

SECTION 03 SPACE AND SITE DESIGN

Table of Contents

03.01 DESIGN REQUIREMENTS	3
A. OVERALL CONSIDERATIONS	3
B. SUSTAINABLE DESIGN	3
C. EXISTING STANDARDS AND NEW TECHNOLOGY	4
03.02 THE BUILDING PROGRAM	4
A. GENERAL	4
B. PROJECT COST	5
C. PROJECT TIME	5
D. SPACE AND ADJACENCY	5
03.03 BUILDING SERVICES AREA SPACE REQUIREMENTS (NONASSIGNABLE)	5
A. PUBLIC RESTROOMS	5
B. PUBLIC SHOWERS	6
C. FAMILY RESTROOM	6
D. LACTATION ROOM	6
E. CUSTODIAL SERVICE CLOSETS	7
F. CUSTODIAL SUPPLY STORAGE ROOM	7
G. CUSTODIAL EQUIPMENT STORAGE ROOM	7
H. MAINTENANCE OFFICE AND CUSTODIAL TEAM ROOM	8
03.04 CIRCULATION AREA SPACE REQUIREMENTS (NONASSIGNABLE)	8
A. ENTRANCES AND VESTIBULES	8
B. CORRIDORS	9
C. STAIRWELLS	9
D. ELEVATORS	9
03.05 MECHANICAL AREA SPACE REQUIREMENTS (NONASSIGNABLE)	9
A. MECHANICAL ROOMS	9
B. ROOF AREAS	9
03.06 MISCELLANEOUS SPACE REQUIREMENTS (ASSIGNABLE)	10
A. MAIL	10
B. TELECOMMUNICATION CLOSETS	10
03.07 GENERAL USE SPACE REQUIREMENTS (ASSIGNABLE OR NONASSIGNABLE)	10
A. GENERAL	10
B. INTERACTION SPACES	10
C. STORM SHELTERS	10
D. VENDING	12
E. PERIODICAL DISTRIBUTION	12
F. RECYCLING	12
03.08 WASTE DISPOSAL	12
A. GENERAL	12
03.09 CLASSROOMS	13
A. GENERAL DESIGN	13
B. FURNISHINGS	13
C. ELECTRICAL	14
D. LIGHTING	14
E. AUDIO-VISUAL	14
F. MEDIA REQUIREMENTS TABLE	16
03.10 OFFICES	16
A. GENERAL	16
03.11 UNIVERSAL & ACCESSIBLE DESIGN	17
A. GENERAL	17
03.12 ART IN STATE BUILDINGS (AISB) PROGRAM	17
A. GENERAL	17
03.13 SITE CONSIDERATIONS	17
A. GENERAL	17
B. SITE DESIGN CRITERIA	17

03.14 SITE AND CLIMATE DESIGN DATA..... 18
A. IOWA STATE UNIVERSITY AT AMES, IOWA..... 18
B. IOWA SCHOOL FOR THE DEAF AT COUNCIL BLUFFS, IOWA 18
C. IOWA LAKESIDE LABORATORY AT MILFORD, IOWA..... 19
D. IOWA BRAILLE AND SIGHT SAVING SCHOOL AT VINTON, IOWA 19

Unless stated otherwise, the standards in this Facilities Design Manual (FDM) are directed to the Design Professional to incorporate into the Project.

03.01 DESIGN REQUIREMENTS

A. OVERALL CONSIDERATIONS

1. Design using forms and materials that are "harmonious and timeless" and that blend with neighboring buildings and the campus as a whole.
2. Achieve a thorough understanding of space relationships and user needs by a careful study of the Building Program and from subsequent discussions with the Planning Committee.
3. Develop a sound, functional plan that fulfills the Building Program.
4. Provide spaces that enhance user comfort and well-being to promote high productivity and task efficiency.
5. Because curricula and space needs change frequently, design to easily accommodate ongoing interior remodelings and building additions.
 - a. Provide easily changeable interior spaces to accommodate unanticipated as well as anticipated changes and future growth.
6. Because funds for maintenance and repair have historically been extremely inadequate, design using materials and systems that are exceptionally durable and need very little maintenance.
 - a. Unless stated otherwise in the Building Program, design buildings to provide useful accommodation to the Owner for at least 50 years.
 - b. Within the building enclosure, take particular care to provide competently installed thermal barrier, air barrier and moisture control systems that will last the life of the building.
7. Optimize design decisions based on a comprehensive life cycle analysis of the Project and a collaborative design process involving all key stakeholders.
8. Specify building systems identified in the executed Agreement Between Owner and Design Professional to be commissioned to ensure compliance with the requirements of the Owner's Building Program.

B. SUSTAINABLE DESIGN

1. Design high-performance building systems and select products and materials to achieve the following goals.
 - a. Minimize energy consumption.
 - b. Minimize environmental impact.
 - c. Minimize waste.
 - d. Minimize water consumption.
 - e. Maximize indoor air quality.
 - f. Maximize use of recycled and low embodied energy materials.
 - g. Maximize rain water retainage on the site.
 - h. Be in harmony with the site's ecology.
2. As a minimum for new buildings, incorporate LEED-NC (new construction) sustainable design strategies as an integral part of all design decisions.
 - a. Register the Project with the U. S. Green Building Council.
 - 1) Identify the Owner as Iowa State University.
 - 2) Identify the Project Name as the Official Project Title.
 - 3) Furnish the web site access code to the University Architect and the Owner's Representative.
 - b. As a minimum, attain LEED-NC, latest edition, Gold Certification, or as required by the executed Agreement Between Owner and Design Professional.
 - c. For minimum LEED points required by the Owner, see FDM Part 1/Support Docs/[Minimum Required LEED Points for ISU New Construction Capital Building Projects.xls](#).

3. The goal for new campus buildings is to consume as little fossil fuel energy as possible without jeopardizing user program requirements, user comfort, building durability, or sustainability goals.
 - a. Provide the Owner's Representative with detailed calculations and documentation that show energy consumption meet the Owner's current energy reduction requirements.
 - b. Wherever possible, design to reduce the use of fossil fuel energy sources by replacing with renewable energy sources.

C. EXISTING STANDARDS AND NEW TECHNOLOGY

1. The guidelines and requirements in this Manual are provided for the following reasons.
 - a. They are based upon the Owner's experience with materials, construction methods and details.
 - b. They have resulted in the fewest problems in operation and maintenance.
 - c. They have resulted in the best service and life of materials and equipment.
2. Uniform use of materials and equipment throughout campus has the following advantages for the Owner.
 - a. It limits the range of cleaning and maintenance products.
 - b. It reduces the variety of parts and materials which must be stocked for repairs and replacements.
 - c. It provides a continuity of aesthetic and functional user-experiences.
3. It is neither the policy nor the intent of the Owner to limit the creativity of the Design Professional in design or selection of materials, products or construction methods.
 - a. New materials, products, and construction methods, when evaluated using current knowledge of building science, may justify changes from these standards to meet the requirements of the Owner's Building Program.
 - 1) Wherever possible, consider using materials, products, and construction methods that are simple to detail and construct, replace a normally higher number of construction steps, encourage a quality installation, decrease construction time, and remain within the construction budget.
 - b. Obtain approval from the Owner's Representative prior to presenting proposed new materials, products and construction methods to the Planning Committee and incorporating them into the Documents.

03.02 THE BUILDING PROGRAM

A. GENERAL

1. Develop a written Building Program based, in part, on the Owner's Project Requirements furnished by the Owner.
 - a. The Building Program may be furnished by the Owner if so stated in the executed Agreement Between Owner and Design Professional.
2. The typical Building Program includes the following parts.
 - a. Approval Statement With Signatures
 - b. Executive Summary
 - c. Project Goals
 - d. Space and Adjacency Requirements
 - e. Existing Site Studies
 - f. Supporting Requirements
 - g. Existing Facilities Studies
 - h. Design Documents
 - i. Project Budget
 - j. Preliminary Project Schedule
 - k. Implementation Approach

3. For additional information, see FDM Part 1/[Sec 05 Pre-Planning and Building Programming.pdf](#).
4. The balance of the content of the Owner's Building Program are the standards contained in this Facilities Design Manual.

B. PROJECT COST

1. Be aware that the estimated amount identified as Construction Cost in the Building Program Project Budget includes all built-in and fixed equipment for the Project.
2. Immediately advise the Owner's Representative if the estimated Construction Cost is inadequate to allow meeting **the requirements of the Building Program**.

C. PROJECT TIME

1. Base the various phases of the tentative time schedule on Owner-furnished occupancy date(s), which normally are critical because they relate to other planned programs and the University academic calendar.

D. SPACE AND ADJACENCY

1. Unless previously approved by the Owner's Representative, significant deviation from Net Assignable Square Feet or from functional relationships in the Building Program could result in rejection of the design.
 - a. For definition of Net Assignable Square Feet and other space related terms, see FDM Part 1/[Sec 05 Pre-Planning and Building Programming.pdf](#)

03.03 BUILDING SERVICES AREA SPACE REQUIREMENTS (NONASSIGNABLE)

A. PUBLIC RESTROOMS

1. Provide adequate facilities to accommodate building occupants, including disabled persons.
2. **For new construction and wherever possible for remodeling projects,** provide restroom access via a short corridor with acoustical control, **visual screening,** and no doors.
3. **Where doors are required, swing doors out wherever possible.**
4. **Fully screen the interior of restrooms from view at the restroom entrance.**
5. Provide glazed ceramic tile on walls and floors.
 - a. For ceramic tile information, see 09 30 00A in FDM Part 2/[Div 09 Finishes.pdf](#).
6. Provide medium-to-dark colored solid high density polyethylene ceiling-hung toilet partitions, wall mounted urinal screens and wall-supported **lavatory** counter tops with 4 to 6 inch high backsplash.
 - a. For toilet partition information, see **10 21 13** in FDM Part 2/[Div 10 Specialties.pdf](#).
 - b. For counter top information, see 12 36 00A in FDM Part 2/[Div 12 Furnishings.pdf](#).
7. Provide a mirror the full width of the counter from top of backsplash to at least 72 inches above the floor.
8. Provide a full height mirror and shelf.
9. **Provide the Owner's standard hook strip and shelf unit as required by the Building Program.**
 - a. **See FDM Part 2/Support Docs for Div 03-13/Arch-ID Details/[Hook Strip Details.pdf](#).**
10. Provide wall-mounted toilets and urinals with automatic flushing sensors.
11. Behind toilets and urinals, provide an easily accessible pipe chase 3 feet wide clear with lighting and 1 duplex receptacle.
 - a. **An equivalent space configuration may be provided where approved by the Owner's Representative.**
12. Provide lavatories with automatic on/off faucet sensors.
13. Where a family restroom is not required, provide comparable baby changing facilities in a wheelchair accessible men's and women's restroom as follows.
 - a. Adjacent to a lavatory, provide a solid surface counter 24 inches deep by 36 inches long mounted 32 inches above the floor, with minimum 30 inches clear under the counter.
14. Provide a wall security box containing a hot/cold water mixer with hose connector under the sink or group of sinks.

15. Provide a floor drain centered in the restroom with the floor sloped toward the drain.
16. For accessory information, see Section 10 28 00 in FDM Part 2/[Div 10 Specialties.pdf](#).
 - a. Verify location of accessories with the Owner's Representative.
17. Place towel dispensers and trash receptacles in separate easily accessible locations.
 - a. Do not specify integral towel dispenser/trash receptacle units.
 - b. Do not layout restrooms with trash receptacles located in front of towel dispensers.
 - c. Locate trash receptacles below access holes in the lavatory counter.
18. Maintain an operating temperature range of 70° F to 76° F.
19. Provide constant mechanical ventilation at no less than 1.5 CFM per square foot.

B. PUBLIC SHOWERS

1. Provide adequate facilities to accommodate building occupants, including disabled persons.
2. Provide glazed ceramic tile on walls and floors
 - a. For ceramic tile information, see 09 30 00A in FDM Part 2/[Div 09 Finishes.pdf](#).
3. Provide medium-to-dark colored solid high density polyethylene ceiling-hung shower partitions.
 - a. For shower partition information, see 10 21 00A in FDM Part 2/[Div 10 Specialties.pdf](#).
4. For accessible shower compartments, specify and locate shower heads and accessories to comply with the Owner's accessibility reference standard.
 - a. See paragraphs under 02.07B Accessibility Standard in FDM Part 1/[Sec 02 Codes and Regulations.pdf](#).
5. Provide a floor drain for each shower compartment with the floor sloped to receive water only from that shower compartment.
6. Provide a wall security box containing a hot/cold water mixer with hose connector and space for a chemical dispenser.
7. Provide recessed waterproof gasketed light fixtures.
 - a. Verify light fixtures with the Owner's Representative.
8. Maintain an operating temperature range of 70° F to 76° F.
9. Provide constant mechanical ventilation at no less than 1.75 CFM per square foot.

C. FAMILY RESTROOM

1. Provide a family restroom in a building that provides public accommodation.
 - a. For example, provide a family restroom in a building that has a general classroom.
2. Where required, provide 1 wheelchair accessible family restroom adjacent to men's and women's restrooms and with the following features.
 - a. Except for providing only 1 lavatory, 1 toilet and a door with a privacy lock, provide features, lighting, temperature and ventilation identical to that required for a public restroom.
 - b. Adjacent to the lavatory, provide a solid surface counter 24 inches deep by 36 inches long mounted 32 inches above the floor, with minimum 30 inches clear under the counter.

D. LACTATION ROOM

1. Provide 1 wheelchair accessible room of approximately 80 square feet with privacy lock in one of the following locations.
 - a. Accessible from a corridor and near a women's restroom
2. Provide a chair and a counter 18 inches to 24 inches deep by 30 inches long mounted 32 inches above the floor, with minimum 30 inches clear under the counter.

3. Provide the Owner's standard hook strip and shelf unit as required by the Building Program.
 - a. See FDM Part 2/Support Docs for Div 03-13/Arch-ID Details/[Hook Strip Details.pdf](#).
4. Provide 1 electrical duplex receptacle above the counter.
5. Provide mechanical ventilation at no less than 1.0 CFM per square foot.
6. Maintain an operating temperature range of 70° F to 76° F.

E. CUSTODIAL SERVICE CLOSETS

1. On each floor, provide an 8 foot by 8 foot (or approximately 64 square foot) room designed to store a custodial cart and mop bucket.
 - a. Do not locate electrical panels, fire equipment, fire panels, condensate lines, mechanical equipment, or telecom equipment in custodial service closets.
2. Locate the service closet adjacent to or between restrooms.
3. Provide an in-swinging 3'-6" wide door to accommodate equipment and supplies.
4. Provide a service sink with floor type precast receptor 30 by 30 inches or larger with maximum 6 inch external sidewall and the following accessories.
 - a. Hot and cold water mixing service sink faucet located no lower than 5 feet above the floor to allow hook up to a chemical dispenser
 - b. Braced faucet spout with pail hook
5. Provide a backsplash on wall the width of the service sink that extends from the service sink to just below the faucet.
 - a. Mount Owner furnished cam-action hose bracket 1 foot above edge of service sink and below faucet.
 - b. Mount Owner furnished cam-action multi-mop bracket 4 feet above floor over sink.
6. Provide a floor drain centered in the room.
7. Provide 1 GFCI protected duplex receptacle.
8. Provide 3 adjustable 3/4 inch thick shelves 12 inches wide that will support 50 psf using heavy duty brackets and double-slotted standards, with top shelf no higher than 6 feet above finish floor.
9. Verify location of receptacle, shelves and brackets with the Owner's Representative.
10. Maintain a temperature of 70° F during winter conditions.
11. Provide constant mechanical ventilation at no less than 1.15 CFM per square foot.

F. CUSTODIAL SUPPLY STORAGE ROOM

1. Provide a 10 foot by 10 foot (or approximately 100 square foot) room located by the loading dock.
 - a. Do not locate electrical panels, fire equipment, fire panels, condensate lines, mechanical equipment, or telecom equipment in the custodial supply storage room.
2. Provide an in-swinging 3'-6" wide door to accommodate easy access of supplies.
3. Provide a floor drain centered in the room with the floor sloped toward the drain.
4. On the two longest walls, provide 5 adjustable 3/4 inch thick shelves 16 inches wide that will support 50 psf using heavy duty brackets and double-slotted standards.
5. Verify location of shelves with the Owner's Representative.
6. Maintain a temperature of 70° F during winter conditions.
7. Provide constant mechanical ventilation at no less than 1.15 CFM per square foot.

G. CUSTODIAL EQUIPMENT STORAGE ROOM

1. Provide a 10 foot x15 foot (or approximately 150 square foot) room located by the loading dock.
 - a. Do not locate electrical panels, fire equipment, fire panels, condensate lines, mechanical equipment, or telecom equipment in the custodial equipment storage room.
2. Provide an in-swinging 3'-6" wide door to accommodate equipment.

3. Provide a floor drain centered in the room with the floor sloped toward the drain.
4. Provide space for Owner to furnish and install 4 painted steel wall mounted hose hangers 3 feet above the floor to store two 50 foot water hoses and two 50 foot extension cords.
5. Provide 1 duplex receptacle on each of 2 separate walls.
6. Verify location of hangers and receptacles with the Owner's Representative.
7. Maintain a temperature of 70° F during winter conditions.
8. Provide constant mechanical ventilation at no less than 1.15 CFM per square foot.

H. MAINTENANCE OFFICE AND CUSTODIAL TEAM ROOM

1. Provide where required by the Building Program.
2. Provide a 15 foot by 13 foot (or approximately 195 square foot) room.
 - a. Do not locate electrical panels, fire equipment, fire panels, condensate lines, mechanical equipment, or telecom equipment in the maintenance and custodial team room.
3. Provide hand washing function using a Fiat L-5 combination sink and storage unit or using other durable, waterproof products approved by the Owner's Representative.
 - a. Do not provide cabinet units that are fabricated of wood or other water sensitive fiber content.
4. Provide a floor drain centered in the room with the floor sloped toward the drain.
5. Provide 1 duplex receptacle on each of 4 separate walls.
6. Provide a built-in nominal 2 foot deep 45 degree standing computer work counter located in a corner of the room approved by the Owner's Representative.
 - a. Locate the plastic laminate counter (no backsplash) with a 42.5 inch clear height above the floor and the front edge 40 inches from each corner, which will result in a triangular shaped hole at the corner for cable management.
 - b. Locate 1 receptacle and 1 voice/data jack near the corner above the counter.
 - c. Specify an articulated keyboard shelf included in the furniture furnished and installed by Owner.
7. Verify location of receptacles and voice/data jack with the Owner's Representative.
8. Provide the Owner's standard 2-hook strip behind the door.
 - a. See FDM Part 2/Support Docs for Div 03-13/Arch-ID Details/[Hook Strip Details.pdf](#).
9. Maintain an operating temperature range of 70° F to 76° F.
10. Provide adequate ventilation to comply with the indoor air quality requirements of ASHRAE 62, current edition.

03.04 CIRCULATION AREA SPACE REQUIREMENTS (NONASSIGNABLE)

A. ENTRANCES AND VESTIBULES

1. Except for exterior exit-only doors and exterior doors to individual rooms, provide vestibules between exterior entrance doors and the building interior circulation system.
2. Vestibules
 - a. Provide no less than 10 feet deep with the floor area depressed 1/2 inch below the adjacent floor level for matting furnished and installed by Owner (see 12 48 00A in FDM Part 2/[Div 12 Furnishings.pdf](#)).
 - b. Provide a floor drain centered in the vestibule under the matting with the floor sloped toward the drain.
 - c. Provide a GFCI protected duplex receptacle and a cold water valve with hose connector in a wall security box with cover.
 - d. Provide a minimum temperature of 55° F during winter conditions.
3. Wherever possible beyond the vestibule, provide a non-recessed area for Owner to install vestibule matting the full width of the corridor or vestibule (whichever is wider) to no less than 40 feet from the exterior door to the end of the matting measured along the line of travel.

4. Provide fully weather-stripped exterior doors and vestibule doors.

B. CORRIDORS

1. Provide minimum 6 foot clear corridor width and minimize length when used only for circulation.
2. Provide direct access to services spaces from major circulation corridors.
3. Minimize length where use is purely for circulation.
4. Provide electrical duplex receptacles spaced not over 50 feet apart
5. Provide **water coolers** and public furnishings, such as benches, to serve building occupants.
 - a. Work with the Owner's Representative on the design of public furnishings.
 - b. For water cooler requirements, see 22 47 00 in FDM Part 2/[Div 22 Plumbing.pdf](#).
6. Provide glare-free, durable floor and wall surfaces.
7. Provide ramps for level changes less than 21 inches.
8. Provide a minimum winter temperature of 60° F and a maximum summer temperature of 80° F.

C. STAIRWELLS

1. Provide an electrical duplex receptacle at each landing.
2. **Wherever possible**, provide slip-resistant treads without using added surface or recessed accessories.
 - a. Where a slip resistant strip must be used, locate the strip within 1 inch of the stair nosing.
3. Provide glare-free lighting that makes tread nosings distinctly visible.
4. Provide a minimum temperature of 60° F **during winter conditions** and a maximum temperature of 80° F **during summer conditions**.

D. ELEVATORS

1. For space requirements, see 14 20 00B in FDM Part 2/[Div 14 Conveying Equipment](#).

03.05 MECHANICAL AREA SPACE REQUIREMENTS (NONASSIGNABLE)

A. MECHANICAL ROOMS

1. Provide access at ground level to accommodate equipment storage and transport.
2. Provide a 3 foot deep by 4 foot wide bench for review and storage of system drawings.
3. Provide a 3 foot by 7 foot work bench with tool storage cabinets.
4. Provide 4 adjustable shelves 16 inch wide that will support 50 psf.
5. Verify design of work bench and location of shelves with the Owner's Representative.
6. Provide mechanical ventilation and temperature **control as required by the Building Program**.

B. ROOF AREAS

1. **Locate roof access doors and hatches from public corridors, stairwells, or mechanical spaces, but not from custodial spaces.**
2. **Safety Requirements**
 - a. **Locate no portion of roof access doors or hatches closer than 6 feet from a roof edge.**
 - 1) **At roof access hatches, install a permanent guard rail with swinging gate to the exterior sides of the hatch.**
 - a) **For guard rail products, see FDM Part 2 Div 07**
 - b. **Locate mechanical equipment no closer than 10 feet from a roof edge.**
 - c. **Where skylight protection is required by the Owner's Representative, specify a cover system or guard rails anchored to the exterior sides of the skylight curb that comply with OSHA requirements.**

- d. Where required by the Owner's Representative, specify anchors installed that comply with OSHA 1926.502 for attachment of fall protection equipment.

03.06 MISCELLANEOUS SPACE REQUIREMENTS (ASSIGNABLE)

A. MAIL

1. Facilities to accommodate the handling of mail are unique to each project.
2. In general, provide a space with locked compartments to store mail and counter space for departments to sort mail.
3. Provide compartments with clear inside dimensions of 15 inches wide, 19 inches deep and 15 inches high to accommodate a single mail tote.
 - a. Provide at least 1 compartment per department for incoming mail.
 - b. Provide at least 1 compartment for outgoing campus mail and 1 compartment for US mail.
4. Compartments with locked doors front and rear are preferred for access on opposite sides by ISU Postal and Parcel personnel and by department personnel.
5. Verify mail handling requirements with the Owner's Representative.
6. Maintain an operating temperature range of 70° F to 76° F.

B. TELECOMMUNICATION CLOSETS

1. Locate telecommunication outlets as required by the Building Program and as approved by the Owner's Representative.
 - a. The typical outlet (voice-data jack) consists of an upper jack for voice (telephone), a lower jack for data (Information System Network – ISN) with a normal duplex outlet cover plate.
2. Request the Owner's Representative to arrange a meeting with Telecommunication personnel to determine locations and sizes of cable and equipment.
3. Locate telecommunication equipment rooms directly accessible from exit corridors.
4. For detailed room requirements, see FDM Part 2/Support Docs for Div 27/[Telecom Closet Standards.pdf](#).

03.07 GENERAL USE SPACE REQUIREMENTS (ASSIGNABLE OR NONASSIGNABLE)

A. GENERAL

1. The following functions may be located in either assignable or nonassignable space.
 - a. If the function is located within a department space, it is assignable.
 - b. If the function is located within a circulation area, it is nonassignable.

B. INTERACTION SPACES

1. Wherever possible, locate interaction spaces in central areas close to major circulation paths.
2. Do not locate interaction spaces in "left-over" areas scattered throughout the building.
3. Maintain an operating temperature range of 70° F to 76° F.

C. STORM SHELTERS

1. Unless tornado shelters that comply with ICC 500-2008 are required by the Building Program, for new campus building and major remodeling projects provide a protected interior space to shelter building occupants from flying projectiles during a severe weather event.
 - a. In addition to complying with the Iowa State Building Code, consider provisions of IBC 1609 for potential loss of building exterior enclosure on the windward side of the building.
 - b. Provide accessible entrances that comply with the Americans With Disabilities Act Accessibility Guidelines (ADAAG).

- c. Clearly designate the storm shelter area on building floor plans required for submittal to the Owner at Schematic Design, Design Development, Construction Documents Phases, and on Record Documents.
2. Design the space to accommodate a minimum of 75% of code-defined occupants at 5 square feet per person, and include a percentage of disabled persons in wheelchairs, as calculated by ADAAG, at 10 square feet per person.
 - a. Shelter capacity may be provided in more than 1 location.
 - b. Locate shelters within 10 minutes travel distance from normally occupied spaces in the building.
3. Lower level interior spaces are preferred as follows.
 - a. Basements
 - b. Interior corridors
 - c. Interior offices or labs
 - d. Interior stairwells
 - e. Restrooms
4. Spaces to avoid include the following.
 - a. Rooms that are normally locked or have restricted or limited access
 - b. Spaces with large windows
 - c. Spaces that have chemical, electrical, or mechanical hazards
 - d. Mechanical rooms
 - e. Elevators
 - f. Upper stories of buildings
5. Consider the flight path of wind-borne or falling debris.
 - a. Be aware that new code-compliant campus buildings can withstand high winds, but may not provide adequate protection from wind driven projectiles.
 - b. Locate doors to the sheltered space well away from possible paths of projectiles coming through openings in the exterior envelope.
 - c. If windows cannot be avoided in the space designated as the storm shelter, keep window size small and glaze with impact resistant materials.
 - d. Provide as many surrounding layers of protection from projectiles as possible.
6. For buildings of light construction and with little surrounding protection, add materials that help increase penetration resistance to shelter walls and roof (ceiling); possible materials include the following.
 - a. Impact resistant gypsum board
 - b. Plywood
 - c. Sheet metal
 - d. A combination of these or other approved materials
7. For guidance in the design of roof and wall assemblies, see FEMA 361: Design and Construction Guidance for Community **Safe Rooms** (<http://www.fema.gov/library/viewRecord.do?id=1657>).
8. Provide storm shelter area(s) with adequate emergency lighting for a minimum duration of 30 minutes.

D. VENDING

1. Provide a wheel chair accessible space and utility connections for vending machines 3 feet deep by 4 feet wide by 6 feet high.
 - a. Minimum number of machines is 1 soft drink machine and 1 candy machine.
 - b. Average number of machines is 2 soft drink machines, 1 candy machine, and 1 chilled food machine.
 - c. Provide a counter 2 feet deep and minimum 3 feet long mounted 32 inches above the floor, with minimum 30 inches clear under the counter for microwave, plates and napkins.
 - d. Provide 1 electrical duplex receptacle above the counter.
2. Locate vending machines and counter to not block an exit path.
3. Discuss specific project requirements and required utilities with the Owner's Representative.

E. PERIODICAL DISTRIBUTION - SUSPENDED 10.14.2021

F. RECYCLING

1. Provide areas which are easily accessible, but not in exit passageways, to accommodate the storage of cardboard boxes and paper recycling bins.
 - a. Locate bins for convenient access (via elevator, if necessary) to the dock for pickup of contents or bin exchange.
2. On each floor, provide at least 1 area 24 inches wide by 30 inches deep for each white paper recycling bin.
3. Adjacent to each group of periodical distribution boxes, provide an area 16 x 16 inches for 1 periodical recycling bin.
4. In a monitored and secured area, provide at least 1 area per building 28 inches wide by 36 inches deep for each confidential paper recycling bin.
 - a. Because this bin can become very heavy when full, provide access to at least 1 side as well as to the front of the bin to ensure successful maneuvering.
5. Provide an area 4x6 feet or larger that is sheltered from wind and rain and close to the dock to store used cardboard boxes for recycling.
6. Bins furnished and installed by the Owner.
 - a. Verify bin locations with the Owner's Representative

03.08 WASTE DISPOSAL

A. GENERAL

1. At the dock area, locate waste containers to permit easy, direct access by packer type trucks each day.
2. Provide building custodians convenient daily access to waste containers.
3. For dimensions of waste containers, see FDM Part 2/Support Docs for Div 03-13/Site Equipment Details/[LA-2 Lodal Trash Containers.pdf](#).

4. Verify waste disposal requirements with the Owner's Representative.
 - a. Give special consideration to biological wastes, chemical wastes and radioactive materials when their waste disposal requirements are included in the Building Program.

03.09 CLASSROOMS

A. GENERAL DESIGN

1. Provide an adequately sized, inviting space that promotes positive student interaction and learning.
2. Accommodate rapid exiting and entering of students at time of class change.
 - a. Locate the main doors at the rear of the classroom.
3. Ensure the design of the HVAC system will provide a comfortable and quiet environment.
4. Provide finish materials that are attractive, durable and easy to clean.
 - a. Provide painted wall surfaces below acoustical surfaces.
 - b. Except for resilient flooring in fixed seating areas, provide carpet for floors.
 - 1) Where classrooms are near building entrances, provide resilient flooring instead of carpet.
 - 2) Verify the floor covering selection with the Owner's Representative.
 - 3) For flooring information, see FDM Part 2/[Div 09 Finishes.pdf](#).
5. Provide acoustical treatment to ensure all occupants can easily hear each other speak.
 - a. Ensure proper acoustics are addressed especially in rooms with a seating capacity of 50 or more.
6. Provide a clear, unobstructed view of projection screens and white boards from all seat locations.
7. Provide attractive, durable and easily operated window coverings that completely darken the room for image projection.
8. Provide adequate wheelchair locations in rooms with fixed seating.
9. **Maintain** an operating temperature range of 70° F to 76° F.
10. **Provide adequate ventilation to comply with the indoor air quality requirements of ASHRAE 62, current edition.**

B. FURNISHINGS

1. Provide porcelain on steel white dry erase marker boards across the entire front wall.
 - a. When required by the Building Program, provide white boards on side walls.
 - b. Above the full width of each white board, provide a 2 inch map rail with continuous cork tack strip.
 - 1) Provide a minimum of 8 map rail accessory spring-clip-hooks per wall.
2. Provide coat racks only in spaces used for adult or general public audience events.
3. Provide furniture of a quality brand, model and color to permit efficient repair, exchange and replacement.
4. Unless the Building Program requires matching existing materials, provide cabinets, table tops and furniture covered with plastic laminate.
5. Provide seats not less than 20 inches wide in auditoriums; 22 inch wide seats are preferred.
 - a. Ensure at least a 12 inch clearance between the seat back and the folding tablet arm when in use.
 - b. Ensure folding tablet arms have a rattle-free mechanism.
 - c. Provide left-handed tablet arms for at least 10 percent of seats.
 - 1) Verify locations of left-handed tablet arms with the Owner's Representative.
6. Media cabinets and teaching stations are furnished by the Owner and installed by the Contractor.
 - a. See the Owner's standard media cabinet at FDM Part 2/Support Docs for Div 03-13/Arch-ID Details/[Media Cabinet.pdf](#).

- b. See the Owner's standard teaching station at FDM Part 2/Support Docs for Div 03-13/Arch-ID Details/[Teaching Station.pdf](#).
- c. Coordinate modifications to the design of standard media cabinets and teaching stations with the Owner's Representative.

C. ELECTRICAL

1. Provide 2 duplex receptacles at the front wall and 1 duplex receptacle at each remaining wall.
 - a. Provide power for receptacles inside media cabinets and teaching stations where required by the Building Program.
 - b. Verify locations of wall duplex receptacles with the Owner's Representative.
2. Where there is a media cabinet or teaching station, locate the voice/data jack on the teaching station or media cabinet.
 - a. Verify the location of the voice/data jack with the Owner's Representative.
3. Where there is no media cabinet or teaching station, provide a voice/data jack near a duplex receptacles on the front wall.
4. For each projection screen, provide 1 duplex receptacle on the ceiling for a ceiling-mounted projector at a location along a line perpendicular to, and at a distance of 1.1 to 1.5 times the width of, the screen.
5. For future use, provide a recessed 2-gang box with blank face plate and 1-1/4 inch empty conduit from the box to above the accessible ceiling.
 - a. Verify the location of the 1-gang box with the Owner's Representative.
6. Provide a single dedicated circuit to power the ceiling projector and media cabinet.
7. Provide electrically operated projection screens in classrooms with 50 seats or more.
 - a. Verify quantity, size and location of projection screens with the Owner's Representative.
8. In classrooms with a ceiling height of 11 feet or more, provide at least 1 clock that is easily read by both instructor and students.
 - a. Provide analog clocks that are automatically set to atomic time by radio signal at least once per day and operate on a single set of batteries for at least 1 year.
 - b. Locate clocks at least 9 feet above the floor and attach with security screws.

D. LIGHTING

1. Provide **an average of 40 foot-candles** at table height from fluorescent fixtures.
2. **Separately switch the row of fixtures at the front of the room**
3. Provide **light fixtures over white boards as required by the Building Program.**
 - a. **Where a projector screen is used, provide a separately switched white board light fixture for concurrent use with the projector screen in the lowered position.**
4. **Provide lighting over instructor stations as required by the Building Program.**
5. Provide aisle lighting in auditoriums.
6. Provide clearly labeled light switches.
7. For more information, see paragraphs under Section 26 50 00 B in FDM Part 2/[Div 26 Electrical](#).

E. AUDIO-VISUAL

1. Provide suitable facilities for audio-visual activities as required by the Building Program.
2. Provide adequate space or room(s) for, and the connection and interconnection of, audio-visual equipment required by the Building Program.
3. Provide projection screens as required by the Building Program.
 - a. Provide electrically operated screens if 8 feet wide or more.
 - b. Provide manually operated screens if less than 8 feet wide.

- c. Provide a convenient method to fix screens at an angle to eliminate "keystoning" when cart-supported projectors are used.
 - d. Verify quantity, size and location of projection screens with the Owner's Representative.
4. To ensure viewing the best quality projected image, locate seating within a line 30 degrees from a line centered and perpendicular to the main projection screen.
 5. Provide for the proper installation and storage of audio-visual equipment.
 6. For audio-visual equipment not furnished by the Owner, provide equipment of a high quality brand and model to permit efficient repair, exchange and replacement.
 7. Provide for specific audio-visual requirements as follows.
 - a. Classrooms (1-49 seats)
 - 1) Provide a full-width lecture area with a minimum depth of 8 feet from the first row of seats to the front wall.
 - 2) Provide a 24x30 inch space for a mobile projection cart at the front center of the room.
 - a) Provide a minimum of 8 feet from front of cart to the projection screen.
 - b) If space is limited, use a second corner-mounted 60-70 inch wide projection screen for video projection to attain the minimum 8 foot projection distance.
 - 3) Provide a 60-70 inch wide projection screen and locate it high enough to allow an unobstructed view of a 70 inch vertical image.
 - b. Large Classrooms (50-99 seats)
 - 1) If seating is fixed, provide a full-width lecture area with a minimum depth of 8 feet from the first row of seats to the front wall.
 - 2) If seating is fixed, provide a sloped or stepped floor that rises in elevation toward the rear.
 - a) Accommodate persons with disabilities and those in wheelchairs.
 - 3) Provide a 24x30 inch space for a mobile projection cart at the front center of the room.
 - a) Provide a minimum of 8 feet from front of cart to the projection screen.
 - b) If space is limited, use a second corner-mounted 60-70 inch wide projection screen for video projection to attain the minimum 8 foot projection distance.
 - 4) Provide a floor-mounted duplex receptacle centered and approximately 15 feet from the front wall to supply power to portable video projection equipment.
 - 5) Provide a 70-84 inch wide projection screen and locate it high enough to allow an unobstructed view of an 84 inch vertical image.
 - c. Auditoriums (100 or more seats)
 - 1) Provide a full-width lecture area with a minimum depth of 10 feet from the first row of fixed seats to the front wall.
 - 2) Provide 2 screens 10-14 foot wide located side-by-side or provide an equivalent smooth wall surface with a projection screen coating approved by the Owner's Representative.
 - a) If a wall surface is used, consider it as 2 separate screens side-by-side for projection purposes.
 - 3) Provide a sloped or stepped floor that rises in elevation toward the rear.
 - a) Accommodate persons with disabilities and those in wheelchairs.
 - 4) Provide a 60x40 inch space for a 22x36 inch mobile projection cart or storage/projection cabinet and standing work space at the rear of the room.
 - 5) Locate the projection screen high enough to allow an unobstructed view of a 96 inch vertical image.
 - 6) Provide a suitable location and infrastructure for an Owner-supplied media cabinet that typically contains an audio-visual control panel and storage at the front or side of the room.
 - a) Verify cabinet dimensions and features with the Owner's Representative.

- b) Locate the cabinet for optimum use by the instructor.
 - c) Provide a minimum 2 inch concealed conduit to each ceiling-mounted projector location.
 - d) Provide all required electrical, lighting, projection, voice/data and audio controls and jacks.
 - e) Provide lockable storage for a sound system amplifier and telecom connections.
 - f) Provide unlocked drawer storage for microphones and projector remote controls.
- 7) If required by the **B**uilding **P**rogram, provide the needed infrastructure for remote video conference reception and origination.
- a) Provide power receptacles at remote camera locations and conduit to the front media cabinet.
 - b) Provide conduit and cable to the building broad band and fiber optics panel.

F. MEDIA REQUIREMENTS TABLE

	Classroom	Large Classroom	Auditorium
<u>General Environment</u>			
Teaching Station		X	X
Media Cabinet – front of room	X	X	
Projection Screen for slides/film/video projectors (front surface, mat white)	X	X	X
Projection Screen for overhead projectors (angled, corner mount)	X	X	
Video projection capability	X	X	X
Control switches at wall panel near presenter		X	X
Control switches near exit door	X	X	X
<u>Audio Requirements</u>			
Public address sound system	X	X	X
Voice/data communications	X	X	X
Audio inputs to sound system (various levels)	X	X	X
<u>Visual Requirements</u>			
Overhead projection	X	X	
Computer projection	X	X	X
Live demo with video	X	X	X
<u>Media Equipment</u>			
S = Space and power for future use B = Item stored and built into facility			
Overhead projector, cart & screen	B	B	
Video projector	S	S	B
Media playback system (VCR/DVD)	S	S	B
Video Conferencing system (camera origination)			S/B
Interactive video (video & computer)	S	S	B
Front surface projection screen	B	B	B
Public address sound system	S	S	B

03.10 OFFICES

A. GENERAL

1. See the Owner's standard **individual** office design at FDM Part 2/Support Docs for Div 03-13/Arch-ID Details/[Typical Faculty-Staff Office.pdf](#).
2. **Maintain** an operating temperature range of 70° F to 76° F.
3. **Provide adequate ventilation to comply with the indoor air quality requirements of ASHRAE 62, current edition.**

03.11 UNIVERSAL & ACCESSIBLE DESIGN

A. GENERAL

1. Provide universal site and building access for all people, including physically challenged persons, without discrimination.
2. Follow federal and state accessibility requirements and universal design and accessibility guidelines in "Access for Everyone" (see paragraphs under 02.07B Accessibility standard in FDM Part 1/[Section 02 Codes and Regulations.pdf](#)).
3. Provide power door openers at frequently used building entrances.

03.12 ART IN STATE BUILDINGS (AISB) PROGRAM

A. GENERAL

1. For projects with a total estimated cost of \$1 million or more, incorporate fine arts into the Project valued at 0.5 percent or more of the total estimated cost of the Project.
2. See the code reference for the AISB Program in paragraph 02.06A1 in FDM Part 1/[Sec 02 Codes And Regulations.pdf](#).
 - a. Fine arts is defined in Iowa Code 304A.8 as "sculpture, fountains, bas-reliefs, mosaics, frescoes, wall hangings, crafts, photography, pictures or other enhancements to be integrated into the total environment of the building or complex of buildings."
 - b. Iowa Code 304A.8 further defines fine arts not to include "the incidental ornamental detail of functional structural elements, or hardware and other accessories."
3. Fine arts may be incorporated in the building construction, either inside or on the exterior, or free-standing outside the structure.

03.13 SITE CONSIDERATIONS

A. GENERAL

1. Because the university administration determined the Project site with full regard to the Master plan, provide careful attention to the design of the Project with respect to the surrounding buildings, landscaping and open space
2. Locate building entrances and walks to coordinate with existing pedestrian traffic patterns.
3. Locate bicycle parking areas to coordinate with existing bicycle traffic patterns.
4. Locate building docks and service drives to coordinate with existing vehicular traffic patterns.
5. Locate building mechanical spaces to coordinate with existing utility line locations.
6. Follow recommendations of City of Ames Fire Department personnel with regard to the following issues.
 - a. Fire truck entry and truck turning radii
 - b. Water supply capability based on current test results
 - c. Location of post indicator valves and fire department hose connections
 - d. Location of fire annunciator panel(s)

B. SITE DESIGN CRITERIA

1. Provide minimum 8 foot wide walks.
2. Provide minimum 5 inch thick un-reinforced walks and other exterior slabs that are able to support snow removal equipment without cracking.
3. Design using gradually sloped walks or ramps instead of steps wherever possible to facilitate access and eliminate snow removal by hand.
4. Locate walks away from walls which may cause snow to drift.
 - a. Where walls are adjacent to walks, provide openings to facilitate snow removal.

- b. Where stairs cannot be avoided, design railings to facilitate snow removal.
5. Avoid surface drainage of storm water across walks.
6. Design using the Owner's standard bicycle rack and site furnishings.
 - a. See the Owner's Representative for details.
7. Provide service drives with a minimum inside radius of 35 feet.
8. Provide space for "Lodal" waste containers in service areas, recessed flush with the front edge of the loading dock.
9. If a "Lodal" waste container is located behind an overhead door, provide a radio controller of a frequency approved by the Owner's Representative.
10. Do not provide grass areas under low overhangs and elevated walkways.
11. Provide a mowing strip or equivalent around fixed objects in grass areas to eliminate hand trimming.
12. Use a maximum slope grade of 3:1 (horizontal:vertical); use 4:1 slope or less where possible.
13. Protect existing plant material to remain during construction.
14. Avoid window wells and below grade open structures unless approved by the Owner's Representative.
15. Connect roof drains to the storm sewer system.

03.14 SITE AND CLIMATE DESIGN DATA

A. IOWA STATE UNIVERSITY AT AMES, IOWA

1. The geographic location is approximately 42° 01' N latitude and 93° 38' W Longitude at elevation 950 feet above sea level.
2. The source of the following table of approximate solar angles (altitude) and azimuth (measured east of north) is the US Naval Observatory at <http://www.usno.navy.mil/USNO/astronomical-applications/data-services/alt-az-us>.

DATE	HOUR	ALTITUDE	AZIMUTH
March 21 and September 21	6:20 AM	0°	89°
	10:05 AM	38°	134°
	12:20 PM	48°	180°
	2:40 PM	38°	226°
	6:25 PM	0°	271°
June 21	4:40 AM	0°	57°
	10:25 AM	60°	120°
	12:15 PM	71°	180°
	2:10 PM	60°	241°
	7:50 PM	0°	303°
December 21	7:40 AM	0°	122°
	10:15 AM	19°	151°
	12:15 PM	25°	180°
	2:10 PM	19°	208°
	4:45 PM	0°	238°

3. For detailed temperature, precipitation and degree day information, see <http://www.wunderground.com/NORMS/DisplayNORMS.asp?AirportCode=KAMW&SafeCityName=Ames&StateCode=IA&Units=none&IATA=DSM> and <http://mesonet.agron.iastate.edu/climodat/index.phtml?&report=01&station=IA5493>.
4. For Heating and Cooling Degree Day (65° F Base) averages and totals by month for approximately the last 10 years, see data compiled by City of Ames Electric Services at <http://www.cityofames.org/ElectricWeb/EnergyGuy/DegreeDays.htm>.

B. IOWA SCHOOL FOR THE DEAF AT COUNCIL BLUFFS, IOWA

1. The geographic location is approximately 41° 13' N latitude and 95° 49' W Longitude at elevation 990 feet above sea level.

SECTION 03 SPACE AND SITE DESIGN

2. The source for the following table of approximate solar angles (altitude) and azimuth (measured east of north) is the US Naval Observatory at <http://www.usno.navy.mil/USNO/astronomical-applications/data-services/alt-az-us>.

DATE	HOUR	ALTITUDE	AZIMUTH
March 21 and September 21	6:30 AM	0°	90°
	10:10 AM	38°	133°
	12:30 PM	49°	180°
	2:55 PM	38°	228°
	6:35 PM	0°	271°
June 21	4:55 AM	0°	58°
	10:30 AM	60°	118°
	12:25 PM	72°	180°
	2:20 PM	60°	242°
	7:55 PM	0°	302°
December 21	7:50 AM	0°	122°
	10:15 AM	19°	149°
	12:20 PM	25°	180°
	2:30 PM	19°	211°
	4:55 PM	0°	239°

3. For detailed temperature, precipitation and degree day information, see http://www.wunderground.com/NORMS/DisplayNORMS.asp?AirportCode=KOMA&SafeCityName=Council_Bluffs&StateCode=IA&Units=none&IATA=OMA and <http://mesonet.agron.iastate.edu/climodat/index.phtml?&report=01&station=IA3290>.

C. IOWA LAKESIDE LABORATORY AT MILFORD, IOWA

1. The geographic location is approximately 43° 22' N latitude and 95° 11' W Longitude at elevation 1430 feet above sea level.
2. The source for the following table of approximate solar angles (altitude) and azimuth (measured east of north) is the US Naval Observatory at <http://www.usno.navy.mil/USNO/astronomical-applications/data-services/alt-az-us>.

DATE	HOUR	ALTITUDE	AZIMUTH
March 21 and September 21	6:25 AM	0°	89°
	10:15 AM	38°	136°
	12:30 PM	47°	180°
	2:40 PM	38°	224°
	6:30 PM	0°	271°
June 21	4:45 AM	0°	57°
	10:35 AM	60°	123°
	12:23 PM	70°	180°
	2:10 PM	60°	237°
	8:00 PM	0°	303°
December 21	7:55 AM	0°	123°
	10:35 AM	19°	155°
	12:20 PM	23°	180°
	2:05 PM	19°	206°
	4:45 PM	0°	237°

3. For detailed temperature, precipitation and degree day information, see <http://www.wunderground.com/NORMS/DisplayNORMS.asp?AirportCode=KSPW&SafeCityName=Milford&StateCode=IA&Units=none&IATA=3SE> and <http://mesonet.agron.iastate.edu/climodat/index.phtml?&report=01&station=IA5493>.

D. IOWA BRAILLE AND SIGHT SAVING SCHOOL AT VINTON, IOWA

1. The geographic location is approximately 42° 09' N latitude and 92° 01' W Longitude at elevation 800 feet above sea level.
2. The source for the following table of approximate solar angles (altitude) and azimuth (measured east of north) is the US Naval Observatory at <http://www.usno.navy.mil/USNO/astronomical-applications/data-services/alt-az-us>.

DATE	HOUR	ALTITUDE	AZIMUTH
March 21 and September 21	6:10 AM	0°	89°
	9:55 AM	38°	133°
	12:15 PM	48°	180°
	2:35 PM	38°	226°
	6:20 PM	0°	271°
June 21	4:35 AM	0°	57°
	10:15 AM	60°	119°
	12:10 PM	71°	180°
	2:05 PM	60°	241°
	7:45 PM	0°	303°
December 21	7:35 AM	0°	122°
	10:05 AM	19°	151°
	12:05 PM	24°	180°
	2:05 PM	19°	209°
	4:35 PM	0°	238°

3. For detailed temperature, precipitation and degree day information, see <http://www.wunderground.com/NORMS/DisplayNORMS.asp?AirportCode=KVTI&SafeCityName=Vinton&StateCode=IA&Units=none&IATA=CID> and <http://mesonet.agron.iastate.edu/climodat/index.phtml?&report=01&station=IA8568>.

END OF SECTION 03 SPACE AND SITE DESIGN