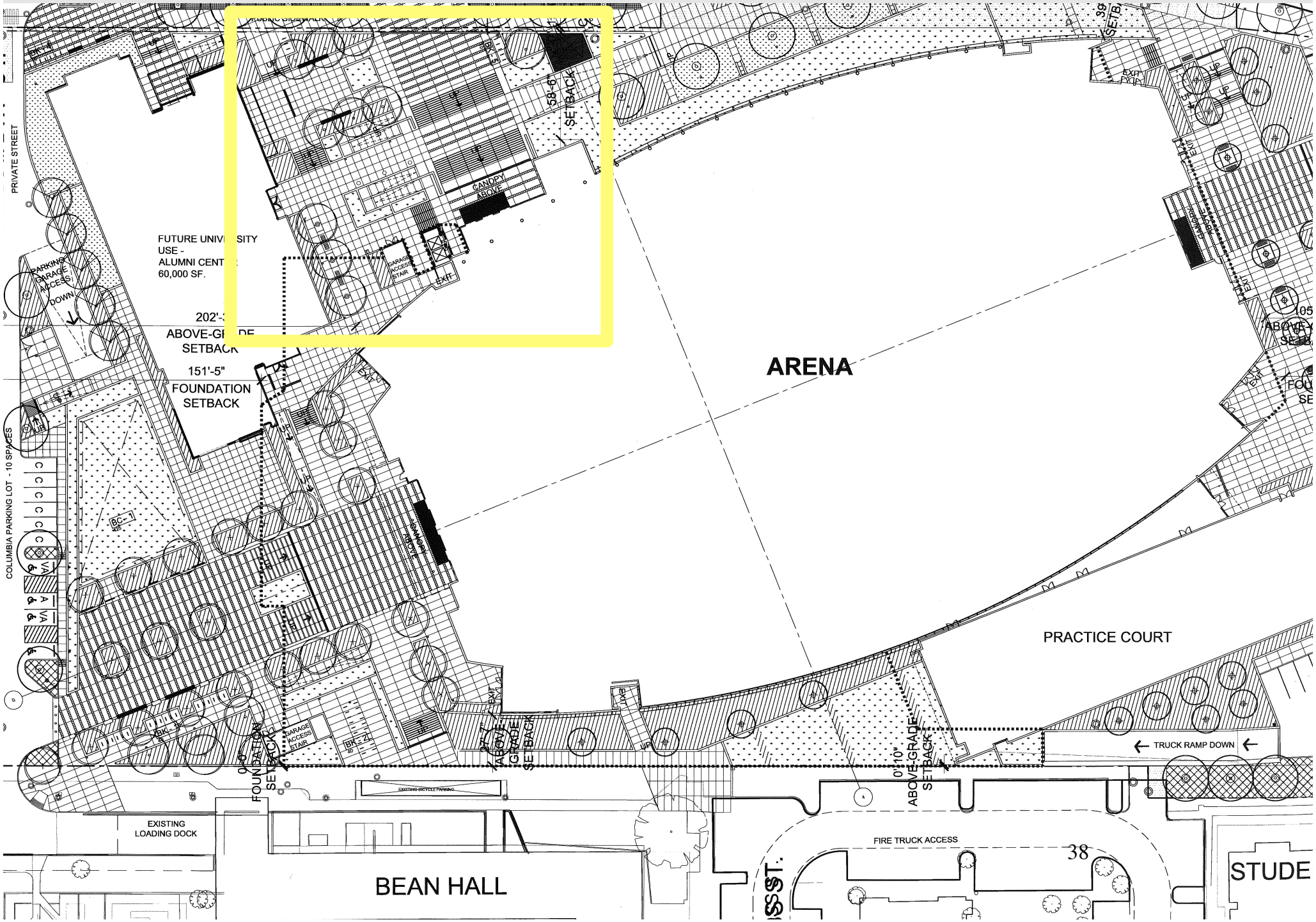
Universal Design Case: Mobility & Wayfinding

Universal Design Case: Mobility & Wayfinding, Knight Arena



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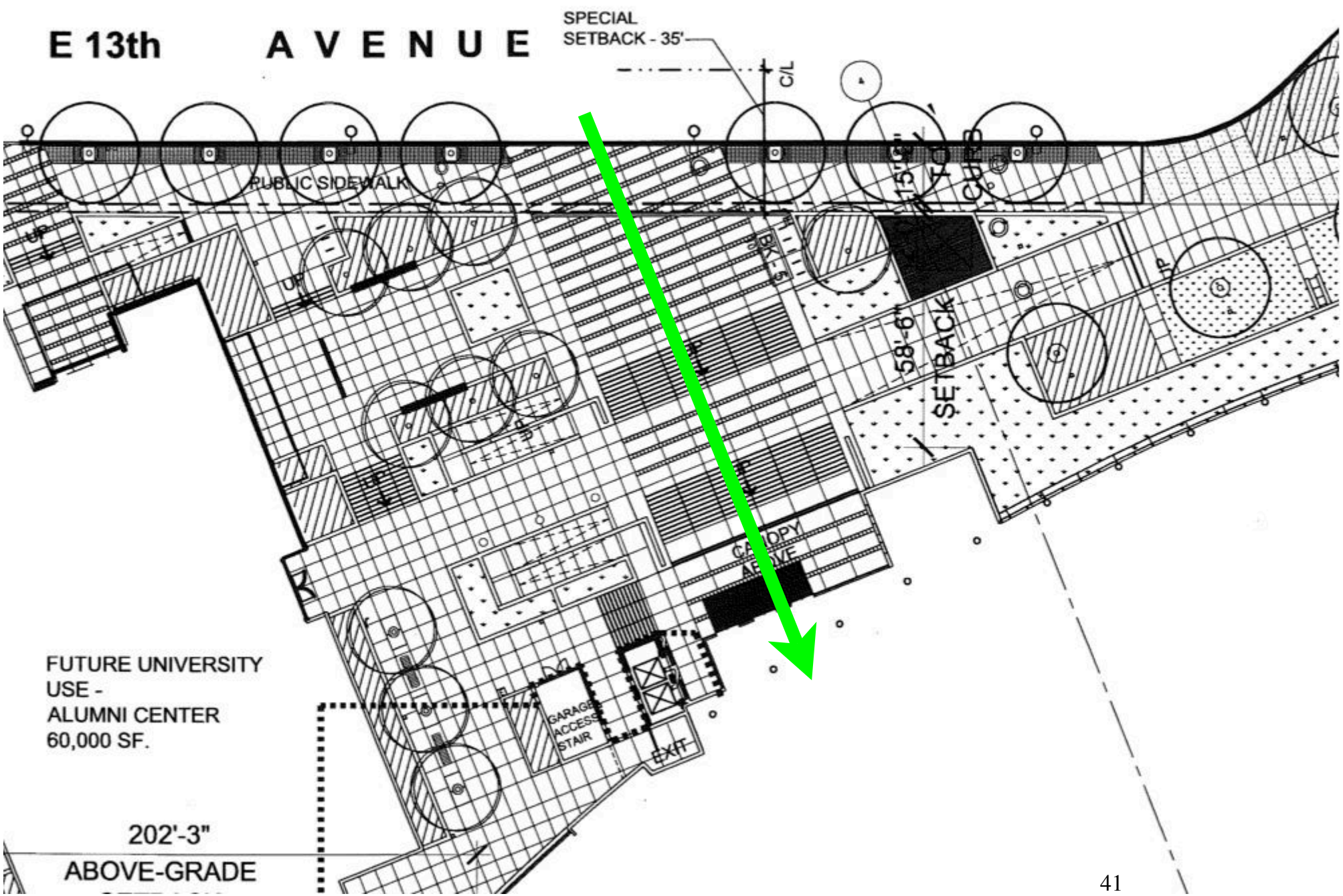

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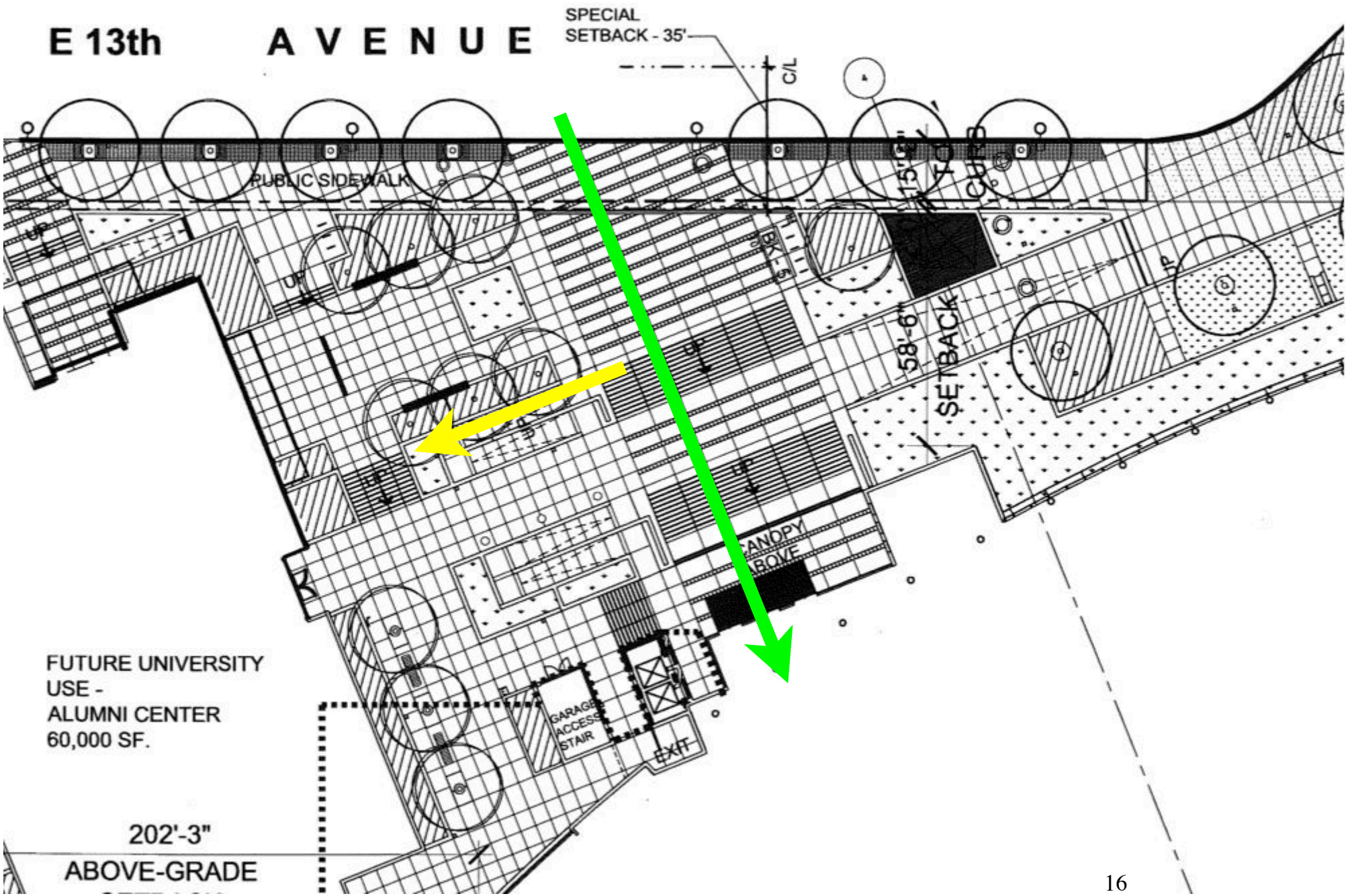

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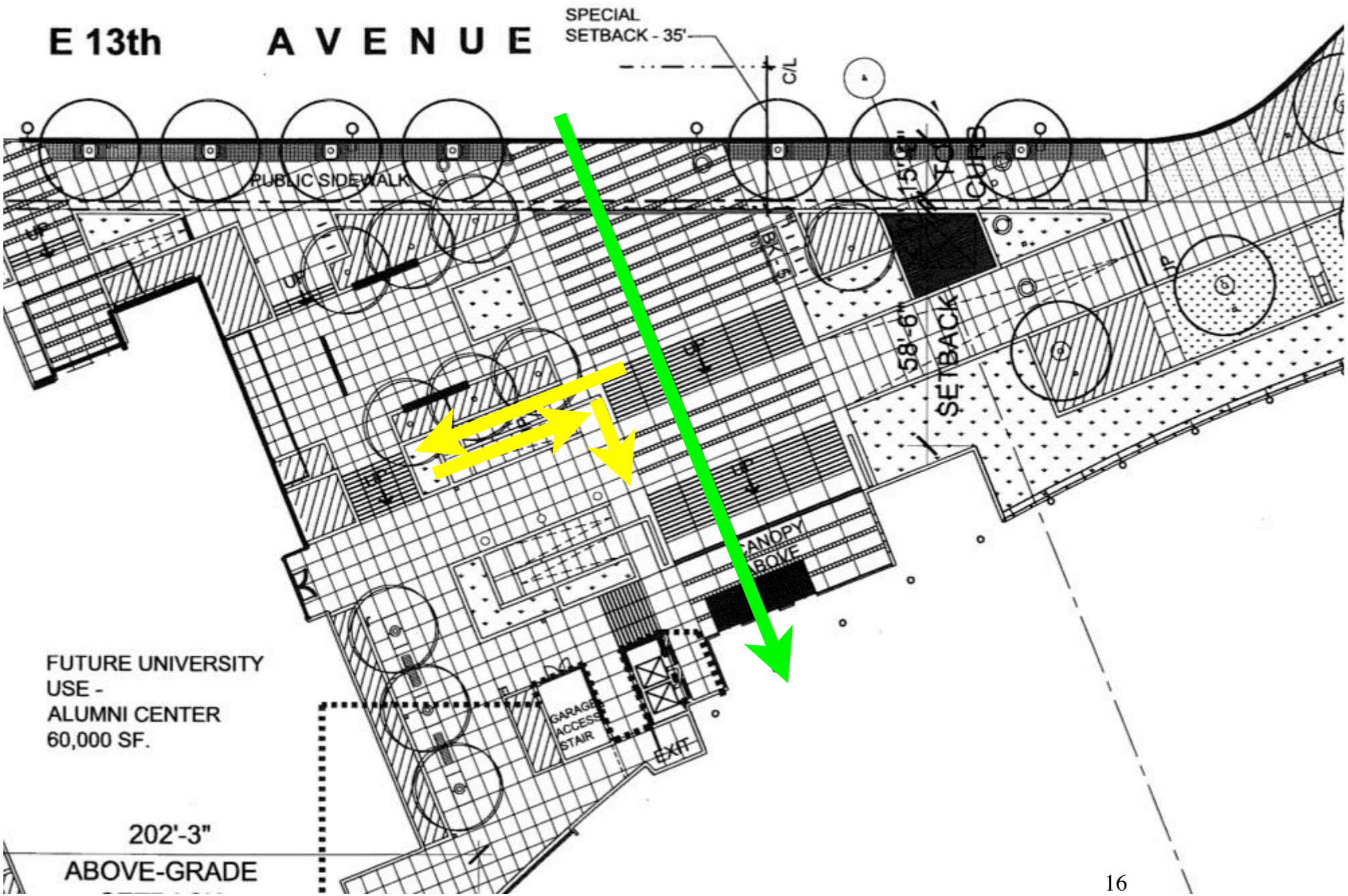

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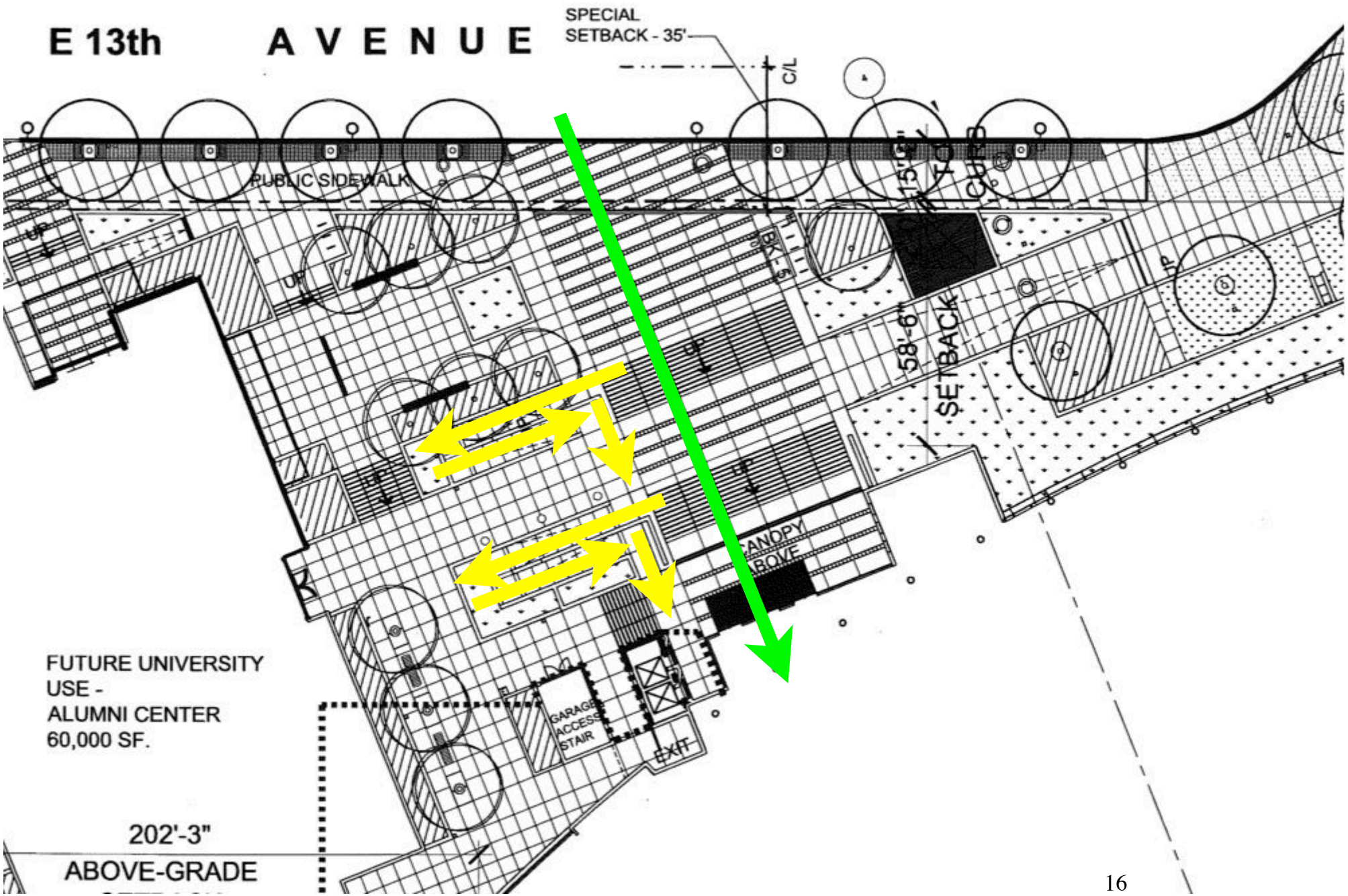

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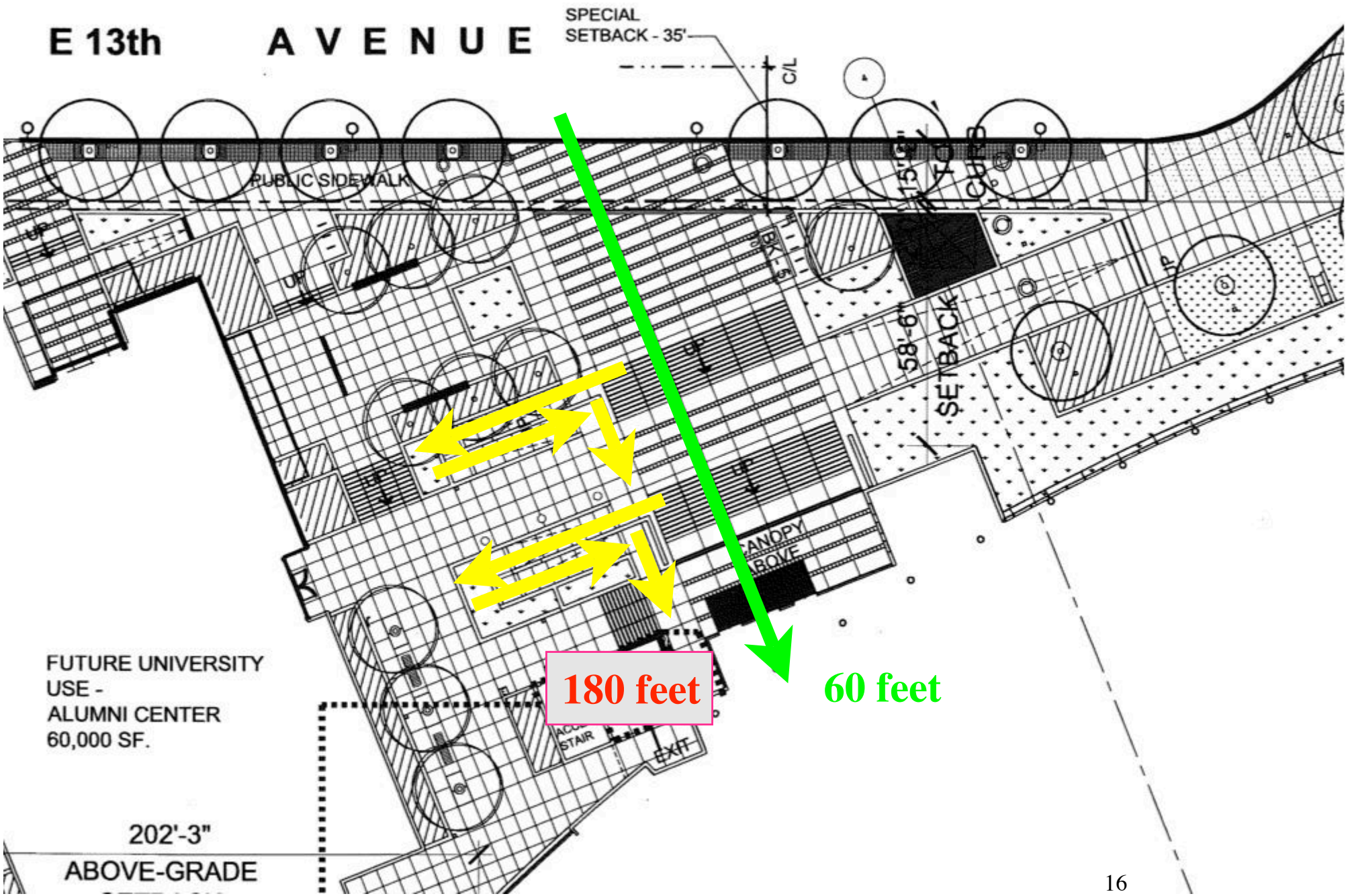

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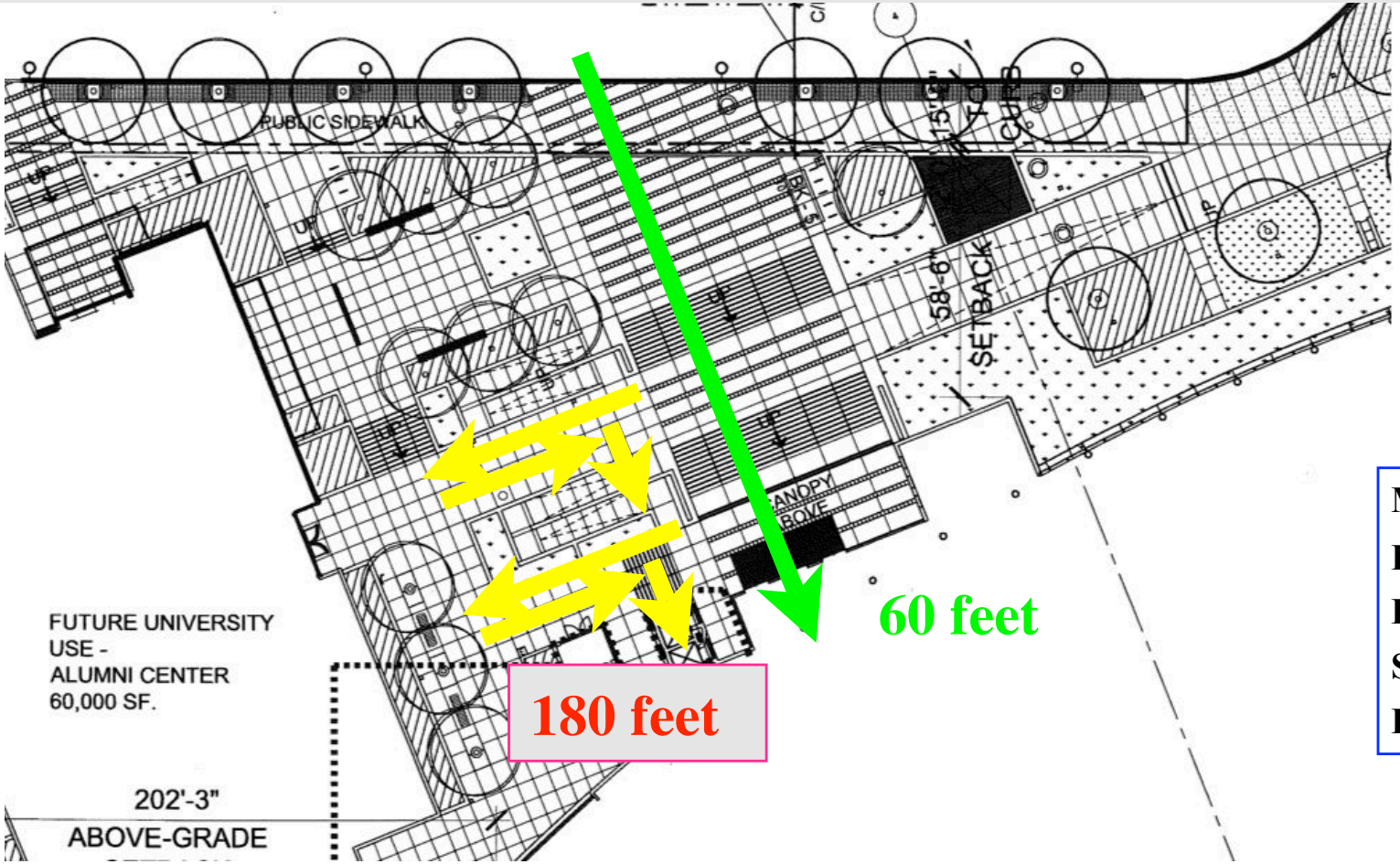

MOBILITY PATTERNS

Integrated Path

Low Slope/Short Ramps

Shortest Path

Easy Climbs

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Universal Design Case: Mobility, Johnson Hall entrance

MOBILITY PATTERNS

Integrated Path

Low Slope/Short Ramps

Shortest Path

Easy Climbs

Universal Design Case: Mobility, Johnson Hall entrance

MOBILITY PATTERNS

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Universal Design Case: Mobility & Wayfinding, Lawrence Hall

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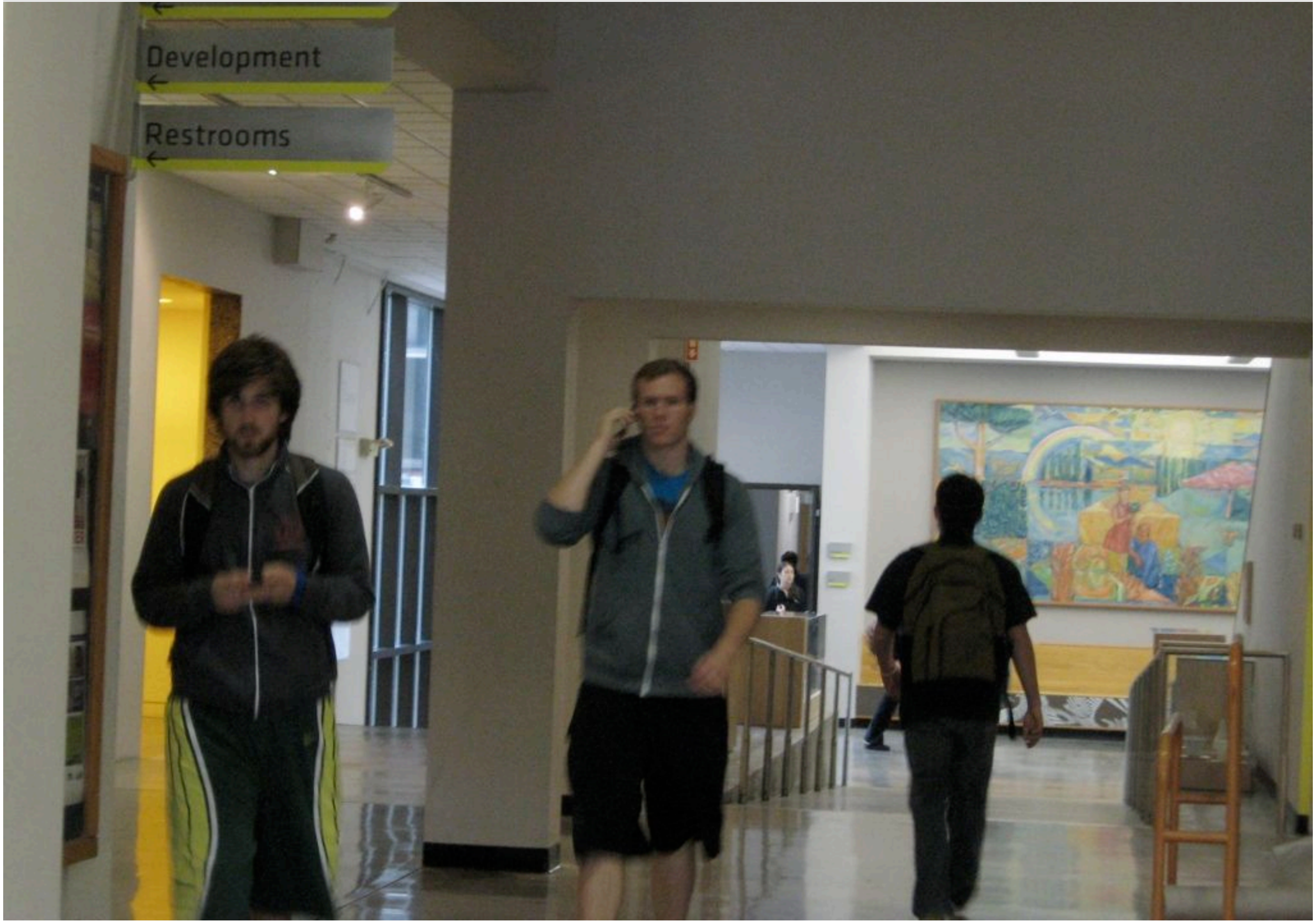

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Universal Design Case: Mobility & Wayfinding, Lawrence Hall

Universal Design Case: Mobility, Lawrence Hall

Universal Design Case: Mobility, Lawrence Hall

MOBILITY PATTERNS

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Shortest Path

Easy Climbs

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Easy Climbs

Universal?	**Welcoming?**	**Effective**?	**Durable**?
Is it universal? Is it designed for a wide range of abilities and needs?	Is it welcoming? Does it feel natural and comfortable for all users? Does it discriminate unnecessarily on the basis of ability? Does it give the impression of disability-based discrimination?	Is it effective? Does it actually work for the specific needs? Has it been tested or reviewed by representatives of a wide range of users? Is it supported by research, design standards, or other sources?	Will the design solution be durable over time? Can it accommodate change through flexibility, adaptability, or adjustability?

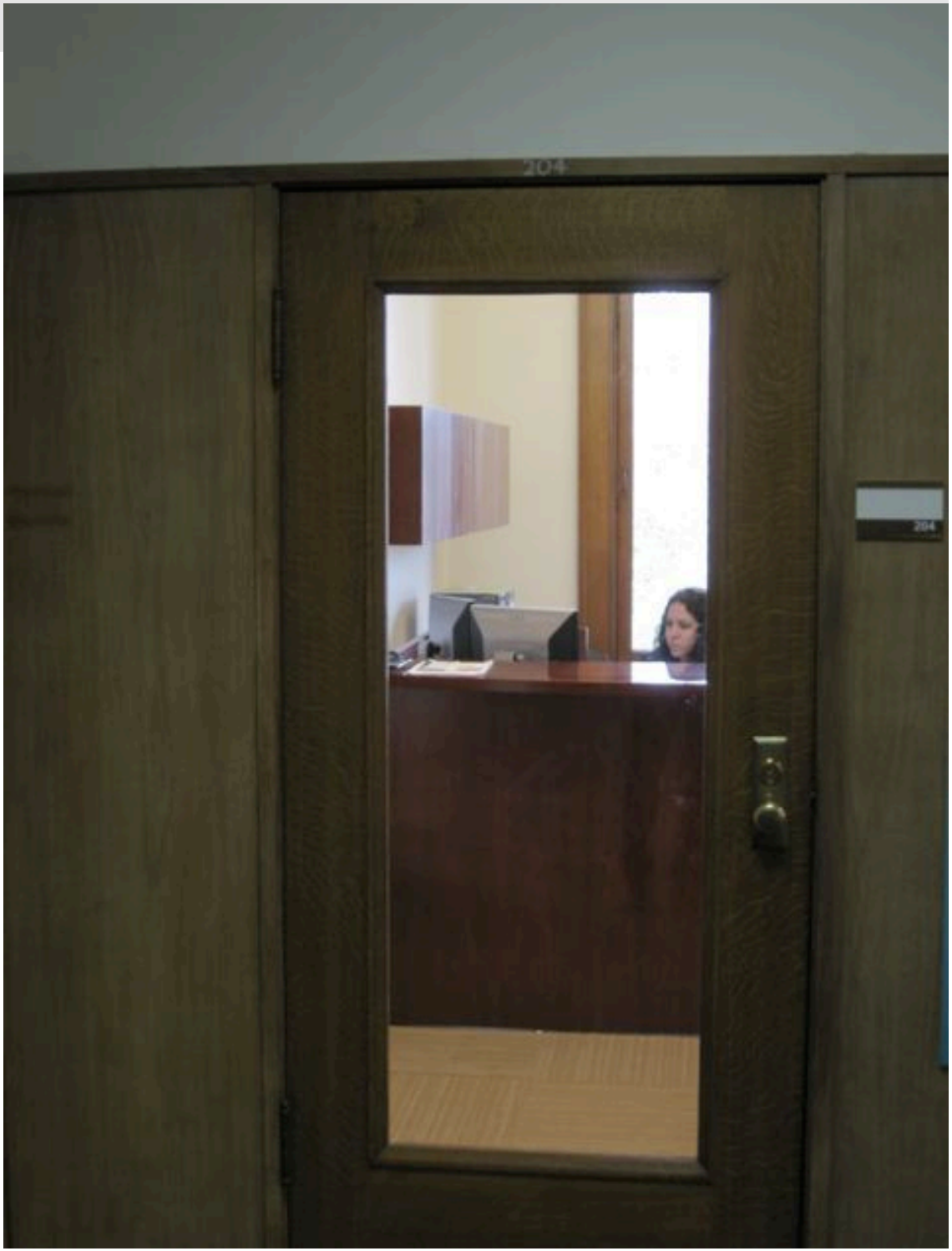
Universal Design: Mobility - Ramps

Universal Design: Mobility - Ramps

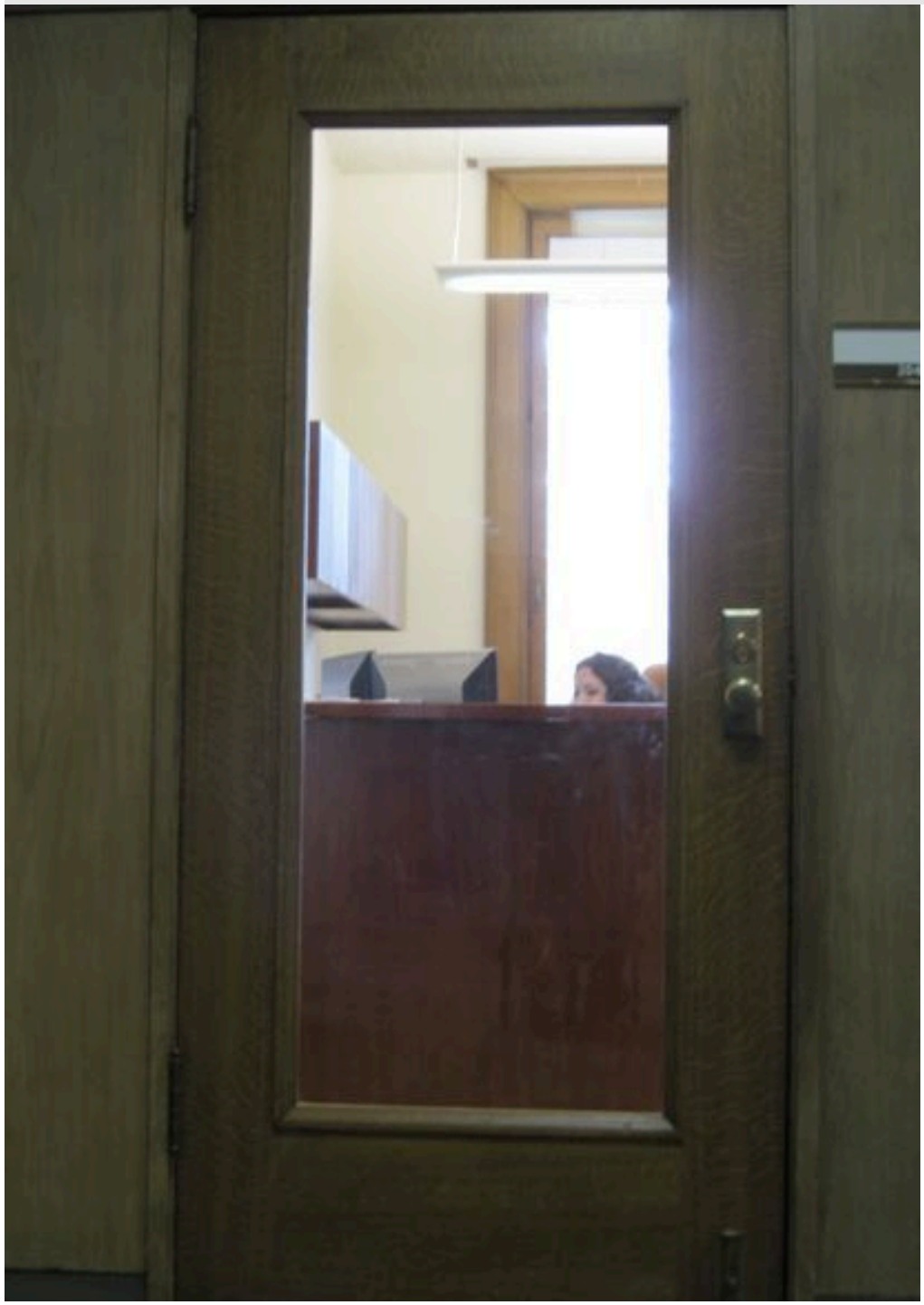
Universal Design: Welcoming

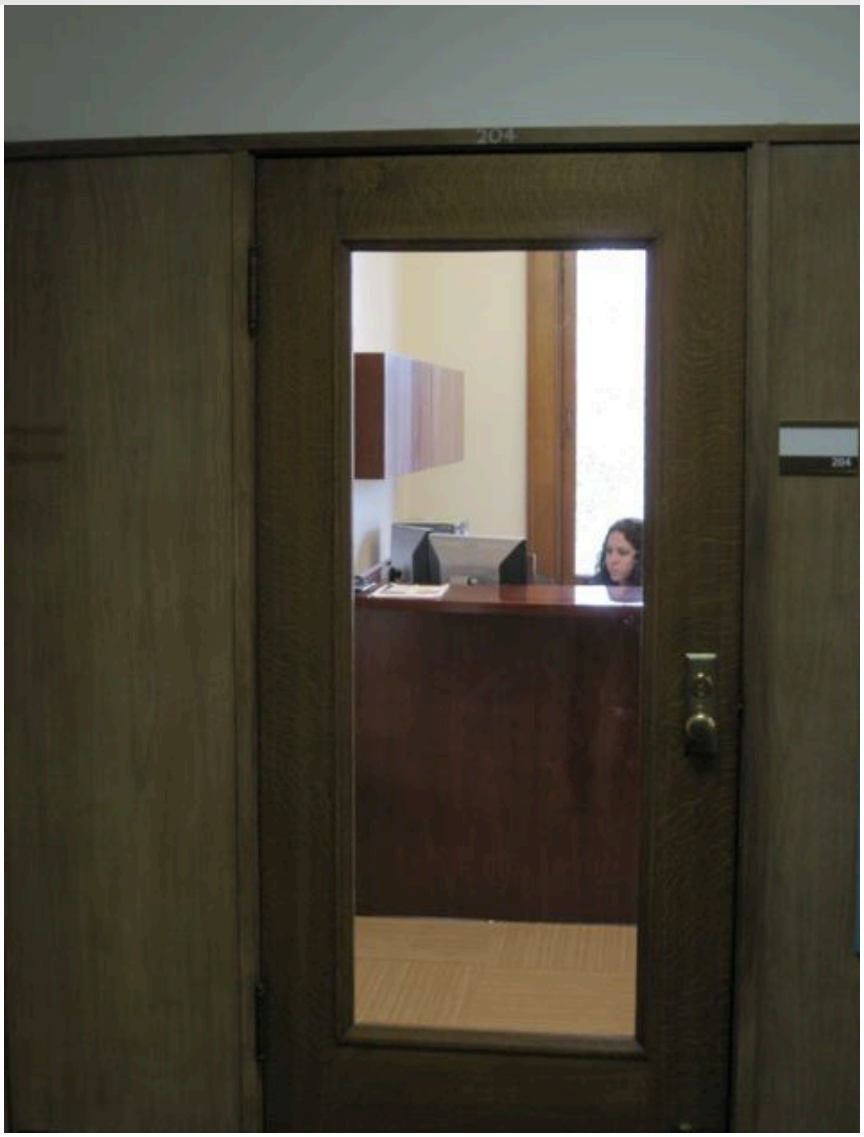
Universal Design: Welcoming

Universal Design: Welcoming



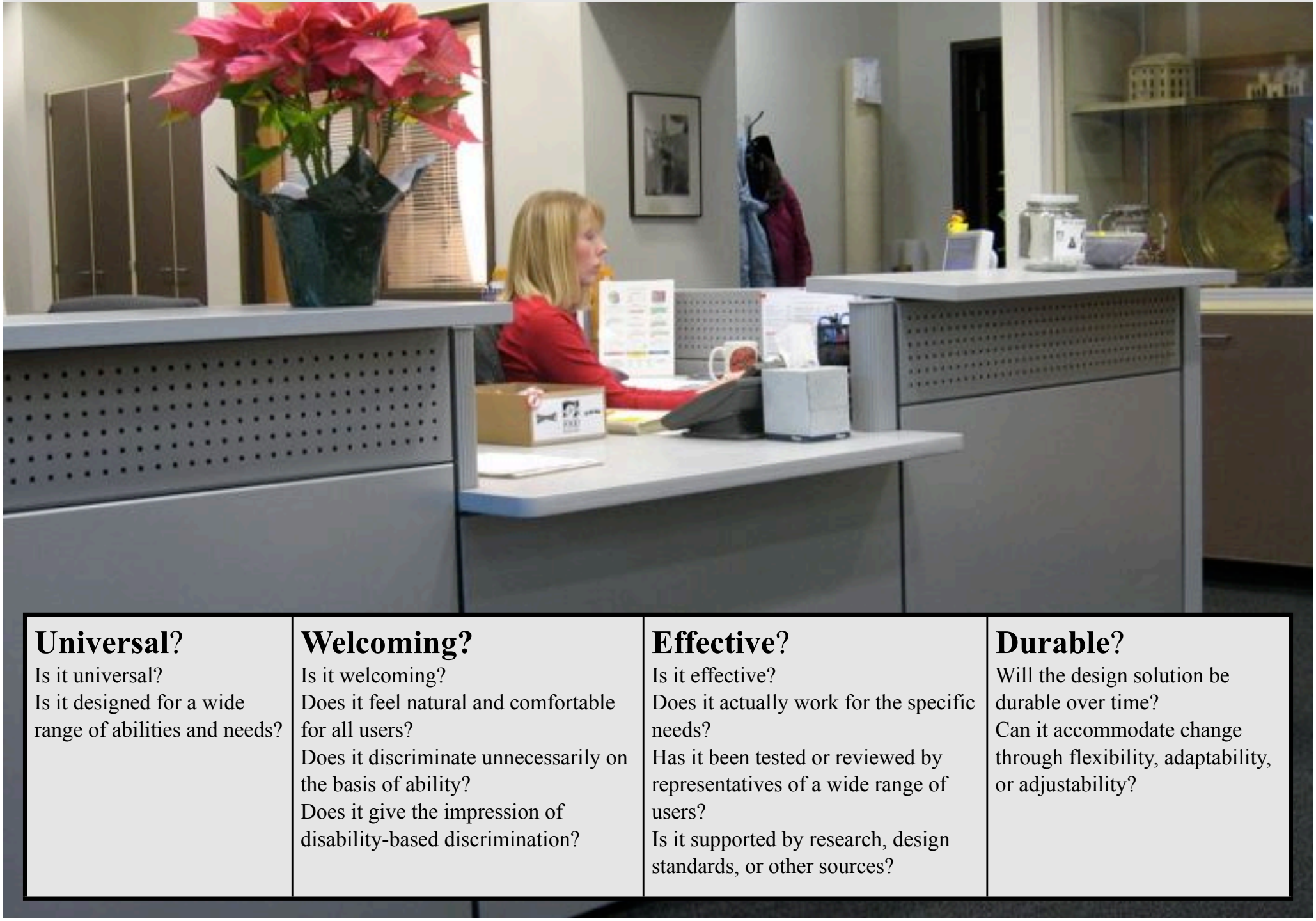
Universal Design: Welcoming





Universal Design: Welcoming

Universal Design: Welcoming



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Universal Design: Vision

PATTERNS:

No Protrusion Hazards

Avoid items that protrude more than 4" above 24" (ADA Standards say 27”) so that blind and low vision users are safe

Safe Crossings

Design vehicular areas with clear separation from pedestrian areas, either

- curbs at 1:12 slope, or
- 3' band of tactile pavement, or
- bollards with 3' maximum gaps

Effective Shorelines

Provide consistent edges to guide cane users and others

- vertical edges such as walls and curbs, or
- textural contrasts such as pavement to planting, or concrete to gravel, or paving type, and
- provide visual contrast along shorelines as appropriate

90 Degree Corners, No Curves

Provide clear circulation to enhance imageability

Avoid curves and angles, use a rectilinear organization for circulation

Visual Contrast

Use light/dark contrast to emphasize stair hazards, shorelines, etc.

VISION PATTERNS

No Protrusion Hazards

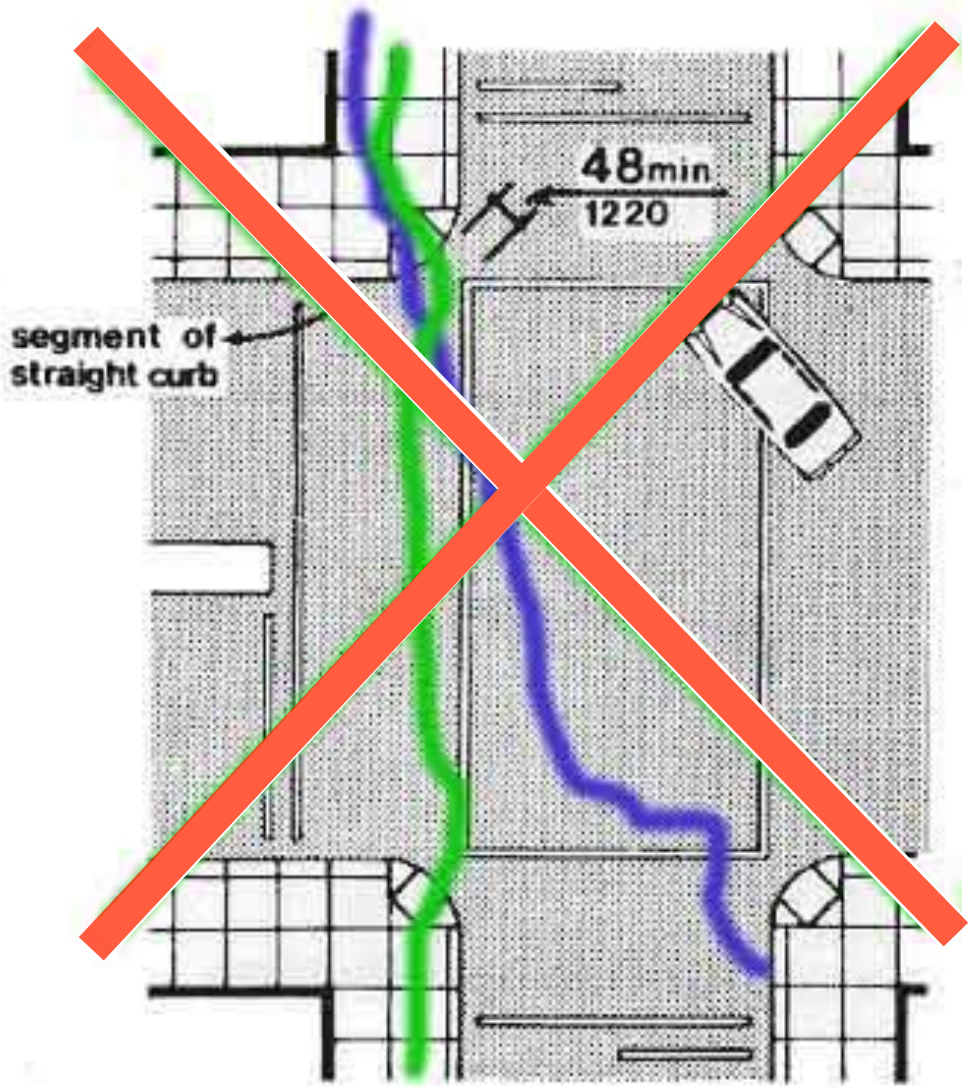
Safe Crossings

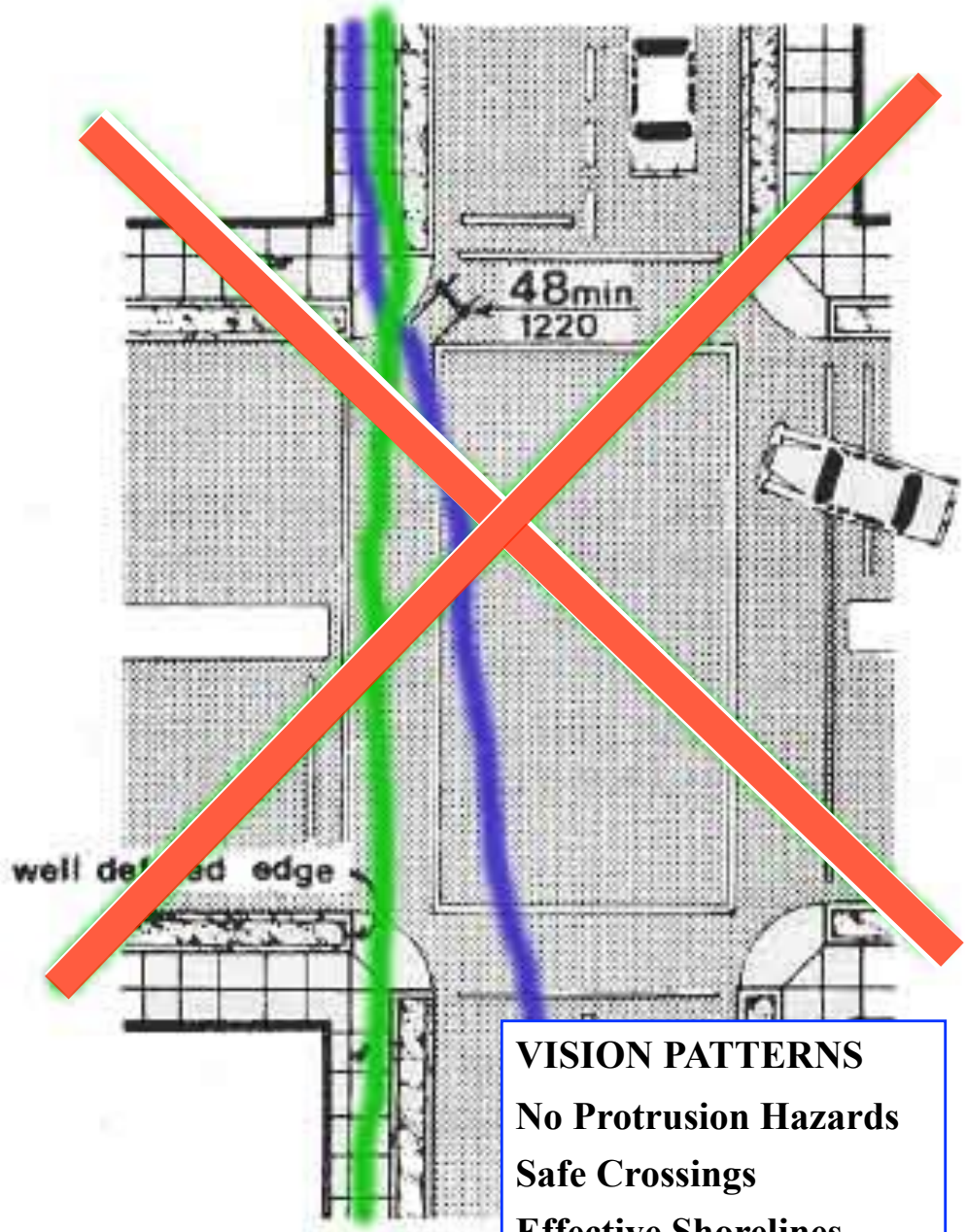
Effective Shorelines

90 Degree Corners

Visual Contrast

Universal Design: Curb Ramps - Mobility vs. Vision?





VISION PATTERNS

No Protrusion Hazards

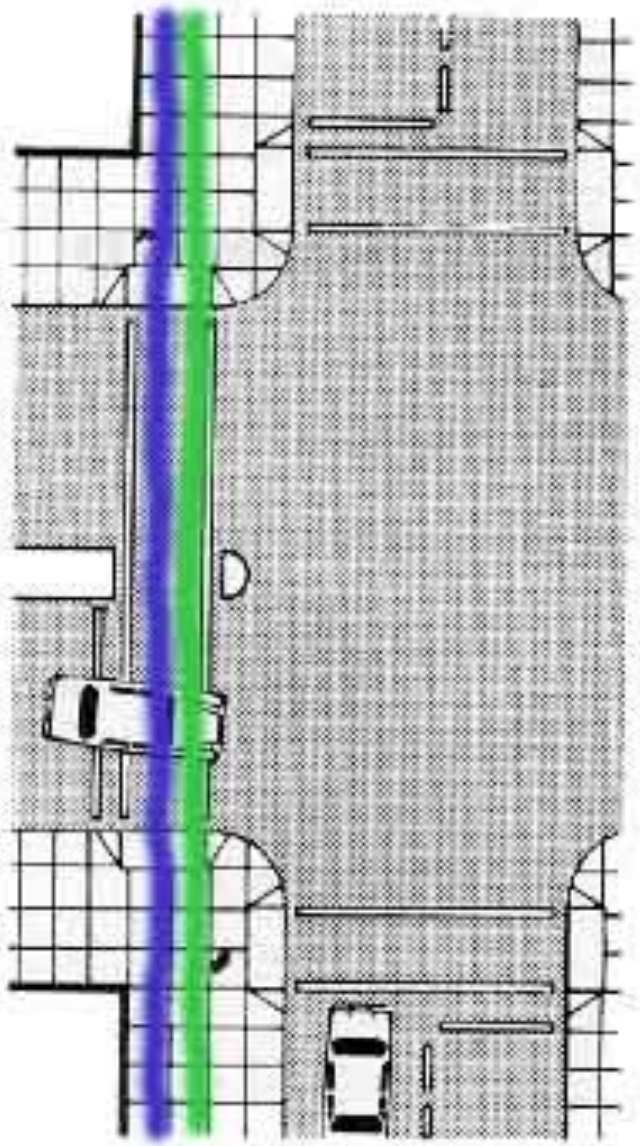
Safe Crossings

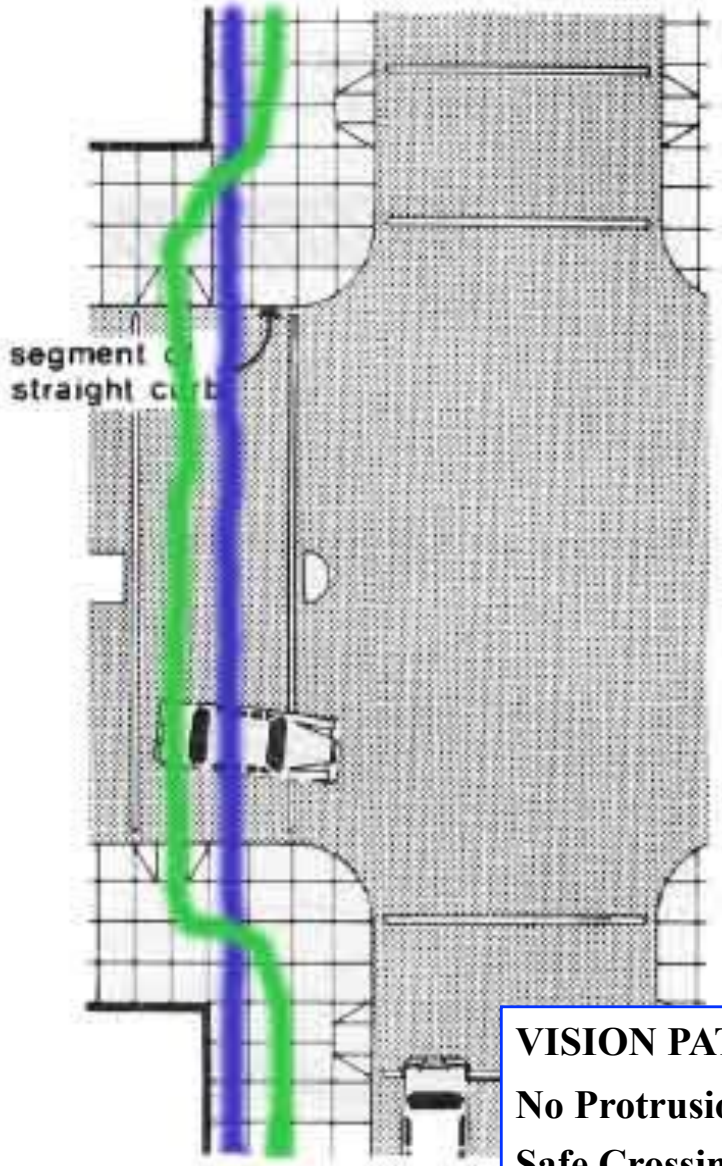
Effective Shorelines

90 Degree Corners

Visual Contrast

Universal Design: Curb Ramps - Mobility vs. Vision?





VISION PATTERNS

No Protrusion Hazards

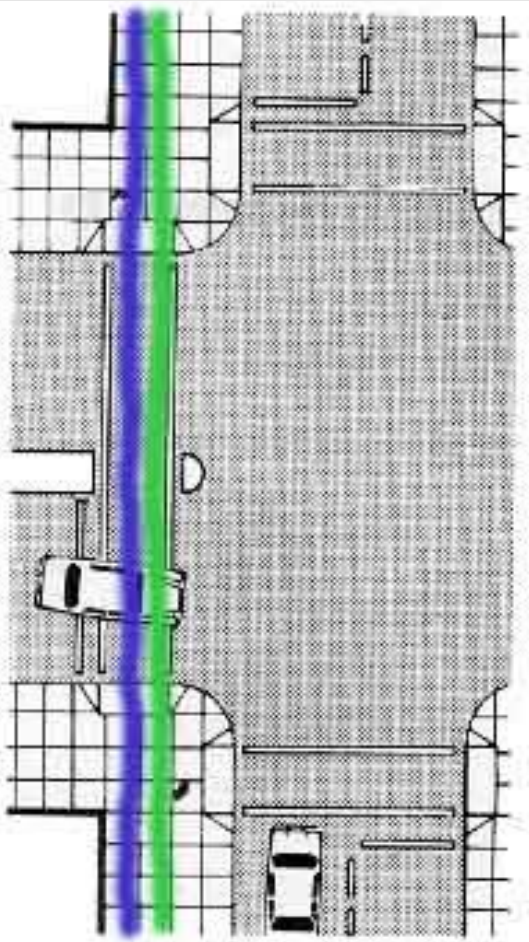
Safe Crossings

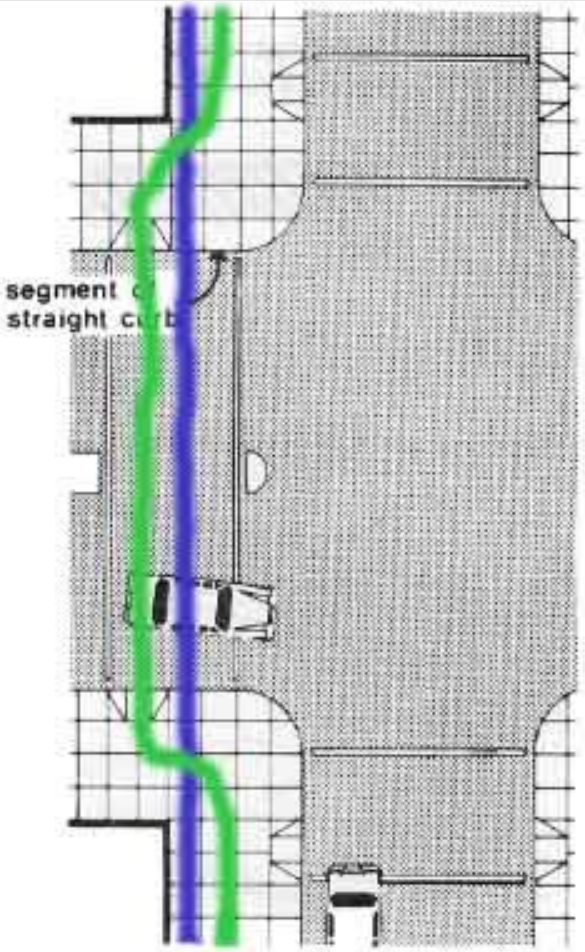
Effective Shorelines

90 Degree Corners

Visual Contrast

Universal Design: Curb Ramps - Mobility vs. Vision?





VISION PATTERNS

No Protrusion Hazards

Safe Crossings

Effective Shorelines

90 Degree Corners

Visual Contrast

Universal?	**Welcoming?**	**Effective**?	**Durable**?
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Universal Design: Vision on Broadway

VISION PATTERNS

No Protrusion Hazards

Safe Crossings

Effective Shorelines

90 Degree Corners

Visual Contrast

Universal Design: Vision on Broadway

VISION PATTERNS

No Protrusion Hazards

Safe Crossings

Effective Shorelines

90 Degree Corners

Visual Contrast

Universal Design: Vision (and mobility) on Broadway at Oak

Universal Design: Vision on Broadway

VISION PATTERNS

No Protrusion Hazards

Safe Crossings

Effective Shorelines

90 Degree Corners

Visual Contrast

Universal Design: Vision on Broadway at Willamette

VISION PATTERNS

No Protrusion Hazards

Safe Crossings

Effective Shorelines

90 Degree Corners

Visual Contrast

Universal Design: Vision on Broadway at Olive

VISION PATTERNS

No Protrusion Hazards

Safe Crossings

Effective Shorelines

90 Degree Corners

Visual Contrast

Universal Design: Vision on Broadway

VISION PATTERNS

No Protrusion Hazards

Safe Crossings

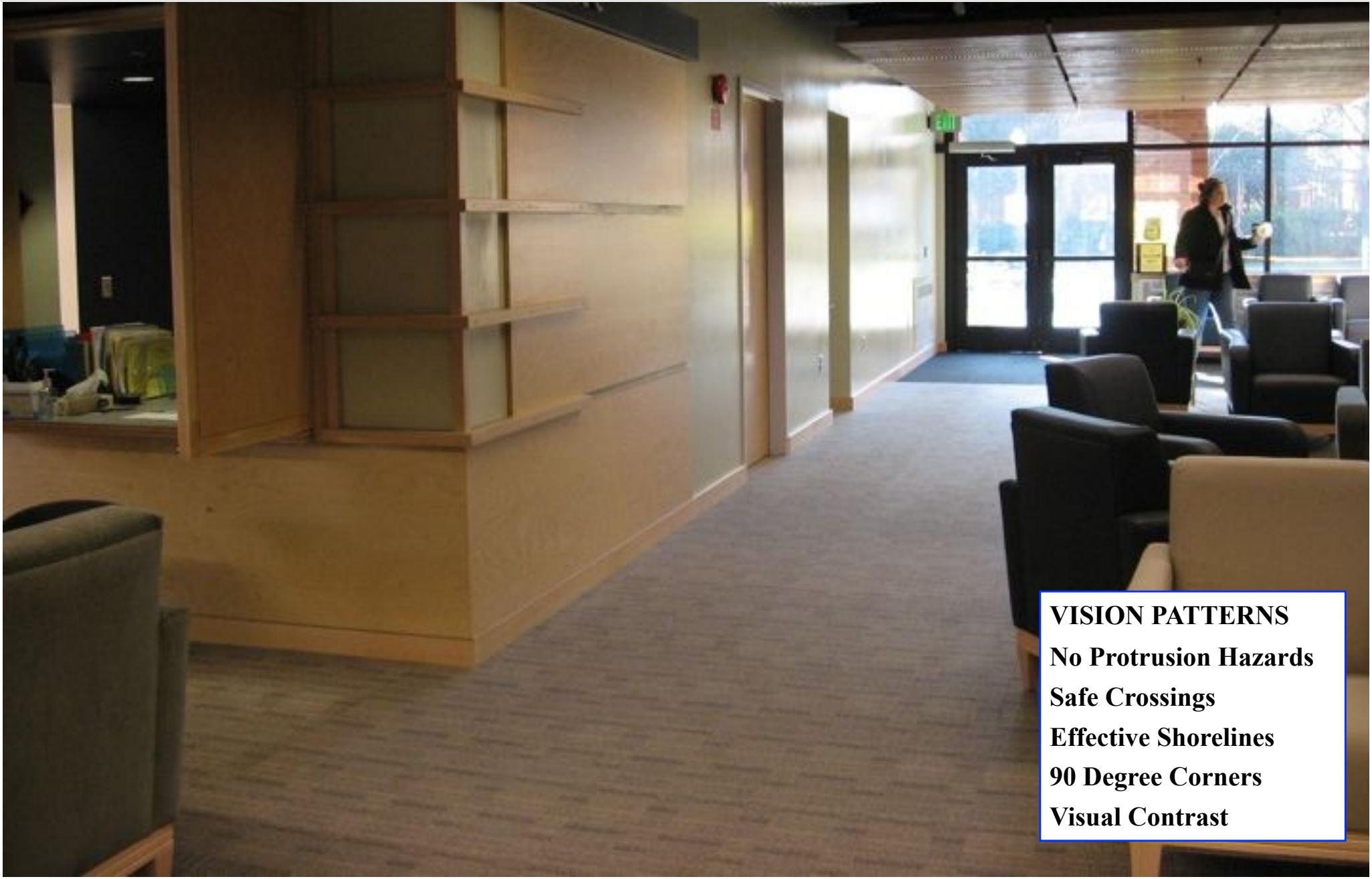
Effective Shorelines

90 Degree Corners

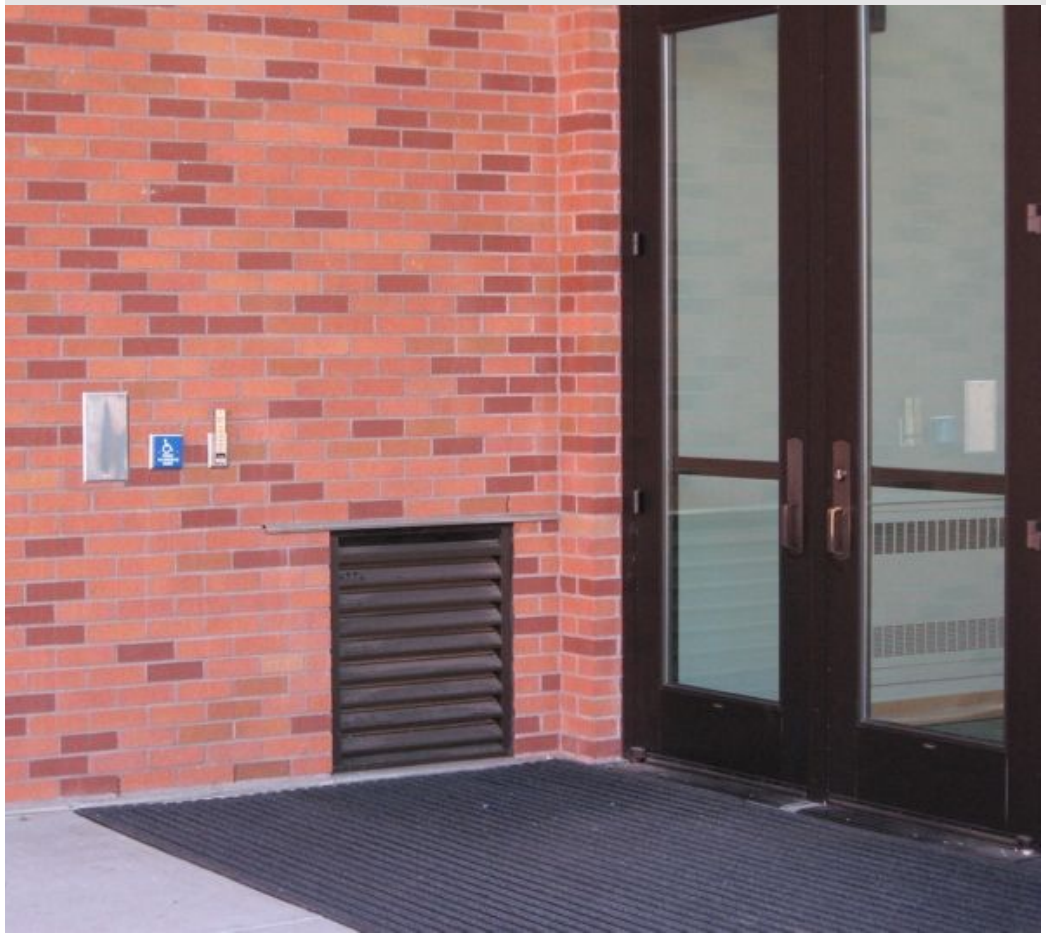
Visual Contrast


Nice building!

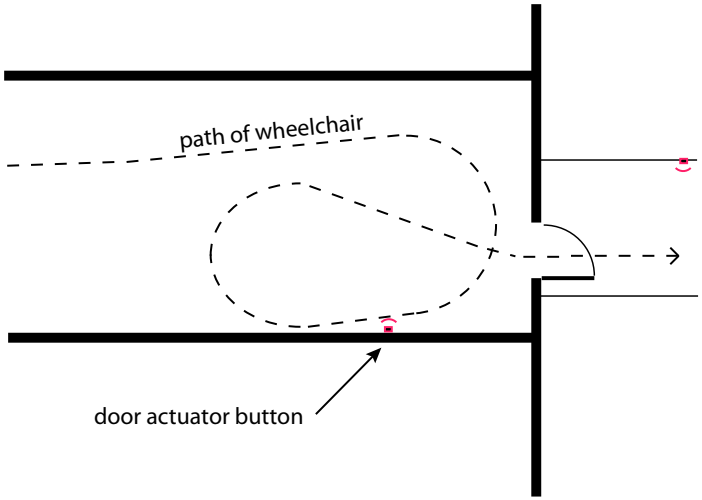
Universal Design: Vision at the Health Center



Universal Design: Mobility at the Health Center

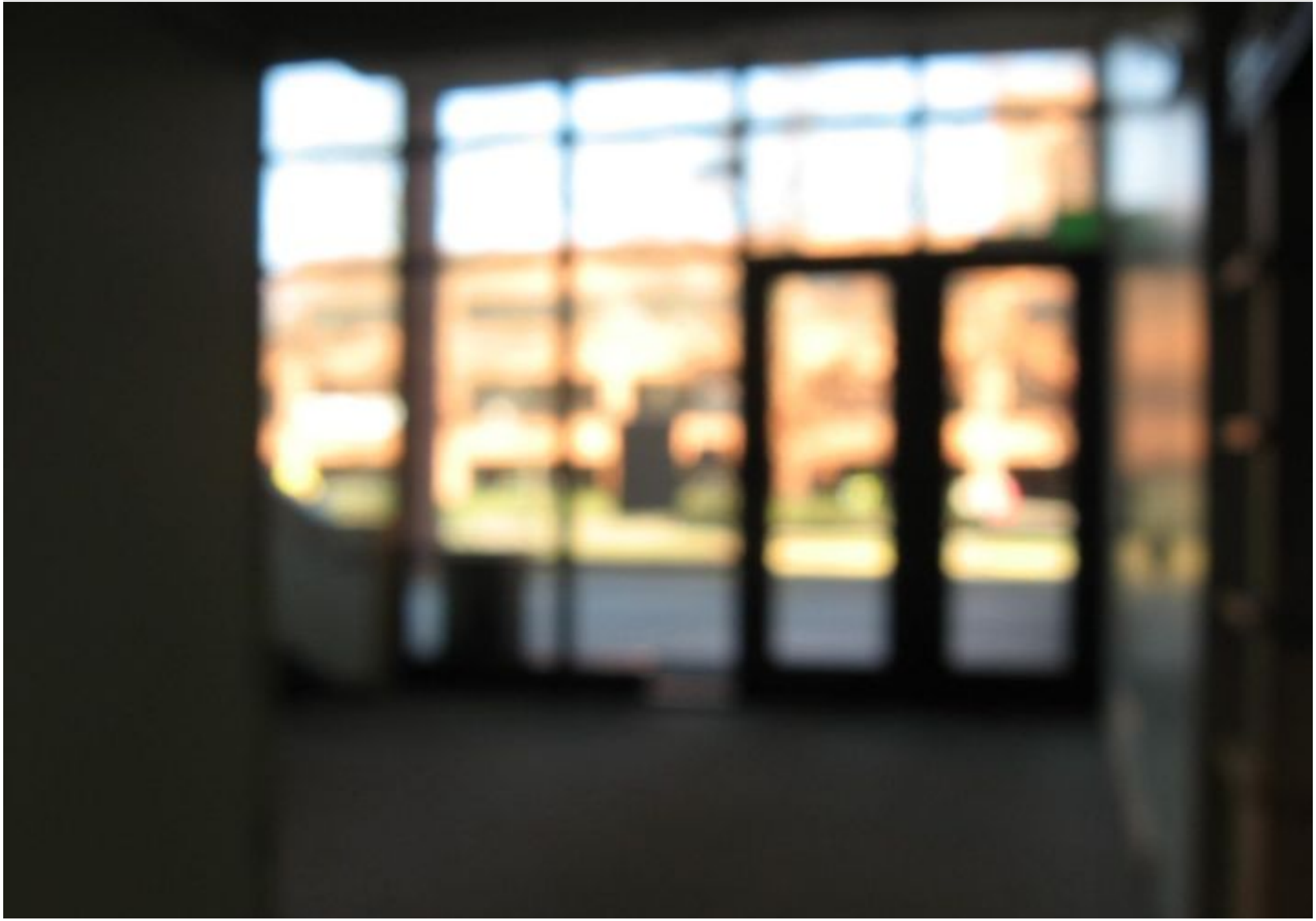


Universal Design: Mobility at the Health Center



Universal Design: Vision at the Health Center

Universal Design: Vision at the Health Center

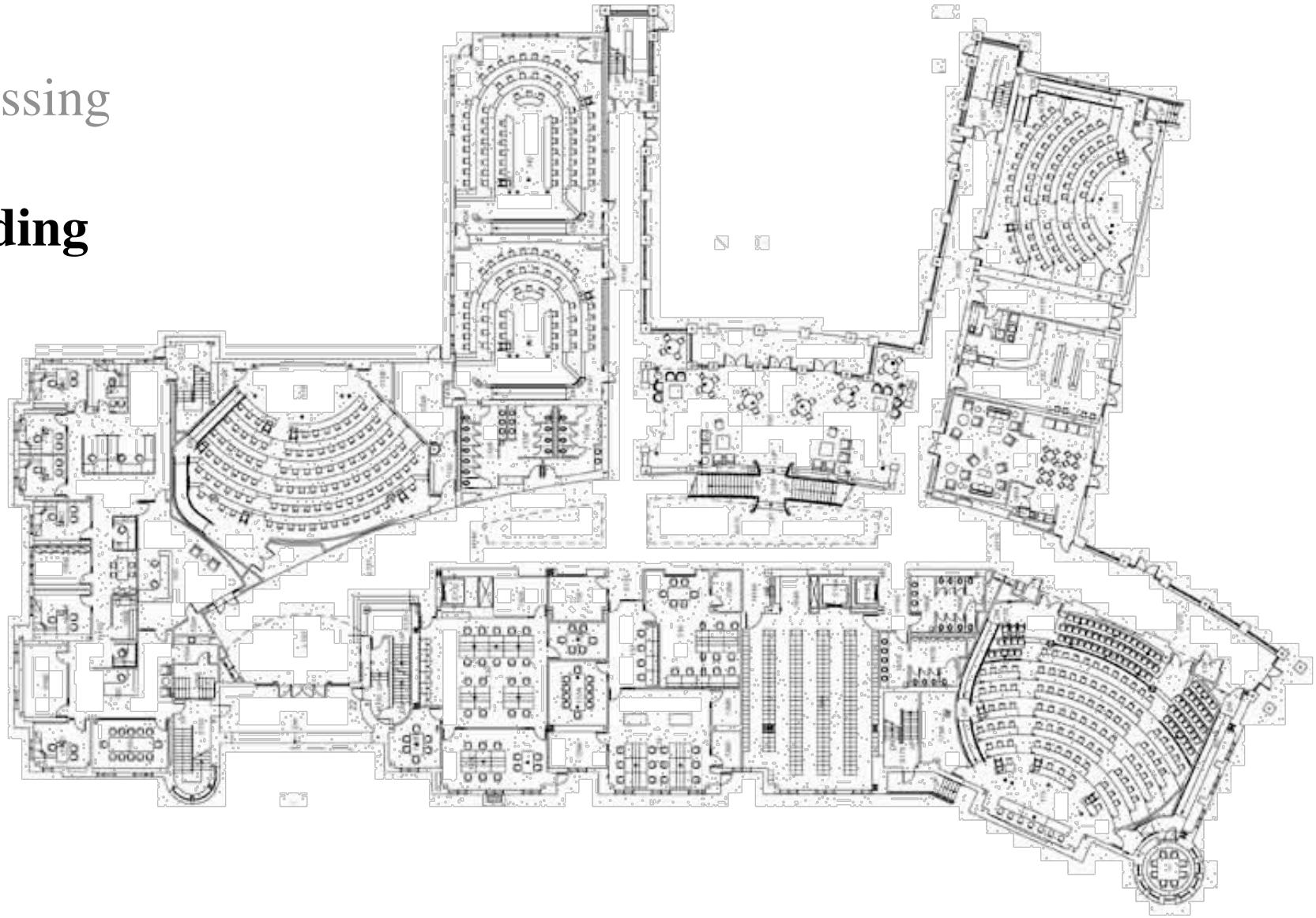


Universal Design: vision

Shoreline

Safe crossing

Wayfinding



Universal Design: Hearing

PATTERNS:

Protection from Fire
Provide visual alarms as part of the main fire alarm system. Provide bed shakers in sleeping areas.

Assistive Listening Systems
Provide personal amplification systems in all assembly areas and all areas with amplification systems.

Excellent Communication Acoustics
Design the room acoustics to maximize sound quality for all. In rooms designed for discussion, design for two-way acoustics. In rooms limited to presentation, maximize for presenter-receiver acoustics. In office environments, control ambient noise.

HEARING PATTERNS

Fire Protection

Assistive Listening

Communication Acoustics

Universal Design: Hearing & Safety

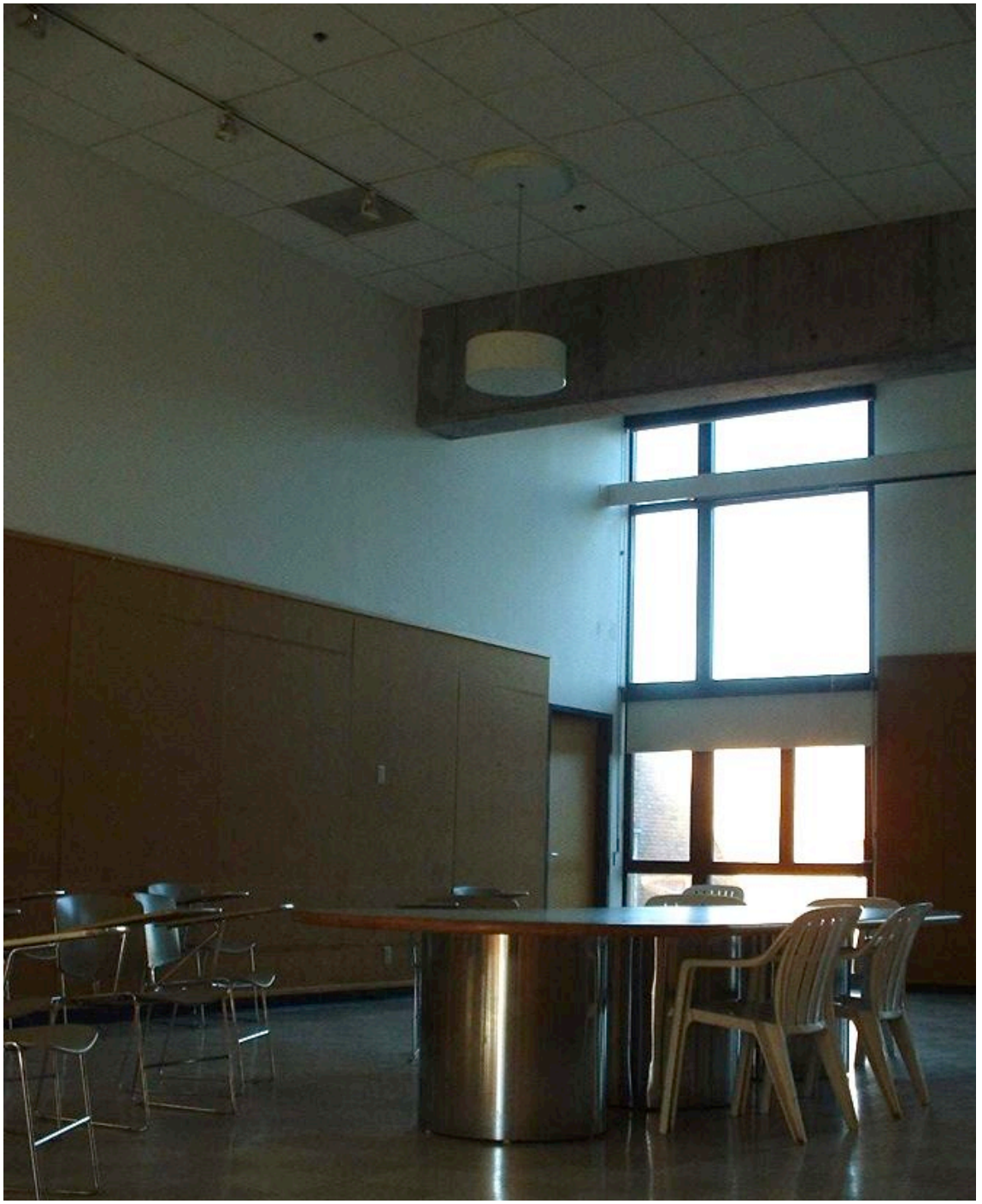
HEARING PATTERNS

Fire Protection

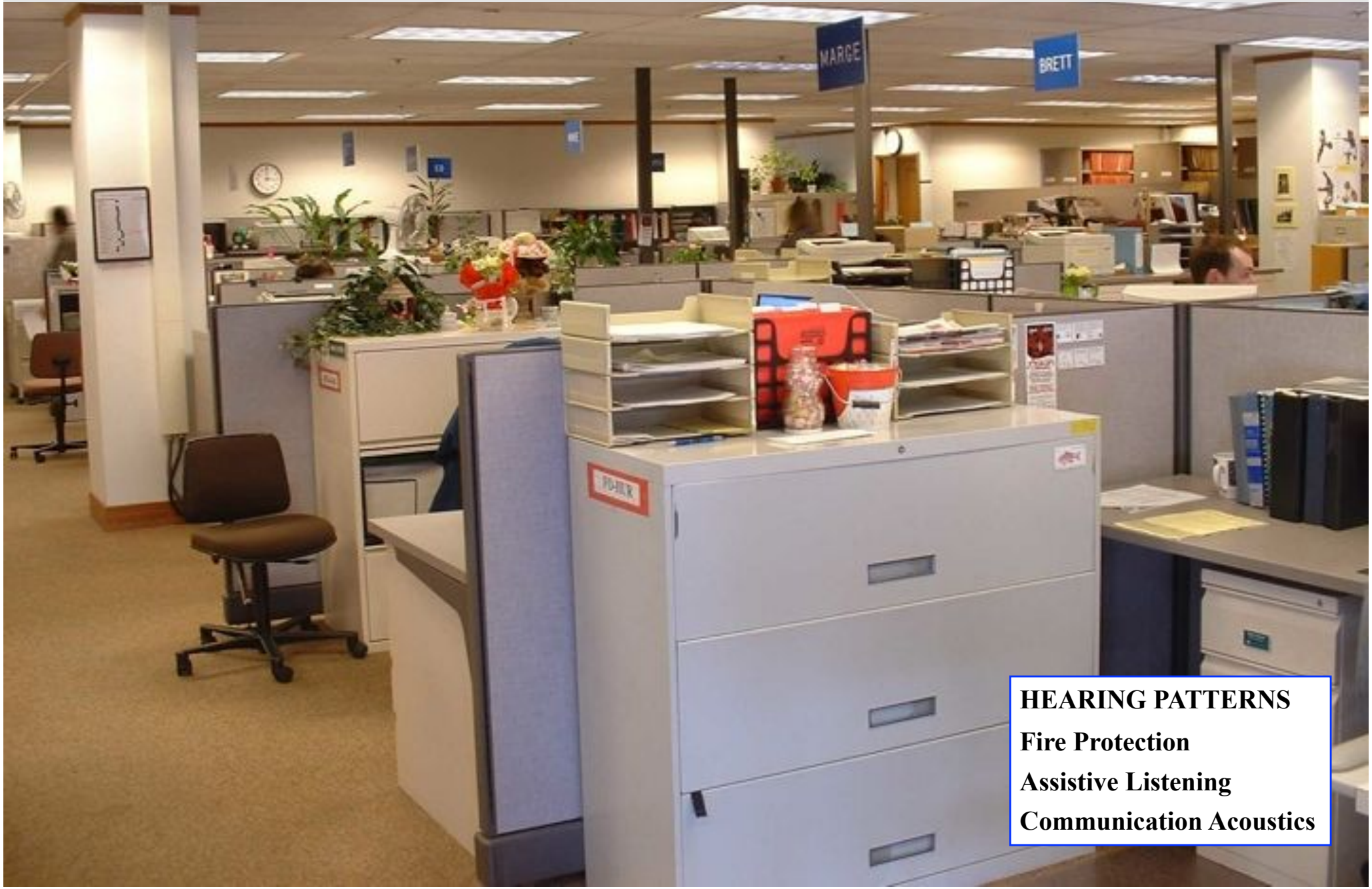
Assistive Listening

Communication Acoustics

Universal Design: Hearing

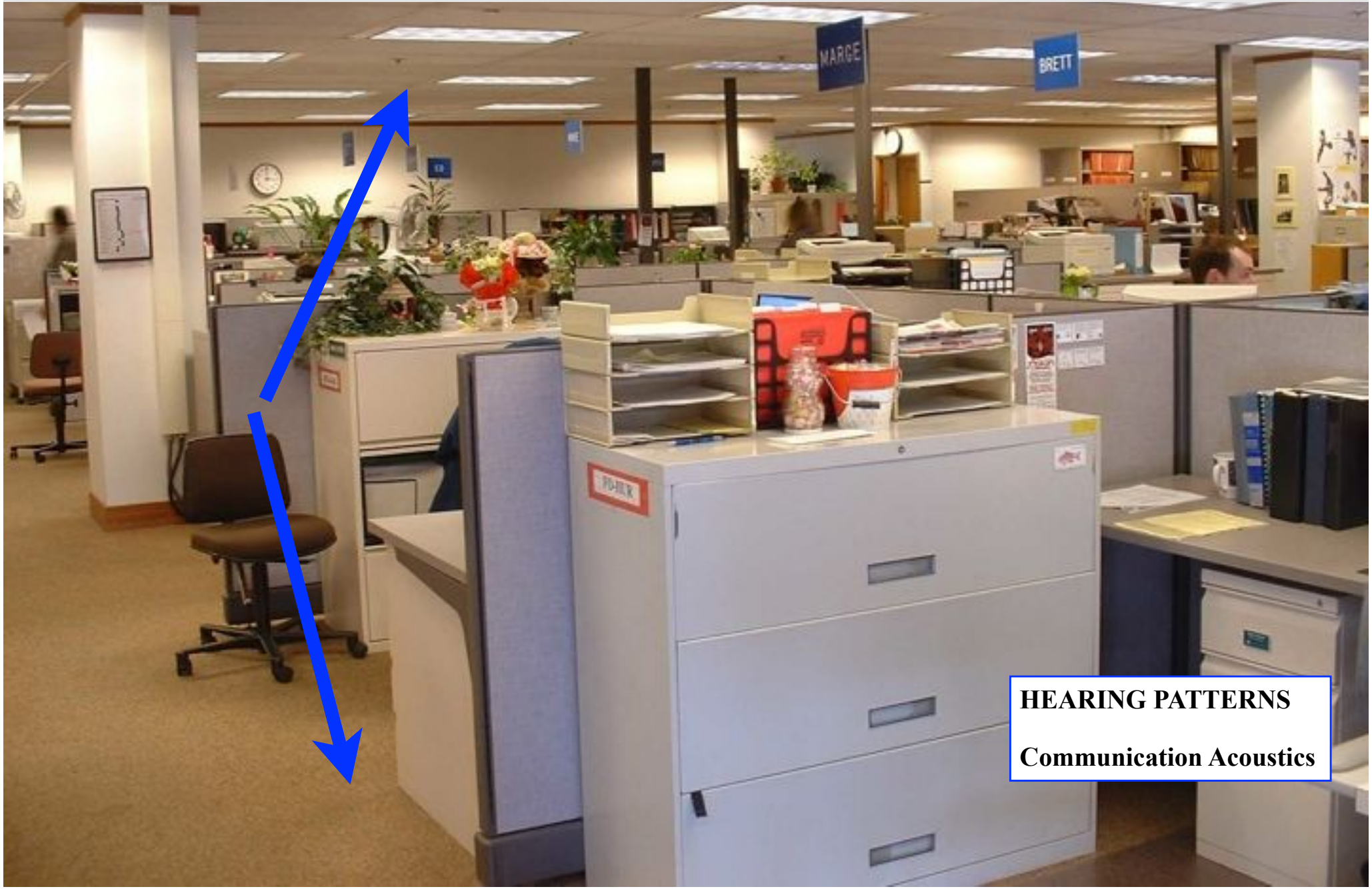


Universal Design: Hearing



Universal Design: Hearing

Universal Design: Hearing



Universal Design: Hearing

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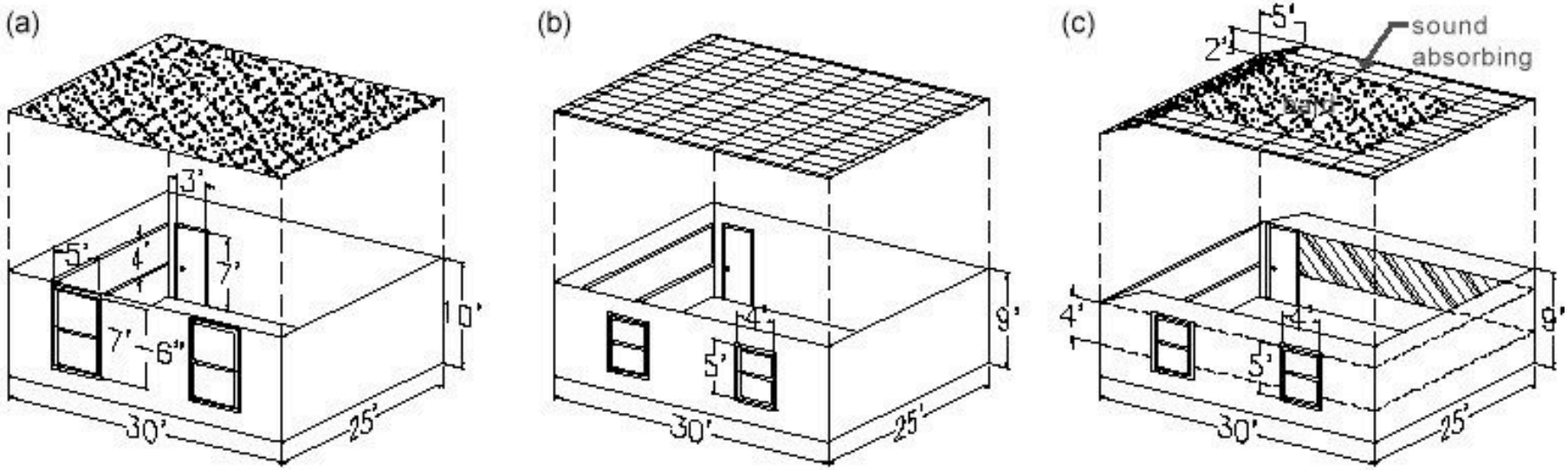
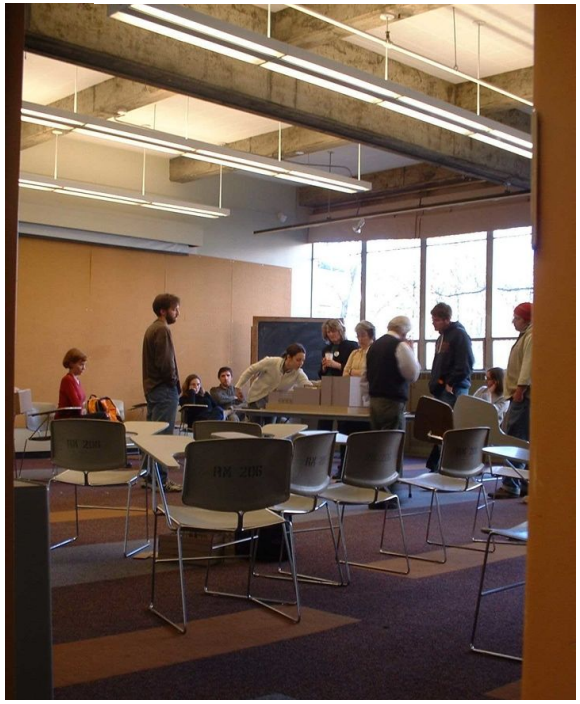


FIGURE 10. Classroom Layouts Classroom (a) is a typical undesirable room with no sound absorbing material and no useful reflection patterns. Classroom (b) is better with an acoustical lay-in, sound absorbing ceiling and thin carpeting. Classroom (c) is a desirable room with sound absorbing wall treatment on three walls, thin carpet, a sloped ceiling reflector at the front, and a ceiling with reflecting surfaces in the center and sound absorbing surfaces around the perimeter.



Classroom materials of high sound absorption placed at ceiling/ wall intersections, combined with carpet to reduce noise at the source, have the maximum effect on reinforcing speech in a classroom or seminar room. This approach works for the primary presenter and also for enhancing discussions.

Diagrams above from www.nonoise.org for use in teaching at the University of Oregon.

HEARING PATTERNS

Fire Protection

Assistive Listening

Communication Acoustics

Universal Design: Four or Five Concepts to Test a Design

- **Is it universal?**
  - Is it designed for a wide range of abilities and needs?

- **Is it effective?**
  - Does it actually work for the specific needs?
  - Has it been tested or at least reviewed by representatives of a wide range of users?
  - Is it supported by research, design standards, or other sources?

- **Is it welcoming?**
  - Does it feel natural and comfortable for all users?
  - Does it discriminate unnecessarily on the basis of ability?
  - Does it give the impression of disability-based discrimination?

- **Will the design solution be durable over time?**
  - Can it accommodate change through flexibility, adaptability, or adjustability?

and...

Universal Design: Conclusion

DON'T BE STUPID!

N.B: This is in no way a comment on any person, present or past, who has every worked as or for the Dean of the School of Architecture and Allied Arts at the University of Oregon. This image has been placed here to demonstrate to architecture students the importance providing vertical transport, in the form of elevators, at or near the main entrance of a building. In the example in the AAA Dean's Office shown above, what appears to be a round white column is in fact the hydraulic piston of an elevator added in the 1990's. It was designed at the right horizontal location but it only served upper floors, which is (to be blunt) stupid. If you still don't get it, send me a note and we'll talk about it sometime.

http://pages.uoregon.edu/ftepfer/access/